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Environmental Quality Board

west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Phone: (304) 926-0475
Fax: (304) 926-0479

Harold D. Ward, Cabinet Secretary
dep.wv.gov

December 3, 2025

CERTIFICATION

RE: Susan Shelton Perry v.
Director, Division of Air Quality, Department of Environmental Protection

TransGas Development Systems, LLC

APPEAL NO: 25-03-AQB

I, Laura Crowder, Director, Division of Air Quality, Department of Environmental Protection, in compliance with Chapter 22B, Article 1, Section 7 (e), Code of West Virginia, as amended, do hereby certify that the enclosed is a true and accurate reproduction of the record of the proceedings out of which the appeal arises including documents and correspondence in the Director's file relating to the matter in question.

Division of Air Quality

Laura M. Crowder

Digitally signed by: Laura M. Crowder
DN: CN = Laura M. Crowder email = Laura.M.Crowder@wv.gov C = US O = WV DEP OU = DAQ
Date: 2025.12.03 14:40:15 -05'00'

Laura M. Crowder
Director

LMC/srm
Enclosures

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1. Redacted Permit Application R13-3714

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : TransGas Development Systems, LLC

[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): New Facility
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): New Facility

- Type of NSR Application (check all that apply):
  - ☑ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Application:
  - ☐ Title V Initial
  - ☐ Title V Renewal
  - ☐ Administrative Amendment**
  - ☐ Minor Modification**
  - ☐ Significant Modification**
  - ☐ Off Permit Change

****If the box above is checked, include the Title V revision information as ATTACHMENT S to the combined NSR/Title V application.**

- Payment Type:
  - ☑ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)

    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE
    Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☑ Responsible Official/Authorized Representative
    - Name: Adam Victor
    - Email: adam@tgds.com
    - Phone Number: (917) 816-3700
  - ☑ Company Contact
    - Name: Adam Victor, Jr.
    - Email: avj@adamsforkenergy.com
    - Phone Number: (917) 816-3700
  - ☑ Consultant
    - Name: Patrick Ward
    - Email: PEWard@potesta.com
    - Phone Number: (304) 342-1400

REGULATION 13 PERMIT APPLICATION FOR THE CONSTRUCTION OF ADAMS FORK HARLESS DATA CENTER ENERGY CAMPUS MINGO COUNTY, WEST VIRGINIA

REDACTED VERSION

Prepared for:

TransGas Development Systems, LLC
630 First Avenue, Suite 30C
New York, New York 10016-3799

Prepared by:

Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
Email: potesta@potesta.com

Project No. 0101-22-0132-003B

March 24, 2025

POTESTA

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Attachments not applicable to this submission: Attachment R, Authority Forms and Attachment S, Title V Permit Revision Information.

SECTION I - III

APPLICATION FOR NSR PERMIT

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
TransGas Development Systems, LLC

2. Federal Employer ID No. ***(FEIN):***
20343110

3. Name of facility *(if different from above):*
Adams Fork Data Center Energy Campus

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
630 First Avenue, Suite 30C
New York, New York 10016-3799

5B. Facility's present physical address:
2002 Twisted Gun Road
Wharncliffe, WV 25651

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

➪ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

➪ If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: No

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☐ **YES** ☐ **NO**

➪ If **YES,** please explain: Applicant has an option on the site with the current owner.

➪ If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Off-grid Power Generation

10. North American Industry Classification System **(NAICS)** code for the facility:
221112

11A. DAQ Plant ID No. (for existing facilities only):
New Facility

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
New Facility

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- ➪ For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- ➪ For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

The facility will be located on the property at the Harless Industrial Park near Holden, West Virginia. The site can be accessed from U.S. Route 119 going South from Holden. Turn left onto 22 Mine Road. The proposed location is adjacent to Mohawk Industries.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Not Applicable	Holden	Mingo
12.E. UTM Northing (KM): 4,179.00211	12F. UTM Easting (KM): 401.42022	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
This application is for the construction of the facility.

14A. Provide the date of anticipated installation or change: 01/01/2026 ➪ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: 01/01/2027

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
24 Hours Per Day 7 Days Per Week Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP **–** Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**

➪ Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**

➪ Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

➪ For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify Engines 1 through 117.

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☒ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☒ Other Collectors, specify Control System

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☒ **YES** ☐ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below: Not Required

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative**, hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry. I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE: _____ DATE: 3/29/25

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Adam Victor		35C. Title: President
35D. E-mail: adam@igds.com	35E. Phone: (917) 816-3700	35F. FAX: Use Email
36A. Printed name of contact person (if different from above): Same as above		36B. Title:
36C. E-mail:	36D. Phone:	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ Attachment A: Business Certificate
- ☐ Attachment B: Map(s)
- ☐ Attachment C: Installation and Start Up Schedule
- ☒ Attachment D: Regulatory Discussion
- ☒ Attachment E: Plot Plan
- ☒ Attachment F: Detailed Process Flow Diagram(s)
- ☒ Attachment G: Process Description
- ☐ Attachment H: Material Safety Data Sheets (MSDS)
- ☐ Attachment I: Emission Units Table
- ☒ Attachment J: Emission Points Data Summary Sheet
- ☒ Attachment K: Fugitive Emissions Data Summary Sheet
- ☐ Attachment L: Emissions Unit Data Sheet(s)
- ☐ Attachment M: Air Pollution Control Device Sheet(s)
- ☒ Attachment N: Supporting Emissions Calculations
- ☒ Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans
- ☒ Attachment P: Public Notice
- ☒ Attachment Q: Business Confidential Claims
- ☐ Attachment R: Authority Forms
- ☐ Attachment S: Title V Permit Revision Information
- ☒ Application Fee

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ *Forward 1 copy of the application to the Title V Permitting Group and:*
- ☐ *For Title V Administrative Amendments:*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
- ☐ *For Title V Minor Modifications:*
  - ☐ *Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt.*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
- ☐ *For Title V Significant Modifications processed in parallel with NSR Permit revision:*
  - ☐ *NSR permit writer should notify a Title V permit writer of draft permit.*
  - ☐ *Public notice should reference both 45CSR13 and Title V permits.*
  - ☐ *EPA has 45 day review period of a draft permit.*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

BUSINESS CERTIFICATE

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
TRANSGAS DEVELOPMENT SYSTEMS, LLC
630 1ST AVE APT 30G
NEW YORK, NY 10016-3799

BUSINESS REGISTRATION ACCOUNT NUMBER: **2218-0756**

This certificate is issued on: 06/29/2010

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with W.Va. Code § 11-12.

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.1
L1333508864

ATTACHMENT B

SITE LOCATION MAP

Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE, Charleston, WV 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
E-Mail: potesta@potesta.com

TransGas Development Systems, LLC
Adams Fork Harless Data Center Energy Campus
Holden, West Virginia
Project No. 0101-22-0132-003B

ATTACHMENT C

INSTALLATION AND STARTUP SCHEDULE

ATTACHMENT C

INSTALLATION AND START UP SCHEDULE

Construction of the facility will begin after receipt of Construction Permit from West Virginia Department of Environmental Protection, Division of Air Quality, and other necessary regulatory approvals on or near January 1, 2026. Operations will commence approximately 12 months after the beginning of construction.

ATTACHMENT D

REGULATORY DISCUSSION

ATTACHMENT D

REGULATORY DISCUSSION

The facility proposed herein, or portions of the facility, may be subject to the following regulations based on a review of potential air quality regulations (see No. 1 and 2). Additionally, there are a few regulations which the source may not be subject to which are also listed below in No. 3.

1. State Regulations

   A. 45CSR4 – "To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors"

   B. 45CSR13 – "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation"

   C. 45CSR16 – "Standards of Performance for New Stationary Sources"

   D. 45CSR20 – "Good Engineering Practice as Applies to Stack Heights"

   E. 45SCR30 – "Requirements for Operation Permits"

   F. 45CSR31 – "Confidential Information"
   This application contains confidential information. This claim of confidentiality is made in accordance with the requirements of 45CSR31.

   G. 45CSR34 – "Emission Standards for Hazardous Air Pollutants"

2. Federal Regulations

   A. 40CFR60 Subpart A – General Provisions

   B. 40CFR60 Subpart IIII - Standard of Performance for Stationary Compression Ignition Internal Combustion Engines

   C. 40CFR63, Subpart ZZZZ – National Emissions Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

3. Non-Applicable Regulations or Exemptions Apply

A. 45CSR40 – Contol of Ozone Season Nitrogen Oxide Emissions
The reciprocating internal combustion engines proposed for this facility do not appear to be considered as a unit per the definition contained in section 2.30 where a unit is defined as a stationary fossil fuel-fired boiler, combustion turbine, or combined cycle system. The engines also have a maximum heat input of less than 250 MMBtu/hr as stated in Section 4.1. Furthermore, the units do not appear to be subject to 40CFR97.

B. 40CFR97, Subpart DDDDD - CSAPR SO2 Group 2 Trading Program and Subpart EEEEE – CSAPR Nox Ozone Season Group 2 Trading Program. The nameplate capacity of the generators attached to each unit is 25 MWe. Also, the units (reciprocating internal combustion engines) do not appear to be regulated by the rule.

C. 45CSR33 – Acid Rain Provisions and Permits
This rule does not appear to apply due to the New Unit Exemption in 40CFR72.

D. 40CFR72, Acid Rain Program, Subpart A, Section 72.7, New Unit Exemption, appears to exempt the units from applicability based on serving a generator of 25 MWe or less, not burning coal or coal-derived fuel, and burns fuel with sulfur of 0.05 percent or less by weight.

E. 40CFR60 Subpart Kc – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced After October 4, 2023. Does not apply due to low vapor pressure of diesel.

ATTACHMENT E

PLOT PLANS

Power House	Engine IDs	Emission ID	Control ID
1	ENG1, ENG2, ENG3	E1, E2, E3	C1, C2, C3
2	ENG4, ENG5, ENG6	E4, E5, E6	C4, C5, C6
3	ENG7, ENG8, ENG9	E7, E8, E9	C7, C8, C9
4	ENG10, ENG11, ENG12	E10, E11, E12	C10, C11, C12
5	ENG13, ENG14, ENG15	E13, E14, E15	C13, C14, C15
6	ENG16, ENG17, ENG18	E16, E17, E18	C16, C17, C18
7	ENG19, ENG20, ENG21	E19, E20, E21	C19, C20, C21
8	ENG22, ENG23, ENG24	E22, E23, E24	C22, C23, C24
9	ENG25, ENG26, ENG27	E25, E26, E27	C25, C26, C27
10	ENG28, ENG29, ENG30	E28, E29, E30	C28, C29, C30
11	ENG31, ENG32, ENG33	E31, E32, E33	C31, C32, C33
12	ENG34, ENG35, ENG36	E34, E35, E36	C34, C35, C36
13	ENG37, ENG38, ENG39	E37, E38, E39	C37, C38, C39
14	ENG40, ENG41, ENG42	E40, E41, E42	C40, C41, C42
15	ENG43, ENG44, ENG45	E43, E44, E45	C43, C44, C45
16	ENG46, ENG47, ENG48	E46, E47, E48	C46, C47, C48
17	ENG49, ENG50, ENG51	E49, E50, E51	C49, C50, C51
18	ENG52, ENG53, ENG54	E52, E53, E54	C52, C53, C54
19	ENG55, ENG56, ENG57	E55, E56, E57	C55, C56, C57
20	ENG58, ENG59, ENG60	E58, E59, E60	C58, C59, C60
21	ENG61, ENG62, ENG63	E61, E62, E63	C61, C62, C63
22	ENG64, ENG65, ENG66	E64, E65, E66	C64, C65, C66
23	ENG67, ENG68, ENG69	E67, E68, E69	C67, C68, C69
24	ENG70, ENG71, ENG72	E70, E71, E72	C70, C71, C72
25	ENG73, ENG74, ENG75	E73, E74, E75	C73, C74, C75
26	ENG76, ENG77, ENG78	E76, E77, E78	C76, C77, C78
27	ENG79, ENG80, ENG81	E79, E80, E81	C79, C80, C81
28	ENG82, ENG83, ENG84	E82, E83, E84	C82, C83, C84
29	ENG85, ENG86, ENG87	E85, E86, E87	C85, C86, C87
30	ENG88, ENG89, ENG90	E88, E89, E90	C88, C89, C90
31	ENG91, ENG92, ENG93	E91, E92, E93	C91, C92, C93
32	ENG94, ENG95, ENG96	E94, E95, E96	C94, C95, C96
33	ENG97, ENG98, ENG99	E97, E98, E99	C97, C98, C99
34	ENG100, ENG101, ENG102	E100, E101, E102	C100, C101, C102
35	ENG103, ENG104, ENG105	E103, E104, E105	C103, C104, C105
36	ENG106, ENG107, ENG108	E106, E107, E108	C106, C107, C108
37	ENG109, ENG110, ENG111	E109, E110, E111	C109, C110, C111
38	ENG112, ENG113, ENG114	E112, E113, E114	C112, C113, C114
39	ENG115, ENG116, ENG117	E115, E116, E117	C115, C116, C117

TANKS

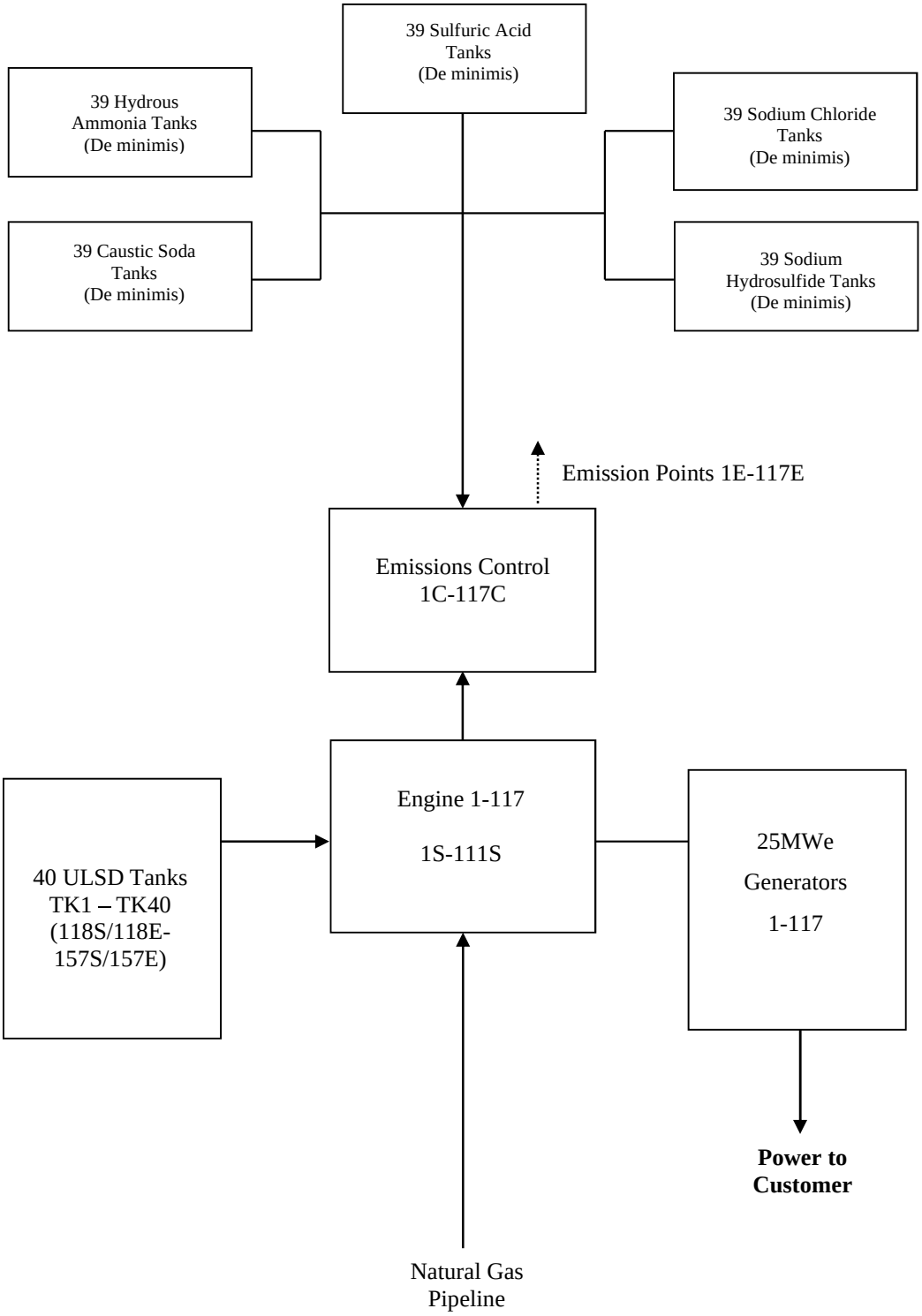
1. Ultra Low Sulfur Diesel will be stored in 40 tanks located on the property near each powerhouse. The tanks are uncontrolled. The tank identification numbers are TK1 – TK40 (118S through 157S with emission points 118E through 157E).
2. Each powerhouse 1 through 39 will have one set of emission control fluid tanks for Hydrous Ammonia, Caustic Soda, Sulfuric Acid, Sodium Chloride, and Sodium Hydrosulfide. These tanks are de minimis.

POTESTA
7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

PLOT PLAN
TransGas Development Systems, LLC
Adams Fork Harless Data Center Energy Campus
Holden, West Virginia
Project No. 0101-22-0132-003B

ATTACHMENT F

PROCESS FLOW DIAGRAM(S)



Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE, Charleston, WV 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
E-Mail: potesta@potesta.com

TransGas Development Systems, LLC
Adams Fork Harless Data Center Energy Campus
Holden, West Virginia
Project No. 0101-22-0132-003B

ATTACHMENT G

PROCESS DESCRIPTION

ATTACHMENT G

PROCESS DESCRIPTION

The facility proposed herein is a unique, off-grid, electric generating facility designed to provide power to adjacent data center operations. The facility encompasses 117 engines (Source Numbers 1S through 117S) with 114 engines operating full-time and 3 engines in reserve. Each engine has a proposed control strategy (Control Numbers 1C through 117C) and vent through their own exhaust stack (Emissions Point 1E through 117E). The facility will contain 39 powerhouses with each containing 3 generator setups with each generator having a nameplate capacity of 25 MWe. Actual power generation will depend on the operating mode of the engines. The operating modes of the engines are more fully described in Attachment L. The control systems for each engine are described in Attachment M.

The engines will operate on ultra-low sulfur diesel and natural gas depending on the operating status. Ultra-low sulfur diesel will be stored in 40 tanks (TK1 through TK40, 118S-157S, 118E-157E) on the property. Natural gas will be delivered via pipeline. Tanks for control device liquids will be located at each powerhouse so there will be 39 tanks of each of hydrous ammonia, caustic soda, sulfuric acid, sodium chlorite, and sodium hydrosulfide. These tanks are considered de minimis. Liquids and supplies will be trucked to the site.

There is no steam-power production at the site. Cooling will be provided by mine pool water as needed; therefore, there is no requirement for cooling towers.

ATTACHMENT H

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet

Sodium hydrosulfide solution

MSDS Number 8000TDC (Revised: 1/23/04) 6 Pages

Section 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

1.1 Product Name .....**Sodium hydrosulfide solution**
Chemical Family ..... Inorganic salt solution
Synonyms ..... KI-300 depressant, NaHS, sodium hydrogen sulfide
Formula ..... NaHS

1.2 Manufacturer .....Tessenderlo Davison Chemicals, LLC.
1916 Farmerville Highway
Ruston, Louisiana 71270
Information ..... (318) 242-5305

1.3 Emergency Contact ..... (800) 877-1737 (Tessenderlo Kerley)
(800) 424-9300 (CHEMTREC)

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

2.1 Chemical Ingredients (% by wt.)

Sodium hydrosulfide	CAS #:16721-80-5	20-45%
Water	CAS #:7732-18-5	55-80%

(See Section 8 for exposure guidelines)

Section 3: HAZARDS IDENTIFICATION

NFPA: Health - 3 Flammability - 2 Reactivity - 1

EMERGENCY OVERVIEW

Warning: Solution is highly alkaline
Contains hydrogen sulfide , a highly toxic gas.
Eye contact will cause marked eye irritation and possibly severe corneal damage. Skin contact will result in irritation and possible corrosion of the skin. Ingestion will irritate/burn mouth, throat and gastrointestinal tract. Contact with stomach acid will cause hydrogen sulfide vapors to be released. Heating or acid will cause hydrogen sulfide gas to evolve. Dilution of NaHS with water will also cause increased evolution of hydrogen sulfide.

Section 3: HAZARDS IDENTIFICATION, Cont.

3.1 POTENTIAL HEALTH EFFECTS

EYE: Contact with the eyes will cause marked eye irritation and possibly severe corneal damage.

SKIN CONTACT: Contact with the skin will cause skin irritation or burning sensation. Prolonged contact will result in corrosion of the skin.

SKIN ABSORPTION: Absorption is unlikely to occur.

INGESTION: Ingestion will result in severe burning and corrosion of mouth, throat and the gastrointestinal tract. If the ingested material contacts stomach acid, highly toxic hydrogen sulfide gas will be evolved.

INHALATION: Product solution and vapors contain highly toxic hydrogen sulfide gas. Exposure to this gas causes, headaches, nausea, dizziness and vomiting. Continued exposure can lead to loss of consciousness and death..

CHRONIC EFFECTS/CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC or OSHA.

Section 4: FIRST AID MEASURES

4.1 EYES: Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye. Obtain immediate medical attention.

4.2 SKIN: Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention

4.3 INGESTION: DO NOT INDUCE VOMITING. If victim is conscious, immediately give 2 to 4 glasses of water. If vomiting does occur, repeat fluid administration. Obtain immediate medical attention.

4.4 INHALATION: Remove victim from contaminated atmosphere. If breathing is labored, administer oxygen. If breathing has ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

Section 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

FLASH POINT: Not flammable **METHOD USED:** NA

5.2 FLAMMABLE LIMITS **Hydrogen sulfide** **LFL**: 4% **UFL**: 44%

5.3 EXTINGUISHING MEDIA: Water spray or foam or as appropriate for combustibles involved in fire.

5.4 FIRE & EXPLOSIVE HAZARDS: Solution is non-flammable. However if these solutions are exposed to heat or acids, hydrogen sulfide will be released and may form explosive mixtures with air (see above).

Keep containers/storage vessels in fire area cooled with water spray. Heating may cause the release of hydrogen sulfide vapors.

Section 5: FIRE FIGHTING MEASURES (Cont.)

5.5 FIRE FIGHTING EQUIPMENT: Because of the possible presence of toxic gases and the corrosive nature of the product, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Small releases: Confine and absorb small releases on sand earth or other inert absorbent. Oxidize residual reactive sulfides with a weak (3-5%) hydrogen peroxide solution.

6.2 Large releases: Wear proper protective equipment. Confine area to qualified personnel. Shut off release if safe to do so. Dike spill area to prevent runoff into sewers, drains (potential explosive mixtures of hydrogen sulfide in confined spaces) or surface waterways (potential aquatic toxicity). Recover as much of the solution as possible. Treat remaining material as a small release (above).

Section 7: HANDLING and STORAGE

7.1 Handling: Wear proper protective equipment (See Section 8). Avoid breathing product vapors. Avoid contact with skin and eyes. Use only in a well ventilated area. Dilute product only in enclosed containers. Wash thoroughly after handling.

7.2 Storage: Store in well ventilated areas. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote and smaller containers out of direct sunlight at moderate temperatures [<80º F (27º C)]. (See Section 10.4 for materials of construction)

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

8.1 RESPIRATORY PROTECTION: If working near open container or storage vessel opening or open tank truck dome cover, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent).

8.2 SKIN PROTECTION: Neoprene rubber gloves, chemical suit and boots should be worn to prevent contact with the liquid. Wash contaminated clothing prior to reuse. Contaminated leather shoes cannot be cleaned and should be discarded.

8.3 EYE PROTECTION: Chemical goggles and a full face shield.

8.4 EXPOSURE GUIDELINES:

	OSHA		ACGIH	
	TWA	STEL	TLV	STEL
Hydrogen sulfide	20 ppm (ceiling)		10 ppm (ceiling)	

8.5 ENGINEERING CONTROLS: Use adequate exhaust ventilation to prevent inhalation of product vapors. Where feasible scrub process or storage vessel vapors with caustic solution.
Maintain eyewash/safety shower in areas where chemical is handled.

Section 9: PHYSICAL and CHEMICAL PROPERTIES

9.1 APPEARANCE:	Yellow to dark green liquid.
9.2 ODOR:	Strong hydrogen sulfide (rotten egg) odor.
9.3 BOILING POINT:	253 °F(122.8 °C) - 269 °F (131.7 °C)
9.4 VAPOR PRESSURE:	17 mm Hg @ 68 °F (20 °C)
9.5 VAPOR DENSITY: (Air = 1.0)	1.17
9.6 SOLUBILITY IN WATER:	Complete
9.7 SPECIFIC GRAVITY:	1.152 - 1.303 (9.6 - 10.9 lbs/gal)
9.8 FREEZING POINT:	0° F (-17.8° C) - 20% 56º F (13.3º C) - 45%
9.9 pH:	11.5 - 12.5
9.10 VOLATILE:	Not applicable

Section 10: STABILITY and REACTIVITY

10.1 STABILITY: This is a stable material

10.2 HAZARDOUS POLYMERIZATION: Will not occur.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS: Heating this product will evolve hydrogen sulfide. Fire conditions will also cause the production of sulfur dioxide. Hydrogen sulfide (4-44%) may form flammable mixtures with air.

10.4 INCOMPATIBILITY: Acids will cause the release of highly toxic hydrogen sulfide. Sodium hydrosulfide solution is not compatible with copper, zinc, aluminum or their alloys (i.e. bronze, brass, galvanized metals, etc.). Corrosive to steel above 150º F (65.5º C). These materials of construction should not be used in handling systems or storage containers for this product (SEE Section 7.2, Storage). Dilution of NaHS with water will increase the evolution of hydrogen sulfide. Dilution should be done in an enclosed container.

Section 11: TOXICOLOGICAL INFORMATION

11.1 ORAL: Data not available

11.2 DERMAL: Data not available

11.3 INHALATION: INH-RAT LC_{50}: 444 ppm (hydrogen sulfide)
INH-MOUSE LC_{50}: 1,500 mg/m^3 18 minutes
INH-RAT LC_{50}: 1,500 mg/m^3 14 minutes

11.4 CHRONIC/CARCINOGENICITY: No evidence available

11.5 TERATOLOGY: Data not available

11.6 REPRODUCTION: Data not available

11.7 MUTAGENICITY: Data not available

Section 12: ECOLOGICAL INFORMATION

Static acute 96 hour-LC_{50} for mosquito fish is 206 mg/L. (Tl_m - fresh water)
LC_{50} fly inhalation 1,500 mg/m^3, 7 minutes
TL_m Gammarus 0.84 mg/L, 96 hours (hydrogen sulfide)
TL_m Ephemera 0.316 mg/L, 96 hours (hydrogen sulfide)
TL_m Flathead minnow 0.071 – 0.55 mg/L @ 6-24ºC, 96 hour flow through bioassay (hydrogen sulfide)
TL_m Bluegill 0.0090 – 0.0140 mg/L @ 20-22ºC, 96 hour flow through bioassay (hydrogen sulfide)
TL_m Brook trout 0.0216 – 0.0308 mg/L @ 8-12.5ºC, 96 hour flow through bioassay (hydrogen sulfide)

Section 13: DISPOSAL CONSIDERATIONS

If released to the environment for other than its intended purpose, this product contains some reactive sulfides which may be in sufficient quantity to meet the definition of a D003, hazardous waste.

Section 14: TRANSPORT INFORMATION

14.1 DOT Shipping Name: Corrosive liquids, toxic, n.o.s.

14.2 DOT Hazard Class: 8

14.3 UN/NA Number: UN2922
UN2949 (IMDG - over water)

14.4 Packing Group: II

14.5 DOT Placard: Corrosive

14.6 DOT Label(s): Corrosive
Toxic

14.7 IMO Shipping Name: Sodium hydrosulphide solution

14.8 RQ (Reportable Quantity): 5,000 lbs (2268 Kg) 100% basis
[2,604 gal (20%) 1,019 gal (45%)]

14.9 RR STCC Number: 28-123-33/49-352-04 (international)

Section 15: REGULATORY INFORMATION

15.1 OSHA: This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.

15.2 SARA TITLE III: a. **EHS** (Extremely Hazardous Substance) List: No

Section 15: REGULATORY INFORMATION (Cont.)

	b.	Section 311/312, (Tier I,II) Categories: Immediate (acute) Fire Sudden release Reactivity Delayed (chronic)	Yes Yes No Yes No
	c.	Section 313 (Toxic Release Report-Form R):	No
	d.	**TPQ** (Threshold Planning Quantity):	No
15.3	**CERCLA/SUPERFUND:**	RQ (Reportable Quantity)	5,000 lbs (2270 Kg)
15.4	**TSCA** (Toxic Substance Control Act) Inventory List:		Yes
15.5	**RCRA** (Resource Conservation and Recovery Act) Status:		D003 (See Section 13)
15.6	**WHMIS** (Canada) Hazard Classification:		E, D1
15.7	**DOT** Hazardous Material: (See Section 14)		Yes
15.8	**CAA** Hazardous Air Pollutant (HAP)		No

Section 16: OTHER INFORMATION

REVISIONS: The entire MSDS was reformatted to comply to ANSI Standard Z400.1-1993.

Revised Sections 1.1, 8.3, 11, 12, 5/7/02
Revised pH range in Section 8, 6/19/02
Revised shipping info & RQ data, 1/15/03
Revised Section 3, Emergency Overview & Section 10.4 to include dilution caution. 1/23/04

THE INFORMATION PUBLISHED IN THIS MATERIAL SAFETY DATA SHEET HAS BEEN COMPILED FROM OUR EXPERIENCE AND OSHA, ANSI, NFPA, DOT, ERG, AND CHRIS**.** IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE SUITABILITY OF THIS INFORMATION FOR THE ADOPTION OF NECESSARY SAFETY PRECAUTIONS. WE RESERVE THE RIGHT TO REVISE MATERIAL SAFETY DATA SHEETS PERIODICALLY AS NEW INFORMATION BECOMES AVAILABLE.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 7.11
Revision Date 15.10.2024
Print Date 16.10.2024
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Sodium chlorite (25% solution in water) for synthesis

Product Number : 8.14815
Catalogue No. : 814815
Brand : Millipore

UFI : CW60-J6H9-Q99X-S01A

REACH No. : This product is a mixture. REACH Registration Number see section 3.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Chemical for synthesis

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Chemical Pvt Limited
Industrial Area, Anekal Taluka
Plot No 12,
12 Bommasandra - Jigani Link Road
560100 BANGALORE
INDIA

1.4 Emergency telephone

Emergency Phone # : 000 800 1007 141 (CHEMTREC)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Corrosive to Metals, (Category 1)	H290: May be corrosive to metals.
Acute toxicity, (Category 4)	H302: Harmful if swallowed.
Acute toxicity, (Category 3)	H311: Toxic in contact with skin.
Skin corrosion, (Category 1)	H314: Causes severe skin burns and eye damage.
Serious eye damage, (Category	H318: Causes serious eye damage.

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1)

Specific target organ toxicity - repeated exposure, (Category 2), spleen	H373: May cause damage to organs through prolonged or repeated exposure.
Short-term (acute) aquatic hazard, (Category 1)	H400: Very toxic to aquatic life.
Long-term (chronic) aquatic hazard, (Category 1)	H410: Very toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram

Signal Word	Danger

Hazard Statements

H290	May be corrosive to metals.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H373	May cause damage to organs (spleen) through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements

P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312	IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/ attention if you feel unwell.

Supplemental Hazard information (EU)

EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

Reduced Labeling (<= 125 ml)

Pictogram

Signal Word	Danger

Hazard Statements

H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.

Precautionary Statements

P280	Wear protective gloves/ protective clothing/ eye protection/ face

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protection.

P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard information (EU)

EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
Toxicological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Component		Classification	Concentration
sodium chlorite			
CAS-No. EC-No.	7758-19-2 231-836-6 *	Ox. Sol. 1; Acute Tox. 3; Acute Tox. 2; Skin Corr. 1B; Eye Dam. 1; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H271, H301, H310, H314, H318, H373, H400, H410	>= 25 - < 30 %

*A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, or the annual tonnage does not require a registration.

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

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In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Hydrogen chloride gas
Sodium oxides
Not combustible.
Fire may cause evolution of:
Hydrogen chloride gas
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

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6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

No metal containers. No metal containers.
Protected from light.Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Do not store near acids.

Recommended storage temperature see product label.

Storage class

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

8.2 Exposure controls

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

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Full contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Filter B-(P3)

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Physical state	liquid
b)	Color	colorless
c)	Odor	weak
d)	Melting point/freezing point	Melting point: < -3 °C
e)	Initial boiling point and boiling range	ca.>= 100 °C at 1.013 hPa
f)	Flammability (solid, gas)	No data available
g)	Upper/lower flammability or explosive limits	No data available
h)	Flash point	Not applicable
i)	Autoignition temperature	Not applicable
j)	Decomposition temperature	No data available
k)	pH	ca.12 - 13 at 20 °C

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l)	Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: No data available
m)	Water solubility	at 20 °C soluble
n)	Partition coefficient: n-octanol/water	Not applicable
o)	Vapor pressure	ca.20 hPa at 20 °C
p)	Density	ca.1,2 g/cm3 at 20 °C
	Relative density	No data available
q)	Relative vapor density	No data available
r)	Particle characteristics	No data available
s)	Explosive properties	Not classified as explosive.
t)	Oxidizing properties	Oxidizing potential

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
explosible after loss of solvent content.
Contact with acids liberates very toxic gas.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Generates dangerous gases or fumes in contact with:
Acids
Release of:
chlorine dioxide
Violent reactions possible with:
combustible substances
Cyanides
sulfur
ammonium compounds
phosphorus
Organic Substances
oxidisable substances
Chlorine
Metals
in powder form
Violent reactions possible with:
Generates dangerous gases or fumes in contact with:
Acids
The generally known reaction partners of water.

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10.4 Conditions to avoid
no information available

10.5 Incompatible materials
Contact with metals liberates hydrogen gas.Metals

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Mixture

Acute toxicity
Acute toxicity estimate Oral - 1.114 mg/kg
(Calculation method)
Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
Symptoms: Possible symptoms:, mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract
Acute toxicity estimate Dermal - 525,49 mg/kg
(Calculation method)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
Remarks: Mixture causes serious eye damage.
Risk of blindness!

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Mixture may cause damage to organs through prolonged or repeated exposure.
- spleen

Aspiration hazard
No data available

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article

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57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Components

sodium chlorite

Acute toxicity
LD50 Oral - Rat - male and female - 284 mg/kg
(OECD Test Guideline 401)
Acute toxicity estimate Oral - 284 mg/kg
(ATE value derived from LD50/LC50 value)
Inhalation: No data available
LD50 Dermal - Rabbit - male and female - 134 mg/kg
(US-EPA)
Acute toxicity estimate Dermal - 134 mg/kg
(ATE value derived from LD50/LC50 value)

Skin corrosion/irritation
Skin - Rabbit
Result: Corrosive after 3 minutes to 1 hour of exposure - 4 h
(US-EPA)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Irreversible effects on the eye
Remarks: Aqueous solution
(ECHA)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: Does not cause skin sensitization.
(OECD Test Guideline 406)

Germ cell mutagenicity
Method: OECD Test Guideline 475
Species: Mouse - male and female - Bone marrow
Result: negative

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.
- spleen

Aspiration hazard
No data available

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SECTION 12: Ecological information

12.1 Toxicity

Mixture
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties
Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects
No data available

Components

sodium chlorite

Toxicity to fish	flow-through test LC50 - Cyprinodon variegatus (sheepshead minnow) - 105 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - < 1 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test ErC50 - Pseudokirchneriella subcapitata (green algae) - 21,5 mg/l - 72 h (OECD Test Guideline 201)
	static test EC10 - Pseudokirchneriella subcapitata (green algae) - 4,8 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	Respiration inhibition EC50 - activated sludge - > 100 mg/l - 3 h (OECD Test Guideline 209)

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SECTION 13: Disposal considerations

13.1 Waste treatment methods
No data available

SECTION 14: Transport information

14.1 UN number
ADR/RID: 1908 IMDG: 1908 IATA: 1908

14.2 UN proper shipping name
ADR/RID: CHLORITE SOLUTION
IMDG: CHLORITE SOLUTION
IATA: Chlorite solution

14.3 Transport hazard class(es)
ADR/RID: 8 IMDG: 8 IATA: 8

14.4 Packaging group
ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards
ADR/RID: no IMDG Marine pollutant: no IATA: no

14.6 Special precautions for user
Tunnel restriction code : (E)

Further information : No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

National legislation

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	E1	ENVIRONMENTAL HAZARDS

Other regulations
Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment
For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements

H271	May cause fire or explosion; strong oxidizer.
H301	Toxic if swallowed.

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H310	Fatal in contact with skin.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Classification of the mixture		**Classification procedure:**
Met. Corr.1	H290	Based on product data or assessment
Acute Tox.4	H302	Calculation method
Acute Tox.3	H311	Calculation method
Skin Corr.1	H314	Based on product data or assessment
Eye Dam.1	H318	Based on product data or assessment

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STOT RE2	H373	Calculation method
Aquatic Acute1	H400	Calculation method
Aquatic Chronic1	H410	Calculation method

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Safety Data Sheet

Sulfuric Acid 36-37% (w/w)

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sulfuric Acid 36-37% (w/w)

Synonyms/Generic Names: Battery Acid, Dihydrogen Sulfate, Oil of Vitriol

Product Number: 9624

Product Use: Industrial, Manufacturing or Laboratory use

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd.
Columbus, WI. 53925

For More Information: 920-623-2140 (Monday-Friday 8:00-4:30)
www.columbuschemical.com

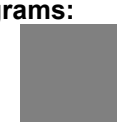
In Case of Emergency Call: CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

2. HAZARDS IDENTIFICATION

Hazard Not Otherwise Classified (HNOC): None

Signal Words: Danger

Pictograms:



GHS Classification:

Skin corrosion	Category 1A
Serious eye damage	Category 1
Acute aquatic toxicity	Category 3

GHS Label Elements, including precautionary statements:

Hazard Statements:

H314	Causes severe skin burns and eye damage.
H402	Harmful to aquatic life.

Precautionary Statements:

P260	Do not breathe mists.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do not induce vomiting.

P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physician.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local regulations.

Potential Health Effects

Eyes	Causes severe eye burns.
Inhalation	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	Causes skin burns.
Ingestion	May be harmful if swallowed.

NFPA Ratings

Health	3
Flammability	0
Reactivity	2
Specific hazard	W

HMIS Ratings

Health	3
Fire	0
Reactivity	2

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS# / ELINCS#	Formula	Molecular Weight
Sulfuric Acid	36-37	7664-93-9	231-939-5	H_2SO_4	98.08 g/mol
Water	Balance	7732-18-5	231-791-2	H_2O	18.00 g/mol

4. FIRST-AID MEASURES

Eyes	Immediately rinse with plenty of water for at least 15 minutes and get medical attention immediately.
Inhalation	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.
Skin	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and wash using soap. Get medical attention immediately.
Ingestion	**Do Not Induce Vomiting!** Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media	Product is not flammable. Use appropriate media for adjacent fire. Cool unopened containers with water.
Special protective equipment and precautions for firefighters	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.
Specific hazards arising from the chemical	Emits toxic fumes (sulfur oxides, hydrogen sulfide gas) under fire conditions. (See also Stability and Reactivity section).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	See section 8 for recommendations on the use of personal protective equipment.
Environmental precautions	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
Methods and materials for containment and cleaning up	Neutralize spill with sodium bicarbonate or lime. Absorb spill with noncombustible absorbent material, then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

7. HANDLING AND STORAGE

Precautions for safe handling
See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of aerosols.

Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls:

Component	Exposure Limits	Basis	Entity
Sulfuric Acid	0.2 mg/m^3	TLV	ACGIH
	1 mg/m^3	PEL	OSHA
	1 mg/m^3`	REL	NIOSH
	15 mg/m^3	IDLH	OSHA

TWA: Time Weighted Average over 8 hours of work.
TLV: Threshold Limit Value over 8 hours of work.
REL: Recommended Exposure Limit
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit during x minutes.
IDLH: Immediately Dangerous to Life or Health
WEEL: Workplace Environmental Exposure Levels
CEIL: Ceiling

Personal Protection

Eyes	Wear chemical safety glasses or goggles, and face shield.
Inhalation	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
Skin	Wear nitrile or rubber gloves, and full body suit. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Other	Not Available

Other Recommendations
Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Clear, colorless liquid.
Odor	Odorless.
Odor threshold	Not Available
pH	~1
Melting point/freezing point	Not Available
Initial boiling point and boiling range	Not Available
Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upper/lower flammability or explosive limit	Not Explosive
Vapor pressure	Not Available
Vapor density	Not Available
Specific gravity	1.2720
Solubility (ies)	Soluble in water.
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Possibility of Hazardous Reactions	Will not occur.
Conditions to Avoid	Moisture.
Incompatible Materials	Bases, halides, organic material, carbides, chlorates, fulminates, nitrates, picrates, cyanides, cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phosphorus (III) oxide, powdered metals.
Hazardous Decomposition Products	Sulfur oxides, hydrogen sulfide gas.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Skin	Not Available
Eyes	Not Available
Respiratory	Not Available
Ingestion	Not Available

Carcinogenicity

IARC	1: Carcinogenic to humans (sulfuric acid aerosol).
ACGIH	A2: Suspected human carcinogen (sulfuric acid aerosol).
NTP	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs & Symptoms of Exposure

Skin	Burning, itching, redness, inflammation upon exposed tissue.
Eyes	Eye burns, watering eyes.
Respiratory	Burning, choking, coughing, shortness of breath.
Ingestion	Nausea, vomiting, diarrhea, burning, severe pain.

Chronic Toxicity	May cause bleeding of nose and gums, nasal and oral mucosal ulceration, conjunctivitis, yellowing of teeth and erosion of tooth enamel.
Teratogenicity	Not Available
Mutagenicity	Not Available
Embryotoxicity	Not Available
Target Organ(s)	Teeth, Lungs
Reproductive Toxicity	Not Available
Respiratory/Skin Sensitization	Not Available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic Vertebrate	Not Available
Aquatic Invertebrate	Not Available
Terrestrial	Not Available

Persistence and Degradability	Not Available
Bioaccumulative Potential	Does not accumulate.
Mobility in Soil	Not Available
PBT and vPvB Assessment	Not Available
Other Adverse Effects	Not Available

13. DISPOSAL CONSIDERATIONS

Waste Product or Residues	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product or residue.
Product Containers	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

US DOT	UN2796, Sulfuric acid, 8, pg II
TDG	UN2796, SULFURIC ACID, 8, PG II
IMDG	UN2796, SULFURIC ACID, 8, PG II
Marine Pollutant	No
IATA/ICAO	UN2796, Sulfuric acid, 8, pg II

15. REGULATORY INFORMATION

TSCA Inventory Status	All ingredients are listed on the TSCA Active inventory.
DSL / NDSL	All ingredients are listed on the DSL inventory.
California Proposition 65	Not Listed
Rhode Island: Hazardous Substance List	Listed: Sulfuric Acid

Massachusetts: Toxic or Hazardous Substance List, Right to Know	Not Listed
Pennsylvania: Hazardous Substance List	Listed: Sulfuric Acid
New Jersey: Right to Know Hazardous Substance List	Listed: Sulfuric Acid
SARA 302	Listed: Sulfuric Acid
SARA 304	Listed: Sulfuric Acid
SARA 311	Acute Health Hazard.
SARA 312	Acute Health Hazard.
SARA 313	Listed: Sulfuric Acid (aerosol forms only)
WHMIS Canada	Class D1A: Poisonous and infectious material – Immediate and serious effects – Very toxic. Class E: Corrosive material.

16. OTHER INFORMATION

Revision	Date
Original	03/27/2013
Revision 1	12/13/2016
Revision 2	11/29/2021

Disclaimer: The information provided in this Safety Data Sheet (“SDS”) is correct to the best of our knowledge, information, and belief at the date of publication. The information in this SDS relates only to the specific Product identified under Section 1, and does not relate to its use in combination with other materials or products, or its use as to any particular process. Those handling, storing, or using the Product should satisfy themselves that they have current information regarding the particular way the Product is handled, stored or used and that the same is done in accordance with federal, state and local law. WE DO NOT MAKE ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE. WE DO NOT ASSUME RESPOSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, INJURY, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT.

SODIUM HYDROXIDE, 50%

SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer:	**Shintech Louisiana, LLC** 3 Greenway Plaza, Suite 1150 Houston, TX 77046 (713) 965-0713
PRODUCT NAME:	Sodium Hydroxide Solution, 50%
CAS#:	1310-73-2
CHEMICAL FOMULA:	NaOH(50)
Synonyms	Caustic Soda Liquid 50%, Soda Lye, Lye, Liquid Caustic, Sodium Hydrate
Product Use:	Neutralizing agent, industrial cleaner, pulping and bleaching, soap manufacturing

For information regarding a chemical emergency involving a spill or leak, call:

24 — Hour Emergency Contact:

U.S.: 1-800-424-9300 — CHEMTREC

SECTION 2 — HAZARDS IDENTIFICATION

Global Harmonization System (GHS) Classification:

Category 1	Corrosive to metals
Category 1	Skin corrosion/irritation
Category 1	Serious eye damage/eye irritation
Category 3	Hazardous to the aquatic environment, long-term (chronic) hazard
Category 4	Acute toxicity, inhalation
Category 4	Acute toxicity, oral

National Fire Protection Association (NFPA) Rating Hazardous Materials Identification Systems (HMIS) Rating

	NFPA	HMIS
Health	3	3
Fire	0	0
Reactivity	1	1

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

W – Water Reactive

DANGER! Causes severe eye burns. Causes severe skin burns. Avoid contact with skin and eyes. Causes burns of the mouth and throat. Causes respiratory tract irritation. Avoid breathing vapors or mist. Aspiration hazard. Can enter lungs and cause damage. May react with water. Keep upwind of spill and use in adequate ventilation.

Emergency Overview:

Color:	Colorless
Odor:	Odorless
Physical State	Liquid above freezing point
Signal Word	DANGER

GHS Label Elements:

GHS Hazard Statements:

H290 - May be corrosive to metals

H314 – Causes severe skin burns and eye

H318 – Causes serious eye damage

H412 – Harmful to aquatic life with long lasting effects

H332 – Harmful if inhaled

H302 – Harmful if swallowed

GHS Precautionary Statements:

Storage:	Keep container closed. Keep in original container. Store in a secure manner.
Ventilation Controls:	Do not breathe (dust, vapor or spray mist).
Hygiene Measures:	When using, do not smoke, eat, or drink. Wash thoroughly after handling. Avoid contact with skin and eyes.
Personal Protective Equipment:	Wear suitable protective clothing, gloves, and eye/face protection.
Spills:	**NEVER** direct water jet on liquid. Dike the area to contain the spill. Collect in suitable and properly labeled containers. Attempt to neutralize by adding material such as Acetic acid.
First Aid (See Section 4):	In case of accident by inhalation, move person to fresh air. If swallowed, do not induce vomiting: seek medical advice immediately and show label to doctor. After contact with skin, immediately take off all contaminated clothing and wash immediately with plenty of water. In case of contact with eyes, rinse immediately with plenty of water. In all cases, if irritation develops and persists, get medical attention. In all cases, call a poison control center or doctor for further treatment advice.
Environmental Protection:	Use appropriate containment to avoid environmental contamination.
Disposal:	Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT	May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Mist may cause eye irritation.
Short Term Exposure	
Long Term Exposure:	
SKIN CONTACT	Brief contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage.
SKIN ABSORPTION	Prolonged skin contact is unlikely to result in absorption of harmful amounts.
INHALATION:	Mist may cause severe irritation of upper respiratory tract (nose and throat). May cause chemical burns to the respiratory tract.
INGESTION	Swallowing may result in burns of the mouth and throat. Swallowing may result in gastrointestinal irritation, ulceration, nausea and/or vomiting. Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.
CONDITIONS AGGRAVATED BY EXPOSURE	Respiratory disorders, pre-existing skin disorders, eye/vision disorders.
TARGET ORGANS EFFECTED:	Skin, Eyes, Respiratory System.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous ingredients (specific)	Typical %	CAS Number	EC Number
Water	50	7732-18-5	7732-18-5
Sodium Hydroxide	50	1310-73-2	7732-18-5
Sodium Chloride	< 1	7647-14-5	231-598-3

Common Names/Synonyms: Caustic Soda Liquid 50%, Soda Lye, Lye, Liquid Caustic, Sodium Hydrate

SECTION 4 – FIRST AID MEASURES

Eye Contact: Immediately flush eyes with water for at least 30 minutes, and up to 60 minutes if necessary. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Skin Contact: Immediately flush skin with water for at least 30 minutes, and up to 60 minutes if necessary. Under water remove contaminated clothing, jewelry, and shoes. If irritation persists, repeat flushing. Obtain medical attention immediately. Handle contaminated clothing and shoes in a manner which limits further exposure.

Ingestion: DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give as much water as possible to dilute material (8 to 10 oz. or 240 to 300 mL). If spontaneous vomiting occurs, have victim lean forward with head down, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility. Do not give anything to an unconscious person.

Inhalation: Move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance: induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention IMMEDIATELY. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.

SECTION 5 – FIRE FIGHTING MEASURES

Extinguishing Media: This material does not burn. If exposed to fire from another source, use suitable extinguishing agent for that fire. Do not use water jet.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Remove containers from fire, if possible, and cool containers with water. When material comes in contact with water, large amounts of heat may be generated and ignite adjacent combustible materials. **This material does not burn.** Fight fire for other material that is burning.

Special Protective Equipment for Firefighters:	Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.
Unusual Fire and Explosion Hazards:	Product reacts with water. Reaction may produce heat and/or gases. This reaction may be violent. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Hazardous Combustion Products:	Not applicable.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Steps to be taken if material is released or spilled:	Contain spilled material if possible. Small spills: Dilute with water and neutralize with dilute acid; absorb and collect. Large spills: Dike the area to contain the spill. Collect in suitable and properly labeled containers. Attempt to neutralize by adding material such as Acetic acid. See Section 13, Disposal Considerations, for additional information.
Personnel Precautions:	Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Refer to Section 7, Handling, for additional precautionary measures. Keep upwind of spill. Ventilate area of leak or spill. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental Precautions:	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

SECTION 7 – HANDLING AND STORAGE

Handling:

Do not get in eyes. Do not get on skin or clothing. Do not swallow. Avoid breathing mist. Keep container closed. Use with adequate ventilation.

1. ALWAYS add caustic soda solution to water with constant agitation. NEVER add water to the caustic soda solution.
2. The water should be lukewarm (27°-38°C or 80°-100°F). NEVER start with hot or cold water. The addition of the caustic soda to liquid will cause a rise in temperature. If caustic soda becomes concentrated in one area, is added too rapidly, or is added to hot or cold liquid, a rapid temperature increase can result in DANGEROUS mists, boiling or spattering which may cause an immediate VIOLENT ERUPTION. See Section 8, Exposure Controls and Personal Protection.

Storage:

Keep container closed. Do not store in: Zinc, Aluminum, Brass, or Tin. See Section 10 for more specific information.

Storage temperature: >16°C

Shelf life: Use within 24 months

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Preventive Measures:

Recommendations listed in this section indicate the type of equipment which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls:

Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact.

Personal Protective Equipment:	Maintain eye wash station and safety shower facilities in work area. Detailed requirements for personal protective equipment should be established on a site-specific basis.
Eye/Face Protection:	Wear full face-shield and chemical safety goggles when there is potential for contact.
Skin/Body Protection:	Wear appropriate personal protective clothing to prevent skin contact that is chemically resistant to this material. Wear rubber boots and chemical resistant gloves. Remove contaminated clothing immediately, wash skin area with soap and water and launder clothing before reuse or dispose of properly.
Respiratory Protection:	Up to 10mg/m³: Supplied Air Respirator (SAR) operated in a continuous-flow mode, eye protection needed; or full face-piece respirator with high-efficiency particulate filter(s); or powered air-purifying respirator with dust and mist filter(s), eye protection needed; or full face-piece Self-Contained Breathing Apparatus (SCBA); or full face-piece SAR. Emergency or Planned Entry into Unknown Concentrations of IDLH Conditions: Positive pressure, full face-piece SAR; or positive pressure, full face-piece SAR with an auxiliary positive pressure SAR.
Guidelines for Sodium Hydroxide Solutions, 30-70%:	**RECOMMENDED** (resistance to breakthrough longer than 8 hours): Butyl rubber; natural rubber, neoprene rubber, nitrile rubber, polyethylene, polyvinyl chloride, Teflon(TM), Viton(TM), Saranex(TM), 4H(TM), Barricade(TM), CPF 3(TM), Responder(TM), Trellchem HPS(TM), Tychem 10000(TM). **NOT RECOMMENDED** for use (resistance to breakthrough less than 1 hour): Polyvinyl alcohol.
Escape:	Full face-piece respirator with high-efficiency particulate filter(s); or escape-type SCBA.
Exposure Guidelines:	
PRODUCT:	**Sodium hydroxide** ACGIH Ceiling Exposure Limit (TLV-C): 2mg/m³ OSHA PEL-TWA & PEL-C: 2mg/m³ NIOSH IDLH: 10mg/m³ NIOSH REL-C: 2mg/m³

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid above freezing point
Physical Form	Liquid
Color	Colorless
Odor	Odorless
Odor Threshold	No data available
Flash Point – Closed Cup	None
Flammable Limits in Air	Lower: Not applicable Upper: Not applicable
Autoignition Temperature	Not applicable
Vapor pressure	1.5 mmHg @ 20°C *Literature*
Boiling Point (760 mmHg)	145°C (293°F) *Literature*
Vapor Density (air=1)	Not applicable
Specific Gravity (H20=1)	1.52 *Literature*
Liquid Density	1.5 g/cm3 @ 20°C *Literature*
Freezing Point	14°C (57°F) *Literature*
Melting Point	14°C (57°F) *Literature*
Solubility in Water (by weight)	Water solution
pH	Strong Basic
Evaporation Rate	No data available
Partition Coefficient n-octanol/water	No data available
Decomposition Temperature	No data available
Molecular Weight	40 g/mol
Volatility	No data available
Kinematic Viscosity	0.35 St @ 25° *Calculated*

* This data is based on 50% Caustic

SECTION 10 – STABILITY AND REACTIVITY

Stability/Instability: Stable under recommended storage conditions. See Storage, Section 7.

Conditions to avoid: Avoid moisture. Product absorbs carbon dioxide from the air. Avoid mixing with water, strong acids, or other incompatible materials. Will react with some metals and create a flammable hydrogen gas.

Incompatible Materials: Heat is generated when mixed with water. Spattering and boiling can occur. Caustic soda solution reacts readily with various reducing sugars (i.e. fructose, galactose, maltose, dry whey solids) to produce CO. Take precautions including monitoring the tank atmosphere for CO to ensure safety of personnel before vessel entry. Avoid contact with:

acids, glycols and halogenated organics. Organic nitro compounds. Flammable hydrogen may be generated from contact with metals such as: Zinc, Aluminum, Tin, or Brass.

Hazardous Polymerization: Will not occur.

Thermal Decomposition: Does not decompose.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute Toxicity:

Ingestion: Single dose oral LD50 has not been determined.

Skin Absorption: The dermal LD50 has not been determined.

The severity of injury depends on the concentration and duration of exposure to the substance. This material is toxic to the skin, eyes, and mucous membranes. It may cause destructive effects on tissues that it contacts. Inhalation will cause irritation to the respiratory tract and difficulty breathing. Eye contact will cause irritation and may cause severe burns and possible blindness. Contact with skin will cause irritation and may cause corrosion of the tissue.

Repeated Dose Toxicity: Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

Genetic Toxicology: For the major component(s): In vitro genetic toxicity studies were negative.

Carcinogenicity: Not a known carcinogen.

SECTION 12 – ECOLOGICAL INFORMATION

Fate and Transport:

Sodium Hydroxide:

Movement No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).

Persistence and Degradability		Biodegradation is not applicable.
Sodium Chloride:	**Movement**	No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).
Persistence and Degradability		Biodegradation is not applicable.

Ecotoxicity:

Sodium Hydroxide:	Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested). May increase pH of aquatic systems to >pH 10 which may be toxic to aquatic organisms.
Fish Acute & Prolonged Toxicity	LC50, rainbow trout (Oncorhynchus mykiss), 96h: 45.5 mg/L
Aquatic Invertebrate Acute Toxicity	LC50, water flea Daphnia magna: 40-240 mg/L
Sodium Chloride:	Material is practically non-toxic to aquatic organisms on an acute basis (IC50/EC50>100 mg/L in the most sensitive species tested).
Fish Acute & Prolonged Toxicity	LC50, fathead minnow (Pimephales promelas): 10,610 mg/L
Aquatic Invertebrate Acute Toxicity	LC50, water flea Daphnia magna: 4,571 mg/L

SECTION 13 – DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable Federal, State/Provincial and local laws and regulations. Waste characterization and compliance with applicable laws and regulations are the responsibility of the waste generator. Do not dispose of waste with normal garbage, or to sewer systems.

SHINTECH LOUISIANA, LLC HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR

USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN SDS SECTION.

SECTION 14 – TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

	BULK / NON BULK
Shipping Name	SODIUM HYDROXIDE SOLUTION
Hazard Class/Division	8
Identification No.	UN1824
Packing Group	PG II
DOT RQ (lbs)	RQ 1000 lbs. (Sodium Hydroxide)

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15 – REGULATORY INFORMATION

USA Classification

OSHA Hazard Communication Standard: This product is a “Hazardous Chemical” as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	Yes
Sudden Release of Pressure Hazard	No
OSHA Process Safety (29CFR1910.119)	No
CERCLA Section 103 (40CFR302.4)	Yes

Reportable Quantity (RQ) under CERCLA	1,000 lbs. (454kg)
TSCA Inventory Status	Yes

This product does not contain nor is it manufactured with ozone depleting substances

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Sodium Hydroxide	1310-73-2	<=51.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US Toxic Substances Control Act:

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 710.30.

CEPA – Domestic Substances List (DSL):

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	Yes
Sudden Release of Pressure Hazard	No
OSHA Process Safety (29CFR1910.119)	No
CERCLA Section 103 (40CFR302.4)	Yes
Reportable Quantity (RQ) under CERCLA	1,000 lbs. (454kg)
TSCA Inventory Status	Yes

This product does not contain nor is it manufactured with ozone depleting substances.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Sodium Hydroxide	1310-73-2	<=51.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US Toxic Substances Control Act:

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 710.30

CEPA – Domestic Substances List (DSL):

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

SECTION 16 – OTHER INFORMATION

IMPORTANT: The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANT ABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SUITABILITY, STABILITY OR OTHERWISE. The information included herein is not intended to be all-inclusive as to the appropriate manner and/or conditions of use, handling and/or storage. Factors pertaining to certain conditions of storage, handling, or use of this product may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended to, and nothing herein shall be construed as a recommendation to, infringe any existing patents or violate any laws, rules, regulations or ordinances of any governmental entity.

Shintech Louisiana, LLC urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as to the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product.

Revisions:

- **January 2011 - no information changed in this MSDS. This MSDS was reviewed for accuracy.**
- **April 2014 – The MSDS was updated to follow new Global Harmonization Guidelines. The MSDS are now called Safety Data Sheets (SDS).**
- **January 2016 – Corrections to improve nomenclature and technical data.**
- **February 2020 – No information changed in this SDS. This SDS was reviewed for accuracy.**
- **July 2022 – Section 2 was updated to include the GHS Classification Category 1 – Corrosive to Metals and Category 4 – Acute toxicity - inhalation. Section 2 - GHS Hazard Statements have been revised to indicate that this material is harmful if inhaled.**
- **November 2022 – Section 2 GHS Classifications and Hazard Statements updated.**
- **January 2023 – Removal of health hazard pictogram based on updated hazard statements.**

SDS Status: *Revision Date:* *1/25/2023*
Supersedes: *11/15/2022*

Aqua Ammonia 19%

Safety Data Sheet

Classified according to the UN-GHS as adopted in the US Hazard Communication Standard (HCS 2012), the Canada Hazardous Products Regulations (WHMIS 2015) and Mexico NOM-018-STPS-2015.

Revision Date: 4 June 2024 Date of issue: 4 June 2024 Supersedes Date: 23 June 2023 Version: 3.1

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Name: Aqua Ammonia 19%

CAS No: 1336-21-6

Synonyms: Ammonia water, Aqueous ammonia, Household ammonia, Ammonium hydrate, Ammonium hydroxide

STCC: 4935280

1.2. Intended Use of the Product

Uses of the substance/mixture: Fertilizer

Uses advised against: Consumer use

1.3. Name, Address, and Telephone of the Responsible Party

Company

CF Industries
2375 Waterview Drive
Northbrook, Illinois, USA
847-405-2400
www.cfindustries.com

1.4. Emergency Telephone Number

Emergency Number : 800-424-9300
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

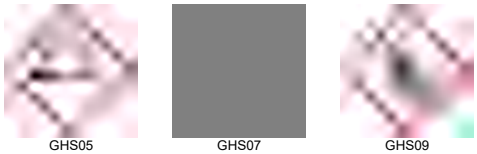
Acute Tox. 4 (Oral)	H302
Acute Tox. 4 (Inhalation:gas)	H332
Skin Corr. 1A	H314
Eye Dam. 1	H318
STOT SE 3	H335
Aquatic Acute 1	H400
Aquatic Chronic 3	H412

Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :



GHS05 GHS07 GHS09

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H302+H332 - Harmful if swallowed or if inhaled.
H314 - Causes severe skin burns and eye damage.
H318 - Causes serious eye damage.
H335 - May cause respiratory irritation.
H400 - Very toxic to aquatic life.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary Statements (GHS-US) : P260 - Do not breathe mist, spray, vapors, gas.
P261 - Avoid breathing vapors, mist, or spray.
P264 - Wash hands, forearms, and exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear eye protection, protective clothing, protective gloves, face protection.

P301+P330+P331+P310 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor.
P303+P361+P353+P310 - IF ON SKIN (OR HAIR): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a poison center or doctor.
P304+P340+P310 - IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor.
P305+P351+P338+P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor.
P363 - Wash contaminated clothing before reuse.
P391 - Collect spillage.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, provincial, territorial, national, and international regulations.

2.3. Other Hazards

Ammonium hydroxide is very volatile and may release ammonia as a gas. Ammonia vapor, in concentrations of 16-25% volume by weight in air, is flammable, toxic by inhalation and corrosive. Take all appropriate precautions.

2.4. Unknown Acute Toxicity (GHS-US)

No data available.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Ammonium hydroxide	(CAS No) 1336-21-6	100	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400
Contains	**Product Identifier**	**% (w/w)**	**Classification (GHS-US)**
Water	(CAS No) 7732-18-5	80.5-81.5	Not classified
Ammonia	(CAS No) 7664-41-7	18.5-19.5	Flam. Gas 2, H221 Compressed gas, H280 Acute Tox. 3 (Inhalation:gas), H331 Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 2, H411

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. Seek medical attention immediately. Show label if possible.

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Immediately call a POISON CENTER or doctor/physician.

Skin Contact: Immediately flush skin with plenty of water for at least 60 minutes. Remove/Take off immediately all contaminated clothing. Immediately call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing for at least 60 minutes. Immediately call a POISON CENTER or doctor/physician.

Ingestion: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: Harmful if swallowed. Corrosive to eyes, respiratory system and skin. Harmful if inhaled.

Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Damage to lungs. Harmful if inhaled.

Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.

Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.

Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic Symptoms: None known.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Water spray, fog.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Ammonia vapor concentrations in the range of 16-25% by volume in air can be ignited if heated to the auto-ignition temperature. Oil or other combustible materials increases the fire hazard. Emits toxic fumes under fire conditions.

Explosion Hazard: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions.

Reactivity: Corrosive to copper, brass, silver, zinc and galvanized steel.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Stop leak if safe to do so. Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

Hazardous Combustion Products: Nitrogen oxides. Ammonia.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Keep away from open flames, hot surfaces and sources of ignition. No smoking. Avoid all contact with skin, eyes, or clothing. Do NOT breathe vapor, mist, spray.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel. Eliminate ignition sources.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Stop leak if safe to do so. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Stop the flow of material, if this is without risk. Ventilate area. Contain any spills with dikes or absorbents.

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely. Never neutralize spill with acid. Absorb and/or contain spill with inert material, then place in suitable container. Use only non-sparking tools. After cleaning, flush traces away with water.

6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Do NOT enter (storage areas, confined spaces) unless adequately ventilated. Emits ammonia vapors. Flammable gas. Ammonium hydroxide reacts with many heavy metals and their salts forming explosive compounds. It may attack metals forming flammable/explosive gas. The solution in water is a strong base, it reacts violently with acids.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Ensure adequate ventilation. Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Detached outside storage is preferable. Keep in fireproof place. Store away from oxidizers, combustible materials, and all ignition sources. Store in corrosive resistant container with a resistant inner liner. Storage containers should have safety relief valves. Store locked up.

Incompatible Materials: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

Storage Area: Post readily visible warning signs in the storage area listing emergency measures. Water hoses should be readily available to disperse vapors in case of a spill.

7.3. Specific End Use(s)

Fertilizer

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Ammonia (7664-41-7)		
Mexico	OEL TWA (mg/m³)	18 mg/m³
Mexico	OEL TWA (ppm)	25 ppm
Mexico	OEL STEL (mg/m³)	27 mg/m³
Mexico	OEL STEL (ppm)	35 ppm
USA ACGIH	ACGIH TWA (ppm)	25 ppm
USA ACGIH	ACGIH STEL (ppm)	35 ppm
USA OSHA	OSHA PEL (TWA) (mg/m³)	35 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	50 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	18 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	25 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m³)	27 mg/m³
USA NIOSH	NIOSH REL (STEL) (ppm)	35 ppm
USA IDLH	US IDLH (ppm)	300 ppm
Alberta	OEL STEL (mg/m³)	24 mg/m³
Alberta	OEL STEL (ppm)	35 ppm
Alberta	OEL TWA (mg/m³)	17 mg/m³
Alberta	OEL TWA (ppm)	25 ppm
British Columbia	OEL STEL (ppm)	35 ppm
British Columbia	OEL TWA (ppm)	25 ppm
Manitoba	OEL STEL (ppm)	35 ppm
Manitoba	OEL TWA (ppm)	25 ppm
New Brunswick	OEL STEL (mg/m³)	24 mg/m³
New Brunswick	OEL STEL (ppm)	35 ppm
New Brunswick	OEL TWA (mg/m³)	17 mg/m³
New Brunswick	OEL TWA (ppm)	25 ppm
Newfoundland &	OEL STEL (ppm)	35 ppm

Labrador		
Newfoundland & Labrador	OEL TWA (ppm)	25 ppm
Nova Scotia	OEL STEL (ppm)	35 ppm
Nova Scotia	OEL TWA (ppm)	25 ppm
Nunavut	OEL STEL (mg/m³)	24 mg/m³
Nunavut	OEL STEL (ppm)	35 ppm
Nunavut	OEL TWA (mg/m³)	17 mg/m³
Nunavut	OEL TWA (ppm)	25 ppm
Northwest Territories	OEL STEL (mg/m³)	24 mg/m³
Northwest Territories	OEL STEL (ppm)	35 ppm
Northwest Territories	OEL TWA (mg/m³)	17 mg/m³
Northwest Territories	OEL TWA (ppm)	25 ppm
Ontario	OEL STEL (ppm)	35 ppm
Ontario	OEL TWA (ppm)	25 ppm
Prince Edward Island	OEL STEL (ppm)	35 ppm
Prince Edward Island	OEL TWA (ppm)	25 ppm
Québec	VECD (mg/m³)	24 mg/m³
Québec	VECD (ppm)	35 ppm
Québec	VEMP (mg/m³)	17 mg/m³
Québec	VEMP (ppm)	25 ppm
Saskatchewan	OEL STEL (ppm)	35 ppm
Saskatchewan	OEL TWA (ppm)	25 ppm
Yukon	OEL STEL (mg/m³)	30 mg/m³
Yukon	OEL STEL (ppm)	40 ppm
Yukon	OEL TWA (mg/m³)	18 mg/m³
Yukon	OEL TWA (ppm)	25 ppm

8.2. Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Gas detectors should be used when toxic gases may be released. Use explosion-proof equipment.

Personal Protective Equipment: Gloves. Protective goggles. Insufficient ventilation: wear respiratory protection. Protective clothing. Face shield.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles and face shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

Other Information: When using, do not eat, drink, or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State : Liquid
Appearance : Colorless
Odor : Pungent
Odor Threshold : 1 - 50 ppm
pH : 10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Evaporation Rate : Not available
Melting Point : - 77 °C (-106 °F) (< 44% NH_3)

Freezing Point	:	-38 °C (-36 °F)
Boiling Point	:	37.4 °C (99.3°F) (25% NH_3)
Flash Point	:	Not available
Auto-ignition Temperature	:	651 °C (1,204°F) (ammonia vapor)
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	16 % (ammonia vapor)
Upper Flammable Limit	:	25 % (ammonia vapor)
Vapor Pressure	:	49642.2 Pa at 68°F (20°C)
Relative Vapor Density at 20 °C	:	0.6 (for ammonia vapor over aqua ammonia at 0°C and 760 mm Hg)
Relative Density	:	Not available
Specific Gravity	:	0.90 at 60 °F (19% NH_3)
Solubility	:	Soluble in water.
Partition Coefficient: N-Octanol/Water	:	-1.14 at 25° C
Viscosity	:	Not available
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	:	Not expected to present an explosion hazard due to static discharge.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity
Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

10.2. Chemical Stability
Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of Hazardous Reactions
Hazardous polymerization will not occur.

10.4. Conditions to Avoid
Direct sunlight. Extremely high or low temperatures. Heat. Sources of ignition.

10.5. Incompatible Materials
Strong acids. Strong bases. Strong oxidizers. Hypochlorites.

10.6. Hazardous Decomposition Products
Thermal decomposition generates: Carbon oxides (CO, CO2). Nitrogen oxides. Emits ammonia vapors.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product
Acute Toxicity: Oral: Harmful if swallowed. Inhalation:gas: Harmful if inhaled.

LD50 and LC50 Data:

Ammonium hydroxide 1336-21-6	
ATE US (oral)	350.00 mg/kg body weight
ATE US (gases)	10,256.41 ppmV/4h

Skin Corrosion/Irritation: Causes severe skin burns and eye damage.
pH: 10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Serious Eye Damage/Irritation: Causes serious eye damage.
pH: 10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Teratogenicity: Not available
Carcinogenicity: Not classified
Specific Target Organ Toxicity (Repeated Exposure): Not classified
Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): May cause respiratory irritation.

Aspiration Hazard: Not classified
Symptoms/Injuries After Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Damage to lungs. Harmful if inhaled.
Symptoms/Injuries After Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.
Symptoms/Injuries After Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.
Symptoms/Injuries After Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.
Chronic Symptoms: None known.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Ammonia (7664-41-7)	
LC50 Inhalation Rat	5.1 mg/l (Exposure time: 1 h)
LC50 Inhalation Rat	2000 ppm/4h (Exposure time: 4 h)

Water (7732-18-5)	
LD50 Oral Rat	> 90000 mg/kg

Ammonium hydroxide (1336-21-6)	
LD50 Oral Rat	350 mg/kg

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General: Toxic to aquatic life. Harmful to aquatic life with long lasting effects.

Ammonia (7664-41-7)	
LC50 Fish 1	0.44 mg/l (Exposure time: 96 h - Species: Cyprinus carpio)
EC50 Daphnia 1	25.4 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	0.26 - 4.6 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)

Ammonium hydroxide (1336-21-6)	
LC50 Fish 1	8.2 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0.66 mg/l (Exposure time: 48 h - Species: water flea)
EC50 Daphnia 2	0.66 mg/l (Exposure time: 48 h - Species: Daphnia pulex)

12.2. Persistence and Degradability

Ammonium hydroxide (1336-21-6)	
Persistence and Degradability	Biodegradation of ammonia occurs in water under aerobic conditions.

12.3. Bioaccumulative Potential

Ammonium hydroxide (1336-21-6)	
Log Pow	-1.14
Bioaccumulative Potential	Not established.

Ammonia (7664-41-7)	
Log Pow	-1.14 (at 25 °C)

12.4. Mobility in Soil

Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.
Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.
Additional Information: Prevent runoff from entering drains, sewers or waterways.
Ecology – Waste Materials: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8

Packing Group : III
ERG Number : 154
CERCLA RQ : Ammonium Hydroxide = 1,000 lbs
Additional Information : Marine Pollutant

14.2. In Accordance with IMDG

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Packing Group : III
Label Codes : 8 + MP(P)
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-B

Additional Information : Marine Pollutant, Classified as HME per MARPOL Annex V

14.3. In Accordance with IATA

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Packing Group : III

ERG Code (IATA) : 8L

14.4. In Accordance with TDG

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Packing Group : III
Additional Information : Marine Pollutant

14.5. Classified in Accordance with MX-SCT

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Additional Information : Marine Pollutant

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Ammonium hydroxide (1336-21-6)	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

Ammonia (7664-41-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on the United States SARA Section 302 Listed on United States SARA Section 313	
SARA Section 302 Threshold Planning Quantity (TPQ)	500
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Sudden release of pressure hazard

SARA Section 313 - Emission Reporting	1.0 % (includes anhydrous Ammonia and aqueous Ammonia from water dissociable Ammonium salts and other sources, 10% of total aqueous Ammonia is reportable under this listing)

Water (7732-18-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ammonium hydroxide (1336-21-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State Regulations

Ammonia (7664-41-7)
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Acute
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Connecticut - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Toxic Endpoints
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Florida - Essential Chemicals List
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)
U.S. - Idaho - Occupational Exposure Limits - TWAs
U.S. - Louisiana - Reportable Quantity List for Pollutants
U.S. - Maine - Air Pollutants - Criteria Pollutants
U.S. - Massachusetts - Allowable Ambient Limits (AALs)
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Threshold Effects Exposure Limits (TELs)
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Occupational Exposure Limits - STELs
U.S. - Michigan - Polluting Materials List
U.S. - Michigan - Process Safety Management Highly Hazardous Chemicals
U.S. - Minnesota - Chemicals of High Concern
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - STELs
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)
U.S. - New Mexico - Precursor Chemicals
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

U.S. - North Carolina - Control of Toxic Air Pollutants
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 1-Hour
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Ohio - Extremely Hazardous Substances - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Oregon - Precursor Chemicals
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 24-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual
U.S. - Rhode Island - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Tennessee - Occupational Exposure Limits - STELs
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Permissible Exposure Limits - STELs
U.S. - Virginia - Water Quality Standards - Acute Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Acute Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Public Water Supply Effluent Limits
U.S. - Virginia - Water Quality Standards - Surface Waters Not Used for the Public Water Supply Effluent Limits
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet
U.S. - Wyoming - Process Safety Management - Highly Hazardous Chemicals
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Marine Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Marine Water
U.S. - Alaska - Ambient Air Quality Standards

Ammonium hydroxide (1336-21-6)

U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Louisiana - Reportable Quantity List for Pollutants
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Polluting Materials List
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List RTK - U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Texas - Effects Screening Levels - Long Term U.S. - Texas - Effects Screening Levels - Short Term

15.3. Canadian Regulations

Ammonium hydroxide (1336-21-6)	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects

Ammonia (7664-41-7)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects Class E - Corrosive Material

Water (7732-18-5)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

Ammonium hydroxide (1336-21-6)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision B - Toxic material causing immediate and serious toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 4 June 2024

Revision Comments : This version contains updates/revisions to the following sections:

- Updated company address

GHS Full Text Phrases:

Acute Tox. 3 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 3
Acute Tox. 4 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Compressed gas	Gases under pressure Compressed gas

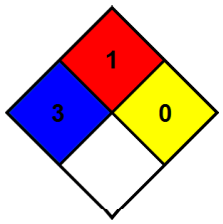
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Flam. Gas 2	Flammable gases Category 2
Skin Corr. 1A	Skin corrosion/irritation Category 1A
Skin Corr. 1B	Skin corrosion/irritation Category 1B
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H221	Flammable gas
H280	Contains gas under pressure; may explode if heated
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H331	Toxic if inhaled
H332	Harmful if inhaled
H335	May cause respiratory irritation
H400	Very toxic to aquatic life
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

NFPA Rating

Health Hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

Fire Hazard : 1 - Must be moderately heated or exposed to relatively high temperature before ignition can occur.

Reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 1 Slight Hazard

Physical : 0 Minimal Hazard

Party Responsible for the Preparation of This Document
CF Industries, Corporate EHS Department, 847-405-2400

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

CF believes the information contained herein is accurate; however, CF makes no guarantees or warranties with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein by CF is not intended to be and should not be construed as legal advice or as ensuring compliance by other parties. Judgments as to the suitability of the information contained herein for the party's own use or purposes are solely the responsibility of that party. Any party handling, transferring, transporting, storing, applying or otherwise using this product should review thoroughly all applicable laws, rules, regulations, standards and good engineering practices. Such thorough review should occur before the party handles, transfers, transports, stores, applies or otherwise uses this product.

North America GHS US 2012 & WHMIS 2

ATTACHMENT I

EMISSION UNITS TABLE

REDACTED
Information Claimed Confidential by
TransGas Development Systems, LLC
March 24, 2025

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
1S-117S	1E-117E	Engine 1 through Engine 117	2026	[redacted] HP	New	1C-117C
118S-157S	118E-157E	ULSD Tank TK1-TK40	2026	170,000 gal	New	NA
De minimis	De minimis	Hydrous Ammonia Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Caustic Soda Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sulfuric Acid Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sodium Chlorite Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sodium Hydrosulfide Tanks 1-39	2026	4,600 gal	New	NA

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, or other appropriate designation.

ATTACHMENT J

EMISSION POINTS DATA SUMMARY SHEET

REDACTED
Information Claimed Confidential by
TransGas Development Systems, LLC
March 24, 2025

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data – STEADY STATE (INCLUDES STARTUP EMISSIONS TO SCR)

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/ Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
Worst case yearly emissions all engines (with 5 startups and shutdowns)															
1E-117E	Vertical	1S to 117S	Engines 1 to 117	1C to 117C	Control System	NA	NA	NOx	NA	13,494	NA	194.30	Gas	Manufacturer	NA
								PM/PM10/PM2.5	NA	248.69	NA	186.53	Solid		NA
								CO	NA	11,174	NA	205.62	Gas		NA
								VOC	NA	11,517	NA	116.59	Gas		NA
								SO2	NA	495	NA	9.93	Gas		NA
								Total HAPS	NA	85.77	NA	0.86	Gas		NA
Normal Operations Single Engine (See emission discussion in Attachment L for different operating scenarios)															
1E to 117E	Vertical	1S to 117S	Engine 1 to 117	1C to 117C	Control System	NA	NA	NOx	[redacted]		0.14	0.61	Gas	Manufacturer	NA
								PM/PM10/PM2.5			0.34	1.49	Solid		NA
								CO			0.34	1.47	Gas		NA
								VOC			0.23	0.99	Gas		NA
								SO2			0.01	0.03	Gas		NA
								Total HAPS			0.54	0.01	Gas		NA
See Emissions Discussion in Attachment L and Emissions Estimate in Attachment N for other emissions scenarios.															

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data – 2E Startup Emissions

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/ Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
118E to 157E	Vertical	118S to 157S	ULSD Tanks 1-40	None	None	NA	NA	VOC (per tank)	0.18	0.02	0.18	0.02	Gas	Tanks 4.09.d	

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1E-117E	4.6	111	32,287	32.37	~1,718	98	4,179.00211	401.42022
118E-157E	NA	Ambient	NA	NA	~1,718	40	4,179.00211	401.42022

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions, which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ Yes ☐ No ☒ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No Leak Source Count is in Attachment N. ☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	PM/PM10/PM2.5	2.88/0.58/0.15	7.16/1.43/0.38	2.88/0.58/0.15	7.16/1.43/0.38	AP-42
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks (See fittings count in Attachment N)	VOC Hexane (C6+)	Does Not Apply	0.3120 0.0053	Does Not Apply	0.3120 0.0053	EE
General Clean-up VOC Emissions						
Other						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT L

EMISSION UNIT DATA SHEET(S)

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Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 1S-117S

1. Name or type and model of proposed affected source:
[redacted] Horsepower Compression Ignition Engines. See attached engine details and emissions.

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

1. Name(s) and maximum amount of proposed process material(s) charged per hour:

Dual Fuel Modes
1. Natural Gas at 98% with Diesel at 2%.
2. Diesel at 100%.

Engine can be retrofit to burn other fuels.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

25 MWe Generators

5. Give chemical reactions, if applicable, that will be involved in the generation of air Pollutants:

Not Applicable

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

See fuel use during different operating modes in the attached document and in Attachment N.

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Natural gas will be pipeline quality natural gas.
Diesel fuel will be ultra-low sulfur diesel.

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(c) Theoretical combustion air requirement (ACF/unit of fuel): NA

@ °F and psia.

(d) Percent excess air: NA

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

Compression Ignition Engines

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

NA

(g) Proposed maximum design heat input: [redacted] × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:
See the attached document and Attachment N.

a.	NO_X	See the attached and Attachment N	lb/hr	See the attached and Attachment N	Ton/yr
b.	SO_2		lb/hr		Ton/yr
c.	CO		lb/hr		Ton/yr
d.	PM_{10}		lb/hr		Ton/yr
e.	Hydrocarbons		lb/hr		Ton/yr
f.	VOCs (Ethane & Methane)		lb/hr		Ton/yr
g.	Pb		lb/hr		Ton/yr
h.	Specify other(s)				
	Total HAPS	See the attached and Attachment N	lb/hr	See the attached and Attachment N	Ton/yr
			lb/hr		Ton/yr
			lb/hr		Ton/yr
			lb/hr		Ton/yr

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Monitoring as required by 40CFR60, Subpart IIII.	Recordkeeping as required by 40CFR60, Subpart IIII.
REPORTING	**TESTING**
Reporting as required by 40CFR60, Subpart IIII.	Testing as required by 40CFR60, Subpart IIII.

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

The engines are designed to run as proposed. Procedures will be provided upon delivery of the engines.

Engine Model and Manufacturer

[redacted]. These are [redacted] fuel engines. The engines will be built in license by the following engine builders:

[redacted]

Performance Data

[redacted] offers very high, single-cycle efficiency. In the selected configuration and rating, one engine will produce a maximum [redacted] kW [redacted] mechanical power at the shaft. The engines are Dual-Fuel capable, for maximum flexibility. [redacted]

[redacted]

Power

On the permitting site there will be a total of 117 engines. With the maximum power output of [redacted] MW per engine, the installed theoretical power output is [redacted] MW. The effective and continuously delivered power output will be [redacted] MW, for 8,760 hours per year.

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Fuel Types

In their Dual-Fuel configuration, the engines operate on natural gas and on diesel fuels or can be operated on diesel fuel only, in backup mode. Under normal operation the engines consume gas as their primary fuel with a pilot injection of Ultra-Low Sulfur Diesel. For this application the gas has the following properties (lower heat rate 976.94 BTU/ft³):

Date	BTU	SG	CO2	N2	Methane	Ethane	Propane	I-Butane	N-Butane	I-Pentane	N-Pentane	c6+
Average	1082.2	0.61	0.20	0.44	90.33	8.44	0.52	0.02	0.03	0.01	0.00	0.01
STD in % of average	0.66	0.78	11.09	5.04	0.85	8.17	57.48	20.82	24.96	33.90	55.06	63.08

Under gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% for emergency operation. The fuel used in this application will be Ultra-Low Sulfur Diesel (ULSD), with a sulfur Content: ≤ 15 parts per million (ppm) and a heat rate of 130,613 BTU/gal.

Operational profiles

Normal Operation

To ensure peak operation conditions, the engines will be regularly serviced. With 1-2 weeks of downtime per engine per year, 3 engines are going to be off-line at any time of the year. Under normal operations, the engines will be run at 75% power only. Therefore, the continuously delivered power will be [redacted] MW.

Compensation Mode

In case of one or – in the unrealistic, but foreseen case of - up to 29 engines out of service, the rest of the field will compensate, increasing their power output to 100%. For the calculation of the yearly emissions the worst case is assumed, when 29 engines go offline and the remaining 85 are operated at 100%.

Emergency Mode

In case the pipeline is down, or the gas cannot be delivered for any other reason, the engines can switch to *diesel fuel mode* immediately and are then operated on diesel fuel only. Apart from the different fuel type, the engines are controlled in the same way as in *Normal Operation*.

Startup Mode

To start an engine and bring power production online, several steps are necessary. In the first phase the emission control system is not operational temperature, therefore the control rate is not optimal. The following is a simplification and a representation of the worst case for emissions emission-wise. The different steps can be reduced to four main sub-modes:

- Speed up
- Fuel Switch
- Generator switched on
- Load up cold control

Speed up

Bring the engine from stand still to nominal speed [redacted]. This is done in diesel mode. The emission control system is still offline at this point, as it is not at optimal temperature. Once nominal speed is set and the minimum load for a fuel switch is reached [redacted], the system initiates the next sub mode: Fuel Changeover

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Fuel Changeover

For about [redacted] the load is kept constant, and the fuel is changed from 100% diesel to 98% gas & 2% diesel.

Generator switched on

On gas operation the load is further increased until the generator can by energized and synchronized with the rest of the engine fleet. This takes no more than [redacted]. For the emissions calculation of all these steps the emission control system is looked at as non-operational, even though the exhaust gases will have heated it already and some abatement is taking place, even at a reduced level.

Load up cold control

Once the generator is online and synchronized, then the engine is powered up to its set point (75% in normal operation mode). For reasons of simplicity and to ensure a conservative view on the problem, during engine load up the control system is looked at as cold and operational at 25% only. This even though in reality the system was heated up constantly by the exhaust gases and reaching operational condition during the load up.

Shut Down

The shut down procedure consists of three phases:

- Ramp down
- Min Load
- Spin out

Ramp down

The load is constantly reduced to a minimum load.

Min Load

At minimum load the generator is decoupled from the grid and the engine's load and speed setting are zero.

Spin out

Due to the zero-load setting the injection systems are turned off and the engine is spun out until full stop. In this entire sequence the emission control system is still operational due to its thermal inertia. Therefore, until the injection is stopped the emissions are treated.

All these steps are represented in Figure 3.

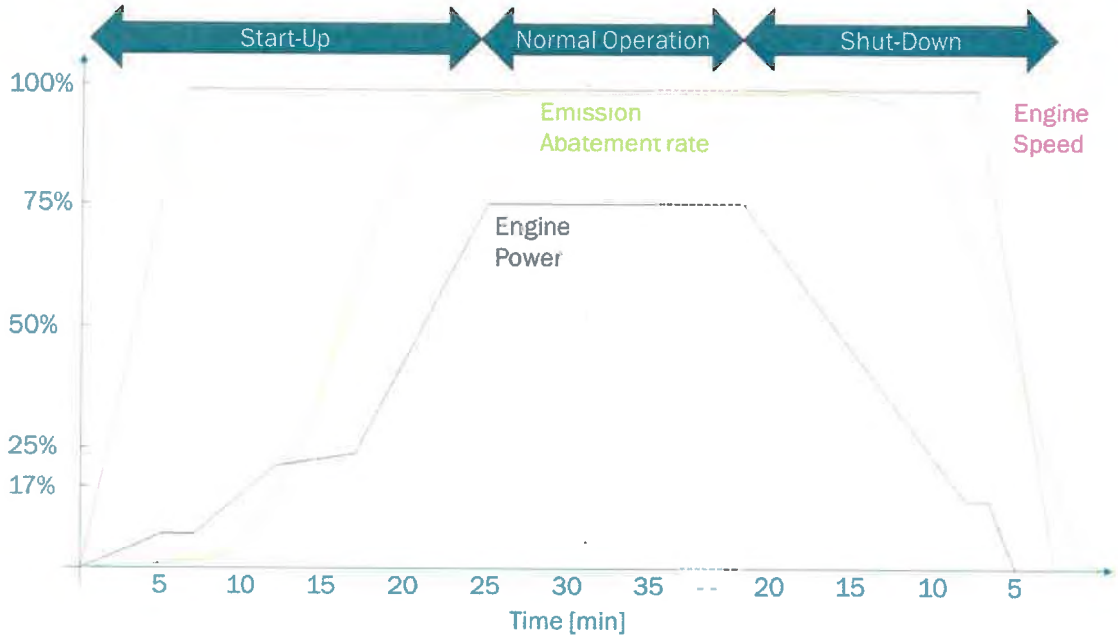

Figure 3: Simplified representation of the Start-Up and Shut-Down phases. Purple: Speed, dark blue: Power and green the efficiency of the emission control system

Emission Levels

For this application the engines are operated in two fuel modes, *Gas mode*, and Diesel mode, where 100% of the energy come from diesel. In Gas mode, where 98% of the energy comes from Natural Gas and 2% from diesel fuel injection (Ultra Low Sulfur Diesel), the engine's raw emissions going into the emission control system are listed in Table 1.

Gas mode		100	75	50	25	20	10
NOx	g/kWh						
PM (Filterable)	mg/Nm3						
PM10 (Filterable + Condensable)	mg/Nm3						
PM2.5 (Filterable + Condensable)	mg/Nm3						
CO	ppm						
VOC	ppm						
N2O	ppm						
CH4	ppm						
CO2	g/kWh						
SO2	g/kWh						

Table 1: Engine raw emissions in Gas mode

For redundancy the engine can switch to *Diesel mode* as a backup, with 100% of the energy coming from diesel fuel (ULSD), in case there is a problem with the gas supply system. The corresponding emissions are listed in Table 2.

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Diesel mode		100	75	50	25	20	10
NOx	g/kWh						
PM (Filterable)	mg/Nm3						
PM10 (Filterable + Condensable)	mg/Nm3						
PM2.5 (Filterable + Condensable)	mg/Nm3						
CO	ppm						
VOC	ppm						
N2O	ppm						
CO2	g/kWh						
SO2	g/kWh						

Table 2: Engine raw emissions in Diesel mode

[redacted] Emission Control System

A detailed description of the system can be found in document *21801.24.0.TGT-PL TGT Process description.pdf*

On a high level the emission abatement, or control system, consists of two main systems, the dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, downstream the turbocharger.

Chemical	%w	lb/gal	[gal/h]	[lb/h]
NH_3 (aq.)				
NaOH				
NaHS (reducing agent)				
NaClO2 (oxidizing agent)				
H_2SO_4				

Table 3: Use of chemicals for the emission control system

Normal Operation

Under normal circumstances the engines operate on gas at 75% load, at their peak efficiency, hence with lowest specific fuel consumption. They are stopped once a year for servicing, while another engine takes up this load. [redacted]

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Doing so, it produces the following raw emissions:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]

Table 4: Emissions of a single engine in Normal Operation
** with Global Warming Potential of 28 for Methane and 265 for laughing gas*

While one individual engine never sees a total run time of 8760 hours per year, there are 114 engines that do experience this as a collective. One single engine of the operated collective therefore consumes 20,035 short tons of gas per year (866,574,112 ft^3/a) and 122 tons (34,273 gal/a) of ULSD per year and produces the following raw emissions:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]

Table 5: Emissions of 1 engine under Normal Operation (8760 hours)

The abatement system reduces the emissions the following:

	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]
Speed up					
Fuel Changeover					
Generator switched on					
Load up cold control					
Normal Operation					
Compensation Mode					
Ramp down					
Min load					
Spin out					
Emergency Mode					

Table 6: Emission abatement efficiency for each individual emission type

Resulting in the total yearly emissions per engine of:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
0.61	1.49	1.47	0.99	0.03	55,339	208	1.1	61,472

Table 7: Total yearly emissions of a single engine after emission treatment

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Start up and Shut down operation

Additionally, one start up and shut down is foreseen. During the individual sequences one engine produces the following emissions:

	[redacted]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
Speed up		89.54	0.34	2.50	19.49	0.10	3,217	0	0.12	3,274
Fuel Switch		4.81	0.53	8.65	13.07	0.00	1,807	28.03	0.12	2,740
Generator on		8.15	0.46	9.25	12.48	0.00	3,535	26.7	0.12	4,529
Load up		9.26	0.43	9.54	12.19	0.00	4,370	26.03	0.12	5,386
Ramp down		10.37	0.32	13.79	14.95	0.00	6,777	31.74	0.15	8,063
Min load		8.15	0.46	9.25	12.48	0.07	3,535	26.7	0.12	4,529
Spin out		4.81	0.53	8.65	13.07	0.07	1,807	28.03	0.12	2,740

Table 8: Emission during the different stages of Startup and Shut down phase
**of the efficiencies mentioned above in Table 6.*

In total during one startup and a shutdown sequence one single engine emits the following:

NOx [t]	PM [t]	CO [t]	VOC [t]	SOx [t]	CO2 [t]	Methane [t]	N2O [t]	CO2_eq [t]
0.0049	0.0002	0.0016	0.0026	0.0000	1.9675	0.0104	0.0001	2.2724
[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]
9.74	0.31	3.22	5.12	0.02	3,935	20.77	0.11	4,545

Table 9: Emissions during a startup and shutdown sequence for one single engine.

Normal Operation Scenario

Therefore, under normal circumstances the 117 engines emit the following over one year, including one startup and shutdown sequence, each:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
69.9	169.9	167.6	113.3	3.7	6,308,872	23,768	127.1	7,008,055

Table 10: Entire yearly emissions for the entire plant und normal circumstances.

[redacted]

Emergency Mode

In case when no gas is available, the engines can be operated in so called emergency mode and the power comes from diesel. In this mode a single engine consumes [redacted] and emits the following:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
10.35	1.29	0.58	0.29	0.11	17,896	0.00	0.67	18,073

Table 11: Controlled hourly emissions per engine in Emergency Mode

Compensation Mode

In case some engines should for any reason fail, the remaining engines will compensate for the loss of power, by increasing their power output. Here the worst case, of each engine ramping up to 100% load, is looked at. Under such conditions the engines consume 6,386 lb of natural gas per hour (138,112 ft³) and 27.8 lb/h of ULSD (3.91 gal/h). The following emissions result from this kind of operation:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
0.46	0.20	1.41	0.27	0.01	17,605	57.73	0.59	19,378

Table 12: Controlled hourly emissions per engine in Compensation Mode

Worst case scenario

As shown earlier, under Normal Operation conditions the engines stay well below the 250 t/year limit for all the regulated emissions. But to ensure that the power plant can be operated under worst case conditions, the following, unrealistic but not impossible scenario was looked at:

The pipeline is out for 8 days (192 hours); hence the power plant is operated on diesel. In the same year an unforeseeable event takes down 31 engines (26% of the entire plant) and the remaining 86 engines will compensate for by delivering the full power, increasing their output to 99.4% load. This situation lasts 24 days (567 hours). Additionally, the engines have to be started up and shut down 5 times, instead of once per year.

The engines are therefore for the following number of hours operated in the corresponding mode:

Speed up	
Fuel Switch	
Generator switched on	
Load up cold control	
Normal Operation	
Compensation Mode	
Ramp down	
Min load	
Spin out	
Emergency Mode	
Total operational time	

Table 13: Operational time in hours for each engine mode under worst case scenario

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Under this scenario and the consequent operational profiles, the entire plant will emit the following emissions per year:

	Gas [t/a]	Diesel [t/a]	NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SO2 [t/a]	CO2_e [t/a]
Speed up			2.13	0.01	0.06	0.46	0.00	77
Fuel Switch			0.05	0.01	0.08	0.12	0.00	25
Generator switched on			0.19	0.01	0.22	0.30	0.00	102
Load up cold control			0.33	0.02	0.34	0.43	0.00	244
Normal Operation			63.31	155.11	152.86	103.15	3.38	6397261
Compensation Mode			14.97	17.22	45.53	8.84	0.33	626484
Ramp down			0.01	0.03	0.08	0.01	0.00	732
Min load			0.06	0.01	0.11	0.09	0.00	102
Spin out			0.01	0.00	0.03	0.04	0.00	12
Emergency Mode			113.24	14.11	6.31	3.15	6.22	197796
Total			**194**	**187**	**206**	**117**	**10**	**7,222,837**

Table 14: Total yearly emissions of the entire power plant under worst case scenario

Hazardous emissions

The hazardous emissions are calculated based on the distribution described in EPA AP-42, Table 3.2-1, 3.2-3 and 3.2-4.
The emissions are calculated as a percentage of the VOC (NMHC) emissions.

NMHC	Benzene	Toluene	Xylenes	Formaldehyde	Acrolein	Acetaldehyde	Naphthalene
0.2	0.000776	0.000281	0.000193	0.0000789	0.00000788	0.0000225	0.00013
100%	**0.388%**	**0.141%**	**0.097%**	**0.039%**	**0.004%**	**0.011%**	**0.065%**

Table 15: Hazardous emission according to EPA AP-42 in lb/MMBtu and as a percentage of the Non-Methane Hydrocarbons

With a reduction factor of 99% the Benzene emissions on an hourly basis per engine, and on a yearly basis for the entire plant are the following:

Benzene, 0.388% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.07564	0.00036
Fuel Switch						0.05070	0.00010
Generator switched						0.04844	0.00023
Load up cold control						0.03548	0.00034
Normal Operation						0.00088	0.40038
Compensation Mode						0.00106	0.03430
Ramp down						0.00058	0.00001
Min load						0.01453	0.00007
Spin out						0.05070	0.00005
Emergency Mode						0.00112	0.01221

Table 16: Calculation of the Benzene hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Benzene emissions of 896 pounds per year.

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March 24, 2025

Toluene, 0.141% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.02739	0.00013
Fuel Switch						0.01836	0.00003
Generator switched						0.01754	0.00008
Load up cold control						0.01285	0.00012
Normal Operation						0.00032	0.14498
Compensation Mode						0.00038	0.01242
Ramp down						0.00021	0.00000
Min load						0.00526	0.00002
Spin out						0.01836	0.00002
Emergency Mode						0.00040	0.00442

Table 17: Calculation of the Toluene hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Toluene emissions of 325 pounds per year.

Xylenes, 0.097% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.01881	0.00009
Fuel Switch						0.01261	0.00002
Generator switched						0.01205	0.00006
Load up cold control						0.00882	0.00008
Normal Operation						0.00022	0.09958
Compensation Mode						0.00026	0.00853
Ramp down						0.00014	0.00000
Min load						0.00361	0.00002
Spin out						0.01261	0.00001
Emergency Mode						0.00028	0.00304

Table 18: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Xylenes emissions of 223 pounds per year.

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Formaldehyde, 0.039% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.00769	0.00004
Fuel Switch						0.00515	0.00001
Generator switched						0.00492	0.00002
Load up cold control						0.00361	0.00003
Normal Operation						0.00009	0.04071
Compensation Mode						0.00011	0.00349
Ramp down						0.00006	0.00000
Min load						0.00148	0.00001
Spin out						0.00515	0.00000
Emergency Mode						0.00011	0.00124

Table 19: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Formaldehyde emissions of 92 pounds per year.

Acrolein, 0.004% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.00077	0.000004
Fuel Switch						0.00051	0.000001
Generator switched						0.00049	0.000002
Load up cold control						0.00036	0.000003
Normal Operation						0.00001	0.004066
Compensation Mode						0.00001	0.000348
Ramp down						0.00001	0.000000
Min load						0.00015	0.000001
Spin out						0.00051	0.000000
Emergency Mode						0.00001	0.000124

Table 20: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acrolein emissions of 9 pounds per year.

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Acetaldehyde, 0.011% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.00219	0.000010
Fuel Switch						0.00147	0.000003
Generator switched						0.00140	0.000007
Load up cold control						0.00103	0.000010
Normal Operation						0.00003	0.011609
Compensation Mode						0.00003	0.000994
Ramp down						0.00002	0.000000
Min load						0.00042	0.000002
Spin out						0.00147	0.000001
Emergency Mode						0.00003	0.000354

Table 21: Calculation of the Acetaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acetaldehyde emissions below 26 pounds per year.

Naphthalene, 0.065% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.01267	0.00006
Fuel Switch						0.00849	0.00002
Generator switched						0.00811	0.00004
Load up cold control						0.00594	0.00006
Normal Operation						0.00015	0.06707
Compensation Mode						0.00018	0.00575
Ramp down						0.00010	0.00000
Min load						0.00243	0.00001
Spin out						0.00849	0.00001
Emergency Mode						0.00019	0.00205

Table 22: Calculation of the Acetaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acetaldehyde emissions below 150 pounds per year.

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Liquid and fuel handling

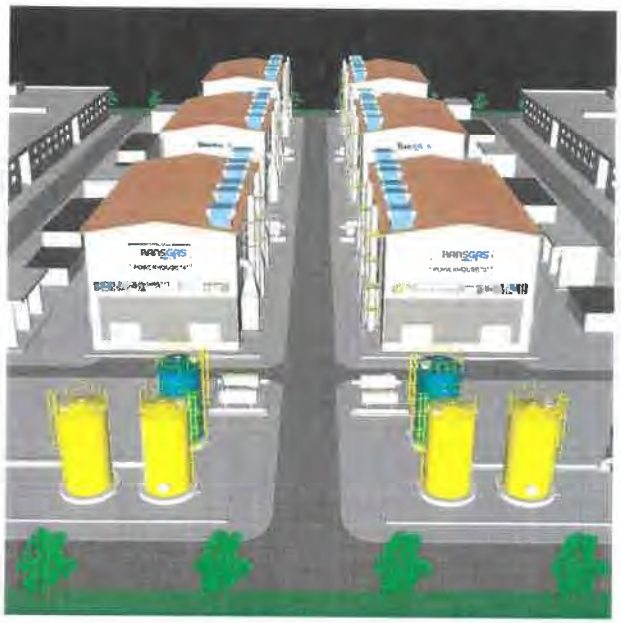

Figure 4: Liquid Storage in front of a set of power houses:
Yellow: Diesel tanks,
Greenish: Water tanks
White: Oil and component tanks

On-site Water Storage

For fire protection and supplementary cooling, the facility maintains an on-site water storage capacity of 2,641,721 gallons, distributed over the entire plant in 14 tanks with 26 feet in diameter and 44 feet in height.

Ultra Low Sulfur Diesel

The engines consume [redacted] which will be transported on site. To ensure fire safety and to protect the valuable hardware within the data center, the volume of flammable liquids stored on-site will be minimized. For emergency preparedness, a three-day supply of 25,000 tons will be maintained in multiple smaller storage tanks. The rest will be in strategic locations nearby.

The diesel will be stored in 40 tanks distributed across the entire plant, 26 feet in diameter and 44 feet in height.

Lubrication Oil

The engines consume about 2,025 tons of lubrication oil per year (1563 gal/day), which will be shipped on site. Additionally, about 20 tons will be stored on site, in tanks of 160 gallon in each power house.

Natural Gas

The gaseous fuel will be transported by pipeline.

Emission Control Components

For the emission abatement system liquids are transported to the site. A 3-day storage will be kept on site.

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Component	Consumption		Storage
-	[t/a]	[gal/h]	[t]
NH_3 (aq)			
NaOH			
NaHS (reducing agent)			
NaClO2 (oxidizing agent)			
H_2SO_4			

Table 23: List of chemicals yearly used, and amount stored on site

The Storage will be in the corresponding standard tanks for these liquids, horizontally arranged tanks of 16 feet length and 7 feet diameter.

Chemicals in Use

- Hydrous Ammonia
- Caustic Soda NaOH
- Sulfuric Acid H2SO4
- NaClO2 (oxidizing agent)
- NaHS (reducing agent)

ANNEX

The 117 engines will be arranged according to the plan on Figure 5. It shows the map of the site, with 7 pods. Every pod holds two large buildings on the outer side, housing the data centers and 6 power houses in the middle (magenta/pink). A powerhouse holds three engine-generator setups (genset), auxiliaries and parts of the emission control systems. This gives theoretically space for 7 x 6 x 3 = 126 gensets. The remaining three buildings will be used for logistical and storage purposes though (spare parts, fluid preparation etc.)

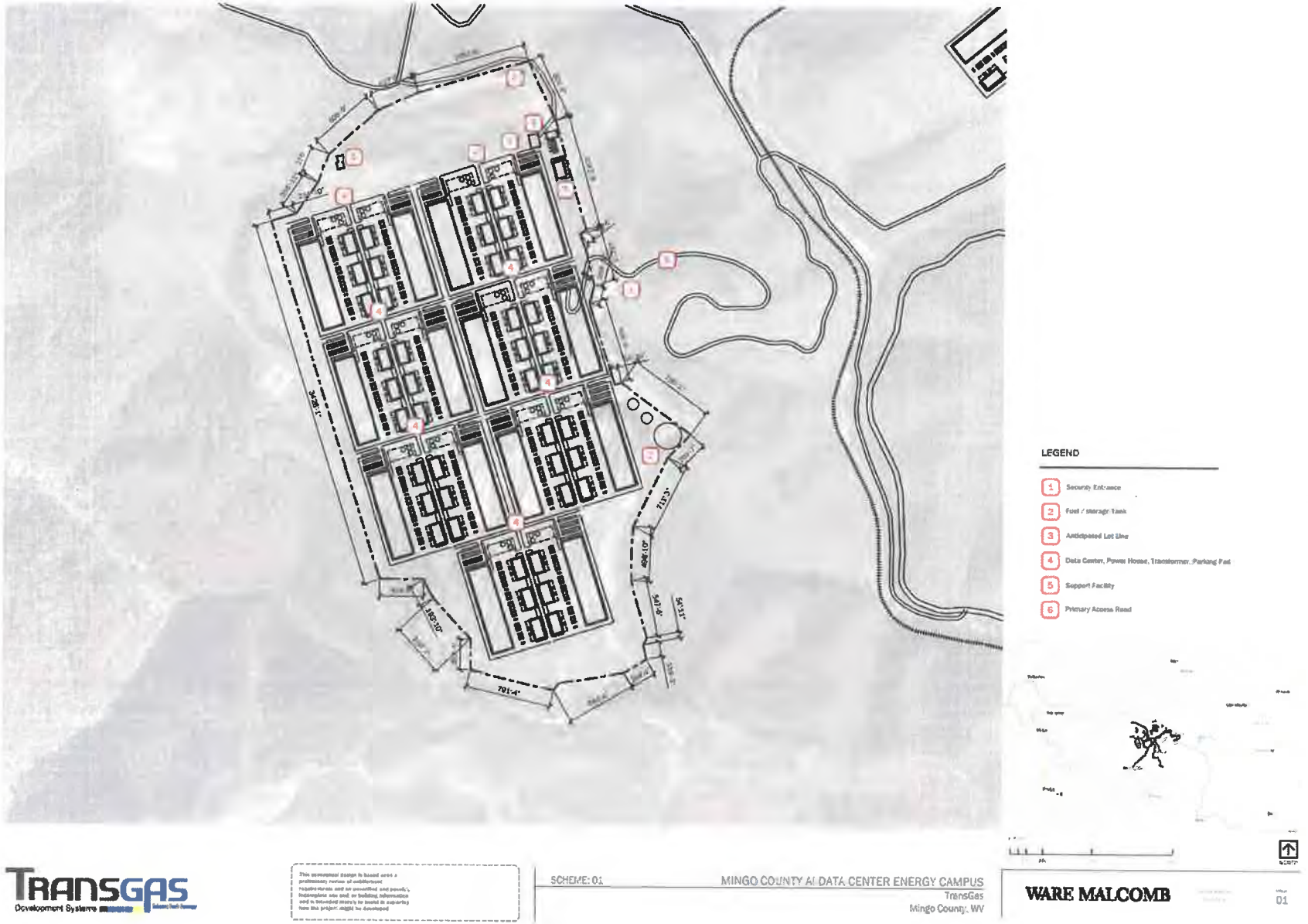

Figure 5: Site plan showing the 7 pods

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Fuel Storage - Site Wide	2. Tank Name 40
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) T1 through T40 (118S - 157S)	4. Emission Point Identification No. (as assigned on *Equipment List Form*)
5. Date of Commencement of Construction (for existing tanks) 2026	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Not Applicable	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). Not Applicable	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): None	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 170,000 gallons	
9A. Tank Internal Diameter (ft) 26	9B. Tank Internal Height (or Length) (ft) 44
10A. Maximum Liquid Height (ft) 43 ft.	10B. Average Liquid Height (ft) NA
11A. Maximum Vapor Space Height (ft) 1 ft.	11B. Average Vapor Space Height (ft) NA
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 170,000 gallons	

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13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
[redacted] yr total for all tanks (Normal Operation)	[redacted] /day total all tanks

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
Average of 4 turnover/tank per year

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof X dome roof
___ other (describe)
☐ External Floating Roof ___ pontoon roof ___ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ___ vertical column support ___ self-supporting
☐ Variable Vapor Space ___ lifter roof ___ diaphragm
☐ Pressurized ___ spherical ___ cylindrical
☐ Underground
☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: Tank construction not selected yet. See TANKS Summary Sheet attached.
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☐ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): to

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one)
☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. See TANKS Summary Sheet
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid: See TANKS Summary Sheet	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☒ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
See TANKS Summary Sheet					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☐ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tanks 1-40
City:	Charleston
State:	West Virginia
Company:	Transgas
Type of Tank:	Vertical Fixed Roof Tank
Description:	Diesel Tanks

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March 24, 2025

Tank Dimensions

Shell Height (ft):	
Diameter (ft):	
Liquid Height (ft) :	
Avg. Liquid Height (ft):	
Volume (gallons):	
Turnovers:	
Net Throughput(gal/yr):	
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	26.00

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	56.67	51.31	62.04	55.00	0.0058	0.0048	0.0070	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

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Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	25.2731
Vapor Space Volume (cu ft):	12,211.8942
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0417
Vented Vapor Saturation Factor:	0.9929
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	12,211.8942
Tank Diameter (ft):	26.0000
Vapor Space Outage (ft):	23.0010
Tank Shell Height (ft):	44.0000
Average Liquid Height (ft):	21.5000
Roof Outage (ft):	0.5010
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5010
Dome Radius (ft):	26.0000
Shell Radius (ft):	13.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Daily Avg. Liquid Surface Temp. (deg. R):	518.3441
Daily Average Ambient Temp. (deg. F):	54.9833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	514.6733
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,250.5726
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0417
Daily Vapor Temperature Range (deg. R):	21.4587
Daily Vapor Pressure Range (psia):	0.0022
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0070
Daily Avg. Liquid Surface Temp. (deg R):	518.3441
Daily Min. Liquid Surface Temp. (deg R):	510.9799
Daily Max. Liquid Surface Temp. (deg R):	521.7082
Daily Ambient Temp. Range (deg. R):	21.5333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9929
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0058
Vapor Space Outage (ft):	23.0010
Working Losses (lb):	12.2809
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	[redacted]
Annual Net Throughput (gal/yr.):	
Annual Turnovers:	
Turnover Factor:	
Maximum Liquid Volume (gal):	
Maximum Liquid Height (ft):	
Tank Diameter (ft):	
Working Loss Product Factor:	
Total Losses (lb):	37.5540

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	12.28	25.27	37.55

ATTACHMENT M

AIR POLLUTION CONTROL DEVICE(S)

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March 24, 2025

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table): 1C – 117C

Equipment Information

1. Manufacturer: [redacted] Model No. NA	2. Control Device Name: Control System Type: Various
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: 100%	
8. Attached efficiency curve and/or other efficiency information. See Attached	
9. Design inlet volume: See Attached SCFM	10. Capacity: See Attached
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any. This emission abatement system is multi-phase and [redacted]. The system controls VOC (VOC HAPs), NOx, PM, CO, and SO_x emissions. A description of the system and each stage is provided on the attachment to this form.	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment. See Attached	
13. Description of method of handling the collected material(s) for reuse of disposal. Spent catalyst and other discardable materials are removed from the site.	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	☒ No
Are particulates present?	☒ Yes	☐ No
Are metals present?	☒ Yes	☐ No

15. Inlet Emission stream parameters:	Maximum	Typical
Pressure (mmHg):		
Heat Content (BTU/scf):	See Attached	
Oxygen Content (%):		
Moisture Content (%):		
Relative Humidity (%):		

16. Type of pollutant(s) controlled: ☒ SO_x ☐ Odor
☒ Particulate (type): Combustion Byproducts ☒ Other NO_x, VOC (VOC HAPs), CO

17. Inlet gas velocity: See Attached ft/sec	18. Pollutant specific gravity: NA
19. Gas flow into the collector: See Attached ACF @ °F and PSIA	20. Gas stream temperature: See Attached Inlet: °F Outlet: °F
21. Gas flow rate: See Attached Design Maximum: ACFM Average Expected: ACFM	22. Particulate Grain Loading in grains/scf: See Attached Inlet: Outlet:

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant		Emission Capture Efficiency %	OUT Pollutant		Control Efficiency %
	lb/hr	grains/acf		lb/hr	grains/acf	
A	See attached document for a description of each control stage.					
B						
C						
D						
E						

24. Dimensions of stack: Height ft. Diameter ft.

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.

Particulate Distribution

26. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	Weight % for Size Range	Weight % for Size Range
0 – 2		
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12	See Attached	
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

See Attached

28. Describe the collection material disposal system:

Spent or collected material is shipped offsite for disposal or regeneration/reuse.

29. Have you included ***Other Collectores Control Device*** in the Emissions Points Data Summary Sheet?

30. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING: Amount of emissions control fluids utilized.	RECORDKEEPING: Amount of emissions control fluids utilized.
REPORTING: None	TESTING: As requested by the permit.

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

31. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

See Attached

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

See Attached

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

The controls are designed to operate within the operational ranges of the engines.

PROCESS DESCRIPTION for

POLLUTION CONTROL for

NATURAL GAS ENGINE EMISSIONS

Abatement system Package

Prepared for

Transgas – Adams Fork project
February 10, 2025
Rev. 03

[redacted]

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March 24, 2025

[redacted]

1. Introduction

Below is a description of the basic concept on which the proposed system is based, together with some preliminary evaluations about the foreseen chemicals consumption.

The overall process scheme is presented in the **attachment 1 – OVERALL PROCESS SCHEME** and detailed below.

The configuration and equipment sizing has been studied for the maximum flow rate – corresponding to 100% load of the engine with iCER, [redacted] kW of mechanical power at shaft when engine runs in compensation mode, and the maximum load of pollutants.

The system described below will be installed individually for each engine.

Attachment 2 rev 02– EMISSION ABATEMENT STEPS shows the pollutant flow at each stage (A to D), as indicated in the overall process scheme, with the target of reaching the maximum total emission level of:

- NOx < 250 tpy (short)
- CO < 250 tpy (short)
- SOx < 250 tpy (short)
- PM < 250 tpy (short)

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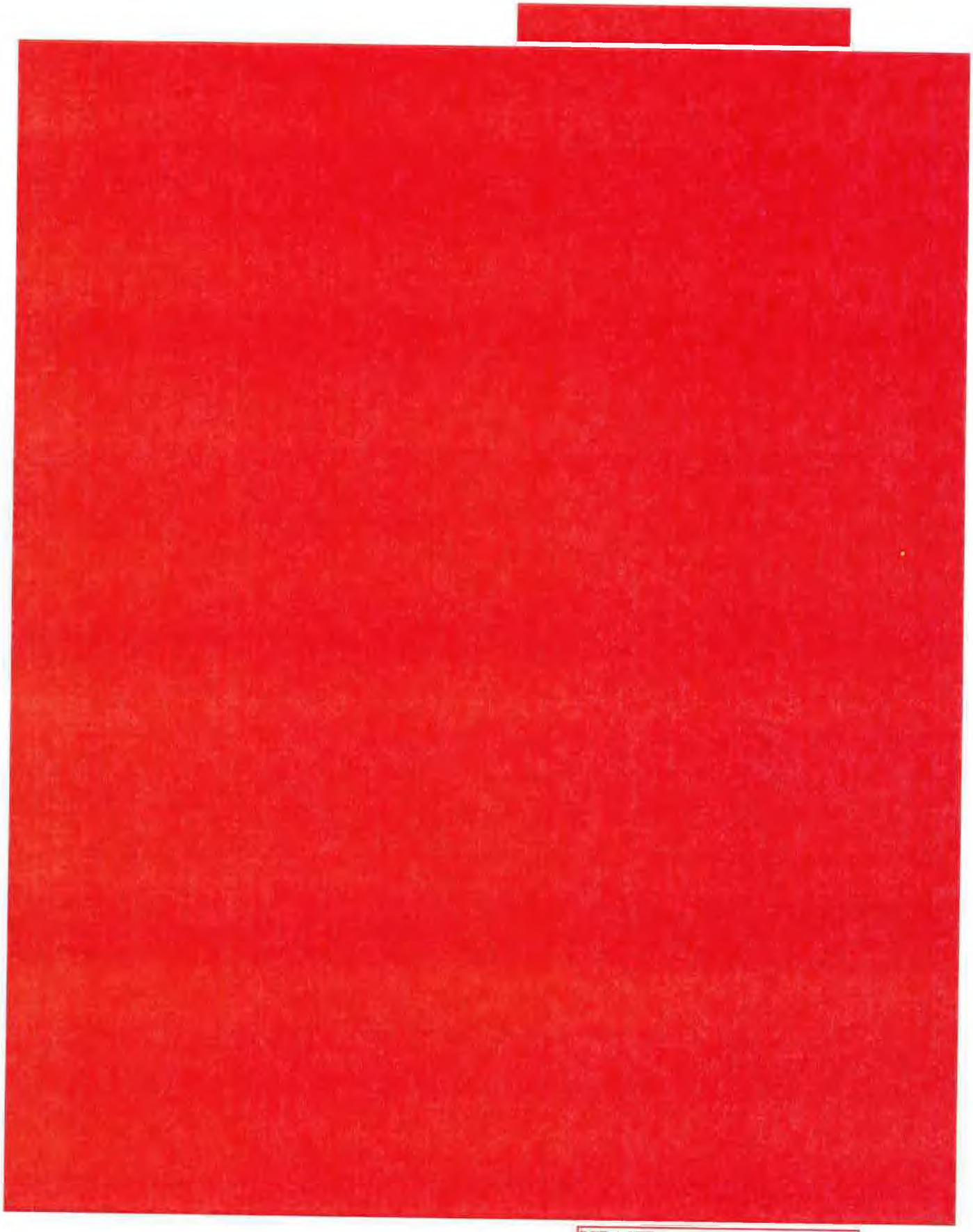
for a total of 114 engines operating at the same time and continuously at maximum load.

[redacted]



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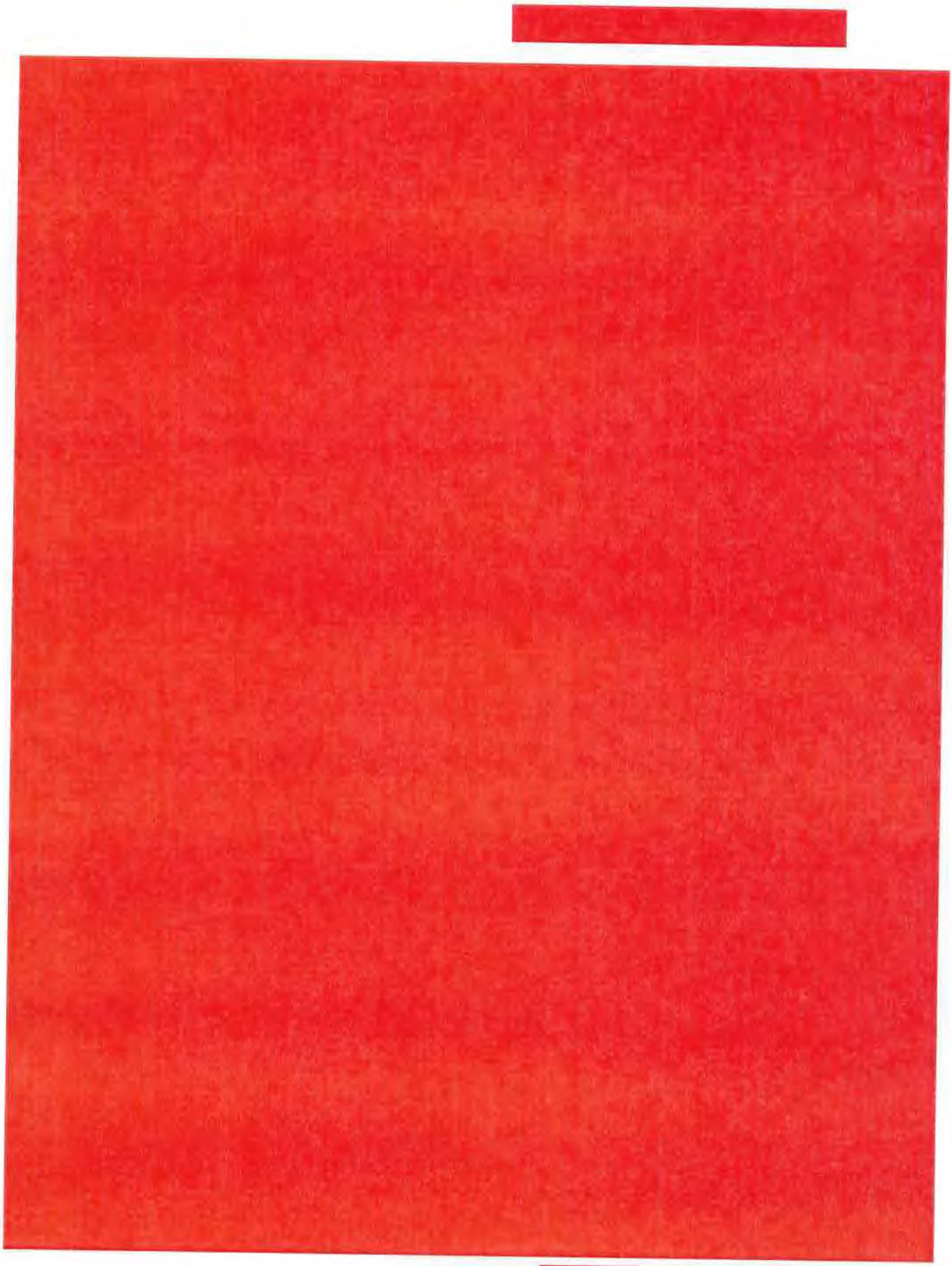

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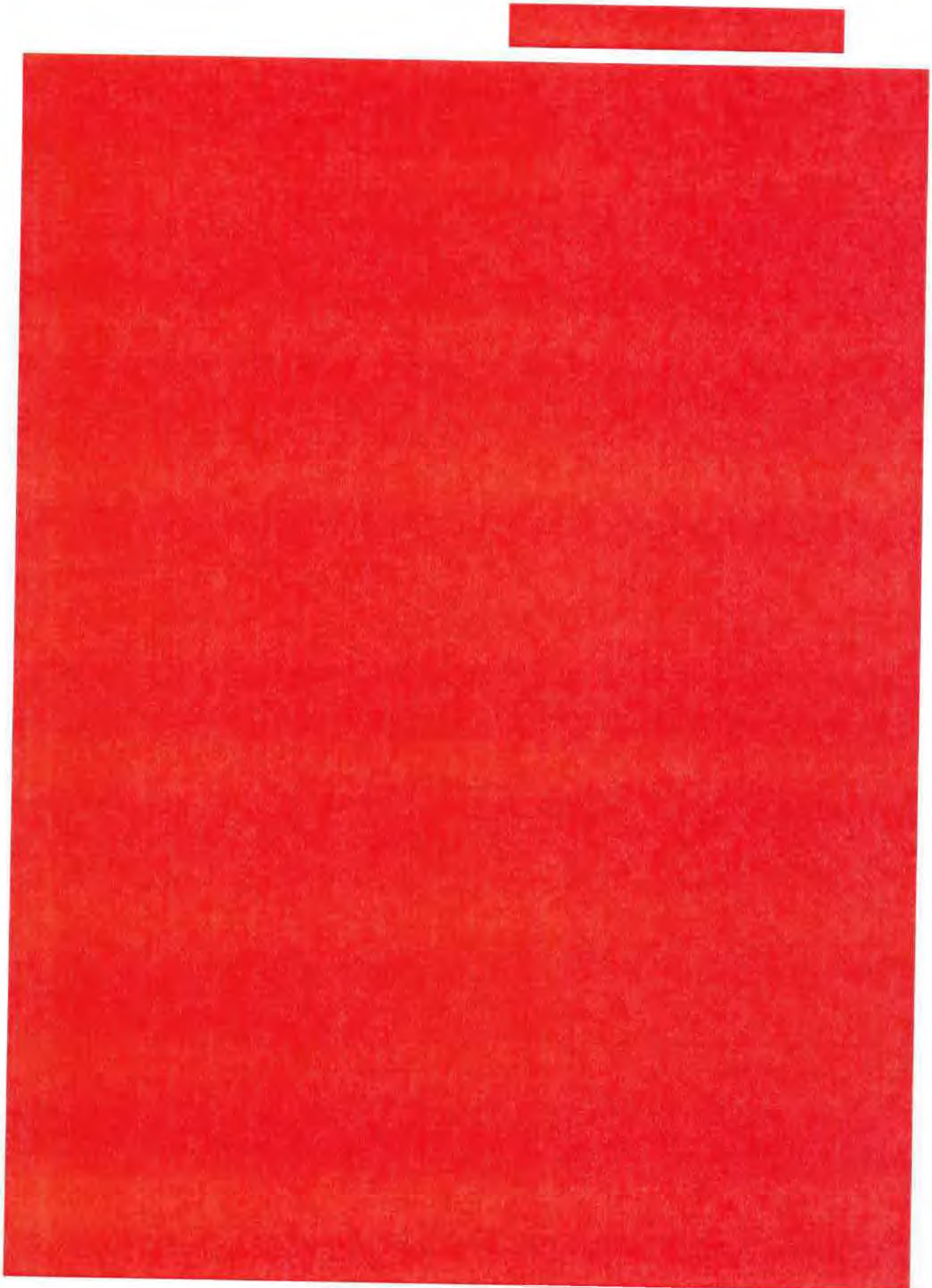

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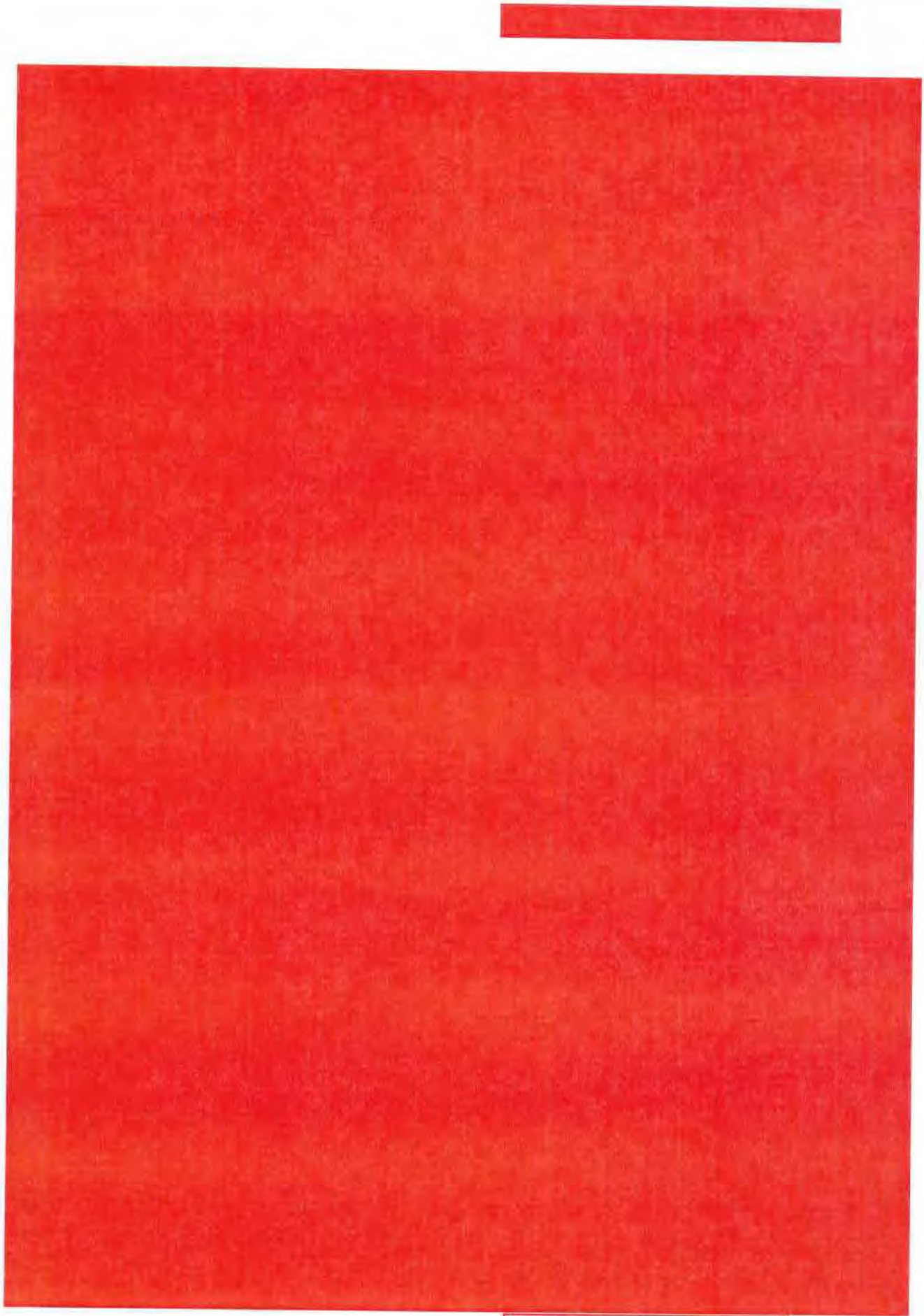

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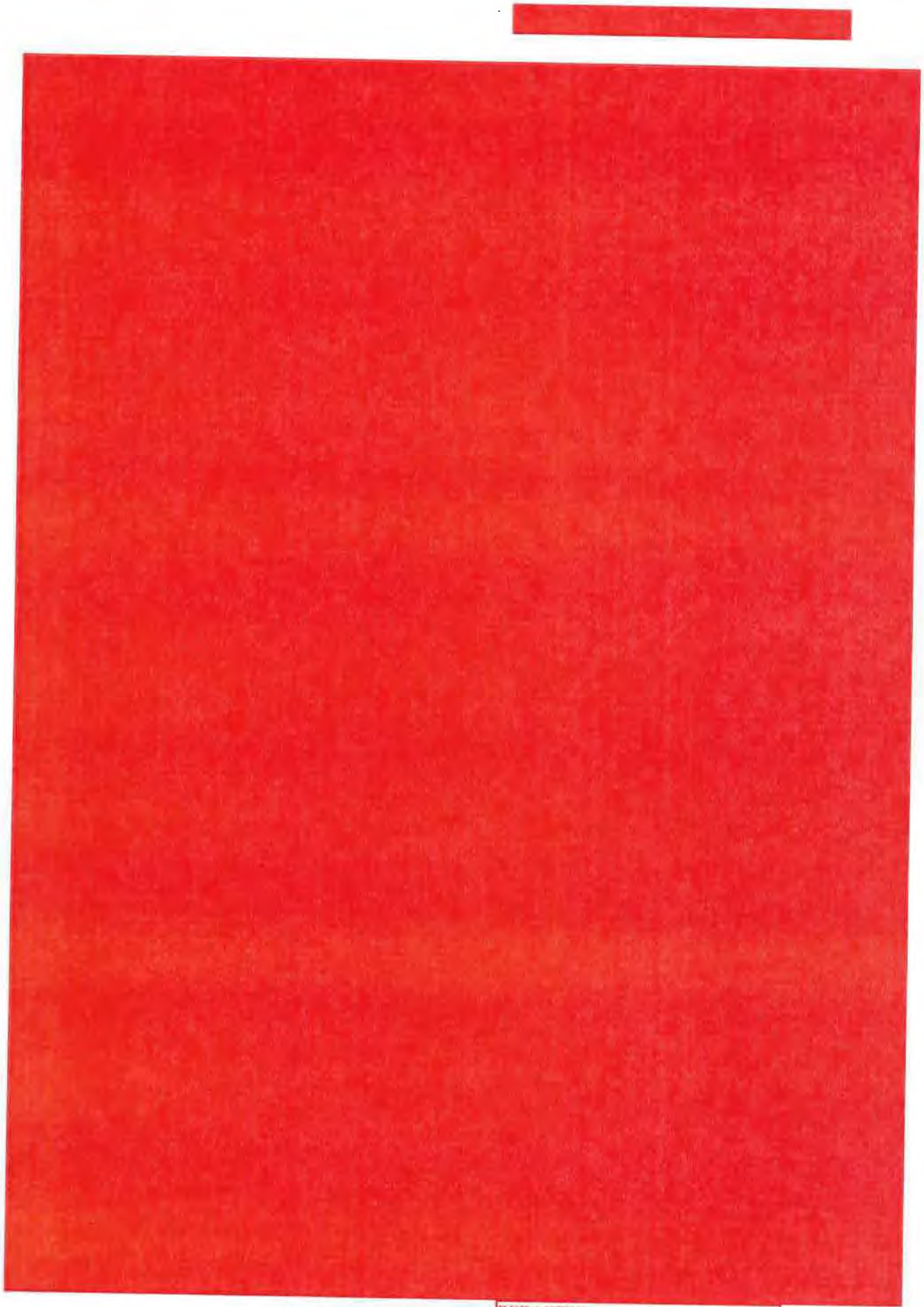

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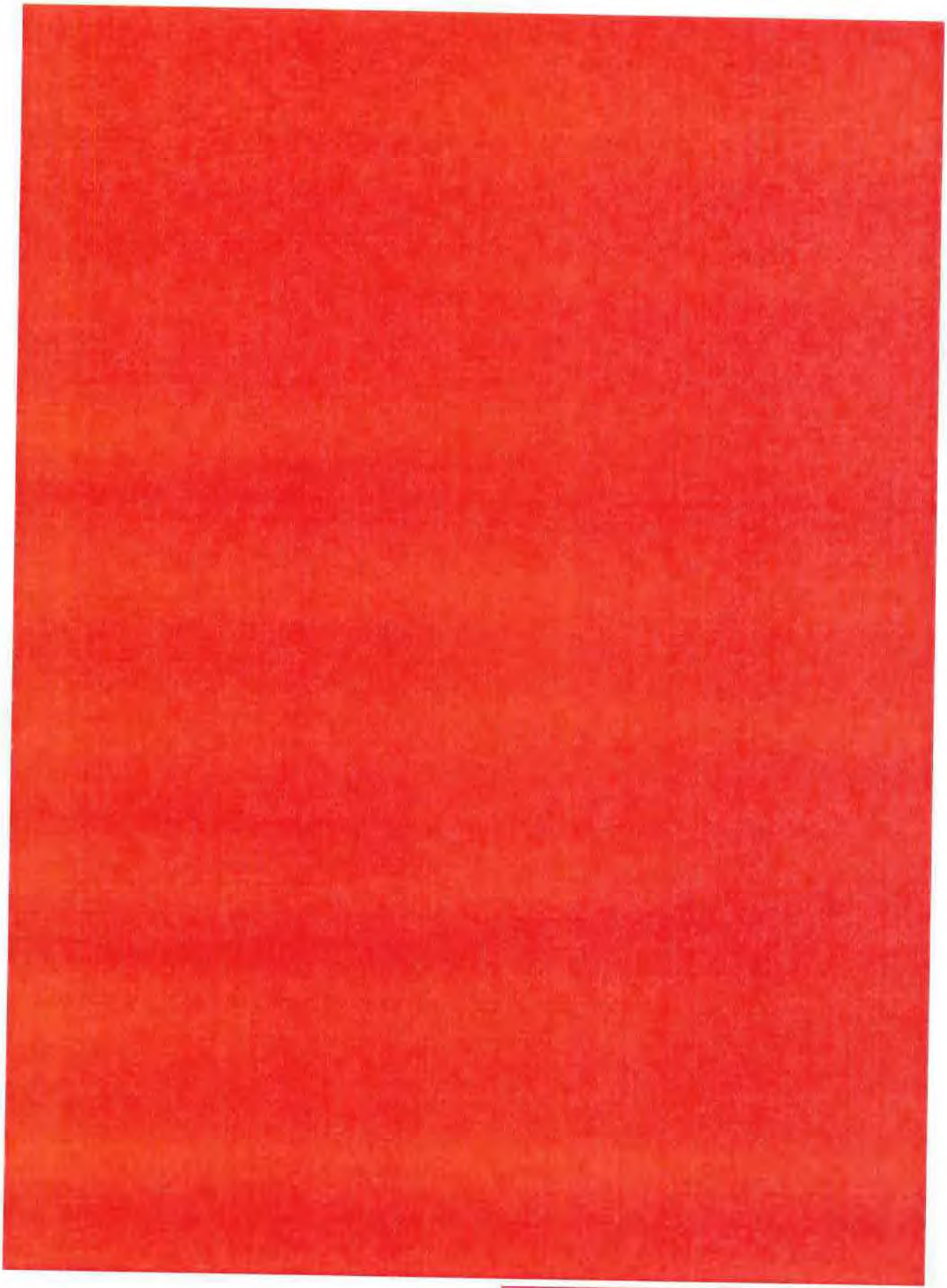

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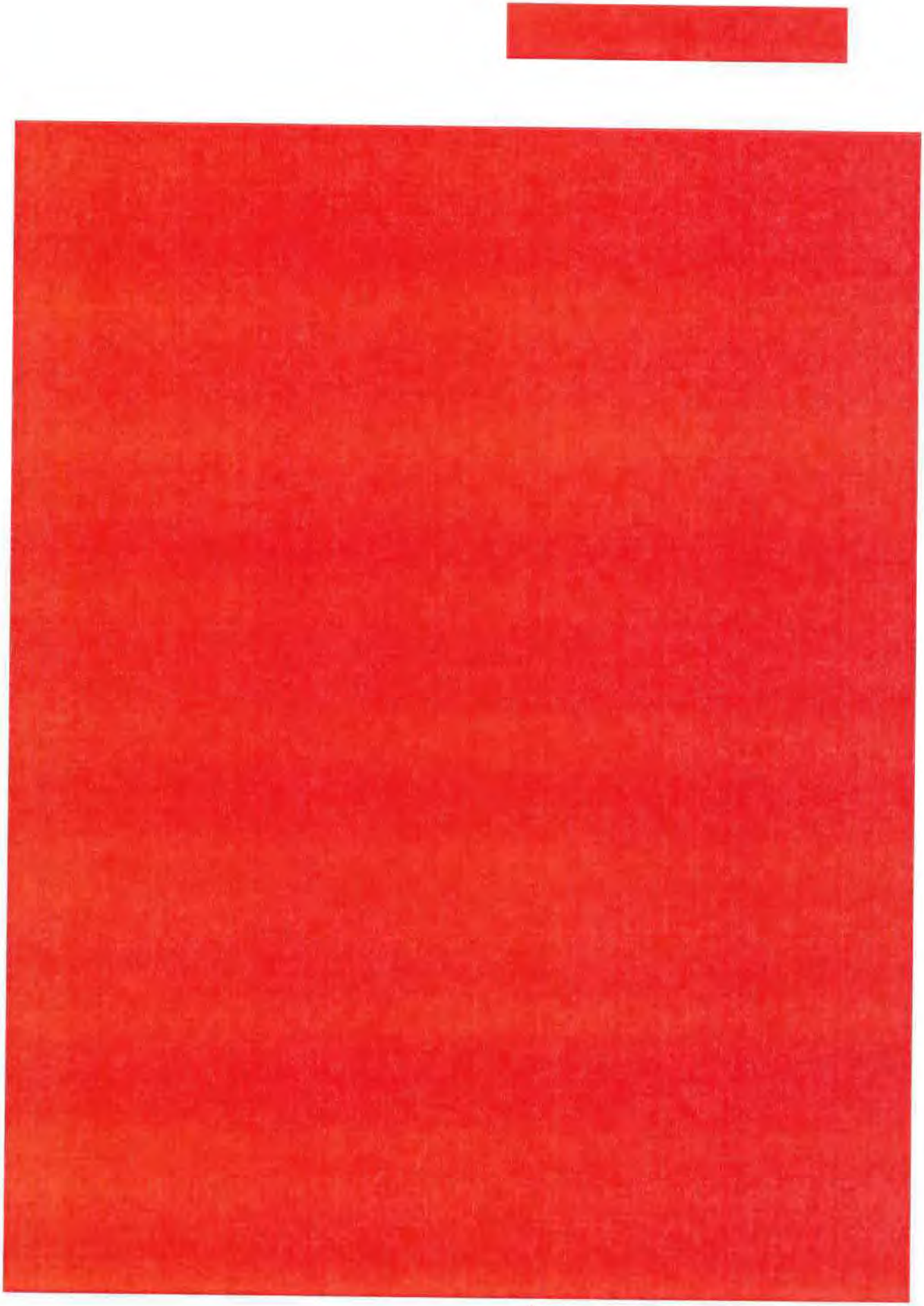

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M13 of M18

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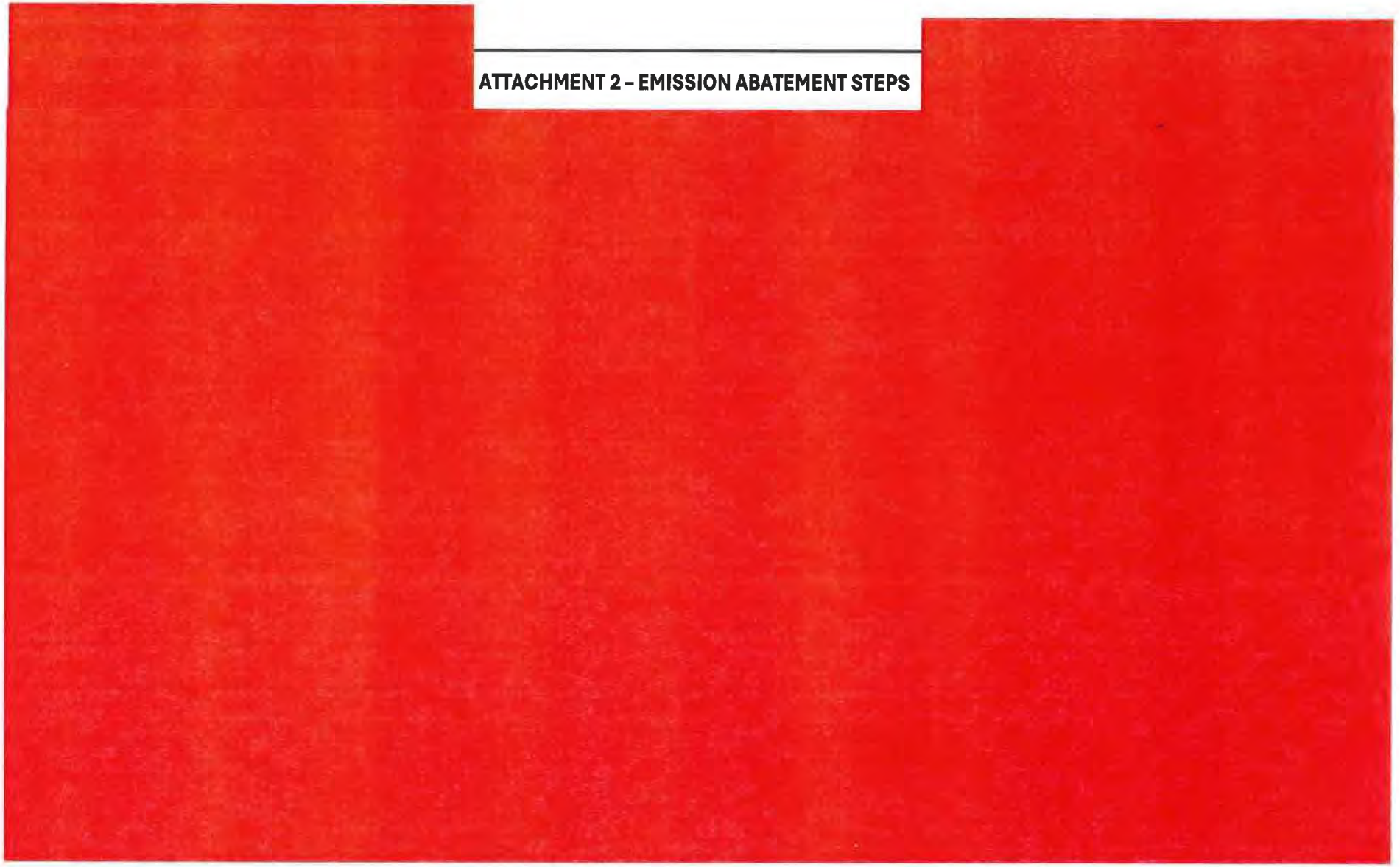
ATTACHMENT 2 – EMISSION ABATEMENT STEPS



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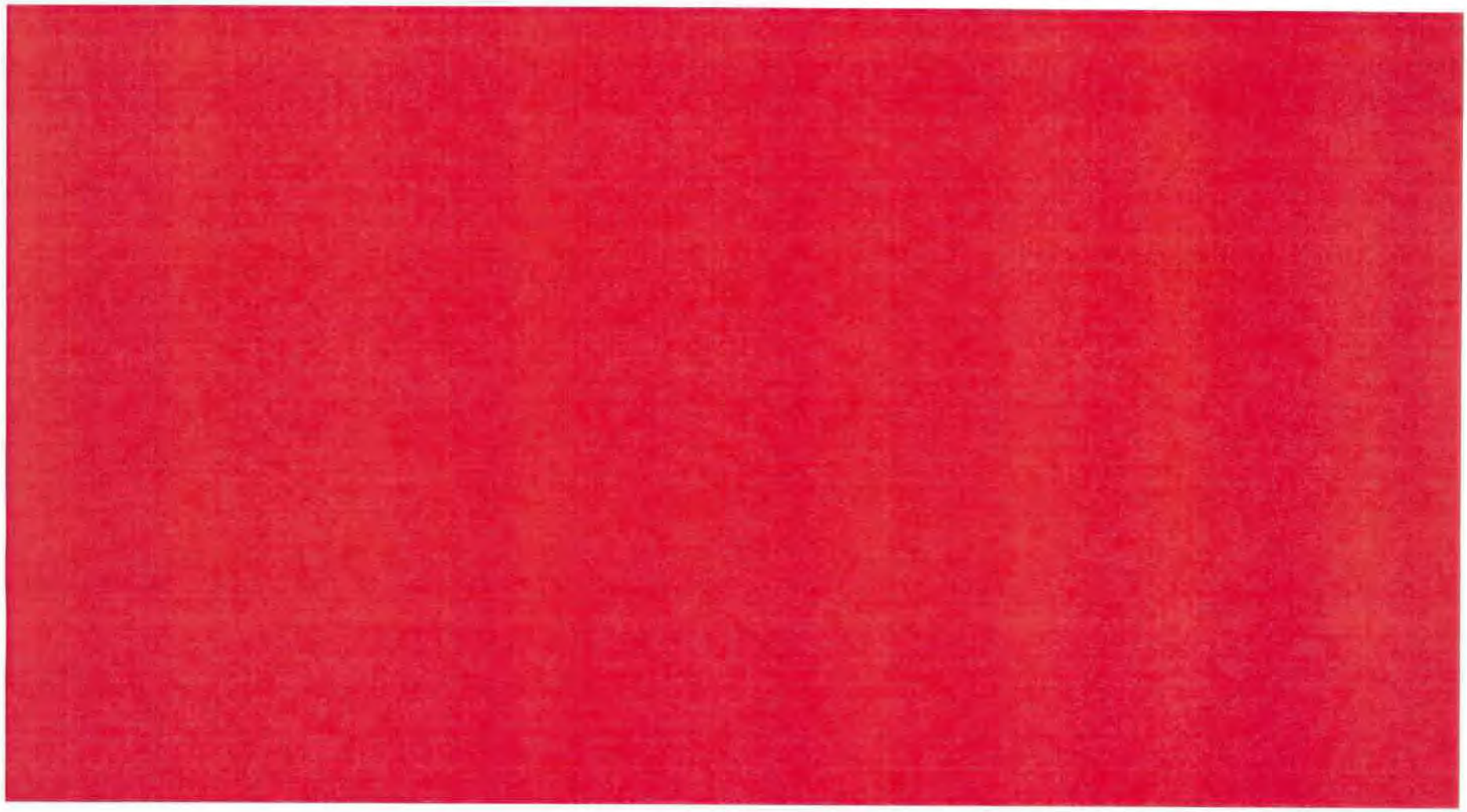

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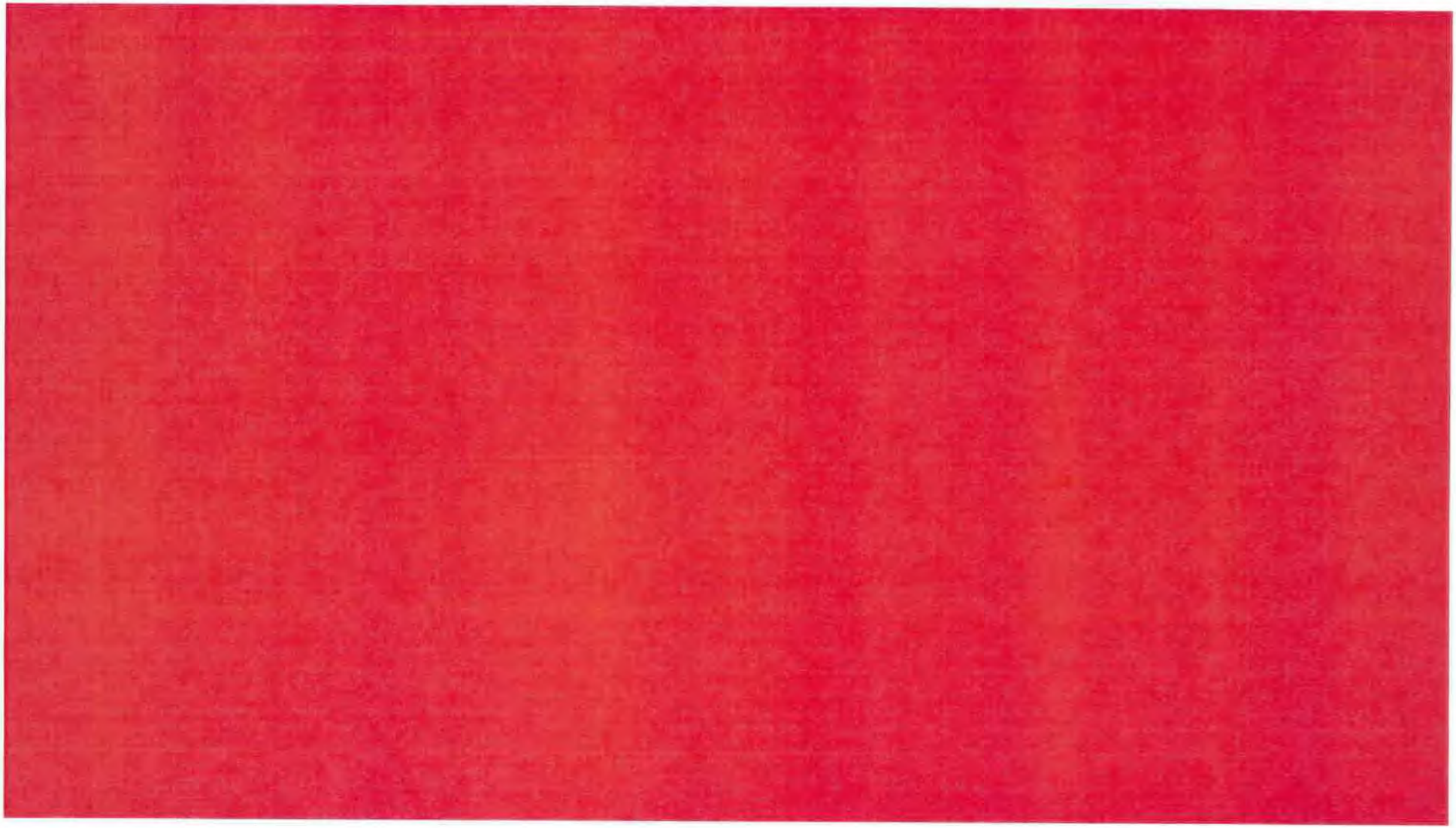

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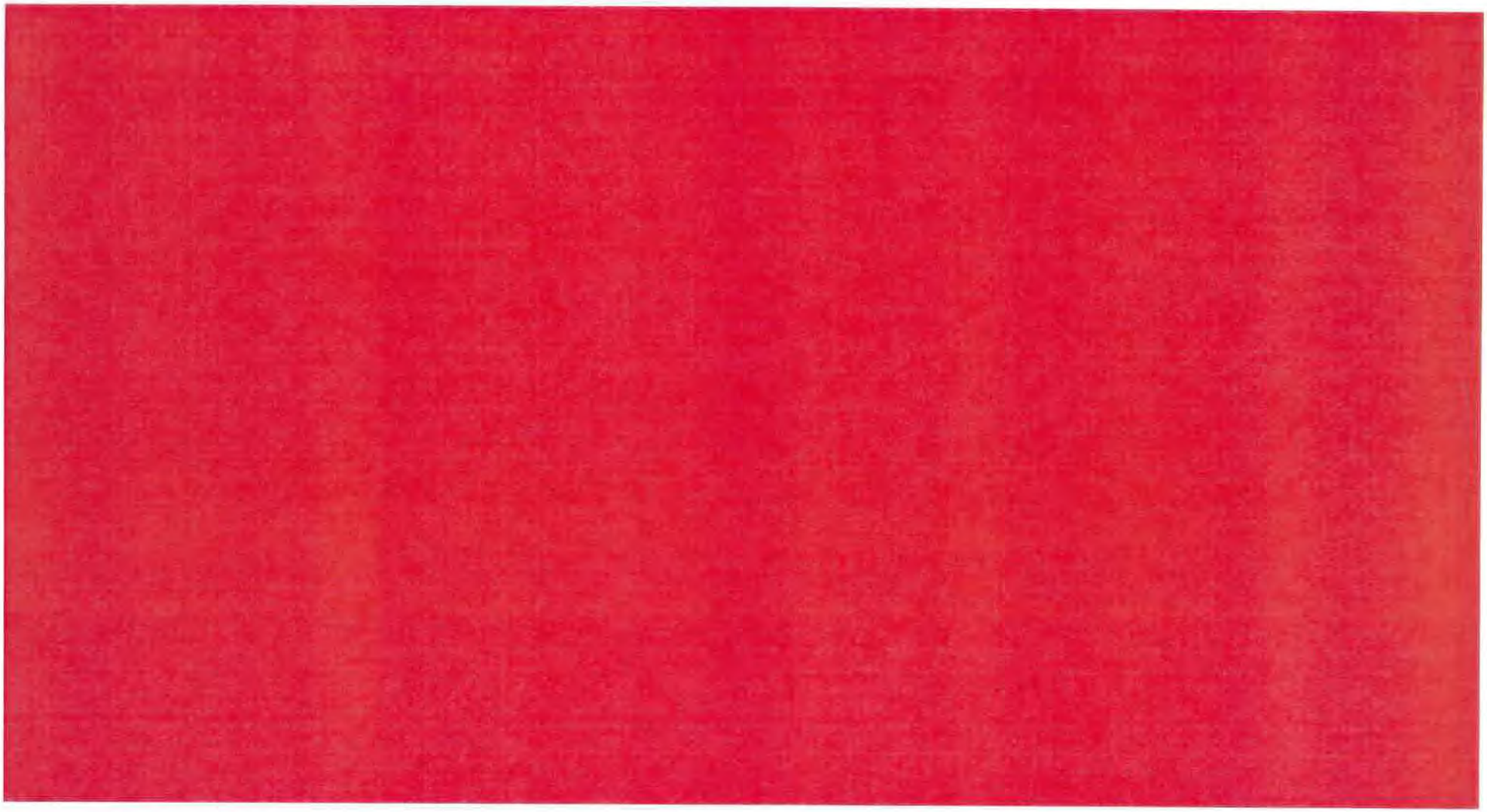

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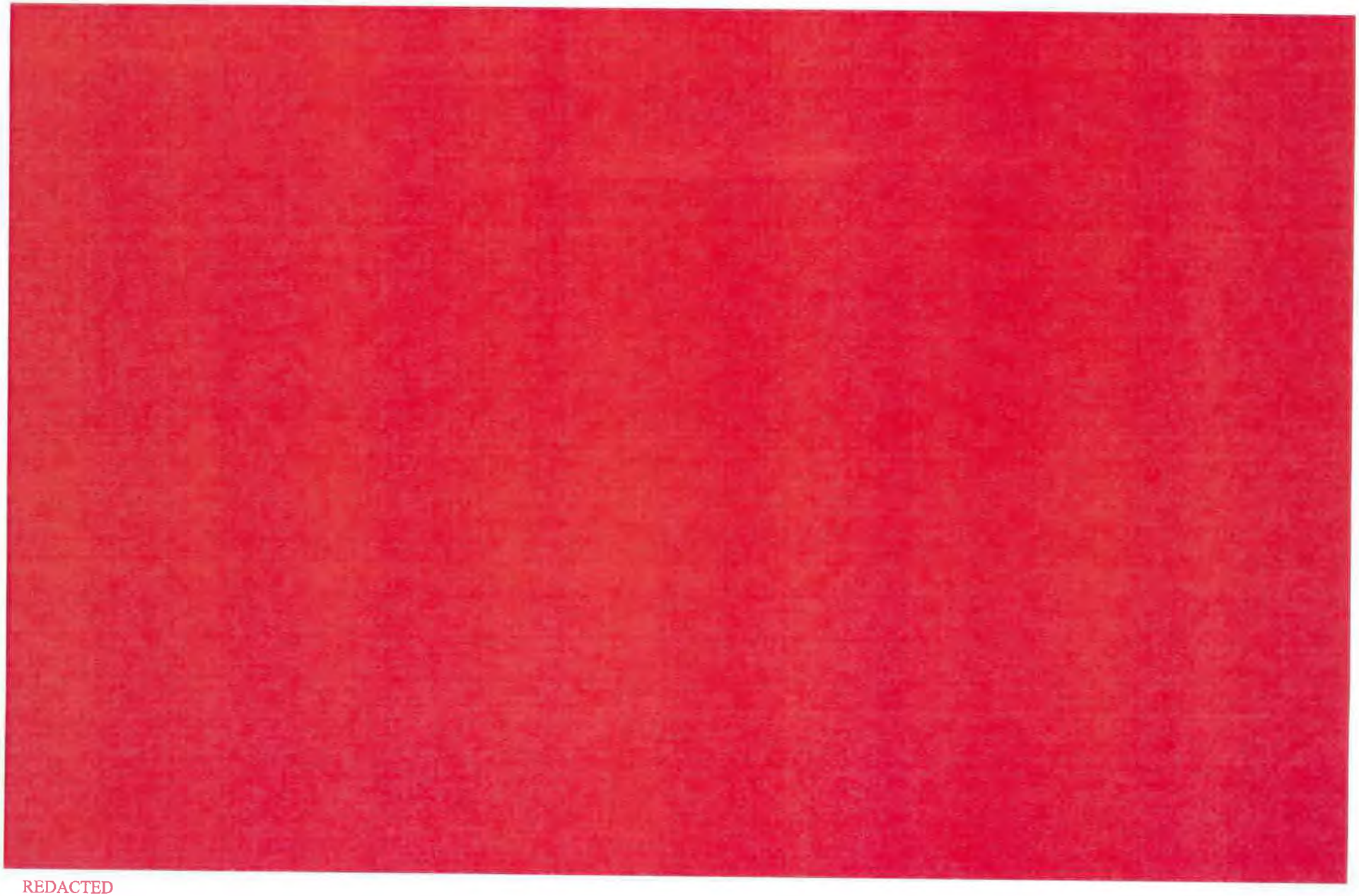

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ATTACHMENT N

SUPPORTING EMISSIONS CALCULATIONS

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March 24, 2025

Facility Total

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	[redacted]	193.69
PM10	[redacted]	187.96
PM2.5	[redacted]	186.91
SO2	[redacted]	9.93
NOx	[redacted]	194.30
CO	[redacted]	205.62
VOC	[redacted]	117.66
Total HAPS	[redacted]	0.87

Engines (Worst Case)

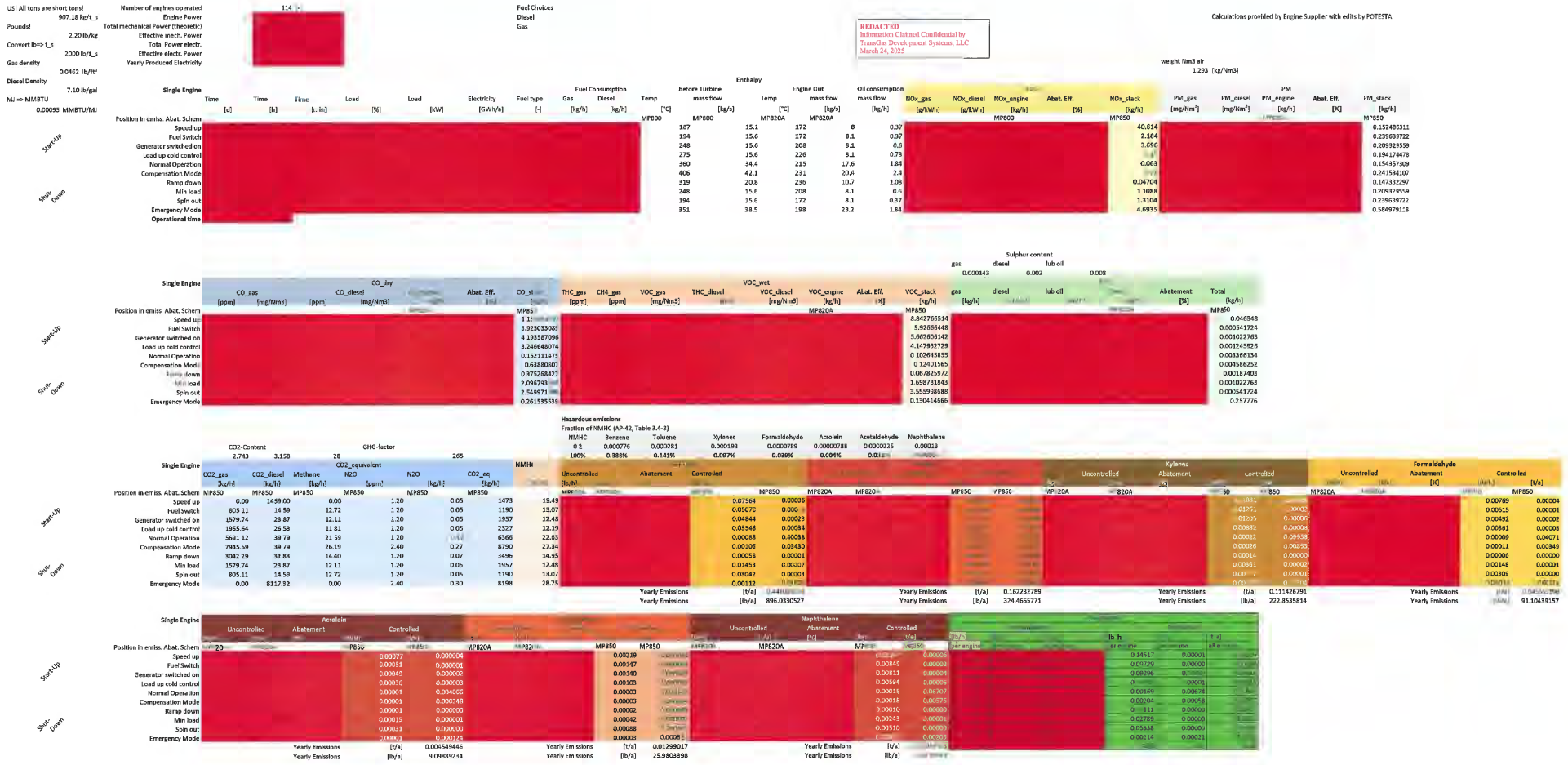
Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	[redacted]	186.53
PM10	[redacted]	186.53
PM2.5	[redacted]	186.53
SO2	[redacted]	9.93
NOx	[redacted]	194.30
CO	[redacted]	205.62
VOC	[redacted]	116.59
Total HAPS	[redacted]	0.86

Tanks

Emission Type	Uncontrolled	Controlled
	tpy	tpy
VOC	0.75	0.75

Haulroads and Fugitive Leaks

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	7.16	7.16
PM10	1.43	1.43
PM2.5	0.38	0.38
VOC	0.31	0.31
Total HAPS	0.0053	0.0053


US! All tons are short tons!
907.18 kg/t_s
Pounds!
2.20 lb/kg
Convert lb=> t_s
2000 lb/t_s
Gas density
0.0462 lb/ft³
Diesel Density
7.10 lb/gal
MJ => MMBTU
0.00095 MMBTU/MJ
Number of engines operated
114
Engine Power
Total mechanical Power (theoretic)
Effective mech. Power
Total Power electr.
Effective electr. Power
Yearly Produced Electricity
Fuel Choices
Diesel
Gas
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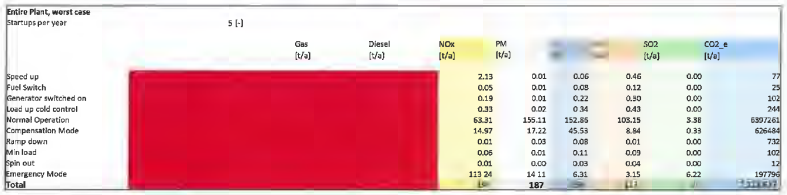
March 24, 2025
Calculations provided by Engine Supplier with edits by POTESTA
weight Nm3 air
1.293 [kg/Nm3]
Single Engine
Time [d]
Time [h]
Time [t. in]
Load [%]
Load [kW]
Electricity [GWh/a]
Fuel type [-]
Fuel Consumption Gas [kg/h]
Fuel Consumption Diesel [kg/h]
Enthalpy before Turbine Temp [°C]
Enthalpy before Turbine mass flow [kg/s]
Enthalpy Engine Out Temp [°C]
Enthalpy Engine Out mass flow [kg/s]
Oil consumption mass flow [kg/h]
NOx_gas [g/kWh]
NOx_diesel [g/kWh]
NOx_engine [kg/h]
Abat. Eff. [%]
NOx_stack [kg/h]
PM_gas [mg/Nm³]
PM_diesel [mg/Nm³]
PM_engine [kg/h]
PM Abat. Eff. [%]
PM_stack [kg/h]
Position in emiss. Abat. Schem
MP800
MP800
MP820A
MP820A
MP850
MP850
Start-Up
Speed up 187 15.1 172 8 0.37 40.614 0.152486311
Fuel Switch 194 15.6 172 8.1 0.37 2.184 0.239639722
Generator switched on 248 15.6 208 8.1 0.6 3.696 0.209329559
Load up cold control 275 15.6 226 8.1 0.73 0.194174478
Normal Operation 360 34.4 215 17.6 1.84 0.063 0.154957309
Compensation Mode 406 42.1 231 20.4 2.4 0.241534107
Shut-Down
Ramp down 319 20.8 236 10.7 1.08 0.04704 0.147332297
Min load 248 15.6 208 8.1 0.6 1.1088 0.209329559
Spin out 194 15.6 172 8.1 0.37 1.3104 0.239639722
Emergency Mode 351 38.5 198 23.2 1.84 4.6935 0.584979118
Operational time
Sulphur content
gas 0.000343
diesel 0.002
lub oil 0.008
Single Engine
CO_gas [ppm]
CO_gas [mg/Nm3]
CO_diesel [ppm]
CO_diesel [mg/Nm3]
CO Abat. Eff.
CO_stack [kg/h]
VOC_wet
THC_gas [ppm]
CH4_gas [ppm]
VOC_gas [mg/Nm3]
THC_diesel
VOC_diesel [mg/Nm3]
VOC_engine [kg/h]
VOC Abat. Eff. [%]
VOC_stack [kg/h]
Sulphur gas [kg/h]
Sulphur diesel
Sulphur lub oil
Sulphur Abatement [%]
Sulphur Total [kg/h]
Position in emiss. Abat. Schem
MP85
MP820A
MP850
MP850
Start-Up
Speed up 1.11 8.842766514 0.046348
Fuel Switch 3.92303308 5.92666448 0.000541724
Generator switched on 4.193587096 5.665606142 0.001022763
Load up cold control 3.246648074 4.147932729 0.001245926
Normal Operation 0.152113471 0.102645855 0.003366134
Compensation Mode 0.6388080 0.12401565 0.004586252
Shut-Down
Ramp down 0.375268427 0.067825972 0.00187403
Min load 2.098793 1.698781843 0.001022763
Spin out 2.549971 3.555998588 0.000541724
Emergency Mode 0.261535536 0.130414666 0.257776
Hazardous emissions
Fraction of NMHC (AP-42, Table 3.4-3)
NMHC
Benzene
Toluene
Xylenes
Formaldehyde
Acrolein
Acetaldehyde
Naphthalene
0.2
0.000776
0.000281
0.000193
0.0000789
0.00000788
0.0000225
0.00013
100%
0.388%
0.141%
0.097%
0.039%
0.004%
0.011%
CO2-Content
2.743
3.158
GHG-factor
28
265
Single Engine
CO2_gas [kg/h]
CO2_diesel [kg/h]
CO2_equivalent Methane [kg/h]
CO2_equivalent N2O [ppm]
CO2_equivalent N2O [kg/h]
CO2_eq [kg/h]
NMHC
Uncontrolled [lb/h]
Abatement [%]
Controlled [lb/h]
Xylenes Uncontrolled
Xylenes Abatement [%]
Xylenes Controlled
Formaldehyde Uncontrolled
Formaldehyde Abatement [%]
Formaldehyde Controlled [lb/h]
Formaldehyde Controlled [t/a]
Position in emiss. Abat. Schem
MP850
MP850
MP850
MP850
MP850
MP850
MP850
MP820A
MP820A
MP850
MP850
MP820A
820A
MP850
MP820A
MP850
Start-Up
Speed up 0.00 1459.00 0.00 1.20 0.05 1473 19.49 0.07564 0.00096 0.00769 0.00004
Fuel Switch 805.11 14.59 12.72 1.20 0.05 1190 13.07 0.05070 0.000 0.00515 0.00001
Generator switched on 1579.74 28.87 12.11 1.20 0.05 1957 12.48 0.04844 0.00023 0.00492 0.00002
Load up cold control 1955.64 26.53 11.81 1.20 0.05 2327 12.19 0.03548 0.00094 0.00361 0.00008
Normal Operation 5691.12 39.79 21.59 1.20 0.24 6366 22.63 0.00088 0.40098 0.00009 0.04071
Compensation Mode 7945.59 39.79 26.19 2.40 0.27 8790 27.84 0.00106 0.03433 0.00011 0.00349
Ramp down 3042.29 31.83 14.40 1.20 0.07 3496 14.95 0.00058 0.00001 0.00006 0.00000
Min load 1579.74 23.87 12.11 1.20 0.05 1957 12.48 0.01453 0.00027 0.00148 0.00001
Spin out 805.11 14.59 12.72 1.20 0.05 1190 13.07 0.03042 0.00003 0.00309 0.00000
Emergency Mode 0.00 8117.32 0.00 2.40 0.30 8198 28.75 0.00112
Yearly Emissions [t/a] 0.162232789 Yearly Emissions [t/a] 0.111426791 Yearly Emissions [t/a]
Yearly Emissions [lb/a] 896.0330527 Yearly Emissions [lb/a] 324.4655771 Yearly Emissions [lb/a] 222.8535834 Yearly Emissions [lb/a] 91.10439157
Single Engine
Acrolein Uncontrolled [lb/h]
Acrolein Abatement [%]
Acrolein Controlled [lb/h]
Acrolein Controlled [t/a]
Naphthalene Uncontrolled [lb/h]
Naphthalene Abatement [%]
Naphthalene Controlled [lb/h]
Naphthalene Controlled [t/a]
lb/h per engine
lb h
t a
Position in emiss. Abat. Schem
MP20
MP850
MP820A
MP820
MP850
MP850
MP820A
MP850
Start-Up
Speed up 0.00077 0.000004 0.00219 0.00849 0.00002 0.14517 0.00001
Fuel Switch 0.00051 0.000001 0.00147 0.00569 0.00001 0.09729 0.00000
Generator switched on 0.00049 0.000002 0.00140 0.00543 0.00001 0.09296 0.00000
Load up cold control 0.00036 0.000003 0.00103 0.00396 0.00001 0.06767 0.00000
Normal Operation 0.00001 0.000355 0.00003 0.00015 0.06707 0.00169 0.00674
Compensation Mode 0.00001 0.000348 0.00003 0.00018 0.00575 0.00104 0.00058
Ramp down 0.00001 0.000000 0.00002 0.00010 0.00000 0.00111 0.00000
Min load 0.00015 0.000001 0.00042 0.00243 0.00001 0.02789 0.00000
Spin out 0.00033 0.000000 0.00088 0.00510 0.00000 0.05816 0.00000
Emergency Mode 0.00001 0.000124 0.00003 0.00018 0.00055 0.00114 0.00011
Yearly Emissions [t/a] 0.004549446 Yearly Emissions [t/a] 0.01299017 Yearly Emissions [t/a]
Yearly Emissions [lb/a] 9.09889234 Yearly Emissions [lb/a] 25.9803398 Yearly Emissions [lb/a]

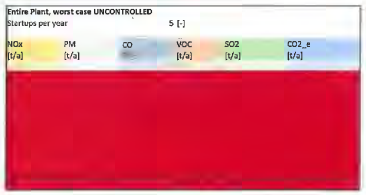
Worst case

Raw Emissions [pounds/hour]

Emission Control [%]

Controlled Emissions [pounds/hour]





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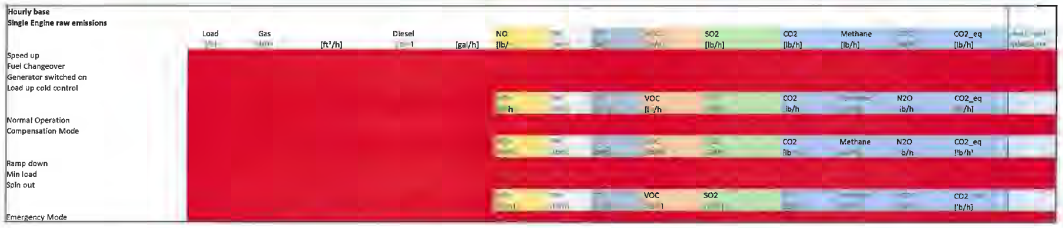
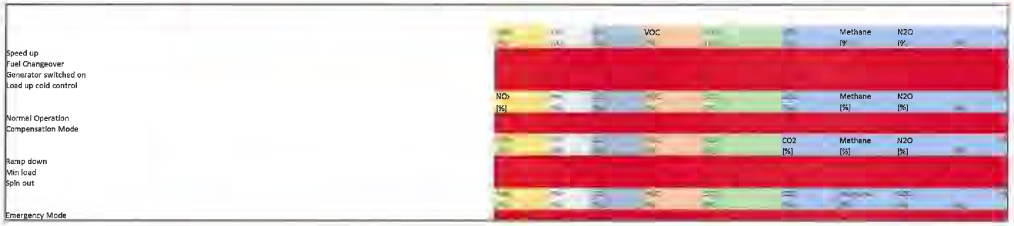
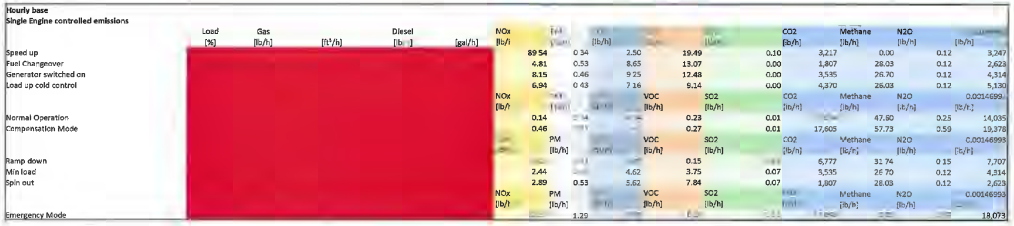


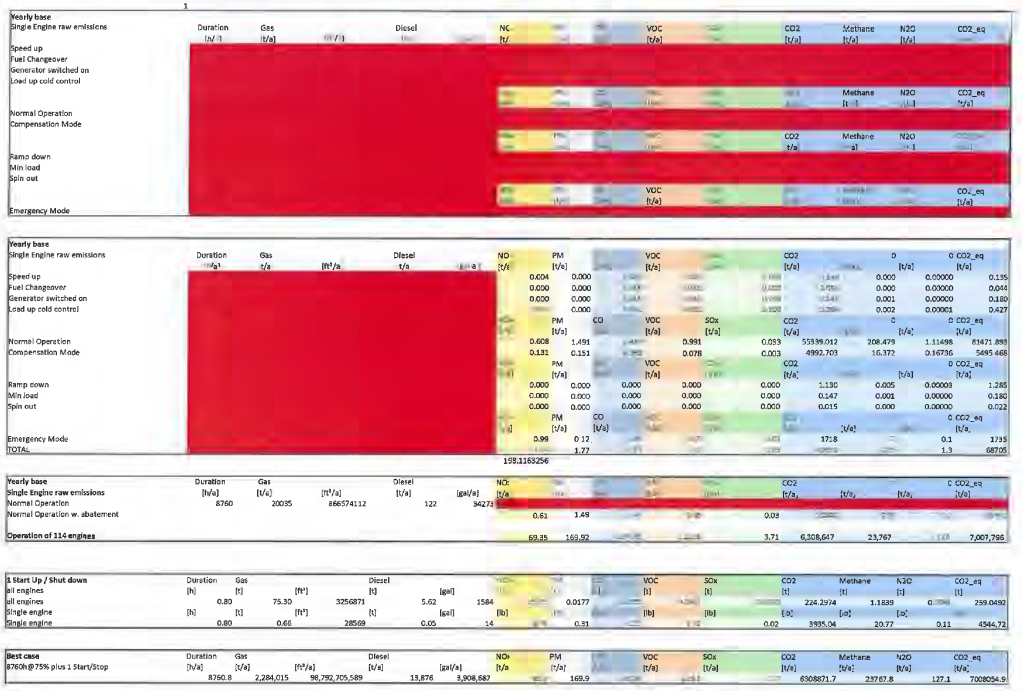




Raw Emissions [tons / year]

Start / Stop controlled

Best case



Yearly base Single Engine raw emissions	Duration [h/a]	Gas [t/a]	Diesel	NOx [t/a]	VOC [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq
Speed up									
Fuel Changeover									
Generator switched on									
Load up cold control							Methane	N2O	CO2_eq
							[t/a]		[t/a]
Normal Operation									
Compensation Mode						CO2	Methane	N2O	
						[t/a]	[t/a]		
Ramp down									
Min load									
Spin out					VOC				CO2_eq
					[t/a]				[t/a]
Emergency Mode									

Yearly base Single Engine raw emissions	Duration [h/a]	Gas [t/a]	[ft³/a]	Diesel [t/a]	[gal/a]	NOx [t/a]	PM [t/a]		VOC [t/a]		CO2 [t/a]		O [t/a]	O CO2_eq [t/a]
Speed up						0.004	0.000						0.000	0.00000	0.135
Fuel Changeover						0.000	0.000						0.000	0.00000	0.044
Generator switched on						0.000	0.000						0.001	0.00000	0.180
Load up cold control							0.000						0.002	0.00001	0.427
							PM	CO	VOC	SOx	CO2		O	O CO2_eq
							[t/a]		[t/a]	[t/a]	[t/a]		[t/a]	[t/a]
Normal Operation						0.608	1.491		0.991	0.033	55939.012	208.479	1.11498	61471.893
Compensation Mode						0.131	0.151		0.078	0.003	4992.703	16.372	0.16736	5495.468
							PM		VOC		CO2			O CO2_eq
							[t/a]		[t/a]		[t/a]		[t/a]	[t/a]
Ramp down						0.000	0.000	0.000	0.000	0.000	1.130	0.005	0.00003	1.285
Min load						0.000	0.000	0.000	0.000	0.000	0.147	0.001	0.00000	0.180
Spin out						0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.00000	0.022
							PM	CO						O CO2_eq
							[t/a]	[t/a]					[t/a]	[t/a]
Emergency Mode						0.99	0.12					17.8	0.1	1735
TOTAL							1.77						1.3	68705
						198.1163256								

Yearly base Single Engine raw emissions	Duration [h/a]	Gas [t/a]	[ft³/a]	Diesel [t/a]	[gal/a]	NOx [t/a]			CO2 [t/a]	[t/a]	[t/a]	O CO2_eq [t/a]
Normal Operation	8760	20035	866574112	122	34273							
Normal Operation w. abatement						0.61	1.49		0.09			
Operation of 114 engines						69.35	169.92		3.71	6,308,647	23,767	7,007,796

1 Start Up / Shut down	Duration [h]	Gas [t]	[ft³]	Diesel [t]	[gal]		VOC [t]	SOx [t]	CO2 [t]	Methane [t]	N2O [t]	CO2_eq [t]
all engines	0.80	75.30	3256871	5.62	1584		0.0177		224.2974	1.1839	0	259.0492
Single engine	[h]	[t]	[ft³]	[t]	[gal]	[lb]	[lb]	[lb]	[g]	[g]	[g]	
Single engine	0.80	0.66	28569	0.05	14		0.31		0.02	3935.04	20.77	0.11	4544.72

Best case 8760h@75% plus 1 Start/Stop	Duration [h/a]	Gas [t/a]	[ft³/a]	Diesel [t/a]	[gal/a]	NOx [t/a]	PM [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
	8760.8	2,284,015	98,792,705,589	13,876	3,908,687		169.9			6308871.7	23767.8	127.1	7008054.9

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Information Claimed Confidential by TransGas Development Systems, LLC March 24, 2025

N4 of N8

TranGas Development, LLC
Power Campus

Potesta & Associates, Inc.
Project No. 0101-22-0132-003B

By: PEW
Date: 3/20/2025

Checked By: KBK
Date: 03/21/2025

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Information Claimed Confidential by
TransGas Development Systems, LLC
March 24, 2025

Tanks

Tank	I.D.	Volume	Turnovers	Yearly Throughput	Fixed Roof Losses		VOC Emissions				
					Working	Breathing	Uncontrolled			Controlled	
		(gal)	(No.)	(gal/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/hr)(1)	(tpy)	(lbs/hr)(1)	(tpy)
Diesel Tank	TK1-40	170,000	4	[redacted]	12.28	25.27	37.55	0.18	0.02	0.18	0.02
Total Emissions (40 tanks)					491.2	1,010.80	1,502.00	7.34	0.75	7.34	0.75
							Total VOC =	7.34	0.75	7.34	0.75

Notes:
1. Emissions based on breathing losses divided by 8,760 hours per year and working losses divided by total throughput multiplied by one truck delivery to the tanks of 10,000 gallons.
2. Number of USLD tanks at the site = 40

Natural Gas (Vapor Sources)

Source Type	Number of Sources	Emission Factor(1) (kg/hr/source)	TOC Emissions (lb/hr)	TOC Emissions (ton/yr)	Uncontrolled VOC Emissions (lb/hr)	Uncontrolled VOC Emissions (ton/yr)	Control Efficiency (%)	Controlled VOC Emissions (lb/hr)	Controlled VOC Emissions (ton/yr)
Valves	176	0.000131	0.050829	0.222632	0.0003	0.0013	0	0.0003	0.0013
Pressure Relief Valves	120	0.0447	11.825474	51.795578	0.0698	0.3056	0	0.0698	0.3056
Connectors (Flanges)	917	0.0000810	0.163751	0.717230	0.0010	0.0042	0	0.0010	0.0042
Compressor Seals	0	0.0894	0.000000	0.000000	0.0000	0.0000	0	0.0000	0.0000
Light Liquid Pumps	0	0.00187	0.000000	0.000000	0.0000	0.0000	0	0.0000	0.0000
Sample Connections (2)	1	0.0150	0.033069	0.144842	0.0002	0.0009	0	0.0002	0.0009
				Total VOC =	0.0712	0.3120		0.0712	0.3120

	Uncontrolled Hexane Emissions (lb/hr)	Uncontrolled Hexane Emissions (ton/yr)	Control Efficiency (%)	Controlled Hexane Emissions (lb/hr)	Controlled Hexane Emissions (ton/yr)
	0.000005	0.000022	0	0.000005	0.000022
	0.001183	0.005180	0	0.001183	0.005180
	0.000016	0.000072	0	0.000016	0.000072
	0.000000	0.000000	0	0.000000	0.000000
	0.000000	0.000000	0	0.000000	0.000000
	0.000003	0.000014	0	0.000003	0.000014
Total	0.001	0.0053		0.001	0.0053

Sample Natural Gas Composition							
Gas Composition Key		BTU	S.G.	Non-VOC	Non-VOC	Non-VOC	Non-VOC
				Carbon Dioxide	Nitrogen	Methane	Ethane
Gas Sample - TransCanada		1082.2	0.6100	0.2000	0.4400	90.3300	8.4400
						Total Non-VOC =	99.4100

Sample Natural Gas Composition							
Gas Composition Key	VOC	VOC	VOC	VOC	VOC	VOC	VOC/HAP
	Propane	N Butane	Iso Butane	Pentane	Iso Pentane	Neo Pentane	Hexane
Gas Sample - TransCanada	0.5200	0.0300	0.0200	0.0001	0.0100	0.0000	0.0100
Max value	0.5200	0.0300	0.0200	0.0001	0.0100	0.0000	0.0100
						Total VOC =	0.5901
						Total HAP =	0.0100

1. AP42, Chapter 5, Protocol for Equipment Leak Emission Estimates, Table 2-1 and 2-5.
2. Sight Glass lb/kg = 2.2046

By: PEW
Date: 3/20/2025

REDACTED
Information Claimed Confidential by
TransGas Development Systems, LLC

Checked By: KBK
Date: 03/21/2025

Vehicle Activity (VA)

Paved Roadway: Trucks delivering fluids, fuel, and miscellaneous deliveries and removal of materials (estimated).

Emission Factor Equation from AP-42 Section 13.2.1, Paved Roads (January 2011):
E = [k * (sL/2)^0.91 * (W)^1.02] * (1 - 1.2P/4N) = lb / Vehicle Mile Traveled (VMT)

	PM	PM10	PM2.5	
k =	0.011	0.0022	0.00054	dimensionless, particle size multiplier
sL =	9.7	9.7	9.7	surface material silt content (g/m^2)
W =	26.8	26.8	26.8	tons, mean vehicle weight
P =	157	157	157	no. days/year with 0.01 in of rain
e =	1.15	0.23	0.06	lb/VMT

Rounding to 2

Pollutant	No. of Vehicles Per Hour	No. of Vehicles Per Year	Miles Per Trip (1) (mi)	Control Device Type	Control Device Effic(%)	Emissions Uncontrolled (lb/hr)	Emissions Uncontrolled (tpy)	Emissions Controlled (lb/hr)	Emissions Controlled (tpy)
PM	[redacted]	[redacted]	1.25	N	0	2.88	7.16	2.88	7.16
PM10			1.25	N	0	0.58	1.43	0.58	1.43
PM2.5			1.25	N	0	0.15	0.38	0.15	0.38

Tankers/Trucks

Product	Empty Weight lbs	Loaded Weight lbs	Gallons Per Load	Average Weight tons	Gallons Per Hour	Gallons Per Year	Trucks Per Hour	Trucks Per Year
Delivery of Fluids	[redacted]						1	[redacted]
Miscellaneous Trucking							1	
						Total =	2	

1. Trip Distance - Round trip on outside of property from access road to the site = 1.25
2. Miscellaneous trucking is for deliveries and shipping of materials other than the fluid identified below. Trucking volume is assumed at one truck per hour and 4,380 trucks per year. Truck weighs are assumed to be the same mean weight as liquid trucking.

Estimated Delivery of Fluids			
Material	gal/hr	gal/day	gal/yr
ULSD	[redacted]		
Lubricant Oil			
NH3(aq)			
NaOH			
NaHS			
NaClO2			
H2SO4			
Total			

REDACTED
Information Claimed Confidential by
TransCore Development Systems, LLC
March 24, 2025

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, TESTING PLANS

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, AND TESTING PLANS

TransGas Development Systems, LLC will work with the Division of Air Quality to identify and address Monitoring, Recordkeeping, Reporting, and Testing Plans. Requirements that are identified in the permit will be implemented.

ATTACHMENT P

PUBLIC NOTICE

ATTACHMENT P

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that TransGas Development Systems, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for the Adams Fork Harless Data Center Energy Campus located on 22 Mine Road near Holden in Mingo County, West Virginia. The latitude and longitude coordinates are: 37.753020 and -82.119050.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: NO_x of 194.30 tons per year (tpy), SO2 of 9.93 tpy, CO of 205.62, tpy, VOC of 117.66 which includes fugitives of 0.31 tpy, PM of 193.69 tpy which includes fugitives of 7.16 tpy, PM10 of 187.96 which includes fugitives of 1.43 tpy, PM2.5 of 186.91 tpy which includes fugitives of 0.30 tpy, and total HAPS of 0.87 tpy.

Startup of operations is planned to begin on or about the 1st day of January 2027. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice. Written comments will also be received via email at DEPAirQualityPermitting@WV.gov.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, Extension 41281, during normal business hours.

Dated this the **(Insert Date)** day of March 2025.

By: TransGas Development Systems, LLC
Adam Victor
President
630 First Avenue, Suite 30C
New York, New York 10016-3799

ATTACHMENT Q

BUSINESS CONFIDENTIAL CLAIMS

Cover Document
Confidential Information

This sample form contains each of the required elements for the cover document required under 45CSR31. The person submitting this form may wish to attach an additional page(s) to provide adequate justification under the "Rationale" section of the form.

Company Name	TransGas Development Systems, LLC	Responsible Official		Adam Victor, President
Company Address	630 Fifth Avenue, Suite 308 New York, NY 10036-3799	Confidential Information Designee in State of WV	Name	Patrick Ward
			Title	Senior Engineer
			Address	7012 MacCorkle Ave, SE Charleston, WV 25304
Person/Title *Submitting* Confidential Information	Adam Victor			
	President		Phone	(304) 342-1400
			Fax	(304) 343-9031

Reason for Submittal of Confidential Information: Initial permitting

Identification of Confidential Information	Rationale for Confidential Claim	Confidential Treatment Time Period
All Marked Confidential Information.	Provide justification that the criteria set forth in § 45CSR31-4.1.a. - e. have been met. The information contained within the application is fully protected under non-disclosure and confidentiality agreements by all parties involved in the application process and design of the facility. See Page Q2 of Q2.	This information is to be maintained confidential. There is no timeframe for expiration of confidential treatment.

Responsible Official Signature:	
Responsible Official Title:	President
Date Signed:	3/24/25

NOTE: Must be signed and dated in **BLUE INK.**

Provide justification that the criteria set forth in § 45CSR31-4.1.a - e have been met.

4.1.a. The claim of confidentiality has not expired by its terms, nor been waived or withdrawn;

The confidentiality agreements do not have an expiration date due to the nature of the information contained in the application.

4.1.b. The person asserting the claim of confidentiality has satisfactorily shown that it has taken reasonable measures to protect the confidentiality of the information, and that it intends to continue to take such measures;

The information contained within the application is fully protected under non-disclosure and confidentiality agreements by all parities involved in the original development of the processes, the design of the facility, and the permit application process.

4.1.c. The information claimed confidential is not, and has not been, reasonably obtainable without the person's consent by other persons (other than governmental bodies) by use of legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding);

The information available herein is not available and is not to be made available to outside parties.

4.1.d. No statute specifically requires disclosure of the information; and

Applicant believes there are no statutes that require disclosure of the information.

4.1.e. Either--

4.1.e.1. The person has satisfactorily shown that disclosure of the information is likely to cause substantial harm to the business's competitive position; or

This is a unique facility with many parties involved in preparing and providing information on the systems. Release of this information could cause substantial harm to Applicant's competitive position in the market.

4.1.e.2. The information is voluntarily submitted information, and its disclosure would likely to impair the State's ability to obtain necessary information in the future.

The State should not disclose this information to anyone.

2. Redacted Permit Application R13-3715

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : TransGas Development Systems, LLC

[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): New Facility
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): New Facility

- Type of NSR Application (check all that apply):
  - ☑ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Application:
  - ☐ Title V Initial
  - ☐ Title V Renewal
  - ☐ Administrative Amendment**
  - ☐ Minor Modification**
  - ☐ Significant Modification**
  - ☐ Off Permit Change

****If the box above is checked, include the Title V revision information as ATTACHMENT S to the combined NSR/Title V application.**

- Payment Type:
  - ☑ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)

    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE
    Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☑ Responsible Official/Authorized Representative
    - Name: Adam Victor
    - Email: adam@tgds.com
    - Phone Number: (917) 816-3700
  - ☑ Company Contact
    - Name: Adam Victor, Jr.
    - Email: avj@adamsforkenergy.com
    - Phone Number: (917) 816-3700
  - ☑ Consultant
    - Name: Patrick Ward
    - Email: PEWard@potesta.com
    - Phone Number: (304) 342-1400

REGULATION 13 PERMIT APPLICATION FOR THE CONSTRUCTION OF ADAMS FORK DATA CENTER ENERGY CAMPUS MINGO COUNTY, WEST VIRGINIA

REDACTED VERSION

Prepared for:

TransGas Development Systems, LLC
630 First Avenue, Suite 30C
New York, New York 10016-3799

Prepared by:

Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
Email: potesta@potesta.com

Project No. 0101-22-0132-003A

March 24, 2025

POTESTA

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Attachments not applicable to this submission: Attachment R, Authority Forms and Attachment S, Title V Permit Revision Information.

SECTION I - III

APPLICATION FOR NSR PERMIT

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
TransGas Development Systems, LLC

2. Federal Employer ID No. ***(FEIN):***
20343110

3. Name of facility *(if different from above):*
Adams Fork Data Center Energy Campus

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
630 First Avenue, Suite 30C
New York, New York 10016-3799

5B. Facility's present physical address:
2002 Twisted Gun Road
Wharncliffe, WV 25651

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

➪ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

➪ If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: No

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☐ **YES** ☐ **NO**

➪ If **YES,** please explain: Applicant has an option on the site with the current owner.

➪ If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Off-grid Power Generation

10. North American Industry Classification System **(NAICS)** code for the facility:
221112

11A. DAQ Plant ID No. (for existing facilities only):
New Facility

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
New Facility

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- ➪ For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- ➪ For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

The facility will be located on the property currently occupied by the Twisted Gun Golf Course near Wharncliffe, West Virginia. The site can be accessed from WV Route 52 headed toward Gilbert. Turn right onto Gilbert Creek Road, then right onto Right Fork Bens Creek Road to Twisted Gun Road. Proceed to the end of Twisted Gun Road for the site.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Not Applicable	Wharncliffe	Mingo
12.E. UTM Northing (KM): 4,161.72229	12F. UTM Easting (KM): 415.70631	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
This application is for the construction of the facility.

14A. Provide the date of anticipated installation or change: 01/01/2026 ➪ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: 01/01/2027

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
24 Hours Per Day 7 Days Per Week Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP **–** Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**

➪ Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**

➪ Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

➪ For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify Engines 1 through 117.

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☒ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☒ Other Collectors, specify Control System

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☒ **YES** ☐ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below: Not Required

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.23) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative**, hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry. I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE: _____ DATE: 3/29/25

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Adam Victor		35C. Title: President
35D. E-mail: adam@igds.com	35E. Phone: (917) 816-3700	35F. FAX: Use Email
36A. Printed name of contact person (if different from above): Same as above		36B. Title:
36C. E-mail:	36D. Phone:	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ Attachment A: Business Certificate
- ☐ Attachment B: Map(s)
- ☐ Attachment C: Installation and Start Up Schedule
- ☒ Attachment D: Regulatory Discussion
- ☒ Attachment E: Plot Plan
- ☒ Attachment F: Detailed Process Flow Diagram(s)
- ☒ Attachment G: Process Description
- ☐ Attachment H: Material Safety Data Sheets (MSDS)
- ☐ Attachment I: Emission Units Table
- ☒ Attachment J: Emission Points Data Summary Sheet
- ☒ Attachment K: Fugitive Emissions Data Summary Sheet
- ☐ Attachment L: Emissions Unit Data Sheet(s)
- ☐ Attachment M: Air Pollution Control Device Sheet(s)
- ☒ Attachment N: Supporting Emissions Calculations
- ☒ Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans
- ☒ Attachment P: Public Notice
- ☒ Attachment Q: Business Confidential Claims
- ☐ Attachment R: Authority Forms
- ☐ Attachment S: Title V Permit Revision Information
- ☒ Application Fee

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ *Forward 1 copy of the application to the Title V Permitting Group and:*
- ☐ *For Title V Administrative Amendments:*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
- ☐ *For Title V Minor Modifications:*
  - ☐ *Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt.*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
- ☐ *For Title V Significant Modifications processed in parallel with NSR Permit revision:*
  - ☐ *NSR permit writer should notify a Title V permit writer of draft permit.*
  - ☐ *Public notice should reference both 45CSR13 and Title V permits.*
  - ☐ *EPA has 45 day review period of a draft permit.*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

BUSINESS CERTIFICATE

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
TRANSGAS DEVELOPMENT SYSTEMS, LLC
630 1ST AVE APT 30G
NEW YORK, NY 10016-3799

BUSINESS REGISTRATION ACCOUNT NUMBER: **2218-0756**

This certificate is issued on: 06/29/2010

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with W.Va. Code § 11-12.

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.1
L1333508864

ATTACHMENT B

SITE LOCATION MAP

Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE, Charleston, WV 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
E-Mail: potesta@potesta.com

TransGas Development Systems, LLC
Adams Fork Data Center Energy Campus
Wharncliffe, West Virginia
Project No. 0101-22-0132-003A

ATTACHMENT C

INSTALLATION AND STARTUP SCHEDULE

ATTACHMENT C

INSTALLATION AND START UP SCHEDULE

Construction of the facility will begin after receipt of Construction Permit from West Virginia Department of Environmental Protection, Division of Air Quality, and other necessary regulatory approvals on or near January 1, 2026. Operations will commence approximately 12 months after the beginning of construction.

ATTACHMENT D

REGULATORY DISCUSSION

ATTACHMENT D

REGULATORY DISCUSSION

The facility proposed herein, or portions of the facility, may be subject to the following regulations based on a review of potential air quality regulations (see No. 1 and 2). Additionally, there are a few regulations which the source may not be subject to which are also listed below in No. 3.

1. State Regulations

   A. 45CSR4 – "To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors"

   B. 45CSR13 – "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation"

   C. 45CSR16 – "Standards of Performance for New Stationary Sources"

   D. 45CSR20 – "Good Engineering Practice as Applies to Stack Heights"

   E. 45SCR30 – "Requirements for Operation Permits"

   F. 45CSR31 – "Confidential Information"
   This application contains confidential information. This claim of confidentiality is made in accordance with the requirements of 45CSR31.

   G. 45CSR34 – "Emission Standards for Hazardous Air Pollutants"

2. Federal Regulations

   A. 40CFR60 Subpart A – General Provisions

   B. 40CFR60 Subpart IIII - Standard of Performance for Stationary Compression Ignition Internal Combustion Engines

   C. 40CFR63, Subpart ZZZZ – National Emissions Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

3. Non-Applicable Regulations or Exemptions Apply

A. 45CSR40 – Contol of Ozone Season Nitrogen Oxide Emissions
The reciprocating internal combustion engines proposed for this facility do not appear to be considered as a unit per the definition contained in section 2.30 where a unit is defined as a stationary fossil fuel-fired boiler, combustion turbine, or combined cycle system. The engines also have a maximum heat input of less than 250 MMBtu/hr as stated in Section 4.1. Furthermore, the units do not appear to be subject to 40CFR97.

B. 40CFR97, Subpart DDDDD - CSAPR SO2 Group 2 Trading Program and Subpart EEEEE – CSAPR Nox Ozone Season Group 2 Trading Program. The nameplate capacity of the generators attached to each unit is 25 MWe. Also, the units (reciprocating internal combustion engines) do not appear to be regulated by the rule.

C. 45CSR33 – Acid Rain Provisions and Permits
This rule does not appear to apply due to the New Unit Exemption in 40CFR72.

D. 40CFR72, Acid Rain Program, Subpart A, Section 72.7, New Unit Exemption, appears to exempt the units from applicability based on serving a generator of 25 MWe or less, not burning coal or coal-derived fuel, and burns fuel with sulfur of 0.05 percent or less by weight.

E. 40CFR60 Subpart Kc – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced After October 4, 2023. Does not apply due to low vapor pressure of diesel.

ATTACHMENT E

PLOT PLANS

ENGINES			
Power House	Engine IDs	Emission ID	Control ID
1	ENG1, ENG2, ENG3	E1, E2, E3	C1, C2, C3
2	ENG4, ENG5, ENG6	E4, E5, E6	C4, C5, C6
3	ENG7, ENG8, ENG9	E7, E8, E9	C7, C8, C9
4	ENG10, ENG11, ENG12	E10, E11, E12	C10, C11, C12
5	ENG13, ENG14, ENG15	E13, E14, E15	C13, C14, C15
6	ENG16, ENG17, ENG18	E16, E17, E18	C16, C17, C18
7	ENG19, ENG20, ENG21	E19, E20, E21	C19, C20, C21
8	ENG22, ENG23, ENG24	E22, E23, E24	C22, C33, C24
9	ENG25, ENG26, ENG27	E25, E26, E27	C25, C26, C27
10	ENG28, ENG29, ENG30	E28, E29, E30	C28, C29, C30
11	ENG31, ENG32, ENG33	E31, E32, E33	C31, C32, C33
12	ENG34, ENG35, ENG36	E34, E35, E36	C34, C35, C36
13	ENG37, ENG38, ENG39	E37, E38, E39	C37, C38, C39
14	ENG40, ENG41, ENG42	E40, E41, E42	C40, C41, C42
15	ENG43, ENG44, ENG45	E43, E44, E45	C43, C44, C45
16	ENG46, ENG47, ENG48	E46, E47, E48	C46, C47, C48
17	ENG49, ENG50, ENG51	E49, E50, E51	C49, C50, C51
18	ENG52, ENG53, ENG54	E52, E53, E54	C52, C53, C54
19	ENG55, ENG56, ENG57	E55, E56, E57	C55, C56, C57
20	ENG58, ENG59, ENG60	E58, E59, E60	C58, C59, C60
21	ENG61, ENG62, ENG63	E61, E62, E63	C61, C62, C63
22	ENG64, ENG65, ENG66	E64, E65, E66	C64, C65, C66
23	ENG67, ENG68, ENG69	E67, E68, E69	C67, C68, C69
24	ENG70, ENG71, ENG72	E70, E71, E72	C70, C71, C72
25	ENG73, ENG74, ENG75	E73, E74, E75	C73, C74, C75
26	ENG76, ENG77, ENG78	E76, E77, E78	C76, C77, C78
27	ENG79, ENG80, ENG81	E79, E80, E81	C79, C80, C81
28	ENG82, ENG83, ENG84	E82, E83, E84	C82, C83, C84
29	ENG85, ENG86, ENG87	E85, E86, E87	C85, C86, C87
30	ENG88, ENG89, ENG90	E88, E89, E90	C88, C89, C90
31	ENG91, ENG92, ENG93	E91, E92, E93	C91, C92, C93
32	ENG94, ENG95, ENG96	E94, E95, E96	C94, C95, C96
33	ENG97, ENG98, ENG99	E97, E98, E99	C97, C98, C99
34	ENG100, ENG101, ENG102	E100, E101, E102	C100, C101, C102
35	ENG103, ENG104, ENG105	E103, E104, E105	C103, C104, C105
36	ENG106, ENG107, ENG108	E106, E107, E108	C106, C107, C108
37	ENG109, ENG110, ENG111	E109, E110, E111	C109, C110, C111
38	ENG112, ENG113, ENG114	E112, E113, E114	C112, C113, C114
39	ENG115, ENG116, ENG117	E115, E116, E117	C115, C116, C117

TANKS

1. Ultra Low Sulfur Diesel will be stored in 40 tanks located on the property near each powerhouse. The tanks are uncontrolled. The tank identification numbers are TK1 – TK40 (118S through 157S with emission points 118E through 157E).
2. Each powerhouse 1 through 39 will have one set of emission control fluid tanks for Hydrous Ammonia, Caustic Soda, Sulfuric Acid, Sodium Chloride, and Sodium Hydrosulfide. These tanks are de minimis.

POTESTA
7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

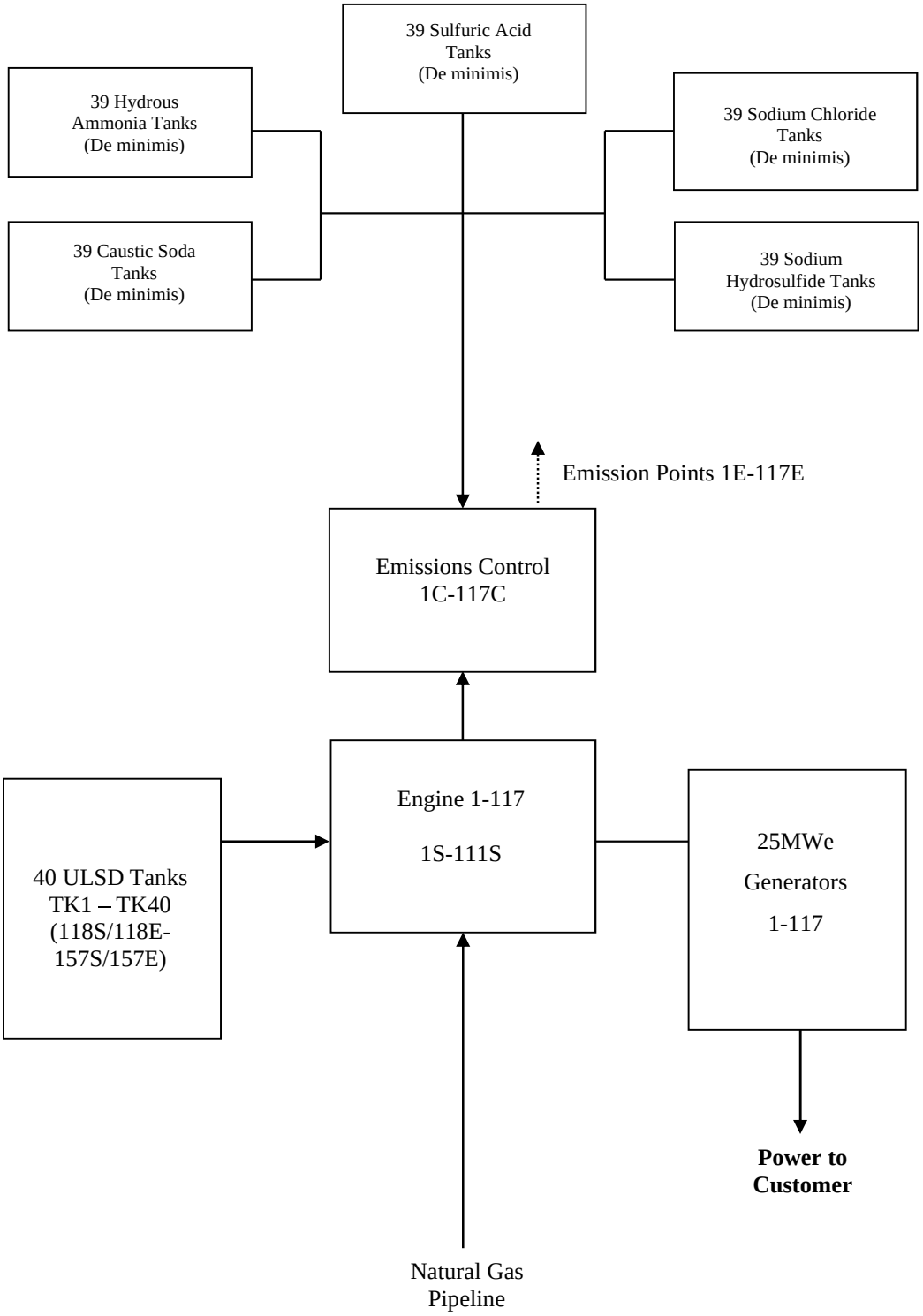
PLOT PLAN

TransGas Development Systems, LLC

Adams Fork Data Center Energy Campus
Wharncliffe, West Virginia
Project No. 0101-22-0132-003A

ATTACHMENT F

PROCESS FLOW DIAGRAM(S)



Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE, Charleston, WV 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
E-Mail: potesta@potesta.com

TransGas Development Systems, LLC
Adams Fork Data Center Energy Campus
Wharncliffe, West Virginia
Project No. 0101-22-0132-003A

ATTACHMENT G

PROCESS DESCRIPTION

ATTACHMENT G

PROCESS DESCRIPTION

The facility proposed herein is a unique, off-grid, electric generating facility designed to provide power to adjacent data center operations. The facility encompasses 117 engines (Source Numbers 1S through 117S) with 114 engines operating full-time and 3 engines in reserve. Each engine has a proposed control strategy (Control Numbers 1C through 117C) and vent through their own exhaust stack (Emissions Point 1E through 117E). The facility will contain 39 powerhouses with each containing 3 generator setups with each generator having a nameplate capacity of 25 MWe. Actual power generation will depend on the operating mode of the engines. The operating modes of the engines are more fully described in Attachment L. The control systems for each engine are described in Attachment M.

The engines will operate on ultra-low sulfur diesel and natural gas depending on the operating status. Ultra-low sulfur diesel will be stored in 40 tanks (TK1 through TK40, 118S-157S, 118E-157E) on the property. Natural gas will be delivered via pipeline. Tanks for control device liquids will be located at each powerhouse so there will be 39 tanks of each of hydrous ammonia, caustic soda, sulfuric acid, sodium chlorite, and sodium hydrosulfide. These tanks are considered de minimis. Liquids and supplies will be trucked to the site.

There is no steam-power production at the site. Cooling will be provided by mine pool water as needed; therefore, there is no requirement for cooling towers.

ATTACHMENT H

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet

Sodium hydrosulfide solution

MSDS Number 8000TDC (Revised: 1/23/04) 6 Pages

Section 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

1.1 Product Name .....**Sodium hydrosulfide solution**
Chemical Family ..... Inorganic salt solution
Synonyms ..... KI-300 depressant, NaHS, sodium hydrogen sulfide
Formula ..... NaHS

1.2 Manufacturer .....Tessenderlo Davison Chemicals, LLC.
1916 Farmerville Highway
Ruston, Louisiana 71270
Information ..... (318) 242-5305

1.3 Emergency Contact ..... (800) 877-1737 (Tessenderlo Kerley)
(800) 424-9300 (CHEMTREC)

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

2.1 Chemical Ingredients (% by wt.)

Sodium hydrosulfide	CAS #:16721-80-5	20-45%
Water	CAS #:7732-18-5	55-80%

(See Section 8 for exposure guidelines)

Section 3: HAZARDS IDENTIFICATION

NFPA: Health - 3 Flammability - 2 Reactivity - 1

EMERGENCY OVERVIEW

Warning: Solution is highly alkaline
Contains hydrogen sulfide , a highly toxic gas.
Eye contact will cause marked eye irritation and possibly severe corneal damage. Skin contact will result in irritation and possible corrosion of the skin. Ingestion will irritate/burn mouth, throat and gastrointestinal tract. Contact with stomach acid will cause hydrogen sulfide vapors to be released. Heating or acid will cause hydrogen sulfide gas to evolve. Dilution of NaHS with water will also cause increased evolution of hydrogen sulfide.

Section 3: HAZARDS IDENTIFICATION, Cont.

3.1 POTENTIAL HEALTH EFFECTS

EYE: Contact with the eyes will cause marked eye irritation and possibly severe corneal damage.

SKIN CONTACT: Contact with the skin will cause skin irritation or burning sensation. Prolonged contact will result in corrosion of the skin.

SKIN ABSORPTION: Absorption is unlikely to occur.

INGESTION: Ingestion will result in severe burning and corrosion of mouth, throat and the gastrointestinal tract. If the ingested material contacts stomach acid, highly toxic hydrogen sulfide gas will be evolved.

INHALATION: Product solution and vapors contain highly toxic hydrogen sulfide gas. Exposure to this gas causes, headaches, nausea, dizziness and vomiting. Continued exposure can lead to loss of consciousness and death..

CHRONIC EFFECTS/CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC or OSHA.

Section 4: FIRST AID MEASURES

4.1 EYES: Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye. Obtain immediate medical attention.

4.2 SKIN: Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention

4.3 INGESTION: DO NOT INDUCE VOMITING. If victim is conscious, immediately give 2 to 4 glasses of water. If vomiting does occur, repeat fluid administration. Obtain immediate medical attention.

4.4 INHALATION: Remove victim from contaminated atmosphere. If breathing is labored, administer oxygen. If breathing has ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

Section 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

FLASH POINT: Not flammable **METHOD USED:** NA

5.2 FLAMMABLE LIMITS **Hydrogen sulfide** **LFL**: 4% **UFL**: 44%

5.3 EXTINGUISHING MEDIA: Water spray or foam or as appropriate for combustibles involved in fire.

5.4 FIRE & EXPLOSIVE HAZARDS: Solution is non-flammable. However if these solutions are exposed to heat or acids, hydrogen sulfide will be released and may form explosive mixtures with air (see above).

Keep containers/storage vessels in fire area cooled with water spray. Heating may cause the release of hydrogen sulfide vapors.

Section 5: FIRE FIGHTING MEASURES (Cont.)

5.5 FIRE FIGHTING EQUIPMENT: Because of the possible presence of toxic gases and the corrosive nature of the product, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Small releases: Confine and absorb small releases on sand earth or other inert absorbent. Oxidize residual reactive sulfides with a weak (3-5%) hydrogen peroxide solution.

6.2 Large releases: Wear proper protective equipment. Confine area to qualified personnel. Shut off release if safe to do so. Dike spill area to prevent runoff into sewers, drains (potential explosive mixtures of hydrogen sulfide in confined spaces) or surface waterways (potential aquatic toxicity). Recover as much of the solution as possible. Treat remaining material as a small release (above).

Section 7: HANDLING and STORAGE

7.1 Handling: Wear proper protective equipment (See Section 8). Avoid breathing product vapors. Avoid contact with skin and eyes. Use only in a well ventilated area. Dilute product only in enclosed containers. Wash thoroughly after handling.

7.2 Storage: Store in well ventilated areas. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote and smaller containers out of direct sunlight at moderate temperatures [<80º F (27º C)]. (See Section 10.4 for materials of construction)

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

8.1 RESPIRATORY PROTECTION: If working near open container or storage vessel opening or open tank truck dome cover, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent).

8.2 SKIN PROTECTION: Neoprene rubber gloves, chemical suit and boots should be worn to prevent contact with the liquid. Wash contaminated clothing prior to reuse. Contaminated leather shoes cannot be cleaned and should be discarded.

8.3 EYE PROTECTION: Chemical goggles and a full face shield.

8.4 EXPOSURE GUIDELINES:

	OSHA		ACGIH	
	TWA	STEL	TLV	STEL
Hydrogen sulfide	20 ppm (ceiling)		10 ppm (ceiling)	

8.5 ENGINEERING CONTROLS: Use adequate exhaust ventilation to prevent inhalation of product vapors. Where feasible scrub process or storage vessel vapors with caustic solution.
Maintain eyewash/safety shower in areas where chemical is handled.

Section 9: PHYSICAL and CHEMICAL PROPERTIES

9.1 APPEARANCE:	Yellow to dark green liquid.
9.2 ODOR:	Strong hydrogen sulfide (rotten egg) odor.
9.3 BOILING POINT:	253 °F(122.8 °C) - 269 °F (131.7 °C)
9.4 VAPOR PRESSURE:	17 mm Hg @ 68 °F (20 °C)
9.5 VAPOR DENSITY: (Air = 1.0)	1.17
9.6 SOLUBILITY IN WATER:	Complete
9.7 SPECIFIC GRAVITY:	1.152 - 1.303 (9.6 - 10.9 lbs/gal)
9.8 FREEZING POINT:	0° F (-17.8° C) - 20% 56º F (13.3º C) - 45%
9.9 pH:	11.5 - 12.5
9.10 VOLATILE:	Not applicable

Section 10: STABILITY and REACTIVITY

10.1 STABILITY: This is a stable material

10.2 HAZARDOUS POLYMERIZATION: Will not occur.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS: Heating this product will evolve hydrogen sulfide. Fire conditions will also cause the production of sulfur dioxide. Hydrogen sulfide (4-44%) may form flammable mixtures with air.

10.4 INCOMPATIBILITY: Acids will cause the release of highly toxic hydrogen sulfide. Sodium hydrosulfide solution is not compatible with copper, zinc, aluminum or their alloys (i.e. bronze, brass, galvanized metals, etc.). Corrosive to steel above 150º F (65.5º C). These materials of construction should not be used in handling systems or storage containers for this product (SEE Section 7.2, Storage). Dilution of NaHS with water will increase the evolution of hydrogen sulfide. Dilution should be done in an enclosed container.

Section 11: TOXICOLOGICAL INFORMATION

11.1 ORAL: Data not available

11.2 DERMAL: Data not available

11.3 INHALATION: INH-RAT LC_{50}: 444 ppm (hydrogen sulfide)
INH-MOUSE LC_{50}: 1,500 mg/m^3 18 minutes
INH-RAT LC_{50}: 1,500 mg/m^3 14 minutes

11.4 CHRONIC/CARCINOGENICITY: No evidence available

11.5 TERATOLOGY: Data not available

11.6 REPRODUCTION: Data not available

11.7 MUTAGENICITY: Data not available

Section 12: ECOLOGICAL INFORMATION

Static acute 96 hour-LC_{50} for mosquito fish is 206 mg/L. (Tl_m - fresh water)
LC_{50} fly inhalation 1,500 mg/m^3, 7 minutes
TL_m Gammarus 0.84 mg/L, 96 hours (hydrogen sulfide)
TL_m Ephemera 0.316 mg/L, 96 hours (hydrogen sulfide)
TL_m Flathead minnow 0.071 – 0.55 mg/L @ 6-24ºC, 96 hour flow through bioassay (hydrogen sulfide)
TL_m Bluegill 0.0090 – 0.0140 mg/L @ 20-22ºC, 96 hour flow through bioassay (hydrogen sulfide)
TL_m Brook trout 0.0216 – 0.0308 mg/L @ 8-12.5ºC, 96 hour flow through bioassay (hydrogen sulfide)

Section 13: DISPOSAL CONSIDERATIONS

If released to the environment for other than its intended purpose, this product contains some reactive sulfides which may be in sufficient quantity to meet the definition of a D003, hazardous waste.

Section 14: TRANSPORT INFORMATION

14.1 DOT Shipping Name:	Corrosive liquids, toxic, n.o.s.
14.2 DOT Hazard Class:	8
14.3 UN/NA Number:	UN2922 UN2949 (IMDG - over water)
14.4 Packing Group:	II
14.5 DOT Placard:	Corrosive
14.6 DOT Label(s):	Corrosive Toxic
14.7 IMO Shipping Name:	Sodium hydrosulphide solution
14.8 RQ (Reportable Quantity):	5,000 lbs (2268 Kg) 100% basis [2,604 gal (20%) 1,019 gal (45%)]
14.9 RR STCC Number:	28-123-33/49-352-04 (international)

Section 15: REGULATORY INFORMATION

15.1 OSHA: This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.

15.2 SARA TITLE III: a. **EHS** (Extremely Hazardous Substance) List: No

Section 15: REGULATORY INFORMATION (Cont.)

	b.	Section 311/312, (Tier I,II) Categories: Immediate (acute) Fire Sudden release Reactivity Delayed (chronic)	Yes Yes No Yes No
	c.	Section 313 (Toxic Release Report-Form R):	No
	d.	**TPQ** (Threshold Planning Quantity):	No

15.3 CERCLA/SUPERFUND: RQ (Reportable Quantity) — 5,000 lbs (2270 Kg)

15.4 TSCA (Toxic Substance Control Act) Inventory List: Yes

15.5 RCRA (Resource Conservation and Recovery Act) Status: D003 (See Section 13)

15.6 WHMIS (Canada) Hazard Classification: E, D1

15.7 DOT Hazardous Material: (See Section 14) Yes

15.8 CAA Hazardous Air Pollutant (HAP) No

Section 16: OTHER INFORMATION

REVISIONS: The entire MSDS was reformatted to comply to ANSI Standard Z400.1-1993.

Revised Sections 1.1, 8.3, 11, 12, 5/7/02
Revised pH range in Section 8, 6/19/02
Revised shipping info & RQ data, 1/15/03
Revised Section 3, Emergency Overview & Section 10.4 to include dilution caution. 1/23/04

THE INFORMATION PUBLISHED IN THIS MATERIAL SAFETY DATA SHEET HAS BEEN COMPILED FROM OUR EXPERIENCE AND OSHA, ANSI, NFPA, DOT, ERG, AND CHRIS**.** IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE SUITABILITY OF THIS INFORMATION FOR THE ADOPTION OF NECESSARY SAFETY PRECAUTIONS. WE RESERVE THE RIGHT TO REVISE MATERIAL SAFETY DATA SHEETS PERIODICALLY AS NEW INFORMATION BECOMES AVAILABLE.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 7.11
Revision Date 15.10.2024
Print Date 16.10.2024
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name : Sodium chlorite (25% solution in water) for synthesis

Product Number : 8.14815
Catalogue No. : 814815
Brand : Millipore

UFI : CW60-J6H9-Q99X-S01A

REACH No. : This product is a mixture. REACH Registration Number see section 3.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses : Chemical for synthesis

1.3 Details of the supplier of the safety data sheet

Company : Sigma-Aldrich Chemical Pvt Limited
Industrial Area, Anekal Taluka
Plot No 12,
12 Bommasandra - Jigani Link Road
560100 BANGALORE
INDIA

1.4 Emergency telephone

Emergency Phone # : 000 800 1007 141 (CHEMTREC)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Corrosive to Metals, (Category 1)	H290: May be corrosive to metals.
Acute toxicity, (Category 4)	H302: Harmful if swallowed.
Acute toxicity, (Category 3)	H311: Toxic in contact with skin.
Skin corrosion, (Category 1)	H314: Causes severe skin burns and eye damage.
Serious eye damage, (Category	H318: Causes serious eye damage.

The life science business of Merck operates as MilliporeSigma in the US and Canada

1)

Specific target organ toxicity - repeated exposure, (Category 2), spleen	H373: May cause damage to organs through prolonged or repeated exposure.
Short-term (acute) aquatic hazard, (Category 1)	H400: Very toxic to aquatic life.
Long-term (chronic) aquatic hazard, (Category 1)	H410: Very toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram

Signal Word	Danger

Hazard Statements

H290	May be corrosive to metals.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H373	May cause damage to organs (spleen) through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements

P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312	IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/ attention if you feel unwell.

Supplemental Hazard information (EU)

EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

Reduced Labeling (<= 125 ml)

Pictogram

Signal Word	Danger

Hazard Statements

H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.

Precautionary Statements

P280	Wear protective gloves/ protective clothing/ eye protection/ face

protection.

P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard information (EU)

EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
Toxicological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Component		Classification	Concentration
sodium chlorite			
CAS-No. EC-No.	7758-19-2 231-836-6 *	Ox. Sol. 1; Acute Tox. 3; Acute Tox. 2; Skin Corr. 1B; Eye Dam. 1; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H271, H301, H310, H314, H318, H373, H400, H410	>= 25 - < 30 %

*A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, or the annual tonnage does not require a registration.

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

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In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Hydrogen chloride gas
Sodium oxides
Not combustible.
Fire may cause evolution of:
Hydrogen chloride gas
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

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6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

No metal containers. No metal containers.
Protected from light.Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Do not store near acids.

Recommended storage temperature see product label.

Storage class

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

8.2 Exposure controls

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

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Full contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Filter B-(P3)

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Physical state	liquid
b)	Color	colorless
c)	Odor	weak
d)	Melting point/freezing point	Melting point: < -3 °C
e)	Initial boiling point and boiling range	ca.>= 100 °C at 1.013 hPa
f)	Flammability (solid, gas)	No data available
g)	Upper/lower flammability or explosive limits	No data available
h)	Flash point	Not applicable
i)	Autoignition temperature	Not applicable
j)	Decomposition temperature	No data available
k)	pH	ca.12 - 13 at 20 °C

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l)	Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: No data available
m)	Water solubility	at 20 °C soluble
n)	Partition coefficient: n-octanol/water	Not applicable
o)	Vapor pressure	ca.20 hPa at 20 °C
p)	Density	ca.1,2 g/cm3 at 20 °C
	Relative density	No data available
q)	Relative vapor density	No data available
r)	Particle characteristics	No data available
s)	Explosive properties	Not classified as explosive.
t)	Oxidizing properties	Oxidizing potential

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
explosible after loss of solvent content.
Contact with acids liberates very toxic gas.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Generates dangerous gases or fumes in contact with:
Acids
Release of:
chlorine dioxide
Violent reactions possible with:
combustible substances
Cyanides
sulfur
ammonium compounds
phosphorus
Organic Substances
oxidisable substances
Chlorine
Metals
in powder form
Violent reactions possible with:
Generates dangerous gases or fumes in contact with:
Acids
The generally known reaction partners of water.

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10.4 Conditions to avoid
no information available

10.5 Incompatible materials
Contact with metals liberates hydrogen gas.Metals

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Mixture

Acute toxicity
Acute toxicity estimate Oral - 1.114 mg/kg
(Calculation method)
Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
Symptoms: Possible symptoms:, mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract
Acute toxicity estimate Dermal - 525,49 mg/kg
(Calculation method)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
Remarks: Mixture causes serious eye damage.
Risk of blindness!

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Mixture may cause damage to organs through prolonged or repeated exposure.
- spleen

Aspiration hazard
No data available

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article

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57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Components

sodium chlorite

Acute toxicity
LD50 Oral - Rat - male and female - 284 mg/kg
(OECD Test Guideline 401)
Acute toxicity estimate Oral - 284 mg/kg
(ATE value derived from LD50/LC50 value)
Inhalation: No data available
LD50 Dermal - Rabbit - male and female - 134 mg/kg
(US-EPA)
Acute toxicity estimate Dermal - 134 mg/kg
(ATE value derived from LD50/LC50 value)

Skin corrosion/irritation
Skin - Rabbit
Result: Corrosive after 3 minutes to 1 hour of exposure - 4 h
(US-EPA)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Irreversible effects on the eye
Remarks: Aqueous solution
(ECHA)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: Does not cause skin sensitization.
(OECD Test Guideline 406)

Germ cell mutagenicity
Method: OECD Test Guideline 475
Species: Mouse - male and female - Bone marrow
Result: negative

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.
- spleen

Aspiration hazard
No data available

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SECTION 12: Ecological information

12.1 Toxicity

Mixture
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties
Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects
No data available

Components

sodium chlorite

Toxicity to fish	flow-through test LC50 - Cyprinodon variegatus (sheepshead minnow) - 105 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - < 1 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test ErC50 - Pseudokirchneriella subcapitata (green algae) - 21,5 mg/l - 72 h (OECD Test Guideline 201)
	static test EC10 - Pseudokirchneriella subcapitata (green algae) - 4,8 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	Respiration inhibition EC50 - activated sludge - > 100 mg/l - 3 h (OECD Test Guideline 209)

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SECTION 13: Disposal considerations

13.1 Waste treatment methods
No data available

SECTION 14: Transport information

14.1 UN number
ADR/RID: 1908 IMDG: 1908 IATA: 1908

14.2 UN proper shipping name
ADR/RID: CHLORITE SOLUTION
IMDG: CHLORITE SOLUTION
IATA: Chlorite solution

14.3 Transport hazard class(es)
ADR/RID: 8 IMDG: 8 IATA: 8

14.4 Packaging group
ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards
ADR/RID: no IMDG Marine pollutant: no IATA: no

14.6 Special precautions for user
Tunnel restriction code : (E)

Further information : No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

National legislation

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	E1	ENVIRONMENTAL HAZARDS

Other regulations
Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment
For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements

H271	May cause fire or explosion; strong oxidizer.
H301	Toxic if swallowed.

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H310	Fatal in contact with skin.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Classification of the mixture		**Classification procedure:**
Met. Corr.1	H290	Based on product data or assessment
Acute Tox.4	H302	Calculation method
Acute Tox.3	H311	Calculation method
Skin Corr.1	H314	Based on product data or assessment
Eye Dam.1	H318	Based on product data or assessment

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STOT RE2	H373	Calculation method
Aquatic Acute1	H400	Calculation method
Aquatic Chronic1	H410	Calculation method

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Safety Data Sheet

Sulfuric Acid 36-37% (w/w)

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sulfuric Acid 36-37% (w/w)

Synonyms/Generic Names: Battery Acid, Dihydrogen Sulfate, Oil of Vitriol

Product Number: 9624

Product Use: Industrial, Manufacturing or Laboratory use

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd.
Columbus, WI. 53925

For More Information: 920-623-2140 (Monday-Friday 8:00-4:30)
www.columbuschemical.com

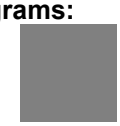
In Case of Emergency Call: CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

2. HAZARDS IDENTIFICATION

Hazard Not Otherwise Classified (HNOC): None

Signal Words: Danger

Pictograms:



GHS Classification:

Skin corrosion	Category 1A
Serious eye damage	Category 1
Acute aquatic toxicity	Category 3

GHS Label Elements, including precautionary statements:

Hazard Statements:

H314	Causes severe skin burns and eye damage.
H402	Harmful to aquatic life.

Precautionary Statements:

P260	Do not breathe mists.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do not induce vomiting.

P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physician.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local regulations.

Potential Health Effects

Eyes	Causes severe eye burns.
Inhalation	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	Causes skin burns.
Ingestion	May be harmful if swallowed.

NFPA Ratings

Health	3
Flammability	0
Reactivity	2
Specific hazard	W

HMIS Ratings

Health	3
Fire	0
Reactivity	2

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS# / ELINCS#	Formula	Molecular Weight
Sulfuric Acid	36-37	7664-93-9	231-939-5	H_2SO_4	98.08 g/mol
Water	Balance	7732-18-5	231-791-2	H_2O	18.00 g/mol

4. FIRST-AID MEASURES

Eyes	Immediately rinse with plenty of water for at least 15 minutes and get medical attention immediately.
Inhalation	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.
Skin	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and wash using soap. Get medical attention immediately.
Ingestion	**Do Not Induce Vomiting!** Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media	Product is not flammable. Use appropriate media for adjacent fire. Cool unopened containers with water.
Special protective equipment and precautions for firefighters	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.
Specific hazards arising from the chemical	Emits toxic fumes (sulfur oxides, hydrogen sulfide gas) under fire conditions. (See also Stability and Reactivity section).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	See section 8 for recommendations on the use of personal protective equipment.
Environmental precautions	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
Methods and materials for containment and cleaning up	Neutralize spill with sodium bicarbonate or lime. Absorb spill with noncombustible absorbent material, then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

7. HANDLING AND STORAGE

Precautions for safe handling
See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of aerosols.

Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls:

Component	Exposure Limits	Basis	Entity
Sulfuric Acid	0.2 mg/m^3	TLV	ACGIH
	1 mg/m^3	PEL	OSHA
	1 mg/m^3`	REL	NIOSH
	15 mg/m^3	IDLH	OSHA

TWA: Time Weighted Average over 8 hours of work.
TLV: Threshold Limit Value over 8 hours of work.
REL: Recommended Exposure Limit
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit during x minutes.
IDLH: Immediately Dangerous to Life or Health
WEEL: Workplace Environmental Exposure Levels
CEIL: Ceiling

Personal Protection

Eyes	Wear chemical safety glasses or goggles, and face shield.
Inhalation	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
Skin	Wear nitrile or rubber gloves, and full body suit. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Other	Not Available

Other Recommendations
Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Clear, colorless liquid.
Odor	Odorless.
Odor threshold	Not Available
pH	~1
Melting point/freezing point	Not Available
Initial boiling point and boiling range	Not Available
Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upper/lower flammability or explosive limit	Not Explosive
Vapor pressure	Not Available
Vapor density	Not Available
Specific gravity	1.2720
Solubility (ies)	Soluble in water.
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Possibility of Hazardous Reactions	Will not occur.
Conditions to Avoid	Moisture.
Incompatible Materials	Bases, halides, organic material, carbides, chlorates, fulminates, nitrates, picrates, cyanides, cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phosphorus (III) oxide, powdered metals.
Hazardous Decomposition Products	Sulfur oxides, hydrogen sulfide gas.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Skin	Not Available
Eyes	Not Available
Respiratory	Not Available
Ingestion	Not Available

Carcinogenicity

IARC	1: Carcinogenic to humans (sulfuric acid aerosol).
ACGIH	A2: Suspected human carcinogen (sulfuric acid aerosol).
NTP	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs & Symptoms of Exposure

Skin	Burning, itching, redness, inflammation upon exposed tissue.
Eyes	Eye burns, watering eyes.
Respiratory	Burning, choking, coughing, shortness of breath.
Ingestion	Nausea, vomiting, diarrhea, burning, severe pain.

Chronic Toxicity	May cause bleeding of nose and gums, nasal and oral mucosal ulceration, conjunctivitis, yellowing of teeth and erosion of tooth enamel.
Teratogenicity	Not Available
Mutagenicity	Not Available
Embryotoxicity	Not Available
Target Organ(s)	Teeth, Lungs
Reproductive Toxicity	Not Available
Respiratory/Skin Sensitization	Not Available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic Vertebrate	Not Available
Aquatic Invertebrate	Not Available
Terrestrial	Not Available

Persistence and Degradability	Not Available
Bioaccumulative Potential	Does not accumulate.
Mobility in Soil	Not Available
PBT and vPvB Assessment	Not Available
Other Adverse Effects	Not Available

13. DISPOSAL CONSIDERATIONS

Waste Product or Residues	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product or residue.
Product Containers	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

US DOT	UN2796, Sulfuric acid, 8, pg II
TDG	UN2796, SULFURIC ACID, 8, PG II
IMDG	UN2796, SULFURIC ACID, 8, PG II
Marine Pollutant	No
IATA/ICAO	UN2796, Sulfuric acid, 8, pg II

15. REGULATORY INFORMATION

TSCA Inventory Status	All ingredients are listed on the TSCA Active inventory.
DSL / NDSL	All ingredients are listed on the DSL inventory.
California Proposition 65	Not Listed
Rhode Island: Hazardous Substance List	Listed: Sulfuric Acid

Massachusetts: Toxic or Hazardous Substance List, Right to Know	Not Listed
Pennsylvania: Hazardous Substance List	Listed: Sulfuric Acid
New Jersey: Right to Know Hazardous Substance List	Listed: Sulfuric Acid
SARA 302	Listed: Sulfuric Acid
SARA 304	Listed: Sulfuric Acid
SARA 311	Acute Health Hazard.
SARA 312	Acute Health Hazard.
SARA 313	Listed: Sulfuric Acid (aerosol forms only)
WHMIS Canada	Class D1A: Poisonous and infectious material – Immediate and serious effects – Very toxic. Class E: Corrosive material.

16. OTHER INFORMATION

Revision	Date
Original	03/27/2013
Revision 1	12/13/2016
Revision 2	11/29/2021

Disclaimer: The information provided in this Safety Data Sheet (“SDS”) is correct to the best of our knowledge, information, and belief at the date of publication. The information in this SDS relates only to the specific Product identified under Section 1, and does not relate to its use in combination with other materials or products, or its use as to any particular process. Those handling, storing, or using the Product should satisfy themselves that they have current information regarding the particular way the Product is handled, stored or used and that the same is done in accordance with federal, state and local law. WE DO NOT MAKE ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE. WE DO NOT ASSUME RESPOSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, INJURY, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT.

SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer:	**Shintech Louisiana, LLC** 3 Greenway Plaza, Suite 1150 Houston, TX 77046 (713) 965-0713
PRODUCT NAME:	Sodium Hydroxide Solution, 50%
CAS#:	1310-73-2
CHEMICAL FOMULA:	NaOH(50)
Synonyms	Caustic Soda Liquid 50%, Soda Lye, Lye, Liquid Caustic, Sodium Hydrate
Product Use:	Neutralizing agent, industrial cleaner, pulping and bleaching, soap manufacturing

For information regarding a chemical emergency involving a spill or leak, call:

24 — Hour Emergency Contact:

U.S.: 1-800-424-9300 — CHEMTREC

SECTION 2 — HAZARDS IDENTIFICATION

Global Harmonization System (GHS) Classification:

Category 1	Corrosive to metals
Category 1	Skin corrosion/irritation
Category 1	Serious eye damage/eye irritation
Category 3	Hazardous to the aquatic environment, long-term (chronic) hazard
Category 4	Acute toxicity, inhalation
Category 4	Acute toxicity, oral

National Fire Protection Association (NFPA) Rating Hazardous Materials Identification Systems (HMIS) Rating

	NFPA	HMIS
Health	3	3
Fire	0	0
Reactivity	1	1

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

W – Water Reactive

DANGER! Causes severe eye burns. Causes severe skin burns. Avoid contact with skin and eyes. Causes burns of the mouth and throat. Causes respiratory tract irritation. Avoid breathing vapors or mist. Aspiration hazard. Can enter lungs and cause damage. May react with water. Keep upwind of spill and use in adequate ventilation.

Emergency Overview:

Color:	Colorless
Odor:	Odorless
Physical State	Liquid above freezing point
Signal Word	DANGER

GHS Label Elements:

GHS Hazard Statements:

H290 - May be corrosive to metals

H314 – Causes severe skin burns and eye

H318 – Causes serious eye damage

H412 – Harmful to aquatic life with long lasting effects

H332 – Harmful if inhaled

H302 – Harmful if swallowed

GHS Precautionary Statements:

Storage:	Keep container closed. Keep in original container. Store in a secure manner.
Ventilation Controls:	Do not breathe (dust, vapor or spray mist).
Hygiene Measures:	When using, do not smoke, eat, or drink. Wash thoroughly after handling. Avoid contact with skin and eyes.
Personal Protective Equipment:	Wear suitable protective clothing, gloves, and eye/face protection.
Spills:	**NEVER** direct water jet on liquid. Dike the area to contain the spill. Collect in suitable and properly labeled containers. Attempt to neutralize by adding material such as Acetic acid.
First Aid (See Section 4):	In case of accident by inhalation, move person to fresh air. If swallowed, do not induce vomiting: seek medical advice immediately and show label to doctor. After contact with skin, immediately take off all contaminated clothing and wash immediately with plenty of water. In case of contact with eyes, rinse immediately with plenty of water. In all cases, if irritation develops and persists, get medical attention. In all cases, call a poison control center or doctor for further treatment advice.
Environmental Protection:	Use appropriate containment to avoid environmental contamination.
Disposal:	Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT	May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Mist may cause eye irritation.
Short Term Exposure	
Long Term Exposure:	
SKIN CONTACT	Brief contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage.
SKIN ABSORPTION	Prolonged skin contact is unlikely to result in absorption of harmful amounts.
INHALATION:	Mist may cause severe irritation of upper respiratory tract (nose and throat). May cause chemical burns to the respiratory tract.
INGESTION	Swallowing may result in burns of the mouth and throat. Swallowing may result in gastrointestinal irritation, ulceration, nausea and/or vomiting. Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.
CONDITIONS AGGRAVATED BY EXPOSURE	Respiratory disorders, pre-existing skin disorders, eye/vision disorders.
TARGET ORGANS EFFECTED:	Skin, Eyes, Respiratory System.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous ingredients (specific)	Typical %	CAS Number	EC Number
Water	50	7732-18-5	7732-18-5
Sodium Hydroxide	50	1310-73-2	7732-18-5
Sodium Chloride	< 1	7647-14-5	231-598-3

Common Names/Synonyms: Caustic Soda Liquid 50%, Soda Lye, Lye, Liquid Caustic, Sodium Hydrate

SECTION 4 – FIRST AID MEASURES

Eye Contact: Immediately flush eyes with water for at least 30 minutes, and up to 60 minutes if necessary. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Skin Contact: Immediately flush skin with water for at least 30 minutes, and up to 60 minutes if necessary. Under water remove contaminated clothing, jewelry, and shoes. If irritation persists, repeat flushing. Obtain medical attention immediately. Handle contaminated clothing and shoes in a manner which limits further exposure.

Ingestion: DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give as much water as possible to dilute material (8 to 10 oz. or 240 to 300 mL). If spontaneous vomiting occurs, have victim lean forward with head down, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility. Do not give anything to an unconscious person.

Inhalation: Move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance: induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention IMMEDIATELY. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.

SECTION 5 – FIRE FIGHTING MEASURES

Extinguishing Media: This material does not burn. If exposed to fire from another source, use suitable extinguishing agent for that fire. Do not use water jet.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Remove containers from fire, if possible, and cool containers with water. When material comes in contact with water, large amounts of heat may be generated and ignite adjacent combustible materials. **This material does not burn.** Fight fire for other material that is burning.

Special Protective Equipment for Firefighters:	Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.
Unusual Fire and Explosion Hazards:	Product reacts with water. Reaction may produce heat and/or gases. This reaction may be violent. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Hazardous Combustion Products:	Not applicable.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Steps to be taken if material is released or spilled:	Contain spilled material if possible. Small spills: Dilute with water and neutralize with dilute acid; absorb and collect. Large spills: Dike the area to contain the spill. Collect in suitable and properly labeled containers. Attempt to neutralize by adding material such as Acetic acid. See Section 13, Disposal Considerations, for additional information.
Personnel Precautions:	Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Refer to Section 7, Handling, for additional precautionary measures. Keep upwind of spill. Ventilate area of leak or spill. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental Precautions:	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

SECTION 7 – HANDLING AND STORAGE

Handling:

Do not get in eyes. Do not get on skin or clothing. Do not swallow. Avoid breathing mist. Keep container closed. Use with adequate ventilation.

1. ALWAYS add caustic soda solution to water with constant agitation. NEVER add water to the caustic soda solution.
2. The water should be lukewarm (27°-38°C or 80°-100°F). NEVER start with hot or cold water. The addition of the caustic soda to liquid will cause a rise in temperature. If caustic soda becomes concentrated in one area, is added too rapidly, or is added to hot or cold liquid, a rapid temperature increase can result in DANGEROUS mists, boiling or spattering which may cause an immediate VIOLENT ERUPTION. See Section 8, Exposure Controls and Personal Protection.

Storage:

Keep container closed. Do not store in: Zinc, Aluminum, Brass, or Tin. See Section 10 for more specific information.

Storage temperature: >16°C

Shelf life: Use within 24 months

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Preventive Measures:

Recommendations listed in this section indicate the type of equipment which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls:

Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact.

Personal Protective Equipment:	Maintain eye wash station and safety shower facilities in work area. Detailed requirements for personal protective equipment should be established on a site-specific basis.
Eye/Face Protection:	Wear full face-shield and chemical safety goggles when there is potential for contact.
Skin/Body Protection:	Wear appropriate personal protective clothing to prevent skin contact that is chemically resistant to this material. Wear rubber boots and chemical resistant gloves. Remove contaminated clothing immediately, wash skin area with soap and water and launder clothing before reuse or dispose of properly.
Respiratory Protection:	Up to 10mg/m³: Supplied Air Respirator (SAR) operated in a continuous-flow mode, eye protection needed; or full face-piece respirator with high-efficiency particulate filter(s); or powered air-purifying respirator with dust and mist filter(s), eye protection needed; or full face-piece Self-Contained Breathing Apparatus (SCBA); or full face-piece SAR. Emergency or Planned Entry into Unknown Concentrations of IDLH Conditions: Positive pressure, full face-piece SAR; or positive pressure, full face-piece SAR with an auxiliary positive pressure SAR.
Guidelines for Sodium Hydroxide Solutions, 30-70%:	**RECOMMENDED** (resistance to breakthrough longer than 8 hours): Butyl rubber; natural rubber, neoprene rubber, nitrile rubber, polyethylene, polyvinyl chloride, Teflon(TM), Viton(TM), Saranex(TM), 4H(TM), Barricade(TM), CPF 3(TM), Responder(TM), Trellchem HPS(TM), Tychem 10000(TM). **NOT RECOMMENDED** for use (resistance to breakthrough less than 1 hour): Polyvinyl alcohol.
Escape:	Full face-piece respirator with high-efficiency particulate filter(s); or escape-type SCBA.
Exposure Guidelines:	
PRODUCT:	**Sodium hydroxide** ACGIH Ceiling Exposure Limit (TLV-C): 2mg/m³ OSHA PEL-TWA & PEL-C: 2mg/m³ NIOSH IDLH: 10mg/m³ NIOSH REL-C: 2mg/m³

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid above freezing point
Physical Form	Liquid
Color	Colorless
Odor	Odorless
Odor Threshold	No data available
Flash Point – Closed Cup	None
Flammable Limits in Air	Lower: Not applicable Upper: Not applicable
Autoignition Temperature	Not applicable
Vapor pressure	1.5 mmHg @ 20°C *Literature*
Boiling Point (760 mmHg)	145°C (293°F) *Literature*
Vapor Density (air=1)	Not applicable
Specific Gravity (H20=1)	1.52 *Literature*
Liquid Density	1.5 g/cm3 @ 20°C *Literature*
Freezing Point	14°C (57°F) *Literature*
Melting Point	14°C (57°F) *Literature*
Solubility in Water (by weight)	Water solution
pH	Strong Basic
Evaporation Rate	No data available
Partition Coefficient n-octanol/water	No data available
Decomposition Temperature	No data available
Molecular Weight	40 g/mol
Volatility	No data available
Kinematic Viscosity	0.35 St @ 25° *Calculated*

* This data is based on 50% Caustic

SECTION 10 – STABILITY AND REACTIVITY

Stability/Instability: Stable under recommended storage conditions. See Storage, Section 7.

Conditions to avoid: Avoid moisture. Product absorbs carbon dioxide from the air. Avoid mixing with water, strong acids, or other incompatible materials. Will react with some metals and create a flammable hydrogen gas.

Incompatible Materials: Heat is generated when mixed with water. Spattering and boiling can occur. Caustic soda solution reacts readily with various reducing sugars (i.e. fructose, galactose, maltose, dry whey solids) to produce CO. Take precautions including monitoring the tank atmosphere for CO to ensure safety of personnel before vessel entry. Avoid contact with:

acids, glycols and halogenated organics. Organic nitro compounds. Flammable hydrogen may be generated from contact with metals such as: Zinc, Aluminum, Tin, or Brass.

Hazardous Polymerization: Will not occur.

Thermal Decomposition: Does not decompose.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute Toxicity:

Ingestion: Single dose oral LD50 has not been determined.

Skin Absorption: The dermal LD50 has not been determined.

The severity of injury depends on the concentration and duration of exposure to the substance. This material is toxic to the skin, eyes, and mucous membranes. It may cause destructive effects on tissues that it contacts. Inhalation will cause irritation to the respiratory tract and difficulty breathing. Eye contact will cause irritation and may cause severe burns and possible blindness. Contact with skin will cause irritation and may cause corrosion of the tissue.

Repeated Dose Toxicity: Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

Genetic Toxicology: For the major component(s): In vitro genetic toxicity studies were negative.

Carcinogenicity: Not a known carcinogen.

SECTION 12 – ECOLOGICAL INFORMATION

Fate and Transport:

Sodium Hydroxide:

Movement No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).

Persistence and Degradability		Biodegradation is not applicable.
Sodium Chloride:	**Movement**	No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).
Persistence and Degradability		Biodegradation is not applicable.

Ecotoxicity:

Sodium Hydroxide:	Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested). May increase pH of aquatic systems to >pH 10 which may be toxic to aquatic organisms.
Fish Acute & Prolonged Toxicity	LC50, rainbow trout (Oncorhynchus mykiss), 96h: 45.5 mg/L
Aquatic Invertebrate Acute Toxicity	LC50, water flea Daphnia magna: 40-240 mg/L
Sodium Chloride:	Material is practically non-toxic to aquatic organisms on an acute basis (IC50/EC50>100 mg/L in the most sensitive species tested).
Fish Acute & Prolonged Toxicity	LC50, fathead minnow (Pimephales promelas): 10,610 mg/L
Aquatic Invertebrate Acute Toxicity	LC50, water flea Daphnia magna: 4,571 mg/L

SECTION 13 – DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable Federal, State/Provincial and local laws and regulations. Waste characterization and compliance with applicable laws and regulations are the responsibility of the waste generator. Do not dispose of waste with normal garbage, or to sewer systems.

SHINTECH LOUISIANA, LLC HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR

USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN SDS SECTION.

SECTION 14 – TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

	BULK / NON BULK
Shipping Name	SODIUM HYDROXIDE SOLUTION
Hazard Class/Division	8
Identification No.	UN1824
Packing Group	PG II
DOT RQ (lbs)	RQ 1000 lbs. (Sodium Hydroxide)

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15 – REGULATORY INFORMATION

USA Classification

OSHA Hazard Communication Standard: This product is a “Hazardous Chemical” as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	Yes
Sudden Release of Pressure Hazard	No
OSHA Process Safety (29CFR1910.119)	No
CERCLA Section 103 (40CFR302.4)	Yes

Reportable Quantity (RQ) under CERCLA	1,000 lbs. (454kg)
TSCA Inventory Status	Yes

This product does not contain nor is it manufactured with ozone depleting substances

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Sodium Hydroxide	1310-73-2	<=51.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US Toxic Substances Control Act:

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 710.30.

CEPA – Domestic Substances List (DSL):

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	Yes
Sudden Release of Pressure Hazard	No
OSHA Process Safety (29CFR1910.119)	No
CERCLA Section 103 (40CFR302.4)	Yes
Reportable Quantity (RQ) under CERCLA	1,000 lbs. (454kg)
TSCA Inventory Status	Yes

This product does not contain nor is it manufactured with ozone depleting substances.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Sodium Hydroxide	1310-73-2	<=51.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US Toxic Substances Control Act:

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 710.30

CEPA – Domestic Substances List (DSL):

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

SECTION 16 – OTHER INFORMATION

IMPORTANT: The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANT ABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SUITABILITY, STABILITY OR OTHERWISE. The information included herein is not intended to be all-inclusive as to the appropriate manner and/or conditions of use, handling and/or storage. Factors pertaining to certain conditions of storage, handling, or use of this product may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended to, and nothing herein shall be construed as a recommendation to, infringe any existing patents or violate any laws, rules, regulations or ordinances of any governmental entity.

Shintech Louisiana, LLC urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as to the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product.

Revisions:

- **January 2011 - no information changed in this MSDS. This MSDS was reviewed for accuracy.**
- **April 2014 – The MSDS was updated to follow new Global Harmonization Guidelines. The MSDS are now called Safety Data Sheets (SDS).**
- **January 2016 – Corrections to improve nomenclature and technical data.**
- **February 2020 – No information changed in this SDS. This SDS was reviewed for accuracy.**
- **July 2022 – Section 2 was updated to include the GHS Classification Category 1 – Corrosive to Metals and Category 4 – Acute toxicity - inhalation. Section 2 - GHS Hazard Statements have been revised to indicate that this material is harmful if inhaled.**
- **November 2022 – Section 2 GHS Classifications and Hazard Statements updated.**
- **January 2023 – Removal of health hazard pictogram based on updated hazard statements.**

SDS Status: *Revision Date:* *1/25/2023*
Supersedes: *11/15/2022*

Aqua Ammonia 19%

Safety Data Sheet

Classified according to the UN-GHS as adopted in the US Hazard Communication Standard (HCS 2012), the Canada Hazardous Products Regulations (WHMIS 2015) and Mexico NOM-018-STPS-2015.

Revision Date: 4 June 2024 Date of issue: 4 June 2024 Supersedes Date: 23 June 2023 Version: 3.1

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Name: Aqua Ammonia 19%

CAS No: 1336-21-6

Synonyms: Ammonia water, Aqueous ammonia, Household ammonia, Ammonium hydrate, Ammonium hydroxide

STCC: 4935280

1.2. Intended Use of the Product

Uses of the substance/mixture: Fertilizer

Uses advised against: Consumer use

1.3. Name, Address, and Telephone of the Responsible Party

Company

CF Industries
2375 Waterview Drive
Northbrook, Illinois, USA
847-405-2400
www.cfindustries.com

1.4. Emergency Telephone Number

Emergency Number : 800-424-9300
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

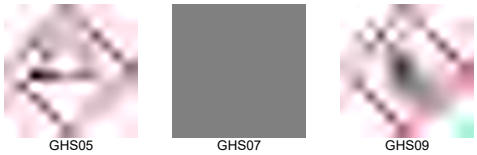
Acute Tox. 4 (Oral)	H302
Acute Tox. 4 (Inhalation:gas)	H332
Skin Corr. 1A	H314
Eye Dam. 1	H318
STOT SE 3	H335
Aquatic Acute 1	H400
Aquatic Chronic 3	H412

Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :



GHS05 GHS07 GHS09

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H302+H332 - Harmful if swallowed or if inhaled.
H314 - Causes severe skin burns and eye damage.
H318 - Causes serious eye damage.
H335 - May cause respiratory irritation.
H400 - Very toxic to aquatic life.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary Statements (GHS-US) : P260 - Do not breathe mist, spray, vapors, gas.
P261 - Avoid breathing vapors, mist, or spray.
P264 - Wash hands, forearms, and exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear eye protection, protective clothing, protective gloves, face protection.

P301+P330+P331+P310 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor.
P303+P361+P353+P310 - IF ON SKIN (OR HAIR): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a poison center or doctor.
P304+P340+P310 - IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor.
P305+P351+P338+P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor.
P363 - Wash contaminated clothing before reuse.
P391 - Collect spillage.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, provincial, territorial, national, and international regulations.

2.3. Other Hazards

Ammonium hydroxide is very volatile and may release ammonia as a gas. Ammonia vapor, in concentrations of 16-25% volume by weight in air, is flammable, toxic by inhalation and corrosive. Take all appropriate precautions.

2.4. Unknown Acute Toxicity (GHS-US)

No data available.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Ammonium hydroxide	(CAS No) 1336-21-6	100	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400
Contains	**Product Identifier**	**% (w/w)**	**Classification (GHS-US)**
Water	(CAS No) 7732-18-5	80.5-81.5	Not classified
Ammonia	(CAS No) 7664-41-7	18.5-19.5	Flam. Gas 2, H221 Compressed gas, H280 Acute Tox. 3 (Inhalation:gas), H331 Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 2, H411

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. Seek medical attention immediately. Show label if possible.

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Immediately call a POISON CENTER or doctor/physician.

Skin Contact: Immediately flush skin with plenty of water for at least 60 minutes. Remove/Take off immediately all contaminated clothing. Immediately call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing for at least 60 minutes. Immediately call a POISON CENTER or doctor/physician.

Ingestion: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: Harmful if swallowed. Corrosive to eyes, respiratory system and skin. Harmful if inhaled.

Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Damage to lungs. Harmful if inhaled.

Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.

Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.

Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic Symptoms: None known.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Water spray, fog.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Ammonia vapor concentrations in the range of 16-25% by volume in air can be ignited if heated to the auto-ignition temperature. Oil or other combustible materials increases the fire hazard. Emits toxic fumes under fire conditions.

Explosion Hazard: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions.

Reactivity: Corrosive to copper, brass, silver, zinc and galvanized steel.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Stop leak if safe to do so. Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

Hazardous Combustion Products: Nitrogen oxides. Ammonia.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Keep away from open flames, hot surfaces and sources of ignition. No smoking. Avoid all contact with skin, eyes, or clothing. Do NOT breathe vapor, mist, spray.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel. Eliminate ignition sources.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Stop leak if safe to do so. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Stop the flow of material, if this is without risk. Ventilate area. Contain any spills with dikes or absorbents.

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely. Never neutralize spill with acid. Absorb and/or contain spill with inert material, then place in suitable container. Use only non-sparking tools. After cleaning, flush traces away with water.

6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Do NOT enter (storage areas, confined spaces) unless adequately ventilated. Emits ammonia vapors. Flammable gas. Ammonium hydroxide reacts with many heavy metals and their salts forming explosive compounds. It may attack metals forming flammable/explosive gas. The solution in water is a strong base, it reacts violently with acids.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Ensure adequate ventilation. Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Detached outside storage is preferable. Keep in fireproof place. Store away from oxidizers, combustible materials, and all ignition sources. Store in corrosive resistant container with a resistant inner liner. Storage containers should have safety relief valves. Store locked up.

Incompatible Materials: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

Storage Area: Post readily visible warning signs in the storage area listing emergency measures. Water hoses should be readily available to disperse vapors in case of a spill.

7.3. Specific End Use(s)

Fertilizer

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Ammonia (7664-41-7)		
Mexico	OEL TWA (mg/m³)	18 mg/m³
Mexico	OEL TWA (ppm)	25 ppm
Mexico	OEL STEL (mg/m³)	27 mg/m³
Mexico	OEL STEL (ppm)	35 ppm
USA ACGIH	ACGIH TWA (ppm)	25 ppm
USA ACGIH	ACGIH STEL (ppm)	35 ppm
USA OSHA	OSHA PEL (TWA) (mg/m³)	35 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	50 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	18 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	25 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m³)	27 mg/m³
USA NIOSH	NIOSH REL (STEL) (ppm)	35 ppm
USA IDLH	US IDLH (ppm)	300 ppm
Alberta	OEL STEL (mg/m³)	24 mg/m³
Alberta	OEL STEL (ppm)	35 ppm
Alberta	OEL TWA (mg/m³)	17 mg/m³
Alberta	OEL TWA (ppm)	25 ppm
British Columbia	OEL STEL (ppm)	35 ppm
British Columbia	OEL TWA (ppm)	25 ppm
Manitoba	OEL STEL (ppm)	35 ppm
Manitoba	OEL TWA (ppm)	25 ppm
New Brunswick	OEL STEL (mg/m³)	24 mg/m³
New Brunswick	OEL STEL (ppm)	35 ppm
New Brunswick	OEL TWA (mg/m³)	17 mg/m³
New Brunswick	OEL TWA (ppm)	25 ppm
Newfoundland &	OEL STEL (ppm)	35 ppm

Labrador		
Newfoundland & Labrador	OEL TWA (ppm)	25 ppm
Nova Scotia	OEL STEL (ppm)	35 ppm
Nova Scotia	OEL TWA (ppm)	25 ppm
Nunavut	OEL STEL (mg/m³)	24 mg/m³
Nunavut	OEL STEL (ppm)	35 ppm
Nunavut	OEL TWA (mg/m³)	17 mg/m³
Nunavut	OEL TWA (ppm)	25 ppm
Northwest Territories	OEL STEL (mg/m³)	24 mg/m³
Northwest Territories	OEL STEL (ppm)	35 ppm
Northwest Territories	OEL TWA (mg/m³)	17 mg/m³
Northwest Territories	OEL TWA (ppm)	25 ppm
Ontario	OEL STEL (ppm)	35 ppm
Ontario	OEL TWA (ppm)	25 ppm
Prince Edward Island	OEL STEL (ppm)	35 ppm
Prince Edward Island	OEL TWA (ppm)	25 ppm
Québec	VECD (mg/m³)	24 mg/m³
Québec	VECD (ppm)	35 ppm
Québec	VEMP (mg/m³)	17 mg/m³
Québec	VEMP (ppm)	25 ppm
Saskatchewan	OEL STEL (ppm)	35 ppm
Saskatchewan	OEL TWA (ppm)	25 ppm
Yukon	OEL STEL (mg/m³)	30 mg/m³
Yukon	OEL STEL (ppm)	40 ppm
Yukon	OEL TWA (mg/m³)	18 mg/m³
Yukon	OEL TWA (ppm)	25 ppm

8.2. Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Gas detectors should be used when toxic gases may be released. Use explosion-proof equipment.

Personal Protective Equipment: Gloves. Protective goggles. Insufficient ventilation: wear respiratory protection. Protective clothing. Face shield.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles and face shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

Other Information: When using, do not eat, drink, or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	Colorless
Odor	:	Pungent
Odor Threshold	:	1 - 50 ppm
pH	:	10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Evaporation Rate	:	Not available
Melting Point	:	- 77 °C (-106 °F) (< 44% NH_3)

Freezing Point	:	-38 °C (-36 °F)
Boiling Point	:	37.4 °C (99.3°F) (25% NH_3)
Flash Point	:	Not available
Auto-ignition Temperature	:	651 °C (1,204°F) (ammonia vapor)
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	16 % (ammonia vapor)
Upper Flammable Limit	:	25 % (ammonia vapor)
Vapor Pressure	:	49642.2 Pa at 68°F (20°C)
Relative Vapor Density at 20 °C	:	0.6 (for ammonia vapor over aqua ammonia at 0°C and 760 mm Hg)
Relative Density	:	Not available
Specific Gravity	:	0.90 at 60 °F (19% NH_3)
Solubility	:	Soluble in water.
Partition Coefficient: N-Octanol/Water	:	-1.14 at 25° C
Viscosity	:	Not available
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	:	Not expected to present an explosion hazard due to static discharge.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity
Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

10.2. Chemical Stability
Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of Hazardous Reactions
Hazardous polymerization will not occur.

10.4. Conditions to Avoid
Direct sunlight. Extremely high or low temperatures. Heat. Sources of ignition.

10.5. Incompatible Materials
Strong acids. Strong bases. Strong oxidizers. Hypochlorites.

10.6. Hazardous Decomposition Products
Thermal decomposition generates: Carbon oxides (CO, CO2). Nitrogen oxides. Emits ammonia vapors.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product
Acute Toxicity: Oral: Harmful if swallowed. Inhalation:gas: Harmful if inhaled.

LD50 and LC50 Data:

Ammonium hydroxide 1336-21-6	
ATE US (oral)	350.00 mg/kg body weight
ATE US (gases)	10,256.41 ppmV/4h

Skin Corrosion/Irritation: Causes severe skin burns and eye damage.
pH: 10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Serious Eye Damage/Irritation: Causes serious eye damage.
pH: 10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Teratogenicity: Not available
Carcinogenicity: Not classified
Specific Target Organ Toxicity (Repeated Exposure): Not classified
Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): May cause respiratory irritation.

Aspiration Hazard: Not classified
Symptoms/Injuries After Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Damage to lungs. Harmful if inhaled.
Symptoms/Injuries After Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.
Symptoms/Injuries After Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.
Symptoms/Injuries After Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.
Chronic Symptoms: None known.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Ammonia (7664-41-7)	
LC50 Inhalation Rat	5.1 mg/l (Exposure time: 1 h)
LC50 Inhalation Rat	2000 ppm/4h (Exposure time: 4 h)

Water (7732-18-5)	
LD50 Oral Rat	> 90000 mg/kg

Ammonium hydroxide (1336-21-6)	
LD50 Oral Rat	350 mg/kg

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General: Toxic to aquatic life. Harmful to aquatic life with long lasting effects.

Ammonia (7664-41-7)	
LC50 Fish 1	0.44 mg/l (Exposure time: 96 h - Species: Cyprinus carpio)
EC50 Daphnia 1	25.4 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	0.26 - 4.6 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)

Ammonium hydroxide (1336-21-6)	
LC50 Fish 1	8.2 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0.66 mg/l (Exposure time: 48 h - Species: water flea)
EC50 Daphnia 2	0.66 mg/l (Exposure time: 48 h - Species: Daphnia pulex)

12.2. Persistence and Degradability

Ammonium hydroxide (1336-21-6)	
Persistence and Degradability	Biodegradation of ammonia occurs in water under aerobic conditions.

12.3. Bioaccumulative Potential

Ammonium hydroxide (1336-21-6)	
Log Pow	-1.14
Bioaccumulative Potential	Not established.

Ammonia (7664-41-7)	
Log Pow	-1.14 (at 25 °C)

12.4. Mobility in Soil

Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.
Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.
Additional Information: Prevent runoff from entering drains, sewers or waterways.
Ecology – Waste Materials: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8

Packing Group : III
ERG Number : 154
CERCLA RQ : Ammonium Hydroxide = 1,000 lbs
Additional Information : Marine Pollutant

14.2. In Accordance with IMDG

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Packing Group : III
Label Codes : 8 + MP(P)
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-B

Additional Information : Marine Pollutant, Classified as HME per MARPOL Annex V

14.3. In Accordance with IATA

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Packing Group : III

ERG Code (IATA) : 8L

14.4. In Accordance with TDG

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Packing Group : III
Additional Information : Marine Pollutant

14.5. Classified in Accordance with MX-SCT

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Additional Information : Marine Pollutant

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Ammonium hydroxide (1336-21-6)	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

Ammonia (7664-41-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on the United States SARA Section 302 Listed on United States SARA Section 313	
SARA Section 302 Threshold Planning Quantity (TPQ)	500
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Sudden release of pressure hazard

SARA Section 313 - Emission Reporting	1.0 % (includes anhydrous Ammonia and aqueous Ammonia from water dissociable Ammonium salts and other sources, 10% of total aqueous Ammonia is reportable under this listing)

Water (7732-18-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ammonium hydroxide (1336-21-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State Regulations

Ammonia (7664-41-7)
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Acute
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Connecticut - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Toxic Endpoints
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Florida - Essential Chemicals List
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)
U.S. - Idaho - Occupational Exposure Limits - TWAs
U.S. - Louisiana - Reportable Quantity List for Pollutants
U.S. - Maine - Air Pollutants - Criteria Pollutants
U.S. - Massachusetts - Allowable Ambient Limits (AALs)
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Threshold Effects Exposure Limits (TELs)
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Occupational Exposure Limits - STELs
U.S. - Michigan - Polluting Materials List
U.S. - Michigan - Process Safety Management Highly Hazardous Chemicals
U.S. - Minnesota - Chemicals of High Concern
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - STELs
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)
U.S. - New Mexico - Precursor Chemicals
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

U.S. - North Carolina - Control of Toxic Air Pollutants
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 1-Hour
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Ohio - Extremely Hazardous Substances - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Oregon - Precursor Chemicals
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 24-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual
U.S. - Rhode Island - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Tennessee - Occupational Exposure Limits - STELs
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Permissible Exposure Limits - STELs
U.S. - Virginia - Water Quality Standards - Acute Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Acute Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Public Water Supply Effluent Limits
U.S. - Virginia - Water Quality Standards - Surface Waters Not Used for the Public Water Supply Effluent Limits
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet
U.S. - Wyoming - Process Safety Management - Highly Hazardous Chemicals
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Marine Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Marine Water
U.S. - Alaska - Ambient Air Quality Standards

Ammonium hydroxide (1336-21-6)

U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Louisiana - Reportable Quantity List for Pollutants
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Polluting Materials List
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List RTK - U.S. - Pennsylvania - RTK (Right to Know) List U.S. - Texas - Effects Screening Levels - Long Term U.S. - Texas - Effects Screening Levels - Short Term

15.3. Canadian Regulations

Ammonium hydroxide (1336-21-6)	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects

Ammonia (7664-41-7)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects Class E - Corrosive Material

Water (7732-18-5)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

Ammonium hydroxide (1336-21-6)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision B - Toxic material causing immediate and serious toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 4 June 2024

Revision Comments : This version contains updates/revisions to the following sections:

- Updated company address

GHS Full Text Phrases:

Acute Tox. 3 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 3
Acute Tox. 4 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Compressed gas	Gases under pressure Compressed gas

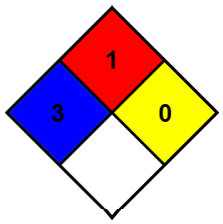
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Flam. Gas 2	Flammable gases Category 2
Skin Corr. 1A	Skin corrosion/irritation Category 1A
Skin Corr. 1B	Skin corrosion/irritation Category 1B
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H221	Flammable gas
H280	Contains gas under pressure; may explode if heated
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H331	Toxic if inhaled
H332	Harmful if inhaled
H335	May cause respiratory irritation
H400	Very toxic to aquatic life
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

NFPA Rating

Health Hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

Fire Hazard : 1 - Must be moderately heated or exposed to relatively high temperature before ignition can occur.

Reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 1 Slight Hazard

Physical : 0 Minimal Hazard

Party Responsible for the Preparation of This Document
CF Industries, Corporate EHS Department, 847-405-2400

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

CF believes the information contained herein is accurate; however, CF makes no guarantees or warranties with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein by CF is not intended to be and should not be construed as legal advice or as ensuring compliance by other parties. Judgments as to the suitability of the information contained herein for the party's own use or purposes are solely the responsibility of that party. Any party handling, transferring, transporting, storing, applying or otherwise using this product should review thoroughly all applicable laws, rules, regulations, standards and good engineering practices. Such thorough review should occur before the party handles, transfers, transports, stores, applies or otherwise uses this product.

North America GHS US 2012 & WHMIS 2

ATTACHMENT I

EMISSION UNITS TABLE

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March 24, 2025

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
1S-117S	1E-117E	Engine 1 through Engine 117	2026	[redacted] HP	New	1C-117C
118S-157S	118E-157E	ULSD Tank TK1-TK40	2026	170,000 gal	New	NA
De minimis	De minimis	Hydrous Ammonia Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Caustic Soda Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sulfuric Acid Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sodium Chlorite Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sodium Hydrosulfide Tanks 1-39	2026	4,600 gal	New	NA

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, or other appropriate designation.

ATTACHMENT J

EMISSION POINTS DATA SUMMARY SHEET

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March 24, 2025

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data – STEADY STATE (INCLUDES STARTUP EMISSIONS TO SCR)

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions[4]		Maximum Potential Controlled Emissions[5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/ Vapor)*	Est. Method Used[6]	Emission Concentration[7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
Worst case yearly emissions all engines (with 5 startups and shutdowns)															
1E-117E	Vertical	1S to 117S	Engines 1 to 117	1C to 117C	Control System	NA	NA	NOx	NA	13,494	NA	194.30	Gas	Manufacturer	NA
								PM/PM10/PM2.5	NA	248.69	NA	186.53	Solid		NA
								CO	NA	11,174	NA	205.62	Gas		NA
								VOC	NA	11,517	NA	116.59	Gas		NA
								SO2	NA	495	NA	9.93	Gas		NA
								Total HAPS	NA	85.77	NA	0.86	Gas		NA
Normal Operations Single Engine (See emission discussion in Attachment L for different operating scenarios)															
1E to 117E	Vertical	1S to 117S	Engine 1 to 117	1C to 117C	Control System	NA	NA	NOx	[redacted]	[redacted]	0.14	0.61	Gas	Manufacturer	NA
								PM/PM10/PM2.5			0.34	1.49	Solid		NA
								CO			0.34	1.47	Gas		NA
								VOC			0.23	0.99	Gas		NA
								SO2			0.01	0.03	Gas		NA
								Total HAPS			0.54	0.01	Gas		NA
See Emissions Discussion in Attachment L and Emissions Estimate in Attachment N for other emissions scenarios.															

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data – 2E Startup Emissions

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/ Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
118E to 157E	Vertical	118S to 157S	ULSD Tanks 1-40	None	None	NA	NA	VOC (per tank)	0.18	0.02	0.18	0.02	Gas	Tanks 4.09.d	

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1E-117E	4.6	111	32,287	32.37	~1,718	98	4,161.72229	415.70631
118E-157E	NA	Ambient	NA	NA	~1,718	40	4,161.72229	415.70631

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions, which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ Yes ☐ No ☒ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No Leak Source Count is in Attachment N. ☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	PM/PM10/PM2.5	11.50/2.30/0.60	28.64/5.73/1.50	11.50/2.30/0.60	28.64/5.73/1.50	AP-42
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks (See fittings count in Attachment N)	VOC Hexane (C6+)	Does Not Apply	0.3120 0.0053	Does Not Apply	0.3120 0.0053	EE
General Clean-up VOC Emissions						
Other						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT L

EMISSION UNIT DATA SHEET(S)

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March 24, 2025

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 1S-117S

1. Name or type and model of proposed affected source:
[redacted] Horsepower Compression Ignition Engines. See attached engine details and emissions.

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

1. Name(s) and maximum amount of proposed process material(s) charged per hour:

Dual Fuel Modes
1. Natural Gas at 98% with Diesel at 2%.
2. Diesel at 100%.

Engine can be retrofit to burn other fuels.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

25 MWe Generators

5. Give chemical reactions, if applicable, that will be involved in the generation of air Pollutants:

Not Applicable

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

See fuel use during different operating modes in the attached document and in Attachment N.

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Natural gas will be pipeline quality natural gas.
Diesel fuel will be ultra-low sulfur diesel.

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(c) Theoretical combustion air requirement (ACF/unit of fuel): NA

@ °F and psia.

(d) Percent excess air: NA

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

Compression Ignition Engines

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

NA

(g) Proposed maximum design heat input: [redacted] × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:
See the attached document and Attachment N.

a.	NO_X	See Attached and Attachment N	lb/hr	See Attached and Attachment N	Ton/yr
b.	SO_2		lb/hr		Ton/yr
c.	CO		lb/hr		Ton/yr
d.	PM_{10}		lb/hr		Ton/yr
e.	Hydrocarbons		lb/hr		Ton/yr
f.	VOCs (Ethane & Methane)		lb/hr		Ton/yr
g.	Pb		lb/hr		Ton/yr
h.	Specify other(s)				
	Total HAPS	See Attached and Attachment N	lb/hr	See Attached and Attachment N	Ton/yr
			lb/hr		Ton/yr
			lb/hr		Ton/yr
			lb/hr		Ton/yr

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Monitoring as required by 40CFR60, Subpart IIII.	Recordkeeping as required by 40CFR60, Subpart IIII.
REPORTING	**TESTING**
Reporting as required by 40CFR60, Subpart IIII.	Testing as required by 40CFR60, Subpart IIII.

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

The engines are designed to run as proposed. Procedures will be provided upon delivery of the engines.

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Engine Model and Manufacturer

[redacted]. These are [redacted] fuel engines. The engines will be built in license by the following engine builders:

[redacted]

Performance Data

[redacted] offers very high, single-cycle efficiency. In the selected configuration and rating, one engine will produce a maximum [redacted] kW [redacted] mechanical power at the shaft. The engines are Dual-Fuel capable, for maximum flexibility. [redacted]

[redacted]

[redacted]

Power

On the permitting site there will be a total of 117 engines. With the maximum power output of [redacted] MW per engine, the installed theoretical power output is [redacted] MW. The effective and continuously delivered power output will be [redacted] MW, for 8,760 hours per year.

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Fuel Types

In their Dual-Fuel configuration, the engines operate on natural gas and on diesel fuels or can be operated on diesel fuel only, in backup mode. Under normal operation the engines consume gas as their primary fuel with a pilot injection of Ultra-Low Sulfur Diesel. For this application the gas has the following properties (lower heat rate 976.94 BTU/ft³):

Date	BTU	SG	CO2	N2	Methane	Ethane	Propane	I-Butane	N-Butane	I-Pentane	N-Pentane	c6+
Average	1082.2	0.61	0.20	0.44	90.33	8.44	0.52	0.02	0.03	0.01	0.00	0.01
STD in % of average	0.66	0.78	11.09	5.04	0.85	8.17	57.48	20.82	24.96	33.90	55.06	63.08

Under gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% for emergency operation. The fuel used in this application will be Ultra-Low Sulfur Diesel (ULSD), with a sulfur Content: ≤ 15 parts per million (ppm) and a heat rate of 130,613 BTU/gal.

Operational profiles

Normal Operation

To ensure peak operation conditions, the engines will be regularly serviced. With 1-2 weeks of downtime per engine per year, 3 engines are going to be off-line at any time of the year. Under normal operations, the engines will be run at 75% power only. Therefore, the continuously delivered power will be [redacted] MW.

Compensation Mode

In case of one or – in the unrealistic, but foreseen case of - up to 29 engines out of service, the rest of the field will compensate, increasing their power output to 100%. For the calculation of the yearly emissions the worst case is assumed, when 29 engines go offline and the remaining 85 are operated at 100%.

Emergency Mode

In case the pipeline is down, or the gas cannot be delivered for any other reason, the engines can switch to *diesel fuel mode* immediately and are then operated on diesel fuel only. Apart from the different fuel type, the engines are controlled in the same way as in *Normal Operation*.

Startup Mode

To start an engine and bring power production online, several steps are necessary. In the first phase the emission control system is not operational temperature, therefore the control rate is not optimal. The following is a simplification and a representation of the worst case for emissions emission-wise. The different steps can be reduced to four main sub-modes:

- Speed up
- Fuel Switch
- Generator switched on
- Load up cold control

Speed up

Bring the engine from stand still to nominal speed [redacted]. This is done in diesel mode. The emission control system is still offline at this point, as it is not at optimal temperature. Once nominal speed is set and the minimum load for a fuel switch is reached [redacted], the system initiates the next sub mode: Fuel Changeover

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Fuel Changeover

For about [redacted] the load is kept constant, and the fuel is changed from 100% diesel to 98% gas & 2% diesel.

Generator switched on

On gas operation the load is further increased until the generator can by energized and synchronized with the rest of the engine fleet. This takes no more than [redacted]. For the emissions calculation of all these steps the emission control system is looked at as non-operational, even though the exhaust gases will have heated it already and some abatement is taking place, even at a reduced level.

Load up cold control

Once the generator is online and synchronized, then the engine is powered up to its set point (75% in normal operation mode). For reasons of simplicity and to ensure a conservative view on the problem, during engine load up the control system is looked at as cold and operational at 25% only. This even though in reality the system was heated up constantly by the exhaust gases and reaching operational condition during the load up.

Shut Down

The shut down procedure consists of three phases:

- Ramp down
- Min Load
- Spin out

Ramp down

The load is constantly reduced to a minimum load.

Min Load

At minimum load the generator is decoupled from the grid and the engine's load and speed setting are zero.

Spin out

Due to the zero-load setting the injection systems are turned off and the engine is spun out until full stop. In this entire sequence the emission control system is still operational due to its thermal inertia. Therefore, until the injection is stopped the emissions are treated.

All these steps are represented in Figure 3.

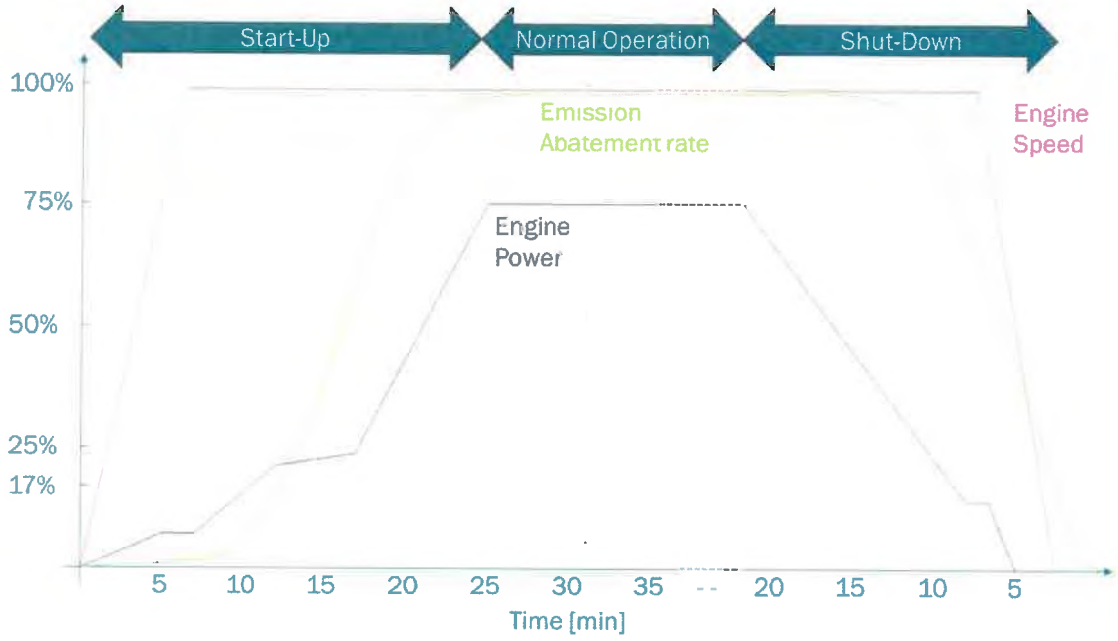

Figure 3: Simplified representation of the Start-Up and Shut-Down phases. Purple: Speed, dark blue: Power and green the efficiency of the emission control system

Emission Levels

For this application the engines are operated in two fuel modes, *Gas mode*, and Diesel mode, where 100% of the energy come from diesel. In Gas mode, where 98% of the energy comes from Natural Gas and 2% from diesel fuel injection (Ultra Low Sulfur Diesel), the engine's raw emissions going into the emission control system are listed in Table 1.

Gas mode		100	75	50	25	20	10
NOx	g/kWh						
PM (Filterable)	mg/Nm3						
PM10 (Filterable + Condensable)	mg/Nm3						
PM2.5 (Filterable + Condensable)	mg/Nm3						
CO	ppm						
VOC	ppm						
N2O	ppm						
CH4	ppm						
CO2	g/kWh						
SO2	g/kWh						

Table 1: Engine raw emissions in Gas mode

For redundancy the engine can switch to *Diesel mode* as a backup, with 100% of the energy coming from diesel fuel (ULSD), in case there is a problem with the gas supply system. The corresponding emissions are listed in Table 2.

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Diesel mode		100	75	50	25	20	10
NOx	g/kWh						
PM (Filterable)	mg/Nm3						
PM10 (Filterable + Condensable)	mg/Nm3						
PM2.5 (Filterable + Condensable)	mg/Nm3						
CO	ppm						
VOC	ppm						
N2O	ppm						
CO2	g/kWh						
SO2	g/kWh						

Table 2: Engine raw emissions in Diesel mode

[redacted] Emission Control System

A detailed description of the system can be found in document *21801.24.0.TGT-PL TGT Process description.pdf*

On a high level the emission abatement, or control system, consists of two main systems, the dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, downstream the turbocharger.

Chemical	%w	lb/gal	[gal/h]	[lb/h]
NH_3 (aq.)				
NaOH				
NaHS (reducing agent)				
NaClO2 (oxidizing agent)				
H_2SO_4				

Table 3: Use of chemicals for the emission control system

Normal Operation

Under normal circumstances the engines operate on gas at 75% load, at their peak efficiency, hence with lowest specific fuel consumption. They are stopped once a year for servicing, while another engine takes up this load. [redacted]

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Doing so, it produces the following raw emissions:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]

Table 4: Emissions of a single engine in Normal Operation
** with Global Warming Potential of 28 for Methane and 265 for laughing gas*

While one individual engine never sees a total run time of 8760 hours per year, there are 114 engines that do experience this as a collective. One single engine of the operated collective therefore consumes 20,035 short tons of gas per year (866,574,112 ft^3/a) and 122 tons (34,273 gal/a) of ULSD per year and produces the following raw emissions:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]

Table 5: Emissions of 1 engine under Normal Operation (8760 hours)

The abatement system reduces the emissions the following:

	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]
Speed up					
Fuel Changeover					
Generator switched on					
Load up cold control					
Normal Operation					
Compensation Mode					
Ramp down					
Min load					
Spin out					
Emergency Mode					

Table 6: Emission abatement efficiency for each individual emission type

Resulting in the total yearly emissions per engine of:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
0.61	1.49	1.47	0.99	0.03	55,339	208	1.1	61,472

Table 7: Total yearly emissions of a single engine after emission treatment

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Start up and Shut down operation

Additionally, one start up and shut down is foreseen. During the individual sequences one engine produces the following emissions:

	[redacted]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
Speed up		89.54	0.34	2.50	19.49	0.10	3,217	0	0.12	3,274
Fuel Switch		4.81	0.53	8.65	13.07	0.00	1,807	28.03	0.12	2,740
Generator on		8.15	0.46	9.25	12.48	0.00	3,535	26.7	0.12	4,529
Load up		9.26	0.43	9.54	12.19	0.00	4,370	26.03	0.12	5,386
Ramp down		10.37	0.32	13.79	14.95	0.00	6,777	31.74	0.15	8,063
Min load		8.15	0.46	9.25	12.48	0.07	3,535	26.7	0.12	4,529
Spin out		4.81	0.53	8.65	13.07	0.07	1,807	28.03	0.12	2,740

Table 8: Emission during the different stages of Startup and Shut down phase
**of the efficiencies mentioned above in Table 6.*

In total during one startup and a shutdown sequence one single engine emits the following:

NOx [t]	PM [t]	CO [t]	VOC [t]	SOx [t]	CO2 [t]	Methane [t]	N2O [t]	CO2_eq [t]
0.0049	0.0002	0.0016	0.0026	0.0000	1.9675	0.0104	0.0001	2.2724
[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]
9.74	0.31	3.22	5.12	0.02	3,935	20.77	0.11	4,545

Table 9: Emissions during a startup and shutdown sequence for one single engine.

Normal Operation Scenario

Therefore, under normal circumstances the 117 engines emit the following over one year, including one startup and shutdown sequence, each:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
69.9	169.9	167.6	113.3	3.7	6,308,872	23,768	127.1	7,008,055

Table 10: Entire yearly emissions for the entire plant und normal circumstances.

[redacted]

Emergency Mode

In case when no gas is available, the engines can be operated in so called emergency mode and the power comes from diesel. In this mode a single engine consumes [redacted] and emits the following:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
10.35	1.29	0.58	0.29	0.11	17,896	0.00	0.67	18,073

Table 11: Controlled hourly emissions per engine in Emergency Mode

Compensation Mode

In case some engines should for any reason fail, the remaining engines will compensate for the loss of power, by increasing their power output. Here the worst case, of each engine ramping up to 100% load, is looked at. Under such conditions the engines consume 6,386 lb of natural gas per hour (138,112 ft³) and 27.8 lb/h of ULSD (3.91 gal/h). The following emissions result from this kind of operation:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
0.46	0.20	1.41	0.27	0.01	17,605	57.73	0.59	19,378

Table 12: Controlled hourly emissions per engine in Compensation Mode

Worst case scenario

As shown earlier, under Normal Operation conditions the engines stay well below the 250 t/year limit for all the regulated emissions. But to ensure that the power plant can be operated under worst case conditions, the following, unrealistic but not impossible scenario was looked at:

The pipeline is out for 8 days (192 hours); hence the power plant is operated on diesel. In the same year an unforeseeable event takes down 31 engines (26% of the entire plant) and the remaining 86 engines will compensate for by delivering the full power, increasing their output to 99.4% load. This situation lasts 24 days (567 hours). Additionally, the engines have to be started up and shut down 5 times, instead of once per year.

The engines are therefore for the following number of hours operated in the corresponding mode:

Speed up	
Fuel Switch	
Generator switched on	
Load up cold control	
Normal Operation	
Compensation Mode	
Ramp down	
Min load	
Spin out	
Emergency Mode	
Total operational time	

Table 13: Operational time in hours for each engine mode under worst case scenario

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Under this scenario and the consequent operational profiles, the entire plant will emit the following emissions per year:

	Gas [t/a]	Diesel [t/a]	NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SO2 [t/a]	CO2_e [t/a]
Speed up			2.13	0.01	0.06	0.46	0.00	77
Fuel Switch			0.05	0.01	0.08	0.12	0.00	25
Generator switched on			0.19	0.01	0.22	0.30	0.00	102
Load up cold control			0.33	0.02	0.34	0.43	0.00	244
Normal Operation			63.31	155.11	152.86	103.15	3.38	6397261
Compensation Mode			14.97	17.22	45.53	8.84	0.33	626484
Ramp down			0.01	0.03	0.08	0.01	0.00	732
Min load			0.06	0.01	0.11	0.09	0.00	102
Spin out			0.01	0.00	0.03	0.04	0.00	12
Emergency Mode			113.24	14.11	6.31	3.15	6.22	197796
Total			**194**	**187**	**206**	**117**	**10**	**7,222,837**

Table 14: Total yearly emissions of the entire power plant under worst case scenario

Hazardous emissions

The hazardous emissions are calculated based on the distribution described in EPA AP-42, Table 3.2-1, 3.2-3 and 3.2-4.
The emissions are calculated as a percentage of the VOC (NMHC) emissions.

NMHC	Benzene	Toluene	Xylenes	Formaldehyde	Acrolein	Acetaldehyde	Naphthalene
0.2	0.000776	0.000281	0.000193	0.0000789	0.00000788	0.0000225	0.00013
100%	**0.388%**	**0.141%**	**0.097%**	**0.039%**	**0.004%**	**0.011%**	**0.065%**

Table 15: Hazardous emission according to EPA AP-42 in lb/MMBtu and as a percentage of the Non-Methane Hydrocarbons

With a reduction factor of 99% the Benzene emissions on an hourly basis per engine, and on a yearly basis for the entire plant are the following:

Benzene, 0.388% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.07564	0.00036
Fuel Switch						0.05070	0.00010
Generator switched						0.04844	0.00023
Load up cold control						0.03548	0.00034
Normal Operation						0.00088	0.40038
Compensation Mode						0.00106	0.03430
Ramp down						0.00058	0.00001
Min load						0.01453	0.00007
Spin out						0.05070	0.00005
Emergency Mode						0.00112	0.01221

Table 16: Calculation of the Benzene hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Benzene emissions of 896 pounds per year.

Toluene, 0.141% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.02739	0.00013
Fuel Switch						0.01836	0.00003
Generator switched						0.01754	0.00008
Load up cold control						0.01285	0.00012
Normal Operation						0.00032	0.14498
Compensation Mode						0.00038	0.01242
Ramp down						0.00021	0.00000
Min load						0.00526	0.00002
Spin out						0.01836	0.00002
Emergency Mode						0.00040	0.00442

Table 17: Calculation of the Toluene hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Toluene emissions of 325 pounds per year.

Xylenes, 0.097% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.01881	0.00009
Fuel Switch						0.01261	0.00002
Generator switched						0.01205	0.00006
Load up cold control						0.00882	0.00008
Normal Operation						0.00022	0.09958
Compensation Mode						0.00026	0.00853
Ramp down						0.00014	0.00000
Min load						0.00361	0.00002
Spin out						0.01261	0.00001
Emergency Mode						0.00028	0.00304

Table 18: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Xylenes emissions of 223 pounds per year.

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Formaldehyde, 0.039% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.00769	0.00004
Fuel Switch						0.00515	0.00001
Generator switched						0.00492	0.00002
Load up cold control						0.00361	0.00003
Normal Operation						0.00009	0.04071
Compensation Mode						0.00011	0.00349
Ramp down						0.00006	0.00000
Min load						0.00148	0.00001
Spin out						0.00515	0.00000
Emergency Mode						0.00011	0.00124

Table 19: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Formaldehyde emissions of 92 pounds per year.

Acrolein, 0.004% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.00077	0.000004
Fuel Switch						0.00051	0.000001
Generator switched						0.00049	0.000002
Load up cold control						0.00036	0.000003
Normal Operation						0.00001	0.004066
Compensation Mode						0.00001	0.000348
Ramp down						0.00001	0.000000
Min load						0.00015	0.000001
Spin out						0.00051	0.000000
Emergency Mode						0.00001	0.000124

Table 20: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acrolein emissions of 9 pounds per year.

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Acetaldehyde, 0.011% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.00219	0.000010
Fuel Switch						0.00147	0.000003
Generator switched						0.00140	0.000007
Load up cold control						0.00103	0.000010
Normal Operation						0.00003	0.011609
Compensation Mode						0.00003	0.000994
Ramp down						0.00002	0.000000
Min load						0.00042	0.000002
Spin out						0.00147	0.000001
Emergency Mode						0.00003	0.000354

Table 21: Calculation of the Acetaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acetaldehyde emissions below 26 pounds per year.

Naphthalene, 0.065% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up						0.01267	0.00006
Fuel Switch						0.00849	0.00002
Generator switched						0.00811	0.00004
Load up cold control						0.00594	0.00006
Normal Operation						0.00015	0.06707
Compensation Mode						0.00018	0.00575
Ramp down						0.00010	0.00000
Min load						0.00243	0.00001
Spin out						0.00849	0.00001
Emergency Mode						0.00019	0.00205

Table 22: Calculation of the Acetaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acetaldehyde emissions below 150 pounds per year.

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Liquid and fuel handling

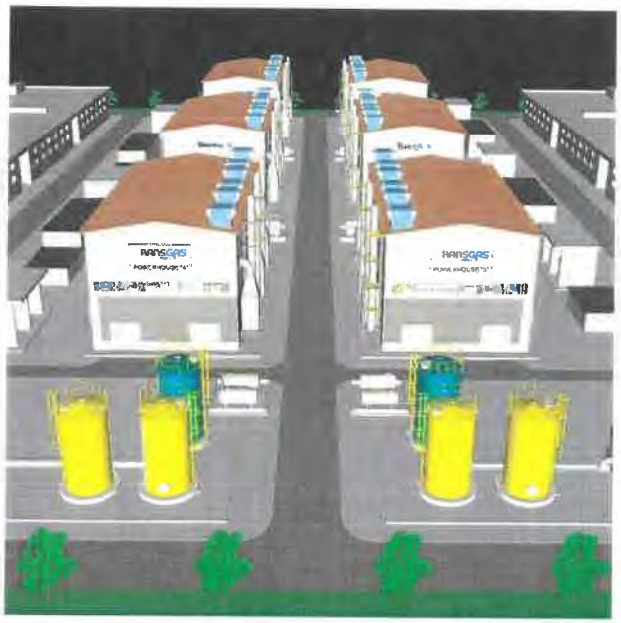

Figure 4: Liquid Storage in front of a set of power houses:
Yellow: Diesel tanks,
Greenish: Water tanks
White: Oil and component tanks

On-site Water Storage

For fire protection and supplementary cooling, the facility maintains an on-site water storage capacity of 2,641,721 gallons, distributed over the entire plant in 14 tanks with 26 feet in diameter and 44 feet in height.

Ultra Low Sulfur Diesel

The engines consume [redacted] which will be transported on site. To ensure fire safety and to protect the valuable hardware within the data center, the volume of flammable liquids stored on-site will be minimized. For emergency preparedness, a three-day supply of 25,000 tons will be maintained in multiple smaller storage tanks. The rest will be in strategic locations nearby.

The diesel will be stored in 40 tanks distributed across the entire plant, 26 feet in diameter and 44 feet in height.

Lubrication Oil

The engines consume about 2,025 tons of lubrication oil per year (1563 gal/day), which will be shipped on site. Additionally, about 20 tons will be stored on site, in tanks of 160 gallon in each power house.

Natural Gas

The gaseous fuel will be transported by pipeline.

Emission Control Components

For the emission abatement system liquids are transported to the site. A 3-day storage will be kept on site.

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Component	Consumption		Storage
-	[t/a]	[gal/h]	[t]
NH_3 (aq)			
NaOH			
NaHS (reducing agent)			
NaClO2 (oxidizing agent)			
H_2SO_4			

Table 23: List of chemicals yearly used, and amount stored on site

The Storage will be in the corresponding standard tanks for these liquids, horizontally arranged tanks of 16 feet length and 7 feet diameter.

Chemicals in Use

- Hydrous Ammonia
- Caustic Soda NaOH
- Sulfuric Acid H2SO4
- NaClO2 (oxidizing agent)
- NaHS (reducing agent)

ANNEX

The 117 engines will be arranged according to the plan on Figure 5. It shows the map of the site, with 7 pods. Every pod holds two large buildings on the outer side, housing the data centers and 6 power houses in the middle (magenta/pink). A powerhouse holds three engine-generator setups (genset), auxiliaries and parts of the emission control systems. This gives theoretically space for 7 x 6 x 3 = 126 gensets. The remaining three buildings will be used for logistical and storage purposes though (spare parts, fluid preparation etc.)

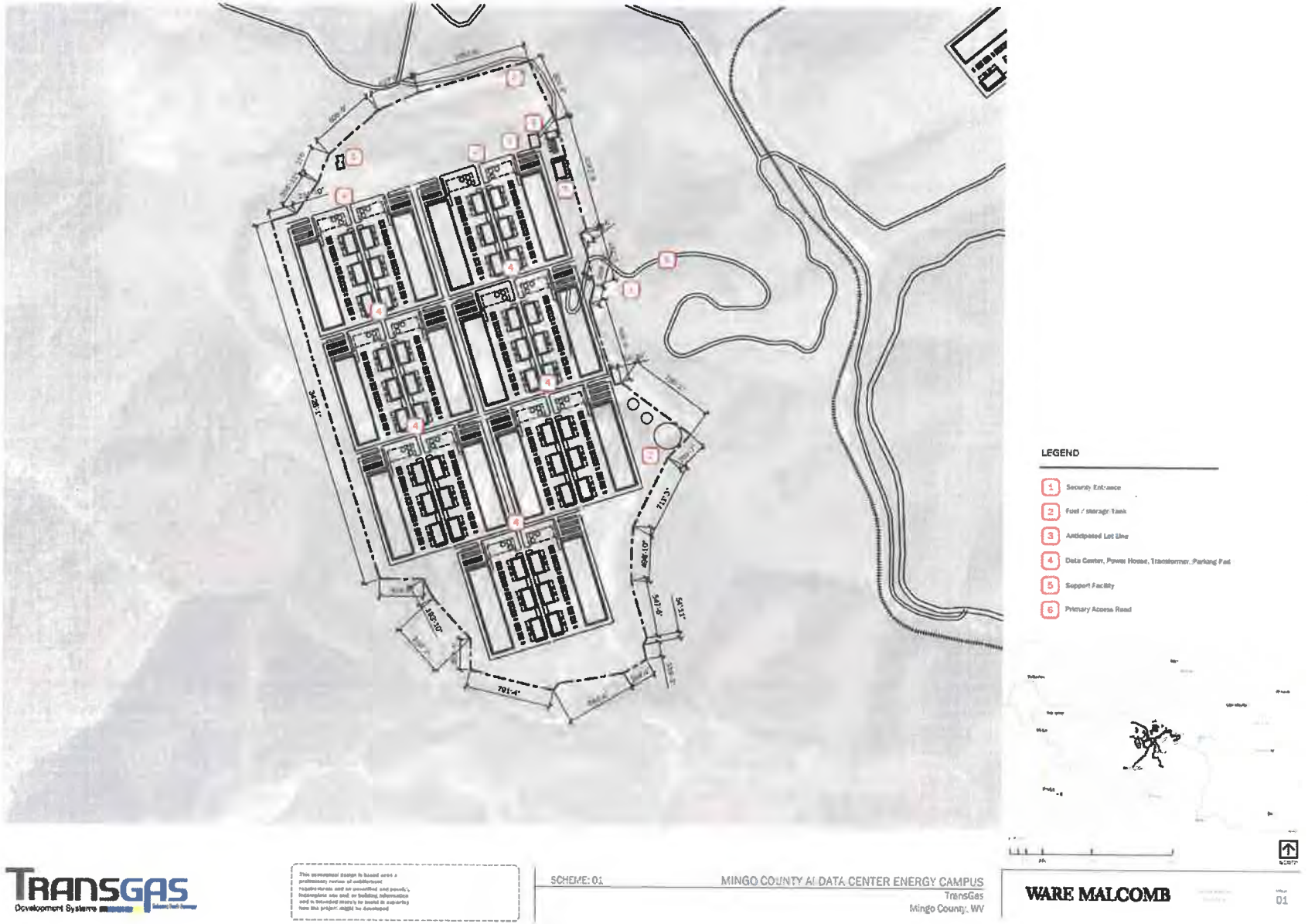

Figure 5: Site plan showing the 7 pods

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Fuel Storage - Site Wide	2. Tank Name 40
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) T1 through T40 (118S - 157S)	4. Emission Point Identification No. (as assigned on *Equipment List Form*)
5. Date of Commencement of Construction (for existing tanks) 2026	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Not Applicable	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). Not Applicable	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): None	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 170,000 gallons	
9A. Tank Internal Diameter (ft) 26	9B. Tank Internal Height (or Length) (ft) 44
10A. Maximum Liquid Height (ft) 43 ft.	10B. Average Liquid Height (ft) NA
11A. Maximum Vapor Space Height (ft) 1 ft.	11B. Average Vapor Space Height (ft) NA
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 170,000 gallons	

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13A. Maximum annual throughput (gal/yr)	13B. Maximum daily throughput (gal/day)
[redacted] yr total for all tanks (Normal Operation)	[redacted] /day total all tanks

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
Average of 4 turnover/tank per year

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof X dome roof
___ other (describe)
☐ External Floating Roof ___ pontoon roof ___ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ___ vertical column support ___ self-supporting
☐ Variable Vapor Space ___ lifter roof ___ diaphragm
☐ Pressurized ___ spherical ___ cylindrical
☐ Underground
☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: Tank construction not selected yet. See TANKS Summary Sheet attached.
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☐ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): to

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one)
☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:

ACCESS HATCH

BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

AUTOMATIC GAUGE FLOAT WELL

BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:

COLUMN WELL

BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:

LADDER WELL

PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:

GAUGE-HATCH/SAMPLE PORT

SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:

ROOF LEG OR HANGER WELL

WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)

VACUUM BREAKER

WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

RIM VENT

WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:

DECK DRAIN (3-INCH DIAMETER)

OPEN:	90% CLOSED:

STUB DRAIN

1-INCH DIAMETER:

OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. See TANKS Summary Sheet
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid: See TANKS Summary Sheet	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.

39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☒ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
See TANKS Summary Sheet					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☐ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tanks 1-40
City:	Charleston
State:	West Virginia
Company:	Transgas
Type of Tank:	Vertical Fixed Roof Tank
Description:	Diesel Tanks

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Tank Dimensions

Shell Height (ft):	
Diameter (ft):	
Liquid Height (ft) :	
Avg. Liquid Height (ft):	
Volume (gallons):	
Turnovers:	
Net Throughput(gal/yr):	
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	26.00

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	56.67	51.31	62.04	55.00	0.0058	0.0048	0.0070	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

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Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

Annual Emission Calculations	
Standing Losses (lb):	25.2731
Vapor Space Volume (cu ft):	12,211.8942
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0417
Vented Vapor Saturation Factor:	0.9929
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	12,211.8942
Tank Diameter (ft):	26.0000
Vapor Space Outage (ft):	23.0010
Tank Shell Height (ft):	44.0000
Average Liquid Height (ft):	21.5000
Roof Outage (ft):	0.5010
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5010
Dome Radius (ft):	26.0000
Shell Radius (ft):	13.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Daily Avg. Liquid Surface Temp. (deg. R):	518.3441
Daily Average Ambient Temp. (deg. F):	54.9833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	514.6733
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,250.5726
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0417
Daily Vapor Temperature Range (deg. R):	21.4587
Daily Vapor Pressure Range (psia):	0.0022
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0070
Daily Avg. Liquid Surface Temp. (deg R):	518.3441
Daily Min. Liquid Surface Temp. (deg R):	510.9799
Daily Max. Liquid Surface Temp. (deg R):	521.7082
Daily Ambient Temp. Range (deg. R):	21.5333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9929
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	0.0058
Vapor Space Outage (ft):	23.0010
Working Losses (lb):	12.2809
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	[redacted]
Annual Net Throughput (gal/yr.):	
Annual Turnovers:	
Turnover Factor:	
Maximum Liquid Volume (gal):	
Maximum Liquid Height (ft):	
Tank Diameter (ft):	
Working Loss Product Factor:	
Total Losses (lb):	37.5540

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	12.28	25.27	37.55

ATTACHMENT M

AIR POLLUTION CONTROL DEVICE(S)

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March 24, 2025

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table): 1C – 117C

Equipment Information

1. Manufacturer: [redacted] Model No. NA	2. Control Device Name: Control System Type: Various
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: 100%	
8. Attached efficiency curve and/or other efficiency information. See Attached	
9. Design inlet volume: See Attached SCFM	10. Capacity: See Attached
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any. This emission abatement system is multi-phase and [redacted]. The system controls VOC (VOC HAPs), NOx, PM, CO, and SO_x emissions. A description of the system and each stage is provided on the attachment to this form.	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment. See Attached	
13. Description of method of handling the collected material(s) for reuse of disposal. Spent catalyst and other discardable materials are removed from the site.	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	☒ No
Are particulates present?	☒ Yes	☐ No
Are metals present?	☒ Yes	☐ No

15. Inlet Emission stream parameters:	Maximum	Typical
Pressure (mmHg):		
Heat Content (BTU/scf):	See Attached	
Oxygen Content (%):		
Moisture Content (%):		
Relative Humidity (%):		

16. Type of pollutant(s) controlled: ☒ SO_x ☐ Odor
☒ Particulate (type): Combustion Byproducts ☒ Other NO_x, VOC (VOC HAPs), CO

17. Inlet gas velocity: See Attached ft/sec	18. Pollutant specific gravity: NA
19. Gas flow into the collector: See Attached ACF @ °F and PSIA	20. Gas stream temperature: See Attached Inlet: °F Outlet: °F
21. Gas flow rate: See Attached Design Maximum: ACFM Average Expected: ACFM	22. Particulate Grain Loading in grains/scf: See Attached Inlet: Outlet:

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant		Emission Capture Efficiency %	OUT Pollutant		Control Efficiency %
	lb/hr	grains/acf		lb/hr	grains/acf	
A	See attached document for a description of each control stage.					
B						
C						
D						
E						

24. Dimensions of stack: Height ft. Diameter ft.

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.

Particulate Distribution

26. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	Weight % for Size Range	Weight % for Size Range
0 – 2		
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12	See Attached	
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

See Attached

28. Describe the collection material disposal system:

Spent or collected material is shipped offsite for disposal or regeneration/reuse.

29. Have you included ***Other Collectores Control Device*** in the Emissions Points Data Summary Sheet?

30. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING: Amount of emissions control fluids utilized.	RECORDKEEPING: Amount of emissions control fluids utilized.
REPORTING: None	TESTING: As requested by the permit.

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

31. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

See Attached

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

See Attached

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

The controls are designed to operate within the operational ranges of the engines.

PROCESS DESCRIPTION for

POLLUTION CONTROL for

NATURAL GAS ENGINE EMISSIONS

Abatement system Package

Prepared for

Transgas – Adams Fork project
February 10, 2025
Rev. 03

[redacted]

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March 24, 2025

[redacted]

1. Introduction

Below is a description of the basic concept on which the proposed system is based, together with some preliminary evaluations about the foreseen chemicals consumption.

The overall process scheme is presented in the **attachment 1 – OVERALL PROCESS SCHEME** and detailed below.

The configuration and equipment sizing has been studied for the maximum flow rate – corresponding to 100% load of the engine with iCER, [redacted] kW of mechanical power at shaft when engine runs in compensation mode, and the maximum load of pollutants.

The system described below will be installed individually for each engine.

Attachment 2 rev 02– EMISSION ABATEMENT STEPS shows the pollutant flow at each stage (A to D), as indicated in the overall process scheme, with the target of reaching the maximum total emission level of:

- NOx < 250 tpy (short)
- CO < 250 tpy (short)
- SOx < 250 tpy (short)
- PM < 250 tpy (short)

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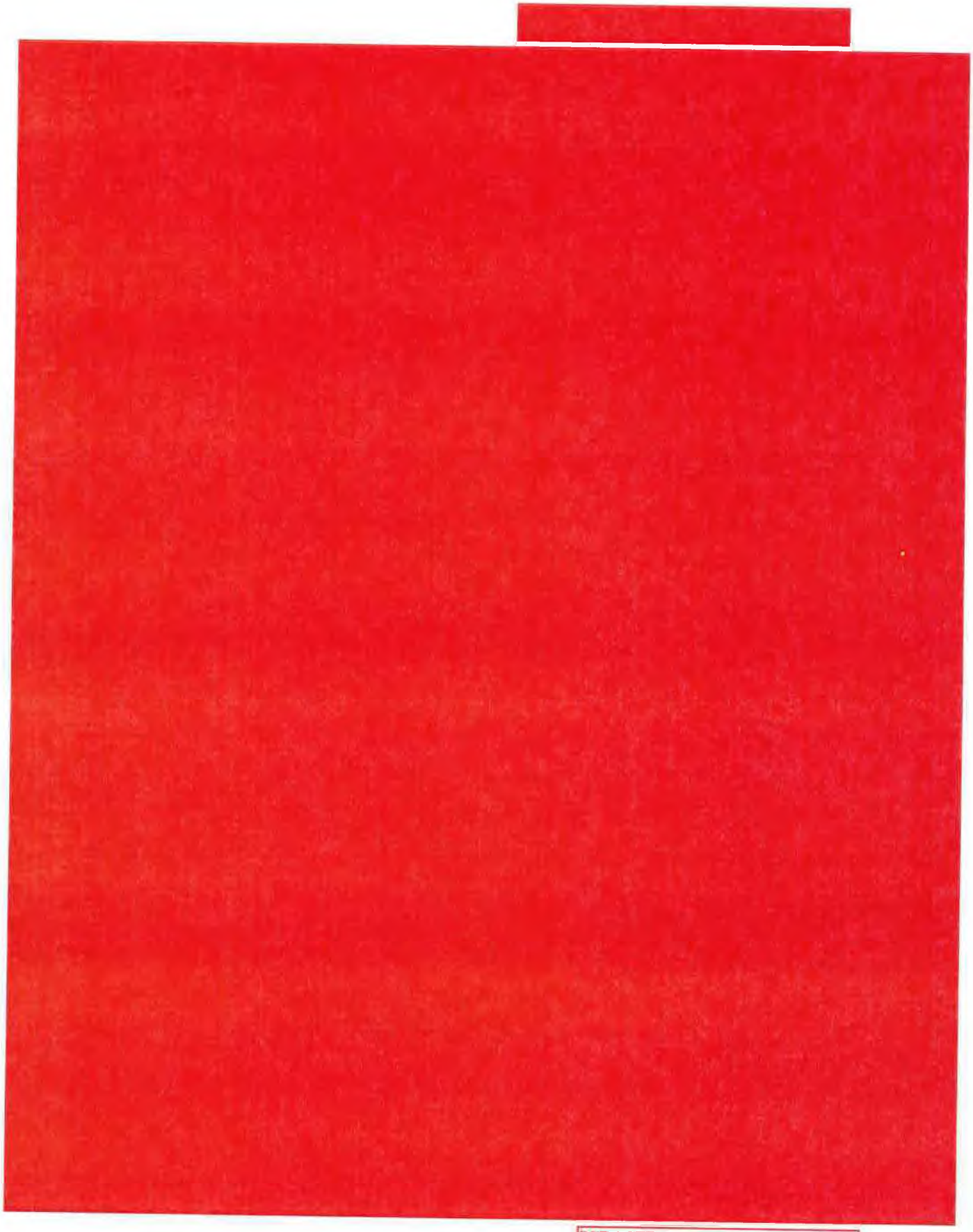
March 24, 2025

for a total of 114 engines operating at the same time and continuously at maximum load.

[redacted]



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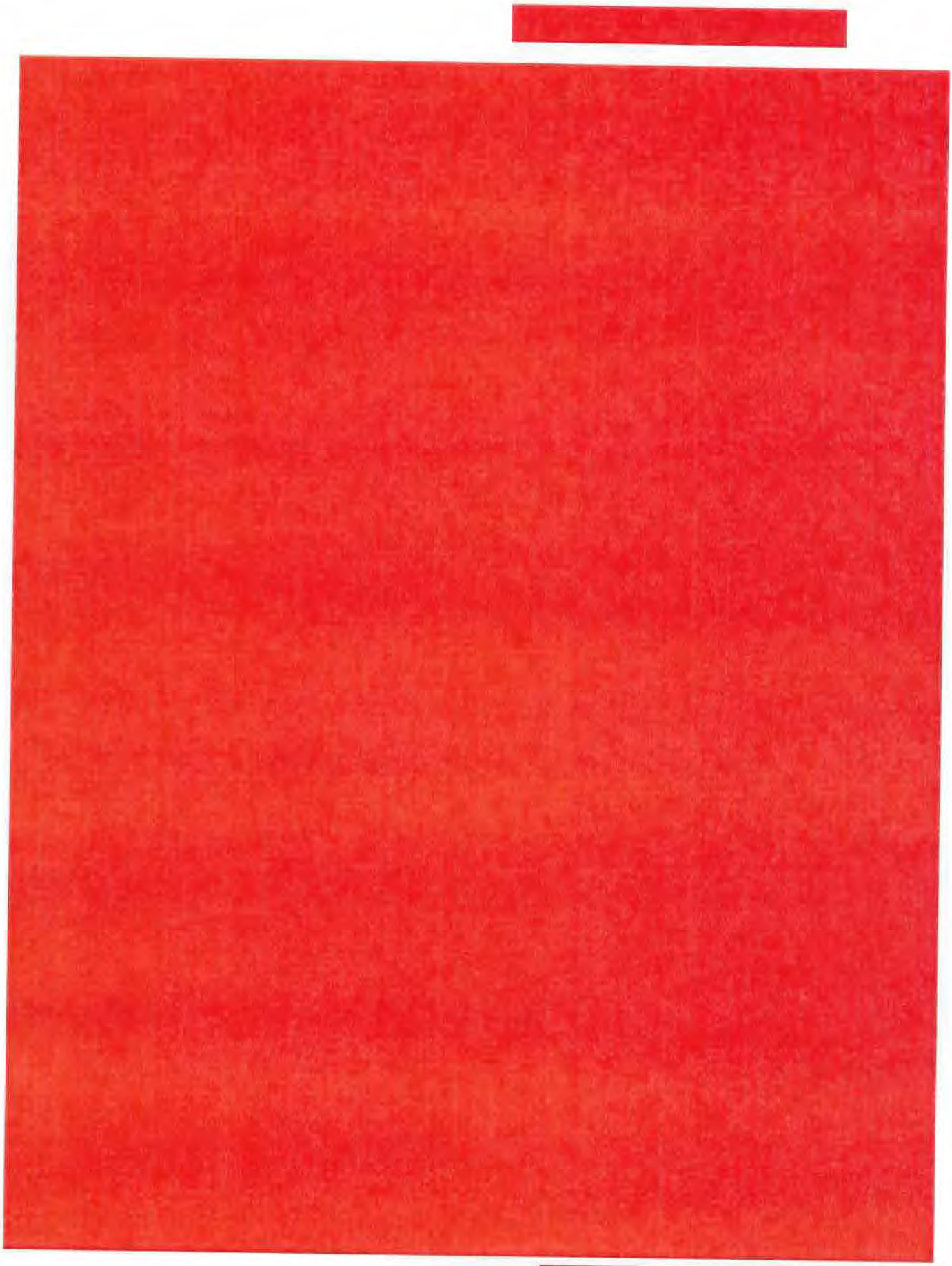

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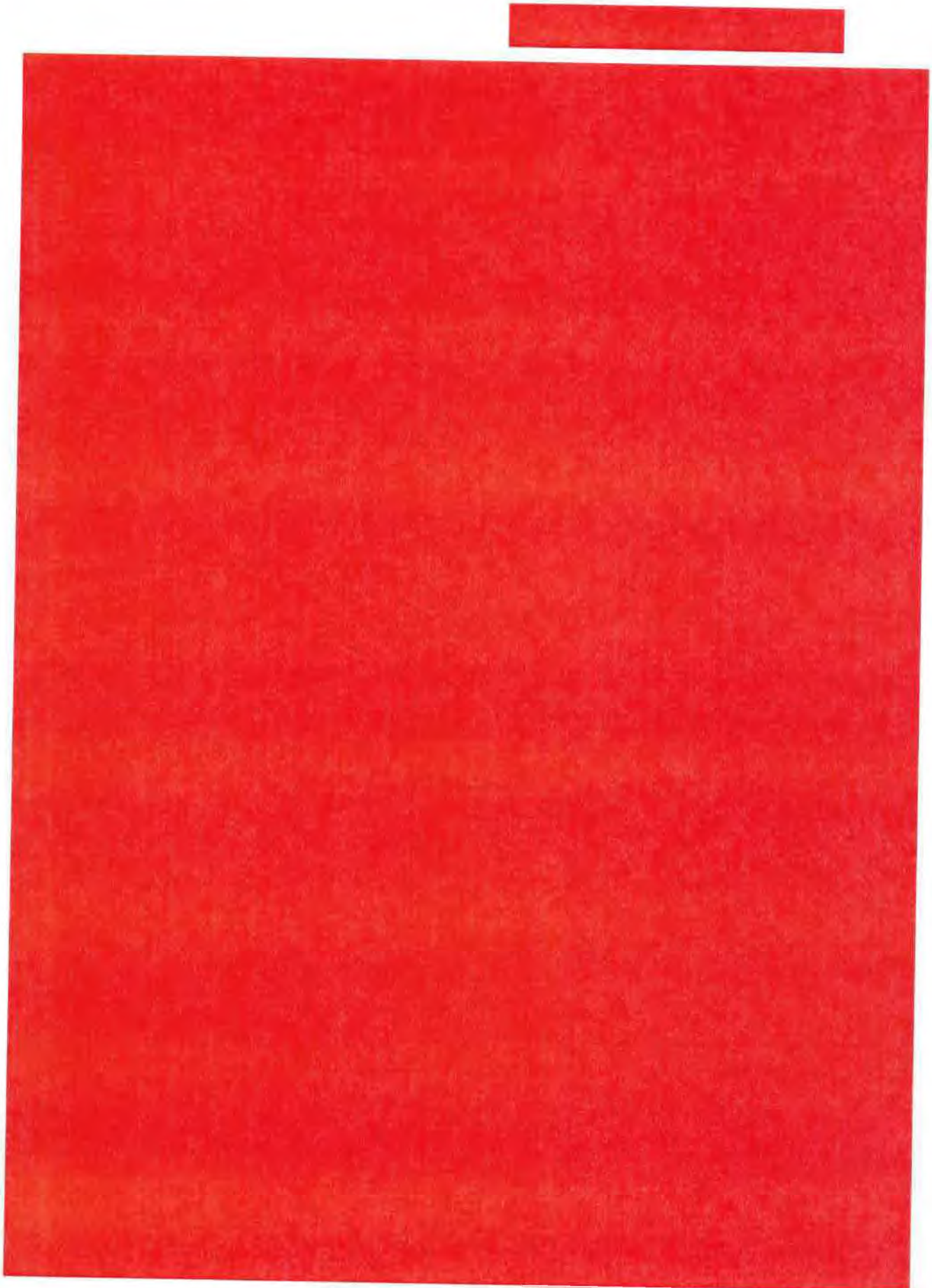

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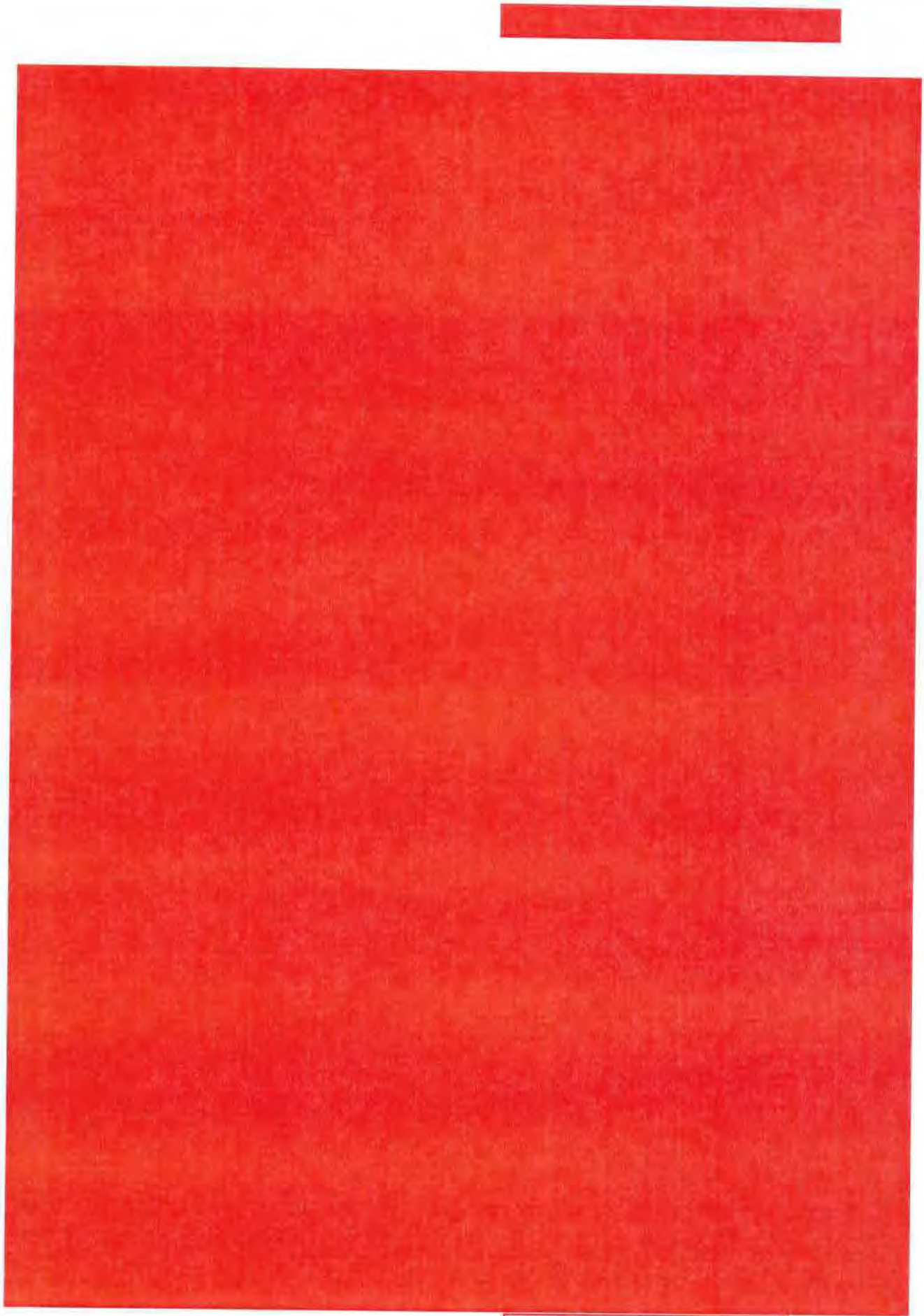

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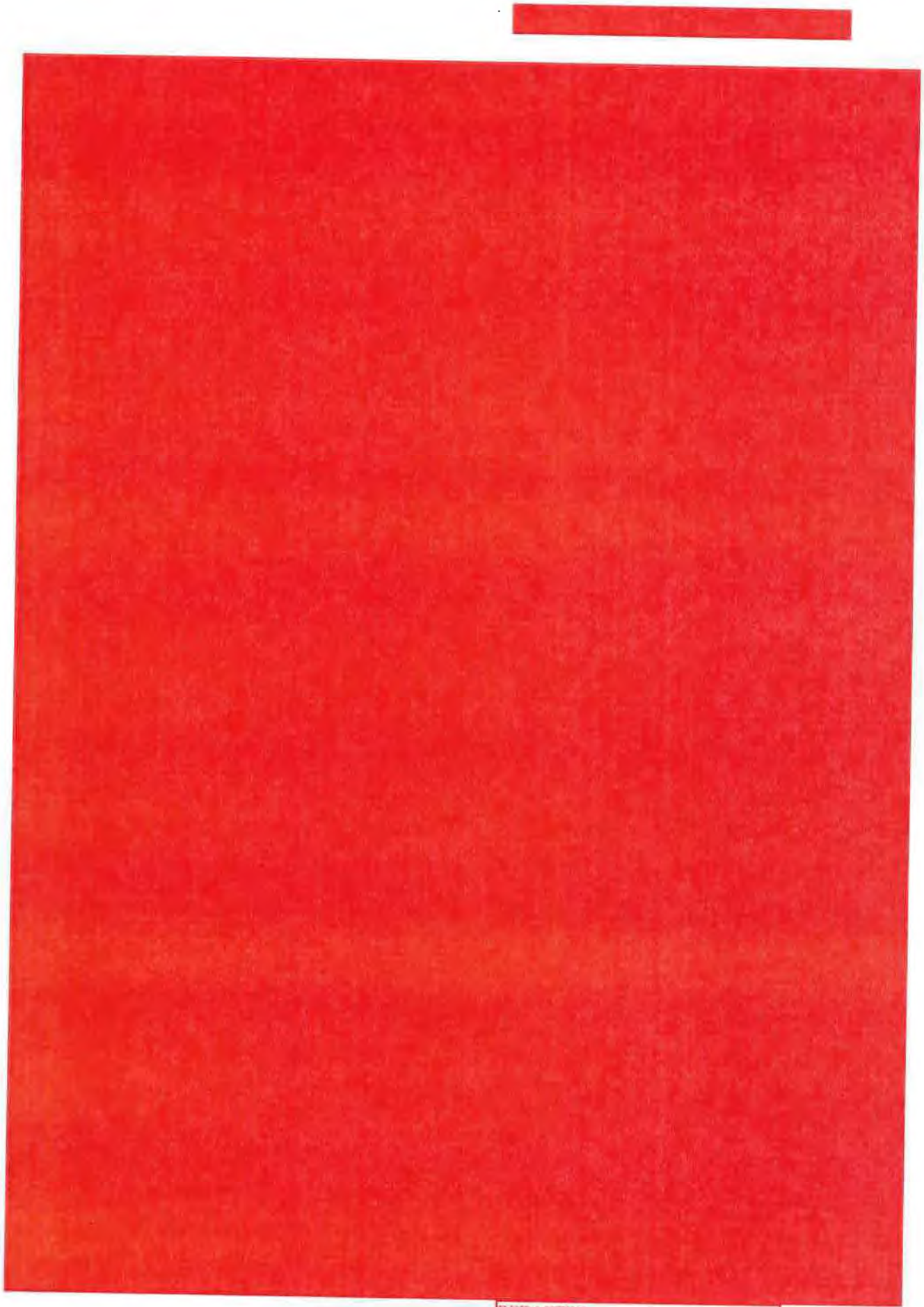

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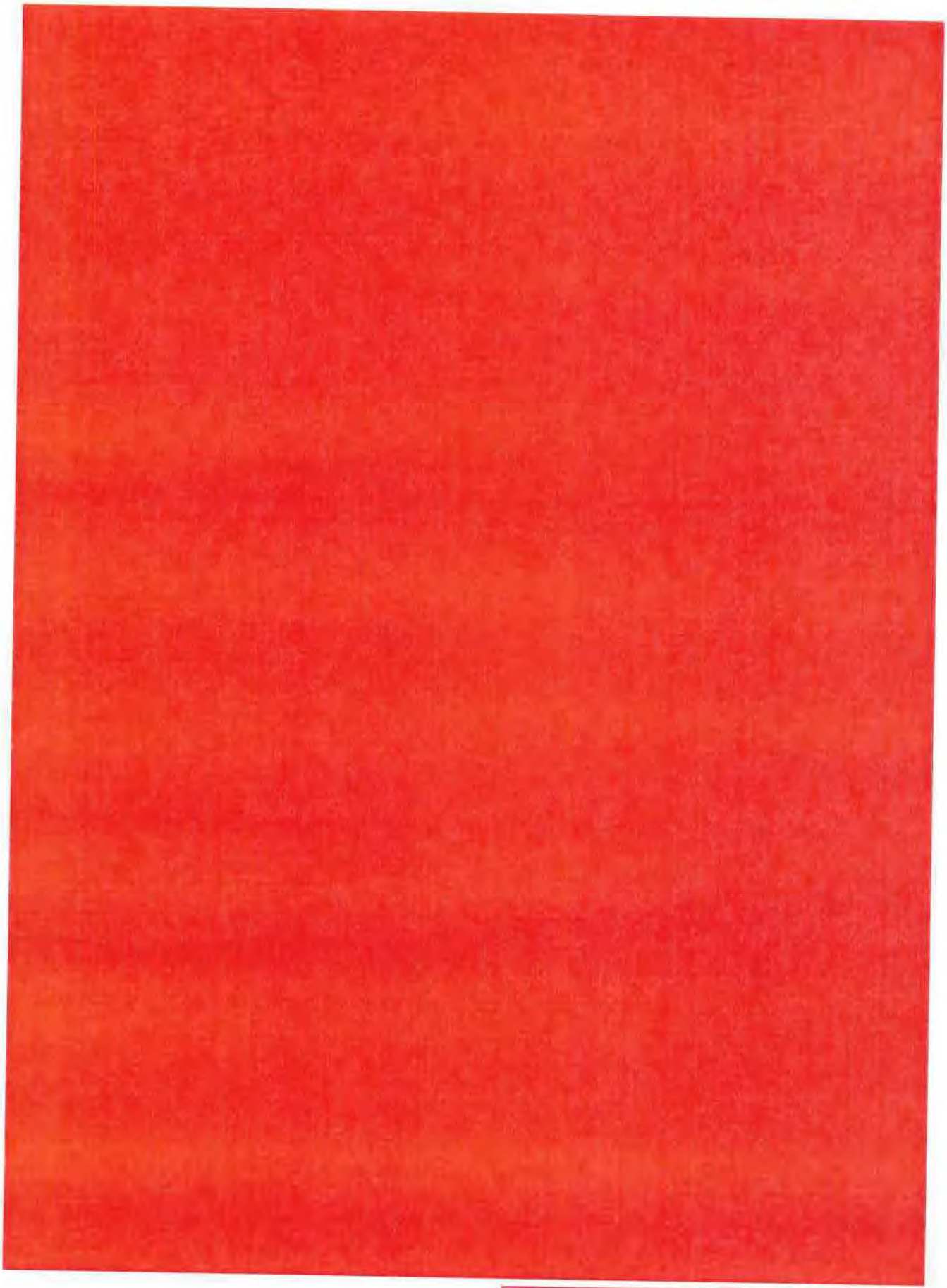

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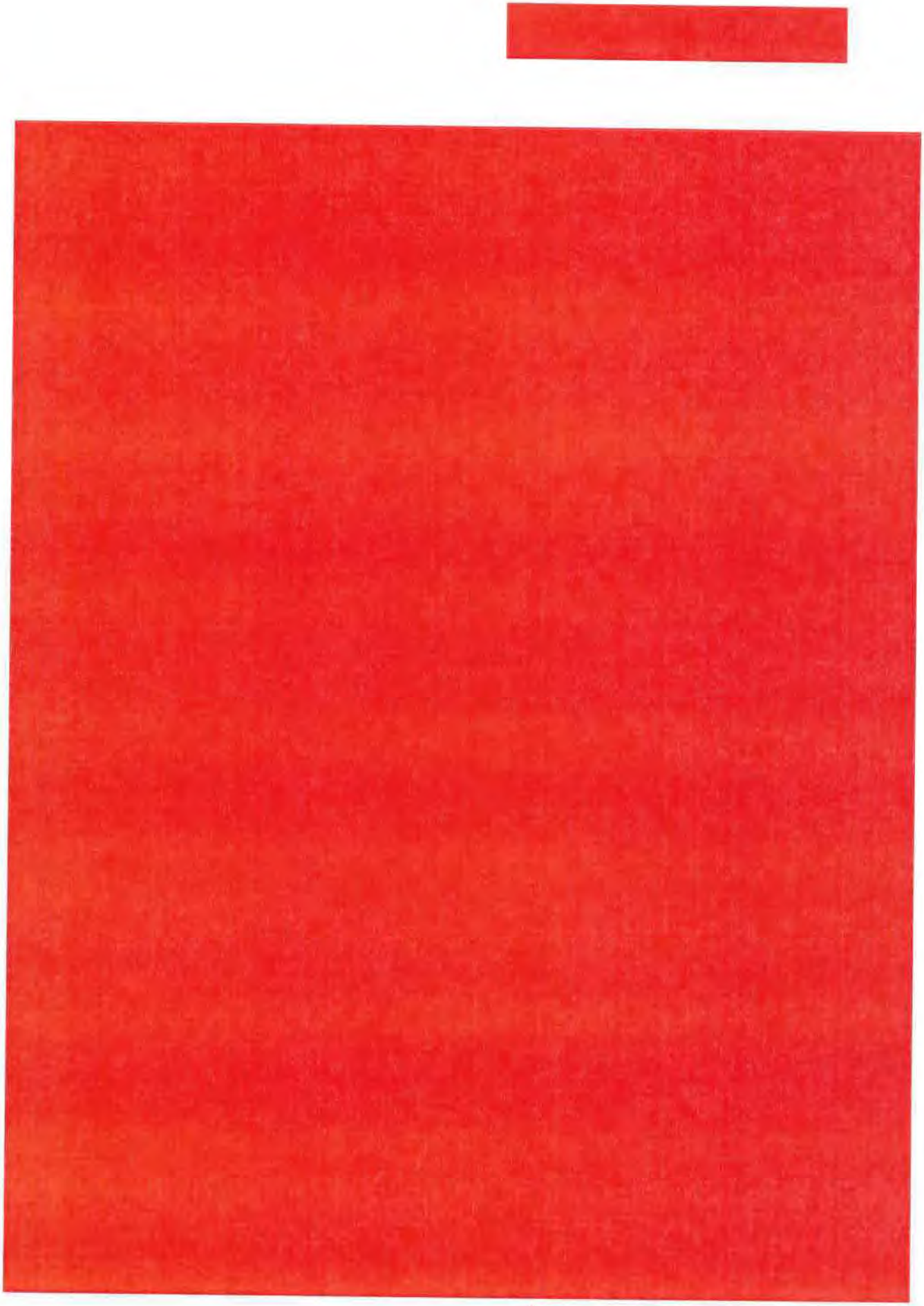

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M13 of M18

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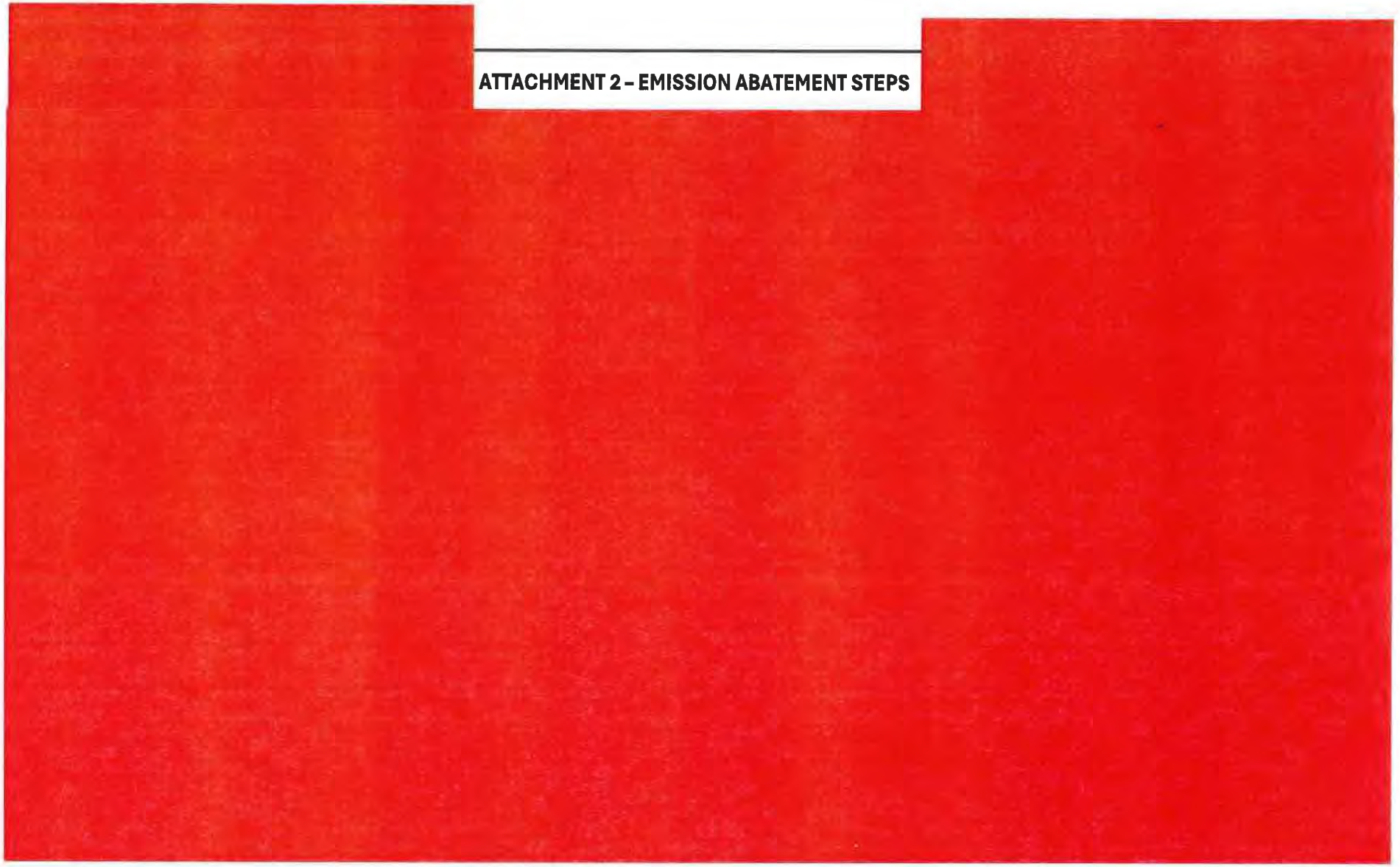
ATTACHMENT 2 – EMISSION ABATEMENT STEPS



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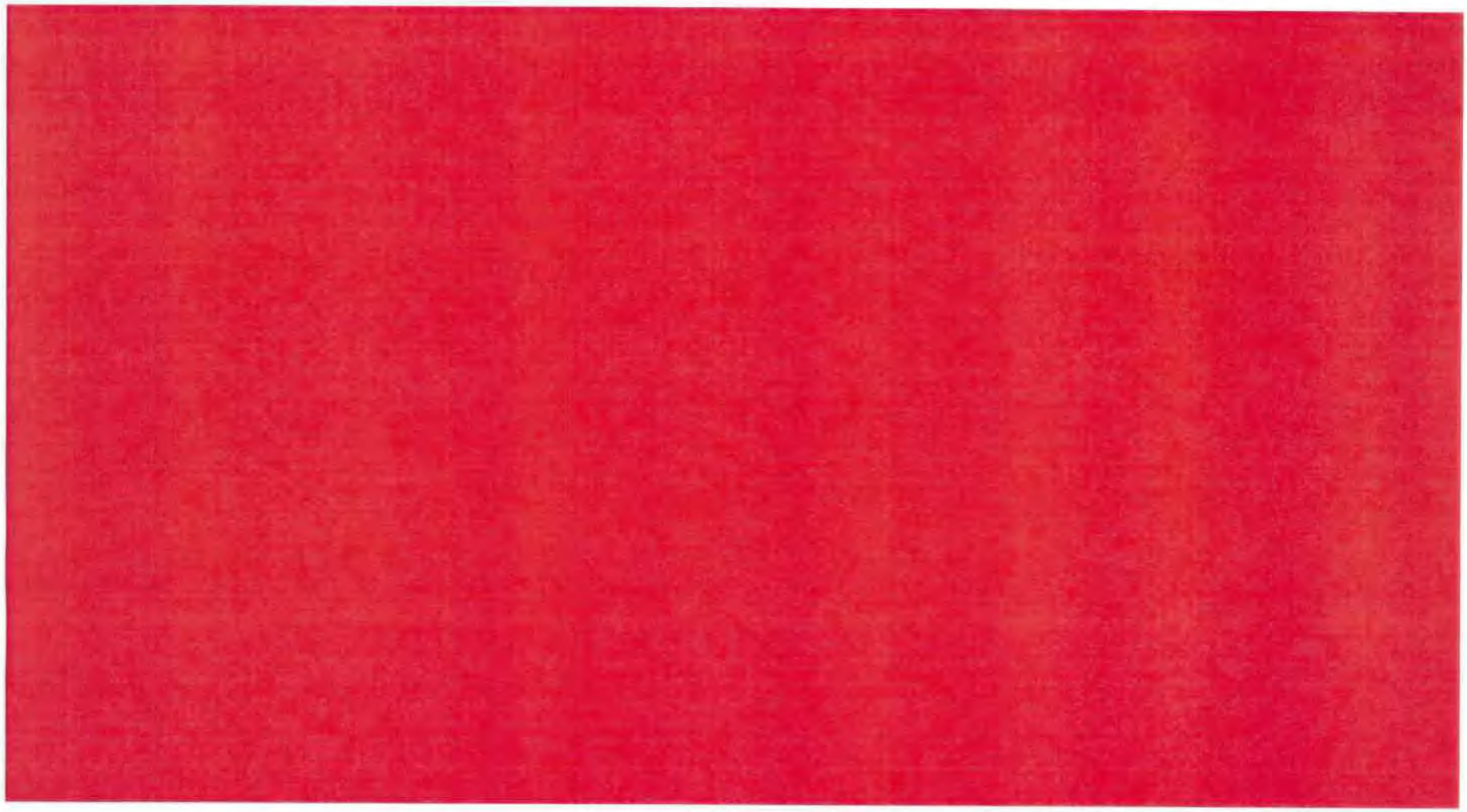

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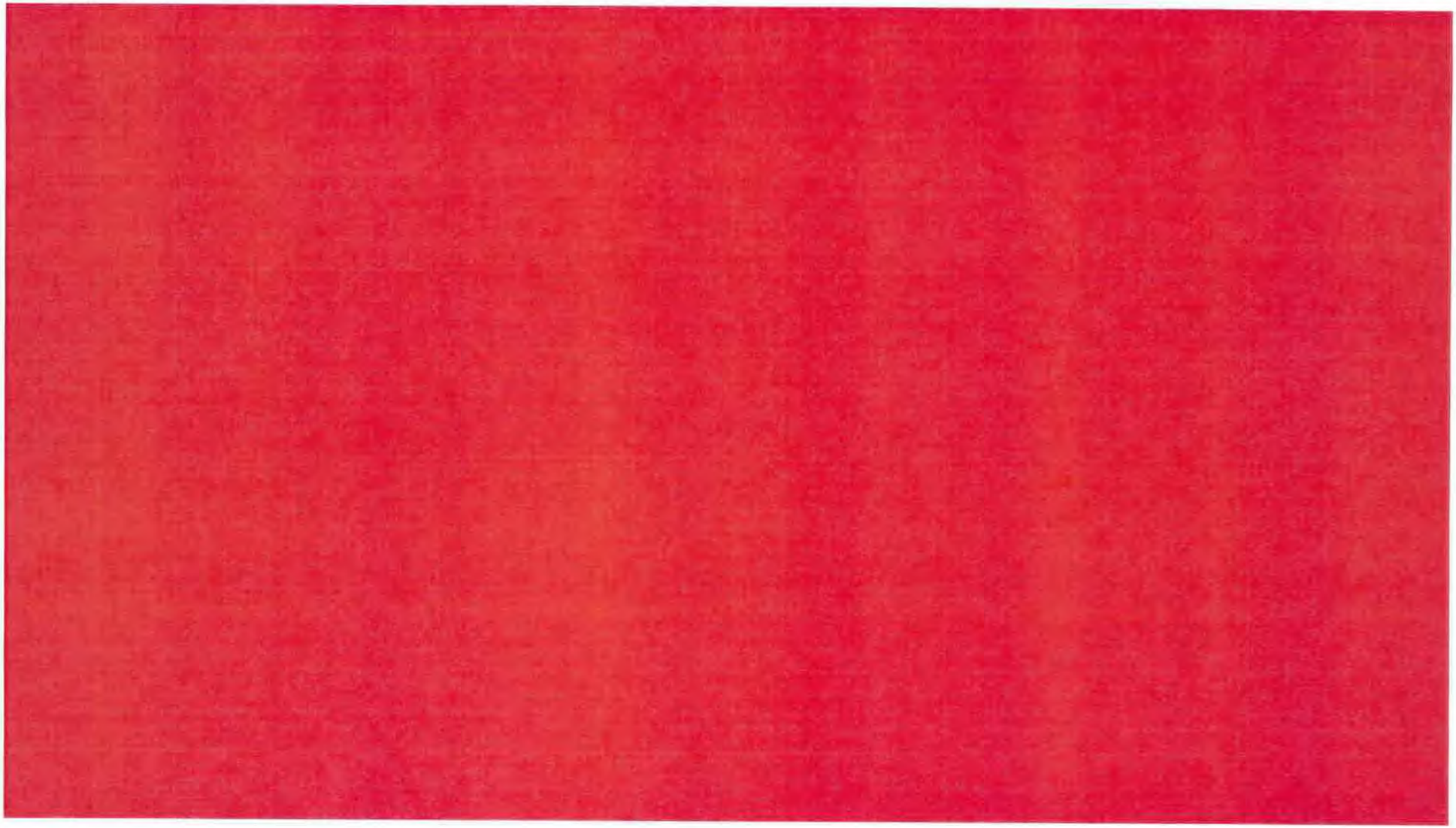

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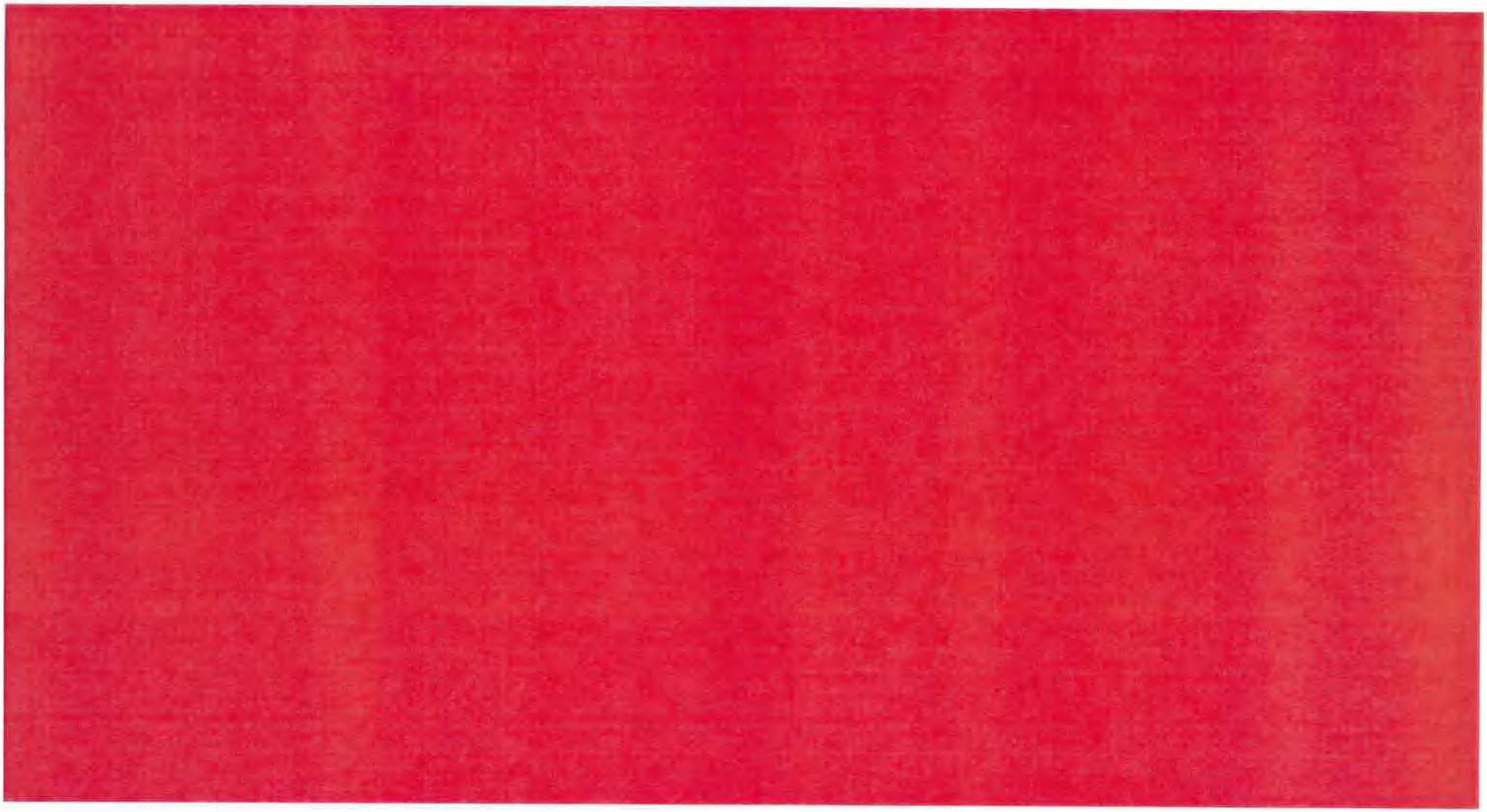

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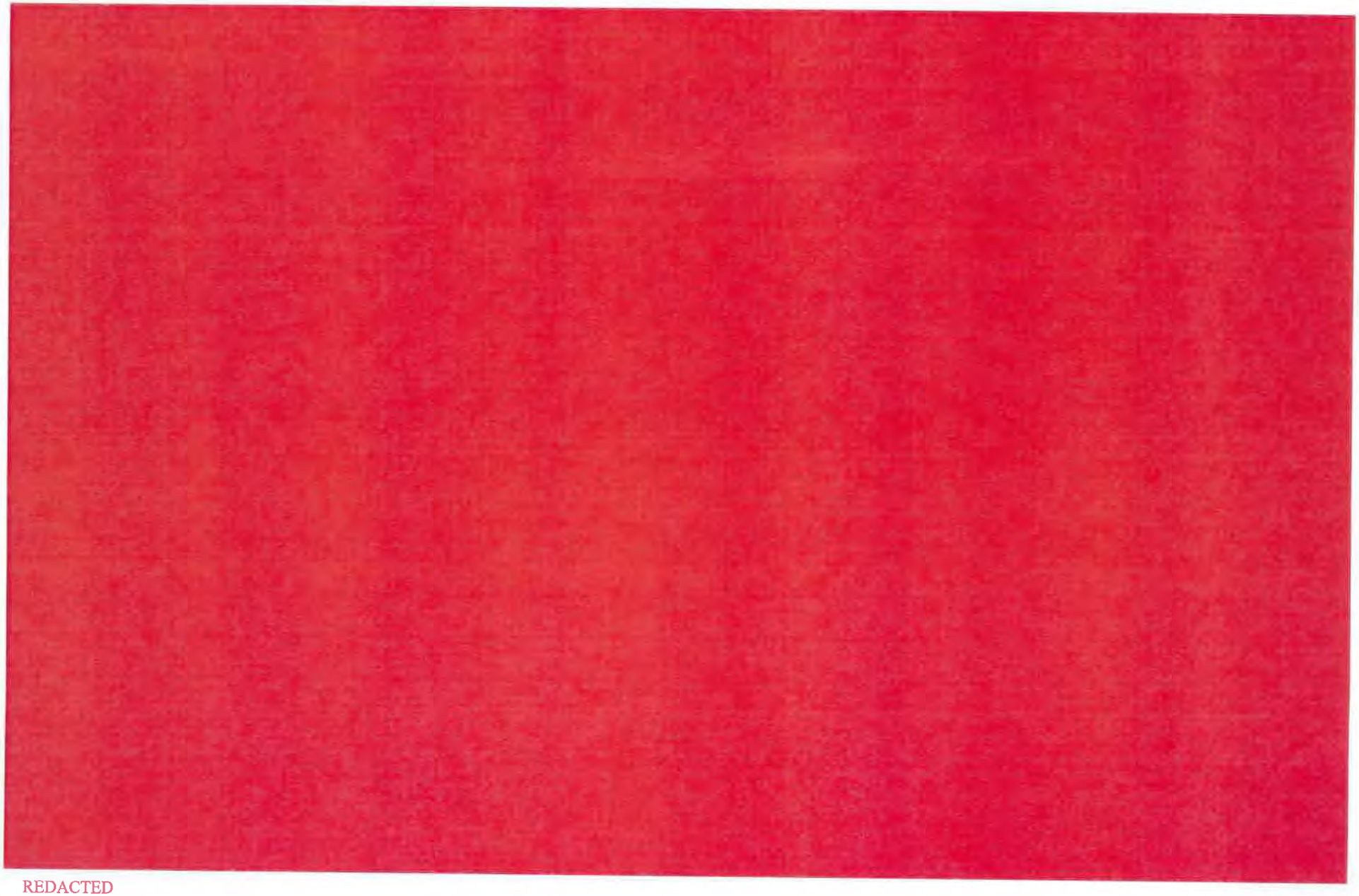

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ATTACHMENT N

SUPPORTING EMISSIONS CALCULATIONS

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By: PEW
Date: 3/20/2025

Checked By: KBK
Date: 03/21/2025

Facility Total

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	[redacted]	215.17
PM10	[redacted]	192.26
PM2.5	[redacted]	188.03
SO2	[redacted]	9.93
NOx	[redacted]	194.30
CO	[redacted]	205.62
VOC	[redacted]	117.66
Total HAPS	[redacted]	0.87

Engines (Worst Case)

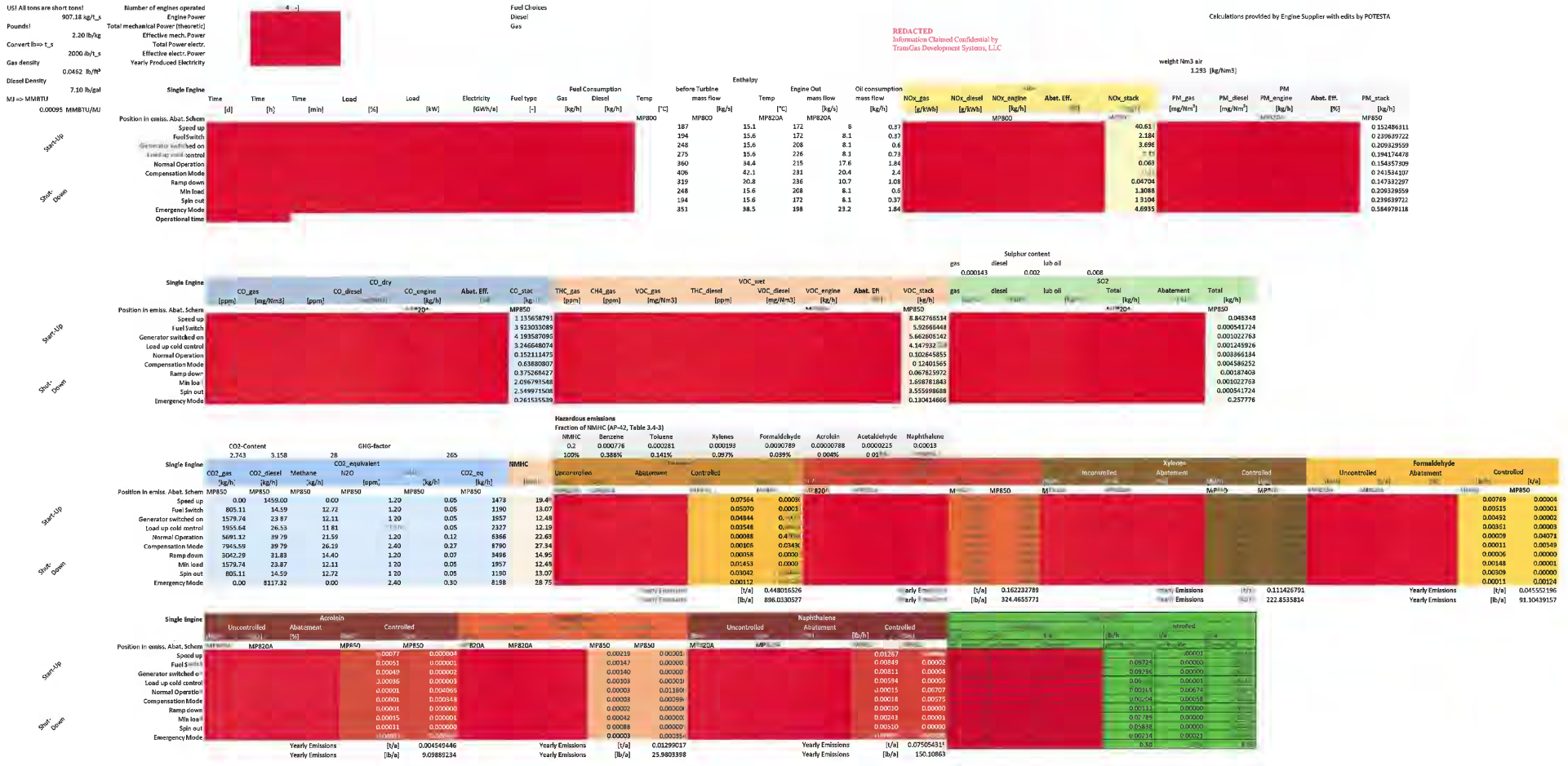
Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	[redacted]	186.53
PM10	[redacted]	186.53
PM2.5	[redacted]	186.53
SO2	[redacted]	9.93
NOx	[redacted]	194.30
CO	[redacted]	205.62
VOC	[redacted]	116.59
Total HAPS	[redacted]	0.86

Tanks

Emission Type	Uncontrolled	Controlled
	tpy	tpy
VOC	0.75	0.75

Haulroads and Fugitive Leaks

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	28.64	28.64
PM10	5.73	5.73
PM2.5	1.50	1.50
VOC	0.31	0.31
Total HAPS	0.0053	0.0053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Calculations provided by Engine Supplier with edits by POTESTA
Fuel Choices
Diesel
Gas
Number of engines operated
Engine Power
Total mechanical Power (theoretic)
Effective mech. Power
Total Power electr.
Effective electr. Power
Yearly Produced Electricity
Pounds!
Convert lb=> t_s
Gas density
Diesel Density
MJ => MMBTU
Single Engine
Start-Up
Shut-Down
Position in emiss. Abat. Schem
Speed up
Fuel Switch
Generator switched on
Load up cold control
Normal Operation
Compensation Mode
Ramp down
Min load
Spin out
Emergency Mode
Operational time
Enthalpy
Fuel Consumption
Oil consumption
Sulphur content
CO_dry
VOC_wet
SO2
Hazardous emissions
Fraction of NMHC (AP-42, Table 3.4-3)
CO2-Content
GHG-factor
CO2_equivalent
NMHC
Uncontrolled
Abatement
Controlled
Acrolein
Naphthalene
Formaldehyde
Xylenes
Yearly Emissions

Worst case

Entire Plant, worst case
Startups per year: 5 [-]

	Gas [t/a]	Diesel [t/a]	NOx [t/a]	PM [t/a]		VOC [t/a]	SO2 [t/a]	CO2_e [t/a]
Speed up				0.01	0.06	0.46	0.00	
Fuel Switch			0.05	0.01	0.08	0.12	0.00	
Generator switched on			0.19	0.01	0.22	0.30	0.00	
Load up cold control			0.33	0.02	0.34	0.43	0.00	244
Normal Operation			83.31	155.11	152.86	103.15	3.38	6397261
Compensation Mode			14.97	17.22	45.53	8.84	0.38	626484
Ramp down			0.01	0.03	0.08	0.01	0.00	732
Min load			0.06	0.01	0.11	0.09	0.00	102
Spin out			0.01	0.00	0.03	0.04	0.00	12
Emergency Mode			113.24	14.11	6.31	3.15	6.22	197796
Total			194	**187**				**7,222,837**

Entire Plant, worst case UNCONTROLLED
Startups per year: 5 [-]

			VOC	CO2_e
				[t/a]

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Raw Emissions [pounds/hour]

Hourly base
Single Engine raw emissions

	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM	SO2	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]	Heat input [MMBtu/hr]
Speed up													
Fuel Changeover													
Generator switched on													
Load up cold control													
												CO2	
												lb/h	
Normal Operation													
Compensation Mode									CO2	Methane	N2O	CO2	
									lb/h	lb/h	lb/h		
Ramp down													
Min load													
Spin out													
								VOC					
								lb/h		lb/h			
Emergency Mode													

Emission Control [%]

	NOx [%]			CO2 [%]	Methane [%]	N2O
Speed up						
Fuel Changeover						
Generator switched on						
Load up cold control						
					Methane	N2O
					[%]	
Normal Operation						
Compensation Mode						
					Methane	N2O
					[%]	[%]
Ramp down						
Min load						
Spin out						
					Methane	
					[%]	
Emergency Mode						

Controlled Emissions [pounds/hour]

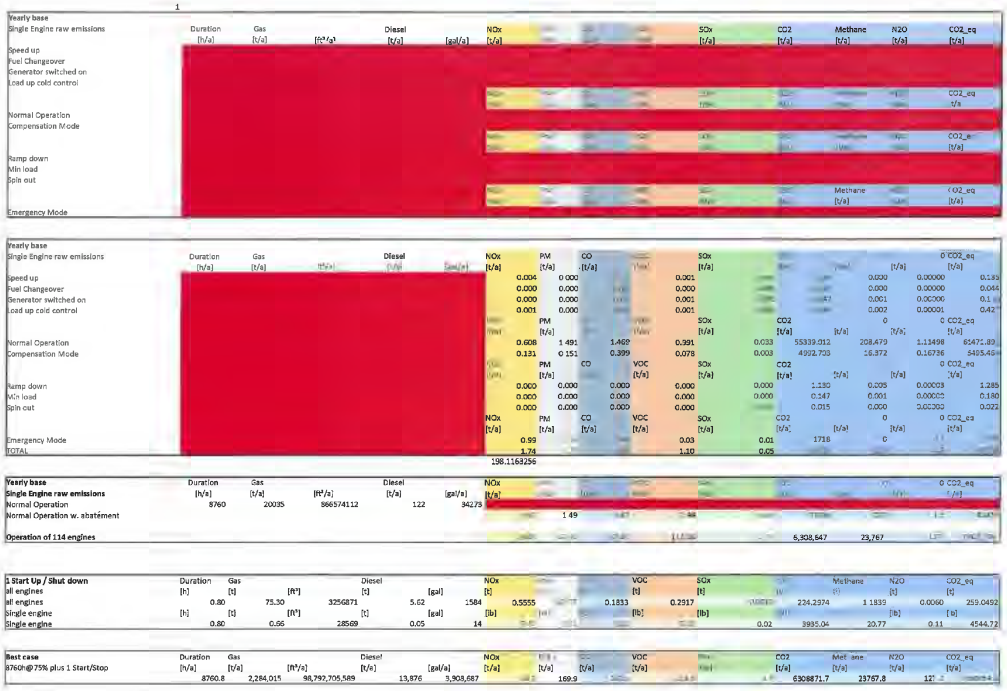
Hourly base
Single Engine controlled emissions

	Load	Gas [lb/h	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	SO2 [lb/h]	[lb/h]	Methane [lb/h]	[lb/h]	[lb/h]
Speed up						89.54	0.34	19.49	0.10	9,217	0.00	0.12	3,247
Fuel Changeover						4.81	0.53		0.00	1,807	28.03	0.12	2,605
Generator switched on						8.15	0.46		0.00	3,535	26.70	0.12	4,314
Load up cold control						6.94	0.43		0.00	4,570	26.03	0.12	5,130
						NOx [lb/h]	PM [lb/h]				Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Normal Operation						0.14	0.34			12,634	47.60	0.25	14,035
Compensation Mode						0.46	0.53		0.01	17,605	57.73	0.59	19,378
						NOx [lb/h]	PM [lb/h]		SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	0.00146993
Ramp down						0.10	0.32					0.15	7,707
Min load						2.44	0.46					0.12	4,314
Spin out						2.89	0.53					0.12	3,623
							PM [lb/h]		SO2 [lb/h]		Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Emergency Mode							1.29			17,896	0.00	0.67	

Raw Emissions
[tons / year]

Start / Stop
controlled

Best case



Yearly base													
Single Engine raw emissions	Duration [h/a]	Gas [t/a]		Diesel [t/a]	[gal/a]	NOx [t/a]			SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
Speed up													
Fuel Changeover													
Generator switched on													
Load up cold control													
													CO2_eq
													t/a
Normal Operation													
Compensation Mode													
													CO2_e
													[t/a]
Ramp down													
Min load													
Spin out													
											Methane		CO2_eq
											[t/a]		[t/a]
Emergency Mode													

Yearly base													
Single Engine raw emissions	Duration [h/a]	Gas [t/a]		Diesel		NOx [t/a]	PM [t/a]	CO [t/a]		SOx [t/a]			0 CO2_eq [t/a]
Speed up						0.004	0 000		0.001		0.000	0.00000	0.133
Fuel Changeover						0.000	0.000		0.000		0.000	0.00000	0.044
Generator switched on						0.000	0.000		0.001		0.001	0.00000	0.1
Load up cold control						0.001	0.000		0.001		0.002	0.00001	0.42
							PM			SOx	CO2	0	0 CO2_eq
							[t/a]			[t/a]	[t/a]	[t/a]	[t/a]
Normal Operation						0.608	1 491	1.469	0.391	0.033	55339.012	208.479	1.11498
Compensation Mode						0.131	0 151	0.399	0.078	0.003	4992.703	16.372	0.16736
							PM	CO	VOC	SOx	CO2		0 CO2_eq
							[t/a]		[t/a]	[t/a]	[t/a]	[t/a]	[t/a]
Ramp down						0.000	0.000	0.000	0.000	0.000	1.130	0.005	0.00003
Min load						0.000	0.000	0.000	0.000	0.000	0.147	0.001	0.00003
Spin out						0.000	0.000	0.000	0.000		0.015	0.000	0.00002
						NOx	PM	CO	VOC	SOx	CO2	0	0 CO2_eq
Emergency Mode						[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]
TOTAL						0.99	1.74		0.03	0.01	1716	0	
						198.1163256			1.10	0.65			

Yearly base	Duration	Gas		Diesel		NOx							0 CO2_eq
Single Engine raw emissions	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]							[t/a]
Normal Operation	8760	20035	866574112	122	34275								
Normal Operation w. abatement							1 49						
Operation of 114 engines										5,308,647	23,767		

1 Start Up / Shut down	Duration	Gas		Diesel		NOx		VOC	SOx		Methane	N2O	CO2_eq
all engines	[h]	[t]	[ft³]	[t]	[gal]	[t]		[t]	[t]			[t]	[t]
all engines	0.80	75.30	3256871	5.62	1584	0.5555		0.1833	0.2917		224.2374	1 1839	0.0060
Single engine	[h]	[t]	[ft³]	[t]	[gal]	[lb]		[lb]	[lb]		[lb]	[lb]	[lb]
Single engine	0.80	0.66	28569	0.05	14					0.02	3935.04	20.77	0.11

Best case	Duration	Gas		Diesel		NOx		VOC		CO2	Methane	N2O	CO2_eq
8760h@75% plus 1 Start/Stop	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]		[t/a]	[t/a]	[t/a]	[t/a]
	8760.8	2,284.015	98,792,705,589	13,876	3,903,687		169.9			630871.7	23767.8	12	

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TransGas Development Systems, LLC

TranGas Development, LLC
Power Campus

Potesta & Associates, Inc.
Project No. 0101-22-0132-003A

By: PEW
Date: 3/20/2025

Checked By: KBK
Date: 03/21/2025

Tanks

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TransGas Development Systems, LLC

Tank	I.D.	Volume	Turnovers	Yearly Throughput	Fixed Roof Losses		VOC Emissions				
					Working	Breathing	Uncontrolled			Controlled	
		(gal)	(No.)	(gal/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/hr)(1)	(tpy)	(lbs/hr)(1)	(tpy)
Diesel Tank	TK1-40	170,000	4	[redacted]	12.28	25.27	37.55	0.18	0.02	0.18	0.02
Total Emissions (40 tanks)					491.2	1,010.80	1,502.00	7.34	0.75	7.34	0.75
							Total VOC =	7.34	0.75	7.34	0.75

Notes:
1. Emissions based on breathing losses divided by 8,760 hours per year and working losses divided by total throughput multiplied by one truck delivery to the tanks of 10,000 gallons.
2. Number of USLD tanks at the site = 40

Natural Gas (Vapor Sources)

Source Type	Number of Sources	Emission Factor(1) (kg/hr/source)	TOC Emissions (lb/hr)	TOC Emissions (ton/yr)	Uncontrolled VOC Emissions (lb/hr)	Uncontrolled VOC Emissions (ton/yr)	Control Efficiency (%)	Controlled VOC Emissions (lb/hr)	Controlled VOC Emissions (ton/yr)
Valves	176	0.000131	0.050829	0.222632	0.0003	0.0013	0	0.0003	0.0013
Pressure Relief Valves	120	0.0447	11.825474	51.795578	0.0698	0.3056	0	0.0698	0.3056
Connectors (Flanges)	917	0.0000810	0.163751	0.717230	0.0010	0.0042	0	0.0010	0.0042
Compressor Seals	0	0.0894	0.000000	0.000000	0.0000	0.0000	0	0.0000	0.0000
Light Liquid Pumps	0	0.00187	0.000000	0.000000	0.0000	0.0000	0	0.0000	0.0000
Sample Connections (2)	1	0.0150	0.033069	0.144842	0.0002	0.0009	0	0.0002	0.0009
				Total VOC =	0.0712	0.3120		0.0712	0.3120

	Uncontrolled Hexane Emissions (lb/hr)	Uncontrolled Hexane Emissions (ton/yr)	Control Efficiency (%)	Controlled Hexane Emissions (lb/hr)	Controlled Hexane Emissions (ton/yr)
	0.000005	0.000022	0	0.000005	0.000022
	0.001183	0.005180	0	0.001183	0.005180
	0.000016	0.000072	0	0.000016	0.000072
	0.000000	0.000000	0	0.000000	0.000000
	0.000000	0.000000	0	0.000000	0.000000
	0.000003	0.000014	0	0.000003	0.000014
Total	0.001	0.0053		0.001	0.0053

Sample Natural Gas Composition							
Gas Composition Key		BTU	S.G.	Non-VOC	Non-VOC	Non-VOC	Non-VOC
				Carbon Dioxide	Nitrogen	Methane	Ethane
Gas Sample - TransCanada		1082.2	0.6100	0.2000	0.4400	90.3300	8.4400
						Total Non-VOC =	99.4100

Sample Natural Gas Composition							
Gas Composition Key	VOC	VOC	VOC	VOC	VOC	VOC	VOC/HAP
	Propane	N Butane	Iso Butane	Pentane	Iso Pentane	Neo Pentane	Hexane
Gas Sample - TransCanada	0.5200	0.0300	0.0200	0.0001	0.0100	0.0000	0.0100
Max value	0.5200	0.0300	0.0200	0.0001	0.0100	0.0000	0.0100
						Total VOC =	0.5901
						Total HAP =	0.0100

1. AP42, Chapter 5, Protocol for Equipment Leak Emission Estimates, Table 2-1 and 2-5.
2. Sight Glass lb/kg = 2.2046

By: PEW
Date: 3/20/2025

Checked By: KBK
Date: 03/21/2025

Vehicle Activity (VA)

Paved Roadway: Trucks delivering fluids, fuel, and miscellaneous deliveries and removal of materials (estimated).

Emission Factor Equation from AP-42 Section 13.2.1, Paved Roads (January 2011):
E = [k * (sL/2)^0.91 * (W)^1.02] * (1 - 1.2P/4N) = lb / Vehicle Mile Traveled (VMT)

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	PM	PM10	PM2.5	
k =	0.011	0.0022	0.00054	dimensionless, particle size multiplier
sL =	9.7	9.7	9.7	surface material silt content (g/m^2)
W =	26.8	26.8	26.8	tons, mean vehicle weight
P =	157	157	157	no. days/year with 0.01 in of rain
e =	1.15	0.23	0.06	lb/VMT

Rounding to 2

Pollutant	No. of Vehicles Per Hour	No. of Vehicles Per Year	Miles Per Trip (1) (mi)	Control Device Type	Control Device Effic(%)	Emissions Uncontrolled (lb/hr)	Emissions Uncontrolled (tpy)	Emissions Controlled (lb/hr)	Emissions Controlled (tpy)
PM			5.00	N	0	11.50	28.64	11.50	28.64
PM10			5.00	N	0	2.30	5.73	2.30	5.73
PM2.5			5.00	N	0	0.60	1.50	0.60	1.50

Tankers/Trucks

Product	Empty Weight lbs	Loaded Weight lbs	Gallons Per Load	Average Weight tons	Gallons Per Hour	Gallons Per Year	Trucks Per Hour	Trucks Per Year
Delivery of Fluids							1	
Miscellaneous Trucking							1	
						Total =	2	

1. Trip Distance - Bens Creek Road to Back of Property (miles one direction) = 2.5
2. Miscellaneous trucking is for deliveries and shipping of materials other than the fluid identified below. Trucking volume is assumed at one truck per hour and 4,380 trucks per year. Truck weighs are assumed to be the same mean weight as liquid trucking.

Estimated Delivery of Fluids			
Material	gal/hr	gal/day	gal/yr
ULSD			
Lubricant Oil			
NH3(aq)			
NaOH			
NaHS			
NaClO2			
H2SO4			
Total			

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TransGas Development Systems, LLC

N8 of N8

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, TESTING PLANS

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, AND TESTING PLANS

TransGas Development Systems, LLC will work with the Division of Air Quality to identify and address Monitoring, Recordkeeping, Reporting, and Testing Plans. Requirements that are identified in the permit will be implemented.

ATTACHMENT P

PUBLIC NOTICE

ATTACHMENT P

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that TransGas Development Systems, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for the Adams Fork Data Center Energy Campus located on Twisted Gun Road near Wharncliffe in Mingo County, West Virginia. The latitude and longitude coordinates are: 37.593717 and -81.954906.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: NO_x of 194.30 tons per year (tpy), SO2 of 9.93 tpy, CO of 205.62, tpy, VOC of 117.66 which includes fugitives of 0.31 tpy, PM of 215.17 tpy which includes fugitives of 28.64 tpy, PM10 of 192.26 which includes fugitives of 5.73 tpy, PM2.5 of 188.03 tpy which includes fugitives of 1.50 tpy, and total HAPS of 0.87 tpy.

Startup of operations is planned to begin on or about the 1st day of January 2027. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice. Written comments will also be received via email at DEPAirQualityPermitting@WV.gov.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, Extension 41281, during normal business hours.

Dated this the **(Insert Date)** day of March 2025.

By: TransGas Development Systems, LLC
Adam Victor
President
630 First Avenue, Suite 30C
New York, New York 10016-3799

ATTACHMENT Q

BUSINESS CONFIDENTIAL CLAIMS

Cover Document
Confidential Information

This sample form contains each of the required elements for the cover document required under 45CSR31. The person submitting this form may wish to attach an additional page(s) to provide adequate justification under the "Rationale" section of the form.

Company Name	TransGas Development Systems, LLC	Responsible Official		Adam Victor, President
Company Address	630 Fifth Avenue, Suite 308 New York, NY 10036-1799	Confidential Information Designee in State of WV	Name	Patrick Ward
			Title	Senior Engineer
			Address	7012 MacCorkle Ave, SE Charleston, WV 25304
Person/Title *Submitting* Confidential Information	Adam Victor			
	President		Phone	(304) 342-1400
			Fax	(304) 343-9031

Reason for Submittal of Confidential Information: Initial permitting

Identification of Confidential Information	Rationale for Confidential Claim	Confidential Treatment Time Period
All Marked Confidential Information.	Provide justification that the criteria set forth in § 45CSR31-4.1.a. - e. have been met. The information contained within the application is fully protected under non-disclosure and confidentiality agreements by all parties involved in the application process and design of the facility. See Page Q2 of Q2.	This information is to be maintained confidential. There is no timeframe for expiration of confidential treatment.

Responsible Official Signature:	
Responsible Official Title:	President
Date Signed:	3/24/25

NOTE: Must be signed and dated in **BLUE INK.**

Provide justification that the criteria set forth in § 45CSR31-4.1.a - e have been met.

4.1.a. The claim of confidentiality has not expired by its terms, nor been waived or withdrawn;

The confidentiality agreements do not have an expiration date due to the nature of the information contained in the application.

4.1.b. The person asserting the claim of confidentiality has satisfactorily shown that it has taken reasonable measures to protect the confidentiality of the information, and that it intends to continue to take such measures;

The information contained within the application is fully protected under non-disclosure and confidentiality agreements by all parities involved in the original development of the processes, the design of the facility, and the permit application process.

4.1.c. The information claimed confidential is not, and has not been, reasonably obtainable without the person's consent by other persons (other than governmental bodies) by use of legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding);

The information available herein is not available and is not to be made available to outside parties.

4.1.d. No statute specifically requires disclosure of the information; and

Applicant believes there are no statutes that require disclosure of the information.

4.1.e. Either--

4.1.e.1. The person has satisfactorily shown that disclosure of the information is likely to cause substantial harm to the business's competitive position; or

This is a unique facility with many parties involved in preparing and providing information on the systems. Release of this information could cause substantial harm to Applicant's competitive position in the market.

4.1.e.2. The information is voluntarily submitted information, and its disclosure would likely to impair the State's ability to obtain necessary information in the future.

The State should not disclose this information to anyone.

3. Revised Permit Application R13-3714

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : TransGas Development Systems, LLC
[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): New Facility
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): New Facility

- Type of NSR Application (check all that apply):
  - ☑ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Application:
  - ☐ Title V Initial
  - ☐ Title V Renewal
  - ☐ Administrative Amendment**
  - ☐ Minor Modification**
  - ☐ Significant Modification**
  - ☐ Off Permit Change

****If the box above is checked, include the Title V revision information as ATTACHMENT S to the combined NSR/Title V application.**

- Payment Type:
  - ☑ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)
    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE
    Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☑ Responsible Official/Authorized Representative
    - Name: Adam Victor
    - Email: adam@tgds.com
    - Phone Number: (917) 816-3700
  - ☑ Company Contact
    - Name: Adam Victor, Jr.
    - Email: avj@adamsforkenergy.com
    - Phone Number: (917) 816-3700
  - ☑ Consultant
    - Name: Patrick Ward
    - Email: PEWard@potesta.com
    - Phone Number: (304) 342-1400

REGULATION 13 PERMIT APPLICATION FOR THE CONSTRUCTION OF ADAMS FORK HARLESS DATA CENTER ENERGY CAMPUS MINGO COUNTY, WEST VIRGINIA

REDACTED VERSION

Prepared for:

TransGas Development Systems, LLC
630 First Avenue, Suite 30C
New York, New York 10016-3799

Prepared by:

Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
Email: potesta@potesta.com

Project No. 0101-22-0132-003B

March 24, 2025

POTESTA

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Attachments not applicable to this submission: Attachment R, Authority Forms and Attachment S, Title V Permit Revision Information.

SECTION I - III

APPLICATION FOR NSR PERMIT

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
TransGas Development Systems, LLC

2. Federal Employer ID No. ***(FEIN):***
20343110

3. Name of facility *(if different from above):*
Adams Fork Harless Data Center Energy Campus

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
630 First Avenue, Suite 30C
New York, New York 10016-3799

5B. Facility's present physical address:
22 Mine Road
Holden, WV 25670

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

➪ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

➪ If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: No

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☐ **YES** ☐ **NO**

➪ If **YES,** please explain: Applicant has an option on the site with the current owner.

➪ If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Off-grid Power Generation

10. North American Industry Classification System **(NAICS)** code for the facility:
221112

11A. DAQ Plant ID No. (for existing facilities only):
New Facility

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
New Facility

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- ➪ For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- ➪ For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

The facility will be located on the property at the Harless Industrial Park near Holden, West Virginia. The site can be accessed from U.S. Route 119 going South from Holden. Turn left onto 22 Mine Road. The proposed location is adjacent to Mohawk Industries.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Not Applicable	Holden	Mingo
12.E. UTM Northing (KM): 4,179.00211	12F. UTM Easting (KM): 401.42022	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
This application is for the construction of the facility.

14A. Provide the date of anticipated installation or change: 01/01/2026 ➪ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: 01/01/2027

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
24 Hours Per Day 7 Days Per Week Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**

➪ Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**

➪ Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

➪ For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify Engines 1 through 117.

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☒ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☒ Other Collectors, specify Control System

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☒ **YES** ☐ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below: Not Required

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ DATE: 3/24/25

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Adam Victor		35C. Title: President
35D. E-mail: adam@tgds.com	36E. Phone: (917) 816-3700	36F. FAX: Use Email
36A. Printed name of contact person (if different from above): Same as above		36B. Title:
36C. E-mail:	36D. Phone:	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ Attachment A: Business Certificate
- ☒ Attachment B: Map(s)
- ☒ Attachment C: Installation and Start Up Schedule
- ☒ Attachment D: Regulatory Discussion
- ☒ Attachment E: Plot Plan
- ☒ Attachment F: Detailed Process Flow Diagram(s)
- ☒ Attachment G: Process Description
- ☒ Attachment H: Material Safety Data Sheets (MSDS)
- ☒ Attachment I: Emission Units Table
- ☒ Attachment J: Emission Points Data Summary Sheet
- ☒ Attachment K: Fugitive Emissions Data Summary Sheet
- ☒ Attachment L: Emissions Unit Data Sheet(s)
- ☒ Attachment M: Air Pollution Control Device Sheet(s)
- ☒ Attachment N: Supporting Emissions Calculations
- ☒ Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans
- ☒ Attachment P: Public Notice
- ☒ Attachment Q: Business Confidential Claims
- ☐ Attachment R: Authority Forms
- ☐ Attachment S: Title V Permit Revision Information
- ☒ Application Fee

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ *Forward 1 copy of the application to the Title V Permitting Group and:*
- ☐ *For Title V Administrative Amendments:*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit,*
- ☐ *For Title V Minor Modifications:*
  - ☐ *Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
- ☐ *For Title V Significant Modifications processed in parallel with NSR Permit revision:*
  - ☐ *NSR permit writer should notify a Title V permit writer of draft permit,*
  - ☐ *Public notice should reference both 45CSR13 and Title V permits,*
  - ☐ *EPA has 45 day review period of a draft permit.*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

BUSINESS CERTIFICATE

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
TRANSGAS DEVELOPMENT SYSTEMS, LLC
630 1ST AVE APT 30G
NEW YORK, NY 10016-3799

BUSINESS REGISTRATION ACCOUNT NUMBER: **2218-0756**

This certificate is issued on: 06/29/2010

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with W.Va. Code § 11-12.

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.1
L1333508864

ATTACHMENT B

SITE LOCATION MAP

Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE, Charleston, WV 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
E-Mail: potesta@potesta.com

TransGas Development Systems, LLC
Adams Fork Harless Data Center Energy Campus
Holden, West Virginia
Project No. 0101-22-0132-003B

ATTACHMENT C

INSTALLATION AND STARTUP SCHEDULE

ATTACHMENT C

INSTALLATION AND START UP SCHEDULE

Construction of the facility will begin after receipt of Construction Permit from West Virginia Department of Environmental Protection, Division of Air Quality, and other necessary regulatory approvals on or near January 1, 2026. Operations will commence approximately 12 months after the beginning of construction.

ATTACHMENT D

REGULATORY DISCUSSION

ATTACHMENT D

REGULATORY DISCUSSION

The facility proposed herein, or portions of the facility, may be subject to the following regulations based on a review of potential air quality regulations (see No. 1 and 2). Additionally, there are a few regulations which the source may not be subject to which are also listed below in No. 3.

1. State Regulations

   A. 45CSR4 – "To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors"

   B. 45CSR13 – "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation"

   C. 45CSR16 – "Standards of Performance for New Stationary Sources"

   D. 45CSR20 – "Good Engineering Practice as Applies to Stack Heights"

   E. 45SCR30 – "Requirements for Operation Permits"

   F. 45CSR31 – "Confidential Information"
   This application contains confidential information. This claim of confidentiality is made in accordance with the requirements of 45CSR31.

   G. 45CSR34 – "Emission Standards for Hazardous Air Pollutants"

2. Federal Regulations

   A. 40CFR60 Subpart A – General Provisions

   B. 40CFR60 Subpart IIII - Standard of Performance for Stationary Compression Ignition Internal Combustion Engines

   C. 40CFR63, Subpart ZZZZ – National Emissions Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

3. Non-Applicable Regulations or Exemptions Apply

A. 45CSR40 – Contol of Ozone Season Nitrogen Oxide Emissions
The reciprocating internal combustion engines proposed for this facility do not appear to be considered as a unit per the definition contained in section 2.30 where a unit is defined as a stationary fossil fuel-fired boiler, combustion turbine, or combined cycle system. The engines also have a maximum heat input of less than 250 MMBtu/hr as stated in Section 4.1. Furthermore, the units do not appear to be subject to 40CFR97.

B. 40CFR97, Subpart DDDDD - CSAPR SO2 Group 2 Trading Program and Subpart EEEEE – CSAPR Nox Ozone Season Group 2 Trading Program. The nameplate capacity of the generators attached to each unit is 25 MWe. Also, the units (reciprocating internal combustion engines) do not appear to be regulated by the rule.

C. 45CSR33 – Acid Rain Provisions and Permits
This rule does not appear to apply due to the New Unit Exemption in 40CFR72.

D. 40CFR72, Acid Rain Program, Subpart A, Section 72.7, New Unit Exemption, appears to exempt the units from applicability based on serving a generator of 25 MWe or less, not burning coal or coal-derived fuel, and burns fuel with sulfur of 0.05 percent or less by weight.

E. 40CFR60 Subpart Kc – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced After October 4, 2023. Does not apply due to low vapor pressure of diesel.

ATTACHMENT E

PLOT PLANS

Power House	Engine IDs	Emission ID	Control ID
1	ENG1, ENG2, ENG3	E1, E2, E3	C1, C2, C3
2	ENG4, ENG5, ENG6	E4, E5, E6	C4, C5, C6
3	ENG7, ENG8, ENG9	E7, E8, E9	C7, C8, C9
4	ENG10, ENG11, ENG12	E10, E11, E12	C10, C11, C12
5	ENG13, ENG14, ENG15	E13, E14, E15	C13, C14, C15
6	ENG16, ENG17, ENG18	E16, E17, E18	C16, C17, C18
7	ENG19, ENG20, ENG21	E19, E20, E21	C19, C20, C21
8	ENG22, ENG23, ENG24	E22, E23, E24	C22, C23, C24
9	ENG25, ENG26, ENG27	E25, E26, E27	C25, C26, C27
10	ENG28, ENG29, ENG30	E28, E29, E30	C28, C29, C30
11	ENG31, ENG32, ENG33	E31, E32, E33	C31, C32, C33
12	ENG34, ENG35, ENG36	E34, E35, E36	C34, C35, C36
13	ENG37, ENG38, ENG39	E37, E38, E39	C37, C38, C39
14	ENG40, ENG41, ENG42	E40, E41, E42	C40, C41, C42
15	ENG43, ENG44, ENG45	E43, E44, E45	C43, C44, C45
16	ENG46, ENG47, ENG48	E46, E47, E48	C46, C47, C48
17	ENG49, ENG50, ENG51	E49, E50, E51	C49, C50, C51
18	ENG52, ENG53, ENG54	E52, E53, E54	C52, C53, C54
19	ENG55, ENG56, ENG57	E55, E56, E57	C55, C56, C57
20	ENG58, ENG59, ENG60	E58, E59, E60	C58, C59, C60
21	ENG61, ENG62, ENG63	E61, E62, E63	C61, C62, C63
22	ENG64, ENG65, ENG66	E64, E65, E66	C64, C65, C66
23	ENG67, ENG68, ENG69	E67, E68, E69	C67, C68, C69
24	ENG70, ENG71, ENG72	E70, E71, E72	C70, C71, C72
25	ENG73, ENG74, ENG75	E73, E74, E75	C73, C74, C75
26	ENG76, ENG77, ENG78	E76, E77, E78	C76, C77, C78
27	ENG79, ENG80, ENG81	E79, E80, E81	C79, C80, C81
28	ENG82, ENG83, ENG84	E82, E83, E84	C82, C83, C84
29	ENG85, ENG86, ENG87	E85, E86, E87	C85, C86, C87
30	ENG88, ENG89, ENG90	E88, E89, E90	C88, C89, C90
31	ENG91, ENG92, ENG93	E91, E92, E93	C91, C92, C93
32	ENG94, ENG95, ENG96	E94, E95, E96	C94, C95, C96
33	ENG97, ENG98, ENG99	E97, E98, E99	C97, C98, C99
34	ENG100, ENG101, ENG102	E100, E101, E102	C100, C101, C102
35	ENG103, ENG104, ENG105	E103, E104, E105	C103, C104, C105
36	ENG106, ENG107, ENG108	E106, E107, E108	C106, C107, C108
37	ENG109, ENG110, ENG111	E109, E110, E111	C109, C110, C111
38	ENG112, ENG113, ENG114	E112, E113, E114	C112, C113, C114
39	ENG115, ENG116, ENG117	E115, E116, E117	C115, C116, C117

TANKS

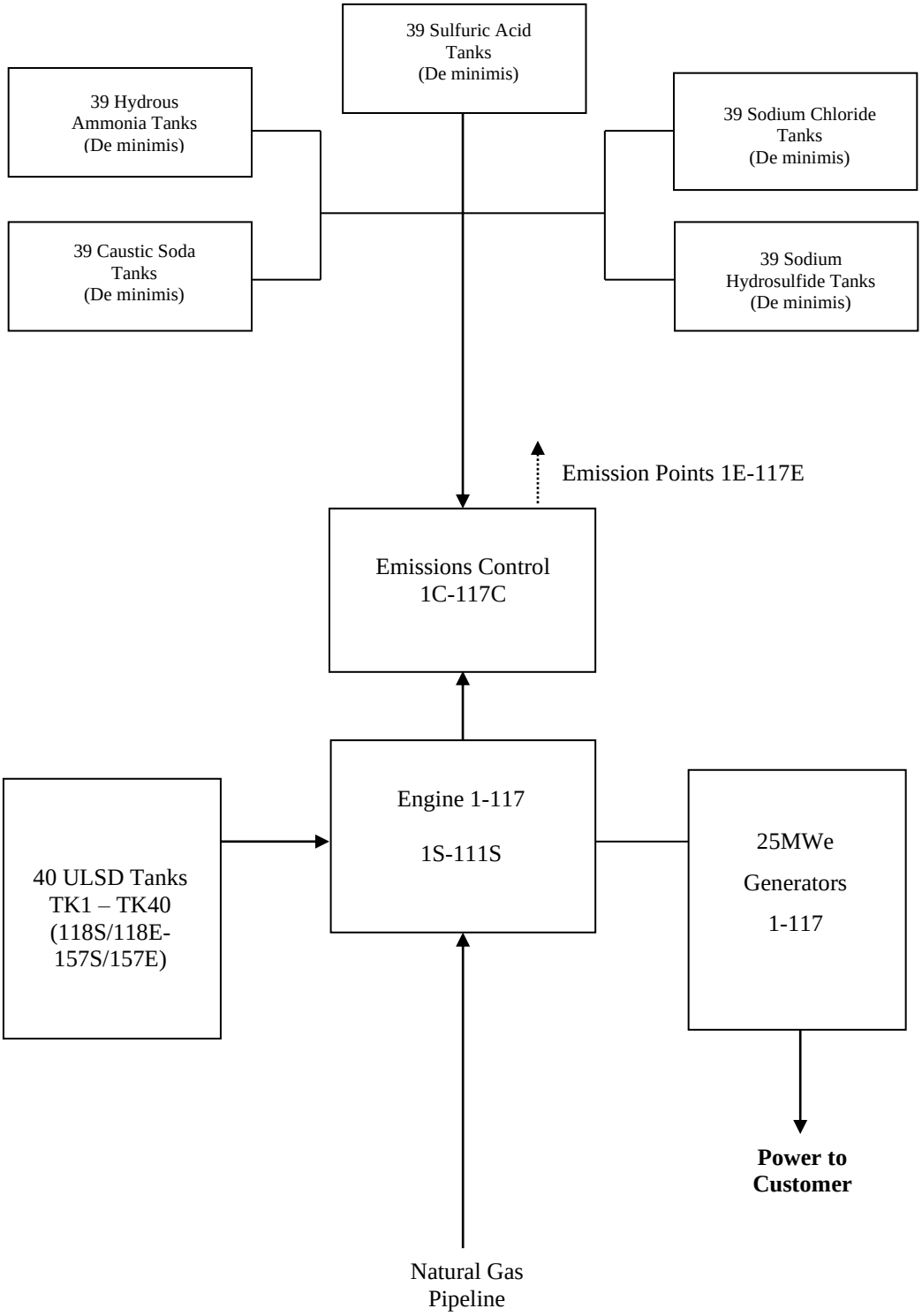
1. Ultra Low Sulfur Diesel will be stored in 40 tanks located on the property near each powerhouse. The tanks are uncontrolled. The tank identification numbers are TK1 – TK40 (118S through 157S with emission points 118E through 157E).
2. Each powerhouse 1 through 39 will have one set of emission control fluid tanks for Hydrous Ammonia, Caustic Soda, Sulfuric Acid, Sodium Chloride, and Sodium Hydrosulfide. These tanks are de minimis.

POTESTA
7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

PLOT PLAN
TransGas Development Systems, LLC
Adams Fork Harless Data Center Energy Campus
Holden, West Virginia
Project No. 0101-22-0132-003B

ATTACHMENT F

PROCESS FLOW DIAGRAM(S)



Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE, Charleston, WV 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
E-Mail: potesta@potesta.com

TransGas Development Systems, LLC
Adams Fork Harless Data Center Energy Campus
Holden, West Virginia
Project No. 0101-22-0132-003B

ATTACHMENT G

PROCESS DESCRIPTION

ATTACHMENT G

PROCESS DESCRIPTION

The facility proposed herein is a unique, off-grid, electric generating facility designed to provide power to adjacent data center operations. The facility encompasses 117 engines (Source Numbers 1S through 117S) with 114 engines operating full-time and 3 engines in reserve. Each engine has a proposed control strategy (Control Numbers 1C through 117C) and vent through their own exhaust stack (Emissions Point 1E through 117E). The facility will contain 39 powerhouses with each containing 3 generator setups with each generator having a nameplate capacity of 25 MWe. Actual power generation will depend on the operating mode of the engines. The operating modes of the engines are more fully described in Attachment L. The control systems for each engine are described in Attachment M.

The engines will operate on ultra-low sulfur diesel and natural gas depending on the operating status. Ultra-low sulfur diesel will be stored in 40 tanks (TK1 through TK40, 118S-157S, 118E-157E) on the property. Natural gas will be delivered via pipeline. Tanks for control device liquids will be located at each powerhouse so there will be 39 tanks of each of hydrous ammonia, caustic soda, sulfuric acid, sodium chlorite, and sodium hydrosulfide. These tanks are considered de minimis. Liquids and supplies will be trucked to the site.

There is no steam-power production at the site. Cooling will be provided by mine pool water as needed; therefore, there is no requirement for cooling towers.

ATTACHMENT H

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet

Sodium hydrosulfide solution

MSDS Number 8000TDC (Revised: 1/23/04) 6 Pages

Section 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

1.1 Product Name .....**Sodium hydrosulfide solution**
Chemical Family ..... Inorganic salt solution
Synonyms ..... KI-300 depressant, NaHS, sodium hydrogen sulfide
Formula ..... NaHS

1.2 Manufacturer .....Tessenderlo Davison Chemicals, LLC.
1916 Farmerville Highway
Ruston, Louisiana 71270
Information ..... (318) 242-5305

1.3 Emergency Contact ..... (800) 877-1737 (Tessenderlo Kerley)
(800) 424-9300 (CHEMTREC)

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

2.1 Chemical Ingredients (% by wt.)

Sodium hydrosulfide	CAS #:16721-80-5	20-45%
Water	CAS #:7732-18-5	55-80%

(See Section 8 for exposure guidelines)

Section 3: HAZARDS IDENTIFICATION

NFPA: Health - 3 Flammability - 2 Reactivity - 1

EMERGENCY OVERVIEW

Warning: Solution is highly alkaline
Contains hydrogen sulfide , a highly toxic gas.
Eye contact will cause marked eye irritation and possibly severe corneal damage. Skin contact will result in irritation and possible corrosion of the skin. Ingestion will irritate/burn mouth, throat and gastrointestinal tract. Contact with stomach acid will cause hydrogen sulfide vapors to be released. Heating or acid will cause hydrogen sulfide gas to evolve. Dilution of NaHS with water will also cause increased evolution of hydrogen sulfide.

Section 3: HAZARDS IDENTIFICATION, Cont.

3.1 POTENTIAL HEALTH EFFECTS

EYE: Contact with the eyes will cause marked eye irritation and possibly severe corneal damage.

SKIN CONTACT: Contact with the skin will cause skin irritation or burning sensation. Prolonged contact will result in corrosion of the skin.

SKIN ABSORPTION: Absorption is unlikely to occur.

INGESTION: Ingestion will result in severe burning and corrosion of mouth, throat and the gastrointestinal tract. If the ingested material contacts stomach acid, highly toxic hydrogen sulfide gas will be evolved.

INHALATION: Product solution and vapors contain highly toxic hydrogen sulfide gas. Exposure to this gas causes, headaches, nausea, dizziness and vomiting. Continued exposure can lead to loss of consciousness and death..

CHRONIC EFFECTS/CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC or OSHA.

Section 4: FIRST AID MEASURES

4.1 EYES: Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye. Obtain immediate medical attention.

4.2 SKIN: Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention

4.3 INGESTION: DO NOT INDUCE VOMITING. If victim is conscious, immediately give 2 to 4 glasses of water. If vomiting does occur, repeat fluid administration. Obtain immediate medical attention.

4.4 INHALATION: Remove victim from contaminated atmosphere. If breathing is labored, administer oxygen. If breathing has ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

Section 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

FLASH POINT: Not flammable **METHOD USED:** NA

5.2 FLAMMABLE LIMITS **Hydrogen sulfide** **LFL**: 4% **UFL**: 44%

5.3 EXTINGUISHING MEDIA: Water spray or foam or as appropriate for combustibles involved in fire.

5.4 FIRE & EXPLOSIVE HAZARDS: Solution is non-flammable. However if these solutions are exposed to heat or acids, hydrogen sulfide will be released and may form explosive mixtures with air (see above).

Keep containers/storage vessels in fire area cooled with water spray. Heating may cause the release of hydrogen sulfide vapors.

Section 5: FIRE FIGHTING MEASURES (Cont.)

5.5 FIRE FIGHTING EQUIPMENT: Because of the possible presence of toxic gases and the corrosive nature of the product, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Small releases: Confine and absorb small releases on sand earth or other inert absorbent. Oxidize residual reactive sulfides with a weak (3-5%) hydrogen peroxide solution.

6.2 Large releases: Wear proper protective equipment. Confine area to qualified personnel. Shut off release if safe to do so. Dike spill area to prevent runoff into sewers, drains (potential explosive mixtures of hydrogen sulfide in confined spaces) or surface waterways (potential aquatic toxicity). Recover as much of the solution as possible. Treat remaining material as a small release (above).

Section 7: HANDLING and STORAGE

7.1 Handling: Wear proper protective equipment (See Section 8). Avoid breathing product vapors. Avoid contact with skin and eyes. Use only in a well ventilated area. Dilute product only in enclosed containers. Wash thoroughly after handling.

7.2 Storage: Store in well ventilated areas. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote and smaller containers out of direct sunlight at moderate temperatures [<80º F (27º C)]. (See Section 10.4 for materials of construction)

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

8.1 RESPIRATORY PROTECTION: If working near open container or storage vessel opening or open tank truck dome cover, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent).

8.2 SKIN PROTECTION: Neoprene rubber gloves, chemical suit and boots should be worn to prevent contact with the liquid. Wash contaminated clothing prior to reuse. Contaminated leather shoes cannot be cleaned and should be discarded.

8.3 EYE PROTECTION: Chemical goggles and a full face shield.

8.4 EXPOSURE GUIDELINES:

	OSHA		ACGIH	
	TWA	STEL	TLV	STEL
Hydrogen sulfide	20 ppm (ceiling)		10 ppm (ceiling)	

8.5 ENGINEERING CONTROLS: Use adequate exhaust ventilation to prevent inhalation of product vapors. Where feasible scrub process or storage vessel vapors with caustic solution.
Maintain eyewash/safety shower in areas where chemical is handled.

Section 9: PHYSICAL and CHEMICAL PROPERTIES

9.1 APPEARANCE:	Yellow to dark green liquid.
9.2 ODOR:	Strong hydrogen sulfide (rotten egg) odor.
9.3 BOILING POINT:	253 °F(122.8 °C) - 269 °F (131.7 °C)
9.4 VAPOR PRESSURE:	17 mm Hg @ 68 °F (20 °C)
9.5 VAPOR DENSITY: (Air = 1.0)	1.17
9.6 SOLUBILITY IN WATER:	Complete
9.7 SPECIFIC GRAVITY:	1.152 - 1.303 (9.6 - 10.9 lbs/gal)
9.8 FREEZING POINT:	0° F (-17.8° C) - 20% 56º F (13.3º C) - 45%
9.9 pH:	11.5 - 12.5
9.10 VOLATILE:	Not applicable

Section 10: STABILITY and REACTIVITY

10.1 STABILITY: This is a stable material

10.2 HAZARDOUS POLYMERIZATION: Will not occur.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS: Heating this product will evolve hydrogen sulfide. Fire conditions will also cause the production of sulfur dioxide. Hydrogen sulfide (4-44%) may form flammable mixtures with air.

10.4 INCOMPATIBILITY: Acids will cause the release of highly toxic hydrogen sulfide. Sodium hydrosulfide solution is not compatible with copper, zinc, aluminum or their alloys (i.e. bronze, brass, galvanized metals, etc.). Corrosive to steel above 150º F (65.5º C). These materials of construction should not be used in handling systems or storage containers for this product (SEE Section 7.2, Storage). Dilution of NaHS with water will increase the evolution of hydrogen sulfide. Dilution should be done in an enclosed container.

Section 11: TOXICOLOGICAL INFORMATION

11.1 ORAL: Data not available

11.2 DERMAL: Data not available

11.3 INHALATION: INH-RAT LC_{50}: 444 ppm (hydrogen sulfide)
INH-MOUSE LC_{50}: 1,500 mg/m^3 18 minutes
INH-RAT LC_{50}: 1,500 mg/m^3 14 minutes

11.4 CHRONIC/CARCINOGENICITY: No evidence available

11.5 TERATOLOGY: Data not available

11.6 REPRODUCTION: Data not available

11.7 MUTAGENICITY: Data not available

Section 12: ECOLOGICAL INFORMATION

Static acute 96 hour-LC_{50} for mosquito fish is 206 mg/L. (Tl_m - fresh water)
LC_{50} fly inhalation 1,500 mg/m^3, 7 minutes
TL_m Gammarus 0.84 mg/L, 96 hours (hydrogen sulfide)
TL_m Ephemera 0.316 mg/L, 96 hours (hydrogen sulfide)
TL_m Flathead minnow 0.071 – 0.55 mg/L @ 6-24ºC, 96 hour flow through bioassay (hydrogen sulfide)
TL_m Bluegill 0.0090 – 0.0140 mg/L @ 20-22ºC, 96 hour flow through bioassay (hydrogen sulfide)
TL_m Brook trout 0.0216 – 0.0308 mg/L @ 8-12.5ºC, 96 hour flow through bioassay (hydrogen sulfide)

Section 13: DISPOSAL CONSIDERATIONS

If released to the environment for other than its intended purpose, this product contains some reactive sulfides which may be in sufficient quantity to meet the definition of a D003, hazardous waste.

Section 14: TRANSPORT INFORMATION

14.1 DOT Shipping Name:	Corrosive liquids, toxic, n.o.s.
14.2 DOT Hazard Class:	8
14.3 UN/NA Number:	UN2922 UN2949 (IMDG - over water)
14.4 Packing Group:	II
14.5 DOT Placard:	Corrosive
14.6 DOT Label(s):	Corrosive Toxic
14.7 IMO Shipping Name:	Sodium hydrosulphide solution
14.8 RQ (Reportable Quantity):	5,000 lbs (2268 Kg) 100% basis [2,604 gal (20%) 1,019 gal (45%)]
14.9 RR STCC Number:	28-123-33/49-352-04 (international)

Section 15: REGULATORY INFORMATION

15.1 OSHA: This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.

15.2 SARA TITLE III: a. **EHS** (Extremely Hazardous Substance) List: No

Section 15: REGULATORY INFORMATION (Cont.)

b.	Section 311/312, (Tier I,II) Categories:	Immediate (acute)	Yes
		Fire	Yes
		Sudden release	No
		Reactivity	Yes
		Delayed (chronic)	No
c.	Section 313 (Toxic Release Report-Form R):		No
d.	**TPQ** (Threshold Planning Quantity):		No

15.3 CERCLA/SUPERFUND: RQ (Reportable Quantity) — 5,000 lbs (2270 Kg)

15.4 TSCA (Toxic Substance Control Act) Inventory List: Yes

15.5 RCRA (Resource Conservation and Recovery Act) Status: D003 (See Section 13)

15.6 WHMIS (Canada) Hazard Classification: E, D1

15.7 DOT Hazardous Material: (See Section 14) Yes

15.8 CAA Hazardous Air Pollutant (HAP) No

Section 16: OTHER INFORMATION

REVISIONS: The entire MSDS was reformatted to comply to ANSI Standard Z400.1-1993.

Revised Sections 1.1, 8.3, 11, 12, 5/7/02
Revised pH range in Section 8, 6/19/02
Revised shipping info & RQ data, 1/15/03
Revised Section 3, Emergency Overview & Section 10.4 to include dilution caution. 1/23/04

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SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 7.11
Revision Date 15.10.2024
Print Date 16.10.2024
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name	:	Sodium chlorite (25% solution in water) for synthesis
Product Number	:	8.14815
Catalogue No.	:	814815
Brand	:	Millipore
UFI	:	CW60-J6H9-Q99X-S01A
REACH No.	:	This product is a mixture. REACH Registration Number see section 3.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Chemical for synthesis

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich Chemical Pvt Limited Industrial Area, Anekal Taluka Plot No 12, 12 Bommasandra - Jigani Link Road 560100 BANGALORE INDIA

1.4 Emergency telephone

Emergency Phone #	:	000 800 1007 141 (CHEMTREC)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Corrosive to Metals, (Category 1)	H290: May be corrosive to metals.
Acute toxicity, (Category 4)	H302: Harmful if swallowed.
Acute toxicity, (Category 3)	H311: Toxic in contact with skin.
Skin corrosion, (Category 1)	H314: Causes severe skin burns and eye damage.
Serious eye damage, (Category	H318: Causes serious eye damage.

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1)

Specific target organ toxicity - repeated exposure, (Category 2), spleen	H373: May cause damage to organs through prolonged or repeated exposure.
Short-term (acute) aquatic hazard, (Category 1)	H400: Very toxic to aquatic life.
Long-term (chronic) aquatic hazard, (Category 1)	H410: Very toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram

Signal Word	Danger

Hazard Statements

H290	May be corrosive to metals.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H373	May cause damage to organs (spleen) through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements

P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312	IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/ attention if you feel unwell.

Supplemental Hazard information (EU)

EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

Reduced Labeling (<= 125 ml)

Pictogram

Signal Word	Danger

Hazard Statements

H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.

Precautionary Statements

P280	Wear protective gloves/ protective clothing/ eye protection/ face

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protection.

P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard information (EU)

EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
Toxicological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Component		Classification	Concentration
sodium chlorite			
CAS-No. EC-No.	7758-19-2 231-836-6 *	Ox. Sol. 1; Acute Tox. 3; Acute Tox. 2; Skin Corr. 1B; Eye Dam. 1; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H271, H301, H310, H314, H318, H373, H400, H410	>= 25 - < 30 %

*A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, or the annual tonnage does not require a registration.

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

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In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Hydrogen chloride gas
Sodium oxides
Not combustible.
Fire may cause evolution of:
Hydrogen chloride gas
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

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6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

No metal containers. No metal containers.
Protected from light.Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Do not store near acids.

Recommended storage temperature see product label.

Storage class

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

8.2 Exposure controls

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

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Full contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Filter B-(P3)

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Physical state	liquid
b)	Color	colorless
c)	Odor	weak
d)	Melting point/freezing point	Melting point: < -3 °C
e)	Initial boiling point and boiling range	ca.>= 100 °C at 1.013 hPa
f)	Flammability (solid, gas)	No data available
g)	Upper/lower flammability or explosive limits	No data available
h)	Flash point	Not applicable
i)	Autoignition temperature	Not applicable
j)	Decomposition temperature	No data available
k)	pH	ca.12 - 13 at 20 °C

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l)	Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: No data available
m)	Water solubility	at 20 °C soluble
n)	Partition coefficient: n-octanol/water	Not applicable
o)	Vapor pressure	ca.20 hPa at 20 °C
p)	Density	ca.1,2 g/cm3 at 20 °C
	Relative density	No data available
q)	Relative vapor density	No data available
r)	Particle characteristics	No data available
s)	Explosive properties	Not classified as explosive.
t)	Oxidizing properties	Oxidizing potential

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
explosible after loss of solvent content.
Contact with acids liberates very toxic gas.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Generates dangerous gases or fumes in contact with:
Acids
Release of:
chlorine dioxide
Violent reactions possible with:
combustible substances
Cyanides
sulfur
ammonium compounds
phosphorus
Organic Substances
oxidisable substances
Chlorine
Metals
in powder form
Violent reactions possible with:
Generates dangerous gases or fumes in contact with:
Acids
The generally known reaction partners of water.

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10.4 Conditions to avoid
no information available

10.5 Incompatible materials
Contact with metals liberates hydrogen gas.Metals

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Mixture

Acute toxicity
Acute toxicity estimate Oral - 1.114 mg/kg
(Calculation method)
Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
Symptoms: Possible symptoms:, mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract
Acute toxicity estimate Dermal - 525,49 mg/kg
(Calculation method)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
Remarks: Mixture causes serious eye damage.
Risk of blindness!

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Mixture may cause damage to organs through prolonged or repeated exposure.
- spleen

Aspiration hazard
No data available

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article

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57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Components

sodium chlorite

Acute toxicity
LD50 Oral - Rat - male and female - 284 mg/kg
(OECD Test Guideline 401)
Acute toxicity estimate Oral - 284 mg/kg
(ATE value derived from LD50/LC50 value)
Inhalation: No data available
LD50 Dermal - Rabbit - male and female - 134 mg/kg
(US-EPA)
Acute toxicity estimate Dermal - 134 mg/kg
(ATE value derived from LD50/LC50 value)

Skin corrosion/irritation
Skin - Rabbit
Result: Corrosive after 3 minutes to 1 hour of exposure - 4 h
(US-EPA)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Irreversible effects on the eye
Remarks: Aqueous solution
(ECHA)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: Does not cause skin sensitization.
(OECD Test Guideline 406)

Germ cell mutagenicity
Method: OECD Test Guideline 475
Species: Mouse - male and female - Bone marrow
Result: negative

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.
- spleen

Aspiration hazard
No data available

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SECTION 12: Ecological information

12.1 Toxicity

Mixture
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties
Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects
No data available

Components

sodium chlorite

Toxicity to fish	flow-through test LC50 - Cyprinodon variegatus (sheepshead minnow) - 105 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - < 1 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test ErC50 - Pseudokirchneriella subcapitata (green algae) - 21,5 mg/l - 72 h (OECD Test Guideline 201) static test EC10 - Pseudokirchneriella subcapitata (green algae) - 4,8 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	Respiration inhibition EC50 - activated sludge - > 100 mg/l - 3 h (OECD Test Guideline 209)

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SECTION 13: Disposal considerations

13.1 Waste treatment methods
No data available

SECTION 14: Transport information

14.1 UN number
ADR/RID: 1908 IMDG: 1908 IATA: 1908

14.2 UN proper shipping name
ADR/RID: CHLORITE SOLUTION
IMDG: CHLORITE SOLUTION
IATA: Chlorite solution

14.3 Transport hazard class(es)
ADR/RID: 8 IMDG: 8 IATA: 8

14.4 Packaging group
ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards
ADR/RID: no IMDG Marine pollutant: no IATA: no

14.6 Special precautions for user
Tunnel restriction code : (E)

Further information : No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

National legislation

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	E1	ENVIRONMENTAL HAZARDS

Other regulations

Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment
For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements

H271	May cause fire or explosion; strong oxidizer.
H301	Toxic if swallowed.

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H310	Fatal in contact with skin.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Classification of the mixture		**Classification procedure:**
Met. Corr.1	H290	Based on product data or assessment
Acute Tox.4	H302	Calculation method
Acute Tox.3	H311	Calculation method
Skin Corr.1	H314	Based on product data or assessment
Eye Dam.1	H318	Based on product data or assessment

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STOT RE2	H373	Calculation method
Aquatic Acute1	H400	Calculation method
Aquatic Chronic1	H410	Calculation method

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Safety Data Sheet

Sulfuric Acid 36-37% (w/w)

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sulfuric Acid 36-37% (w/w)

Synonyms/Generic Names: Battery Acid, Dihydrogen Sulfate, Oil of Vitriol

Product Number: 9624

Product Use: Industrial, Manufacturing or Laboratory use

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd.
Columbus, WI. 53925

For More Information: 920-623-2140 (Monday-Friday 8:00-4:30)
www.columbuschemical.com

In Case of Emergency Call: CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

2. HAZARDS IDENTIFICATION

Hazard Not Otherwise Classified (HNOC): None

Signal Words: Danger

Pictograms:

GHS Classification:

Skin corrosion	Category 1A
Serious eye damage	Category 1
Acute aquatic toxicity	Category 3

GHS Label Elements, including precautionary statements:

Hazard Statements:

H314	Causes severe skin burns and eye damage.
H402	Harmful to aquatic life.

Precautionary Statements:

P260	Do not breathe mists.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do not induce vomiting.

P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physician.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local regulations.

Potential Health Effects

Eyes	Causes severe eye burns.
Inhalation	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	Causes skin burns.
Ingestion	May be harmful if swallowed.

NFPA Ratings

Health	3
Flammability	0
Reactivity	2
Specific hazard	W

HMIS Ratings

Health	3
Fire	0
Reactivity	2

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS# / ELINCS#	Formula	Molecular Weight
Sulfuric Acid	36-37	7664-93-9	231-939-5	H_2SO_4	98.08 g/mol
Water	Balance	7732-18-5	231-791-2	H_2O	18.00 g/mol

4. FIRST-AID MEASURES

Eyes	Immediately rinse with plenty of water for at least 15 minutes and get medical attention immediately.
Inhalation	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.
Skin	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and wash using soap. Get medical attention immediately.
Ingestion	**Do Not Induce Vomiting!** Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media	Product is not flammable. Use appropriate media for adjacent fire. Cool unopened containers with water.
Special protective equipment and precautions for firefighters	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.
Specific hazards arising from the chemical	Emits toxic fumes (sulfur oxides, hydrogen sulfide gas) under fire conditions. (See also Stability and Reactivity section).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	See section 8 for recommendations on the use of personal protective equipment.
Environmental precautions	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
Methods and materials for containment and cleaning up	Neutralize spill with sodium bicarbonate or lime. Absorb spill with noncombustible absorbent material, then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

7. HANDLING AND STORAGE

Precautions for safe handling
See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of aerosols.

Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls:

Component	Exposure Limits	Basis	Entity
Sulfuric Acid	0.2 mg/m^3	TLV	ACGIH
	1 mg/m^3	PEL	OSHA
	1 mg/m^3`	REL	NIOSH
	15 mg/m^3	IDLH	OSHA

TWA: Time Weighted Average over 8 hours of work.
TLV: Threshold Limit Value over 8 hours of work.
REL: Recommended Exposure Limit
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit during x minutes.
IDLH: Immediately Dangerous to Life or Health
WEEL: Workplace Environmental Exposure Levels
CEIL: Ceiling

Personal Protection

Eyes	Wear chemical safety glasses or goggles, and face shield.
Inhalation	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
Skin	Wear nitrile or rubber gloves, and full body suit. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Other	Not Available

Other Recommendations
Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Clear, colorless liquid.
Odor	Odorless.
Odor threshold	Not Available
pH	~1
Melting point/freezing point	Not Available
Initial boiling point and boiling range	Not Available
Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upper/lower flammability or explosive limit	Not Explosive
Vapor pressure	Not Available
Vapor density	Not Available
Specific gravity	1.2720
Solubility (ies)	Soluble in water.
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Possibility of Hazardous Reactions	Will not occur.
Conditions to Avoid	Moisture.
Incompatible Materials	Bases, halides, organic material, carbides, chlorates, fulminates, nitrates, picrates, cyanides, cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phosphorus (III) oxide, powdered metals.
Hazardous Decomposition Products	Sulfur oxides, hydrogen sulfide gas.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Skin	Not Available
Eyes	Not Available
Respiratory	Not Available
Ingestion	Not Available

Carcinogenicity

IARC	1: Carcinogenic to humans (sulfuric acid aerosol).
ACGIH	A2: Suspected human carcinogen (sulfuric acid aerosol).
NTP	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs & Symptoms of Exposure

Skin	Burning, itching, redness, inflammation upon exposed tissue.
Eyes	Eye burns, watering eyes.
Respiratory	Burning, choking, coughing, shortness of breath.
Ingestion	Nausea, vomiting, diarrhea, burning, severe pain.

Chronic Toxicity	May cause bleeding of nose and gums, nasal and oral mucosal ulceration, conjunctivitis, yellowing of teeth and erosion of tooth enamel.
Teratogenicity	Not Available
Mutagenicity	Not Available
Embryotoxicity	Not Available
Target Organ(s)	Teeth, Lungs
Reproductive Toxicity	Not Available
Respiratory/Skin Sensitization	Not Available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic Vertebrate	Not Available
Aquatic Invertebrate	Not Available
Terrestrial	Not Available

Persistence and Degradability	Not Available
Bioaccumulative Potential	Does not accumulate.
Mobility in Soil	Not Available
PBT and vPvB Assessment	Not Available
Other Adverse Effects	Not Available

13. DISPOSAL CONSIDERATIONS

Waste Product or Residues	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product or residue.
Product Containers	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

US DOT	UN2796, Sulfuric acid, 8, pg II
TDG	UN2796, SULFURIC ACID, 8, PG II
IMDG	UN2796, SULFURIC ACID, 8, PG II
Marine Pollutant	No
IATA/ICAO	UN2796, Sulfuric acid, 8, pg II

15. REGULATORY INFORMATION

TSCA Inventory Status	All ingredients are listed on the TSCA Active inventory.
DSL / NDSL	All ingredients are listed on the DSL inventory.
California Proposition 65	Not Listed
Rhode Island: Hazardous Substance List	Listed: Sulfuric Acid

Massachusetts: Toxic or Hazardous Substance List, Right to Know	Not Listed
Pennsylvania: Hazardous Substance List	Listed: Sulfuric Acid
New Jersey: Right to Know Hazardous Substance List	Listed: Sulfuric Acid
SARA 302	Listed: Sulfuric Acid
SARA 304	Listed: Sulfuric Acid
SARA 311	Acute Health Hazard.
SARA 312	Acute Health Hazard.
SARA 313	Listed: Sulfuric Acid (aerosol forms only)
WHMIS Canada	Class D1A: Poisonous and infectious material – Immediate and serious effects – Very toxic. Class E: Corrosive material.

16. OTHER INFORMATION

Revision	Date
Original	03/27/2013
Revision 1	12/13/2016
Revision 2	11/29/2021

Disclaimer: The information provided in this Safety Data Sheet (“SDS”) is correct to the best of our knowledge, information, and belief at the date of publication. The information in this SDS relates only to the specific Product identified under Section 1, and does not relate to its use in combination with other materials or products, or its use as to any particular process. Those handling, storing, or using the Product should satisfy themselves that they have current information regarding the particular way the Product is handled, stored or used and that the same is done in accordance with federal, state and local law. WE DO NOT MAKE ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE. WE DO NOT ASSUME RESPOSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, INJURY, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT.

SODIUM HYDROXIDE, 50%

SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer:	**Shintech Louisiana, LLC** 3 Greenway Plaza, Suite 1150 Houston, TX 77046 (713) 965-0713
PRODUCT NAME:	Sodium Hydroxide Solution, 50%
CAS#:	1310-73-2
CHEMICAL FOMULA:	NaOH(50)
Synonyms	Caustic Soda Liquid 50%, Soda Lye, Lye, Liquid Caustic, Sodium Hydrate
Product Use:	Neutralizing agent, industrial cleaner, pulping and bleaching, soap manufacturing

For information regarding a chemical emergency involving a spill or leak, call:

24 — Hour Emergency Contact:

U.S.: 1-800-424-9300 — CHEMTREC

SECTION 2 — HAZARDS IDENTIFICATION

Global Harmonization System (GHS) Classification:

Category 1	Corrosive to metals
Category 1	Skin corrosion/irritation
Category 1	Serious eye damage/eye irritation
Category 3	Hazardous to the aquatic environment, long-term (chronic) hazard
Category 4	Acute toxicity, inhalation
Category 4	Acute toxicity, oral

National Fire Protection Association (NFPA) Rating Hazardous Materials Identification Systems (HMIS) Rating

	NFPA	HMIS
Health	3	3
Fire	0	0
Reactivity	1	1

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

W – Water Reactive

DANGER! Causes severe eye burns. Causes severe skin burns. Avoid contact with skin and eyes. Causes burns of the mouth and throat. Causes respiratory tract irritation. Avoid breathing vapors or mist. Aspiration hazard. Can enter lungs and cause damage. May react with water. Keep upwind of spill and use in adequate ventilation.

Emergency Overview:

Color:	Colorless
Odor:	Odorless
Physical State	Liquid above freezing point
Signal Word	DANGER

GHS Label Elements:

GHS Hazard Statements:

H290 - May be corrosive to metals

H314 – Causes severe skin burns and eye

H318 – Causes serious eye damage

H412 – Harmful to aquatic life with long lasting effects

H332 – Harmful if inhaled

H302 – Harmful if swallowed

GHS Precautionary Statements:

Storage:	Keep container closed. Keep in original container. Store in a secure manner.
Ventilation Controls:	Do not breathe (dust, vapor or spray mist).
Hygiene Measures:	When using, do not smoke, eat, or drink. Wash thoroughly after handling. Avoid contact with skin and eyes.
Personal Protective Equipment:	Wear suitable protective clothing, gloves, and eye/face protection.
Spills:	**NEVER** direct water jet on liquid. Dike the area to contain the spill. Collect in suitable and properly labeled containers. Attempt to neutralize by adding material such as Acetic acid.
First Aid (See Section 4):	In case of accident by inhalation, move person to fresh air. If swallowed, do not induce vomiting: seek medical advice immediately and show label to doctor. After contact with skin, immediately take off all contaminated clothing and wash immediately with plenty of water. In case of contact with eyes, rinse immediately with plenty of water. In all cases, if irritation develops and persists, get medical attention. In all cases, call a poison control center or doctor for further treatment advice.
Environmental Protection:	Use appropriate containment to avoid environmental contamination.
Disposal:	Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT	May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Mist may cause eye irritation.
Short Term Exposure	
Long Term Exposure:	
SKIN CONTACT	Brief contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage.
SKIN ABSORPTION	Prolonged skin contact is unlikely to result in absorption of harmful amounts.
INHALATION:	Mist may cause severe irritation of upper respiratory tract (nose and throat). May cause chemical burns to the respiratory tract.
INGESTION	Swallowing may result in burns of the mouth and throat. Swallowing may result in gastrointestinal irritation, ulceration, nausea and/or vomiting. Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.
CONDITIONS AGGRAVATED BY EXPOSURE	Respiratory disorders, pre-existing skin disorders, eye/vision disorders.
TARGET ORGANS EFFECTED:	Skin, Eyes, Respiratory System.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous ingredients (specific)	Typical %	CAS Number	EC Number
Water	50	7732-18-5	7732-18-5
Sodium Hydroxide	50	1310-73-2	7732-18-5
Sodium Chloride	< 1	7647-14-5	231-598-3

Common Names/Synonyms: Caustic Soda Liquid 50%, Soda Lye, Lye, Liquid Caustic, Sodium Hydrate

SECTION 4 – FIRST AID MEASURES

Eye Contact: Immediately flush eyes with water for at least 30 minutes, and up to 60 minutes if necessary. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Skin Contact: Immediately flush skin with water for at least 30 minutes, and up to 60 minutes if necessary. Under water remove contaminated clothing, jewelry, and shoes. If irritation persists, repeat flushing. Obtain medical attention immediately. Handle contaminated clothing and shoes in a manner which limits further exposure.

Ingestion: DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give as much water as possible to dilute material (8 to 10 oz. or 240 to 300 mL). If spontaneous vomiting occurs, have victim lean forward with head down, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility. Do not give anything to an unconscious person.

Inhalation: Move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance: induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention IMMEDIATELY. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.

SECTION 5 – FIRE FIGHTING MEASURES

Extinguishing Media: This material does not burn. If exposed to fire from another source, use suitable extinguishing agent for that fire. Do not use water jet.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Remove containers from fire, if possible, and cool containers with water. When material comes in contact with water, large amounts of heat may be generated and ignite adjacent combustible materials. **This material does not burn.** Fight fire for other material that is burning.

Special Protective Equipment for Firefighters:	Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.
Unusual Fire and Explosion Hazards:	Product reacts with water. Reaction may produce heat and/or gases. This reaction may be violent. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Hazardous Combustion Products:	Not applicable.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Steps to be taken if material is released or spilled:	Contain spilled material if possible. Small spills: Dilute with water and neutralize with dilute acid; absorb and collect. Large spills: Dike the area to contain the spill. Collect in suitable and properly labeled containers. Attempt to neutralize by adding material such as Acetic acid. See Section 13, Disposal Considerations, for additional information.
Personnel Precautions:	Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Refer to Section 7, Handling, for additional precautionary measures. Keep upwind of spill. Ventilate area of leak or spill. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental Precautions:	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

SECTION 7 – HANDLING AND STORAGE

Handling:

Do not get in eyes. Do not get on skin or clothing. Do not swallow. Avoid breathing mist. Keep container closed. Use with adequate ventilation.

1. ALWAYS add caustic soda solution to water with constant agitation. NEVER add water to the caustic soda solution.
2. The water should be lukewarm (27°-38°C or 80°-100°F). NEVER start with hot or cold water. The addition of the caustic soda to liquid will cause a rise in temperature. If caustic soda becomes concentrated in one area, is added too rapidly, or is added to hot or cold liquid, a rapid temperature increase can result in DANGEROUS mists, boiling or spattering which may cause an immediate VIOLENT ERUPTION. See Section 8, Exposure Controls and Personal Protection.

Storage:

Keep container closed. Do not store in: Zinc, Aluminum, Brass, or Tin. See Section 10 for more specific information.

Storage temperature: >16°C

Shelf life: Use within 24 months

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Preventive Measures:

Recommendations listed in this section indicate the type of equipment which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls:

Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact.

Personal Protective Equipment:	Maintain eye wash station and safety shower facilities in work area. Detailed requirements for personal protective equipment should be established on a site-specific basis.
Eye/Face Protection:	Wear full face-shield and chemical safety goggles when there is potential for contact.
Skin/Body Protection:	Wear appropriate personal protective clothing to prevent skin contact that is chemically resistant to this material. Wear rubber boots and chemical resistant gloves. Remove contaminated clothing immediately, wash skin area with soap and water and launder clothing before reuse or dispose of properly.
Respiratory Protection:	Up to 10mg/m³: Supplied Air Respirator (SAR) operated in a continuous-flow mode, eye protection needed; or full face-piece respirator with high-efficiency particulate filter(s); or powered air-purifying respirator with dust and mist filter(s), eye protection needed; or full face-piece Self-Contained Breathing Apparatus (SCBA); or full face-piece SAR. Emergency or Planned Entry into Unknown Concentrations of IDLH Conditions: Positive pressure, full face-piece SAR; or positive pressure, full face-piece SAR with an auxiliary positive pressure SAR.
Guidelines for Sodium Hydroxide Solutions, 30-70%:	**RECOMMENDED** (resistance to breakthrough longer than 8 hours): Butyl rubber; natural rubber, neoprene rubber, nitrile rubber, polyethylene, polyvinyl chloride, Teflon(TM), Viton(TM), Saranex(TM), 4H(TM), Barricade(TM), CPF 3(TM), Responder(TM), Trellchem HPS(TM), Tychem 10000(TM). **NOT RECOMMENDED** for use (resistance to breakthrough less than 1 hour): Polyvinyl alcohol.
Escape:	Full face-piece respirator with high-efficiency particulate filter(s); or escape-type SCBA.
Exposure Guidelines:	
PRODUCT:	**Sodium hydroxide** ACGIH Ceiling Exposure Limit (TLV-C): 2mg/m³ OSHA PEL-TWA & PEL-C: 2mg/m³ NIOSH IDLH: 10mg/m³ NIOSH REL-C: 2mg/m³

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid above freezing point
Physical Form	Liquid
Color	Colorless
Odor	Odorless
Odor Threshold	No data available
Flash Point – Closed Cup	None
Flammable Limits in Air	Lower: Not applicable Upper: Not applicable
Autoignition Temperature	Not applicable
Vapor pressure	1.5 mmHg @ 20°C *Literature*
Boiling Point (760 mmHg)	145°C (293°F) *Literature*
Vapor Density (air=1)	Not applicable
Specific Gravity (H20=1)	1.52 *Literature*
Liquid Density	1.5 g/cm3 @ 20°C *Literature*
Freezing Point	14°C (57°F) *Literature*
Melting Point	14°C (57°F) *Literature*
Solubility in Water (by weight)	Water solution
pH	Strong Basic
Evaporation Rate	No data available
Partition Coefficient n-octanol/water	No data available
Decomposition Temperature	No data available
Molecular Weight	40 g/mol
Volatility	No data available
Kinematic Viscosity	0.35 St @ 25° *Calculated*

* This data is based on 50% Caustic

SECTION 10 – STABILITY AND REACTIVITY

Stability/Instability: Stable under recommended storage conditions. See Storage, Section 7.

Conditions to avoid: Avoid moisture. Product absorbs carbon dioxide from the air. Avoid mixing with water, strong acids, or other incompatible materials. Will react with some metals and create a flammable hydrogen gas.

Incompatible Materials: Heat is generated when mixed with water. Spattering and boiling can occur. Caustic soda solution reacts readily with various reducing sugars (i.e. fructose, galactose, maltose, dry whey solids) to produce CO. Take precautions including monitoring the tank atmosphere for CO to ensure safety of personnel before vessel entry. Avoid contact with:

acids, glycols and halogenated organics. Organic nitro compounds. Flammable hydrogen may be generated from contact with metals such as: Zinc, Aluminum, Tin, or Brass.

Hazardous Polymerization: Will not occur.

Thermal Decomposition: Does not decompose.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute Toxicity:

Ingestion: Single dose oral LD50 has not been determined.

Skin Absorption: The dermal LD50 has not been determined.

The severity of injury depends on the concentration and duration of exposure to the substance. This material is toxic to the skin, eyes, and mucous membranes. It may cause destructive effects on tissues that it contacts. Inhalation will cause irritation to the respiratory tract and difficulty breathing. Eye contact will cause irritation and may cause severe burns and possible blindness. Contact with skin will cause irritation and may cause corrosion of the tissue.

Repeated Dose Toxicity: Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.

Genetic Toxicology: For the major component(s): In vitro genetic toxicity studies were negative.

Carcinogenicity: Not a known carcinogen.

SECTION 12 – ECOLOGICAL INFORMATION

Fate and Transport:

Sodium Hydroxide:

Movement No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).

Persistence and Degradability		Biodegradation is not applicable.
Sodium Chloride:	**Movement**	No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).
Persistence and Degradability		Biodegradation is not applicable.

Ecotoxicity:

Sodium Hydroxide:	Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested). May increase pH of aquatic systems to >pH 10 which may be toxic to aquatic organisms.
Fish Acute & Prolonged Toxicity	LC50, rainbow trout (Oncorhynchus mykiss), 96h: 45.5 mg/L
Aquatic Invertebrate Acute Toxicity	LC50, water flea Daphnia magna: 40-240 mg/L
Sodium Chloride:	Material is practically non-toxic to aquatic organisms on an acute basis (IC50/EC50>100 mg/L in the most sensitive species tested).
Fish Acute & Prolonged Toxicity	LC50, fathead minnow (Pimephales promelas): 10,610 mg/L
Aquatic Invertebrate Acute Toxicity	LC50, water flea Daphnia magna: 4,571 mg/L

SECTION 13 – DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable Federal, State/Provincial and local laws and regulations. Waste characterization and compliance with applicable laws and regulations are the responsibility of the waste generator. Do not dispose of waste with normal garbage, or to sewer systems.

SHINTECH LOUISIANA, LLC HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR

USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN SDS SECTION.

SECTION 14 – TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

	BULK / NON BULK
Shipping Name	SODIUM HYDROXIDE SOLUTION
Hazard Class/Division	8
Identification No.	UN1824
Packing Group	PG II
DOT RQ (lbs)	RQ 1000 lbs. (Sodium Hydroxide)

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15 – REGULATORY INFORMATION

USA Classification

OSHA Hazard Communication Standard: This product is a “Hazardous Chemical” as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	Yes
Sudden Release of Pressure Hazard	No
OSHA Process Safety (29CFR1910.119)	No
CERCLA Section 103 (40CFR302.4)	Yes

Reportable Quantity (RQ) under CERCLA	1,000 lbs. (454kg)
TSCA Inventory Status	Yes

This product does not contain nor is it manufactured with ozone depleting substances

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Sodium Hydroxide	1310-73-2	<=51.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US Toxic Substances Control Act:

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 710.30.

CEPA – Domestic Substances List (DSL):

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	Yes
Sudden Release of Pressure Hazard	No
OSHA Process Safety (29CFR1910.119)	No
CERCLA Section 103 (40CFR302.4)	Yes
Reportable Quantity (RQ) under CERCLA	1,000 lbs. (454kg)
TSCA Inventory Status	Yes

This product does not contain nor is it manufactured with ozone depleting substances.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Sodium Hydroxide	1310-73-2	<=51.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US Toxic Substances Control Act:

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 710.30

CEPA – Domestic Substances List (DSL):

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

SECTION 16 – OTHER INFORMATION

IMPORTANT: The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANT ABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SUITABILITY, STABILITY OR OTHERWISE. The information included herein is not intended to be all-inclusive as to the appropriate manner and/or conditions of use, handling and/or storage. Factors pertaining to certain conditions of storage, handling, or use of this product may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended to, and nothing herein shall be construed as a recommendation to, infringe any existing patents or violate any laws, rules, regulations or ordinances of any governmental entity.

Shintech Louisiana, LLC urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as to the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product.

Revisions:

- **January 2011 - no information changed in this MSDS. This MSDS was reviewed for accuracy.**
- **April 2014 – The MSDS was updated to follow new Global Harmonization Guidelines. The MSDS are now called Safety Data Sheets (SDS).**
- **January 2016 – Corrections to improve nomenclature and technical data.**
- **February 2020 – No information changed in this SDS. This SDS was reviewed for accuracy.**
- **July 2022 – Section 2 was updated to include the GHS Classification Category 1 – Corrosive to Metals and Category 4 – Acute toxicity - inhalation. Section 2 - GHS Hazard Statements have been revised to indicate that this material is harmful if inhaled.**
- **November 2022 – Section 2 GHS Classifications and Hazard Statements updated.**
- **January 2023 – Removal of health hazard pictogram based on updated hazard statements.**

SDS Status: *Revision Date:* *1/25/2023*
Supersedes: *11/15/2022*

Aqua Ammonia 19%

Safety Data Sheet

Classified according to the UN-GHS as adopted in the US Hazard Communication Standard (HCS 2012), the Canada Hazardous Products Regulations (WHMIS 2015) and Mexico NOM-018-STPS-2015.

Revision Date: 4 June 2024 Date of issue: 4 June 2024 Supersedes Date: 23 June 2023 Version: 3.1

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Name: Aqua Ammonia 19%

CAS No: 1336-21-6

Synonyms: Ammonia water, Aqueous ammonia, Household ammonia, Ammonium hydrate, Ammonium hydroxide

STCC: 4935280

1.2. Intended Use of the Product

Uses of the substance/mixture: Fertilizer

Uses advised against: Consumer use

1.3. Name, Address, and Telephone of the Responsible Party

Company

CF Industries
2375 Waterview Drive
Northbrook, Illinois, USA
847-405-2400
www.cfindustries.com

1.4. Emergency Telephone Number

Emergency Number : 800-424-9300
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

Acute Tox. 4 (Oral)	H302
Acute Tox. 4 (Inhalation:gas)	H332
Skin Corr. 1A	H314
Eye Dam. 1	H318
STOT SE 3	H335
Aquatic Acute 1	H400
Aquatic Chronic 3	H412

Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :

GHS05 GHS07 GHS09

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H302+H332 - Harmful if swallowed or if inhaled.
H314 - Causes severe skin burns and eye damage.
H318 - Causes serious eye damage.
H335 - May cause respiratory irritation.
H400 - Very toxic to aquatic life.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary Statements (GHS-US) : P260 - Do not breathe mist, spray, vapors, gas.
P261 - Avoid breathing vapors, mist, or spray.
P264 - Wash hands, forearms, and exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear eye protection, protective clothing, protective gloves, face protection.

P301+P330+P331+P310 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor.
P303+P361+P353+P310 - IF ON SKIN (OR HAIR): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a poison center or doctor.
P304+P340+P310 - IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor.
P305+P351+P338+P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor.
P363 - Wash contaminated clothing before reuse.
P391 - Collect spillage.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, provincial, territorial, national, and international regulations.

2.3. Other Hazards

Ammonium hydroxide is very volatile and may release ammonia as a gas. Ammonia vapor, in concentrations of 16-25% volume by weight in air, is flammable, toxic by inhalation and corrosive. Take all appropriate precautions.

2.4. Unknown Acute Toxicity (GHS-US)

No data available.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Ammonium hydroxide	(CAS No) 1336-21-6	100	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400
Contains	**Product Identifier**	**% (w/w)**	**Classification (GHS-US)**
Water	(CAS No) 7732-18-5	80.5-81.5	Not classified
Ammonia	(CAS No) 7664-41-7	18.5-19.5	Flam. Gas 2, H221 Compressed gas, H280 Acute Tox. 3 (Inhalation:gas), H331 Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 2, H411

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. Seek medical attention immediately. Show label if possible.

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Immediately call a POISON CENTER or doctor/physician.

Skin Contact: Immediately flush skin with plenty of water for at least 60 minutes. Remove/Take off immediately all contaminated clothing. Immediately call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing for at least 60 minutes. Immediately call a POISON CENTER or doctor/physician.

Ingestion: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: Harmful if swallowed. Corrosive to eyes, respiratory system and skin. Harmful if inhaled.

Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Damage to lungs. Harmful if inhaled.

Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.

Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.

Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic Symptoms: None known.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Water spray, fog.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Ammonia vapor concentrations in the range of 16-25% by volume in air can be ignited if heated to the auto-ignition temperature. Oil or other combustible materials increases the fire hazard. Emits toxic fumes under fire conditions.

Explosion Hazard: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions.

Reactivity: Corrosive to copper, brass, silver, zinc and galvanized steel.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Stop leak if safe to do so. Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

Hazardous Combustion Products: Nitrogen oxides. Ammonia.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Keep away from open flames, hot surfaces and sources of ignition. No smoking. Avoid all contact with skin, eyes, or clothing. Do NOT breathe vapor, mist, spray.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel. Eliminate ignition sources.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Stop leak if safe to do so. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Stop the flow of material, if this is without risk. Ventilate area. Contain any spills with dikes or absorbents.

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely. Never neutralize spill with acid. Absorb and/or contain spill with inert material, then place in suitable container. Use only non-sparking tools. After cleaning, flush traces away with water.

6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Do NOT enter (storage areas, confined spaces) unless adequately ventilated. Emits ammonia vapors. Flammable gas. Ammonium hydroxide reacts with many heavy metals and their salts forming explosive compounds. It may attack metals forming flammable/explosive gas. The solution in water is a strong base, it reacts violently with acids.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Ensure adequate ventilation. Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Detached outside storage is preferable. Keep in fireproof place. Store away from oxidizers, combustible materials, and all ignition sources. Store in corrosive resistant container with a resistant inner liner. Storage containers should have safety relief valves. Store locked up.

Incompatible Materials: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

Storage Area: Post readily visible warning signs in the storage area listing emergency measures. Water hoses should be readily available to disperse vapors in case of a spill.

7.3. Specific End Use(s)

Fertilizer

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Ammonia (7664-41-7)		
Mexico	OEL TWA (mg/m³)	18 mg/m³
Mexico	OEL TWA (ppm)	25 ppm
Mexico	OEL STEL (mg/m³)	27 mg/m³
Mexico	OEL STEL (ppm)	35 ppm
USA ACGIH	ACGIH TWA (ppm)	25 ppm
USA ACGIH	ACGIH STEL (ppm)	35 ppm
USA OSHA	OSHA PEL (TWA) (mg/m³)	35 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	50 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	18 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	25 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m³)	27 mg/m³
USA NIOSH	NIOSH REL (STEL) (ppm)	35 ppm
USA IDLH	US IDLH (ppm)	300 ppm
Alberta	OEL STEL (mg/m³)	24 mg/m³
Alberta	OEL STEL (ppm)	35 ppm
Alberta	OEL TWA (mg/m³)	17 mg/m³
Alberta	OEL TWA (ppm)	25 ppm
British Columbia	OEL STEL (ppm)	35 ppm
British Columbia	OEL TWA (ppm)	25 ppm
Manitoba	OEL STEL (ppm)	35 ppm
Manitoba	OEL TWA (ppm)	25 ppm
New Brunswick	OEL STEL (mg/m³)	24 mg/m³
New Brunswick	OEL STEL (ppm)	35 ppm
New Brunswick	OEL TWA (mg/m³)	17 mg/m³
New Brunswick	OEL TWA (ppm)	25 ppm
Newfoundland &	OEL STEL (ppm)	35 ppm

Labrador		
Newfoundland & Labrador	OEL TWA (ppm)	25 ppm
Nova Scotia	OEL STEL (ppm)	35 ppm
Nova Scotia	OEL TWA (ppm)	25 ppm
Nunavut	OEL STEL (mg/m³)	24 mg/m³
Nunavut	OEL STEL (ppm)	35 ppm
Nunavut	OEL TWA (mg/m³)	17 mg/m³
Nunavut	OEL TWA (ppm)	25 ppm
Northwest Territories	OEL STEL (mg/m³)	24 mg/m³
Northwest Territories	OEL STEL (ppm)	35 ppm
Northwest Territories	OEL TWA (mg/m³)	17 mg/m³
Northwest Territories	OEL TWA (ppm)	25 ppm
Ontario	OEL STEL (ppm)	35 ppm
Ontario	OEL TWA (ppm)	25 ppm
Prince Edward Island	OEL STEL (ppm)	35 ppm
Prince Edward Island	OEL TWA (ppm)	25 ppm
Québec	VECD (mg/m³)	24 mg/m³
Québec	VECD (ppm)	35 ppm
Québec	VEMP (mg/m³)	17 mg/m³
Québec	VEMP (ppm)	25 ppm
Saskatchewan	OEL STEL (ppm)	35 ppm
Saskatchewan	OEL TWA (ppm)	25 ppm
Yukon	OEL STEL (mg/m³)	30 mg/m³
Yukon	OEL STEL (ppm)	40 ppm
Yukon	OEL TWA (mg/m³)	18 mg/m³
Yukon	OEL TWA (ppm)	25 ppm

8.2. Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Gas detectors should be used when toxic gases may be released. Use explosion-proof equipment.

Personal Protective Equipment: Gloves. Protective goggles. Insufficient ventilation: wear respiratory protection. Protective clothing. Face shield.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles and face shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

Other Information: When using, do not eat, drink, or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	Colorless
Odor	:	Pungent
Odor Threshold	:	1 - 50 ppm
pH	:	10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Evaporation Rate	:	Not available
Melting Point	:	- 77 °C (-106 °F) (< 44% NH_3)

Freezing Point	:	-38 °C (-36 °F)
Boiling Point	:	37.4 °C (99.3°F) (25% NH_3)
Flash Point	:	Not available
Auto-ignition Temperature	:	651 °C (1,204°F) (ammonia vapor)
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	16 % (ammonia vapor)
Upper Flammable Limit	:	25 % (ammonia vapor)
Vapor Pressure	:	49642.2 Pa at 68°F (20°C)
Relative Vapor Density at 20 °C	:	0.6 (for ammonia vapor over aqua ammonia at 0°C and 760 mm Hg)
Relative Density	:	Not available
Specific Gravity	:	0.90 at 60 °F (19% NH_3)
Solubility	:	Soluble in water.
Partition Coefficient: N-Octanol/Water	:	-1.14 at 25° C
Viscosity	:	Not available
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	:	Not expected to present an explosion hazard due to static discharge.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity
Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

10.2. Chemical Stability
Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of Hazardous Reactions
Hazardous polymerization will not occur.

10.4. Conditions to Avoid
Direct sunlight. Extremely high or low temperatures. Heat. Sources of ignition.

10.5. Incompatible Materials
Strong acids. Strong bases. Strong oxidizers. Hypochlorites.

10.6. Hazardous Decomposition Products
Thermal decomposition generates: Carbon oxides (CO, CO2). Nitrogen oxides. Emits ammonia vapors.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product
Acute Toxicity: Oral: Harmful if swallowed. Inhalation:gas: Harmful if inhaled.

LD50 and LC50 Data:

Ammonium hydroxide 1336-21-6	
ATE US (oral)	350.00 mg/kg body weight
ATE US (gases)	10,256.41 ppmV/4h

Skin Corrosion/Irritation: Causes severe skin burns and eye damage.
pH: 10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Serious Eye Damage/Irritation: Causes serious eye damage.
pH: 10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Teratogenicity: Not available
Carcinogenicity: Not classified
Specific Target Organ Toxicity (Repeated Exposure): Not classified
Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): May cause respiratory irritation.

Aspiration Hazard: Not classified
Symptoms/Injuries After Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Damage to lungs. Harmful if inhaled.
Symptoms/Injuries After Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.
Symptoms/Injuries After Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.
Symptoms/Injuries After Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.
Chronic Symptoms: None known.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Ammonia (7664-41-7)	
LC50 Inhalation Rat	5.1 mg/l (Exposure time: 1 h)
LC50 Inhalation Rat	2000 ppm/4h (Exposure time: 4 h)

Water (7732-18-5)	
LD50 Oral Rat	> 90000 mg/kg

Ammonium hydroxide (1336-21-6)	
LD50 Oral Rat	350 mg/kg

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General: Toxic to aquatic life. Harmful to aquatic life with long lasting effects.

Ammonia (7664-41-7)	
LC50 Fish 1	0.44 mg/l (Exposure time: 96 h - Species: Cyprinus carpio)
EC50 Daphnia 1	25.4 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	0.26 - 4.6 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)

Ammonium hydroxide (1336-21-6)	
LC50 Fish 1	8.2 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0.66 mg/l (Exposure time: 48 h - Species: water flea)
EC50 Daphnia 2	0.66 mg/l (Exposure time: 48 h - Species: Daphnia pulex)

12.2. Persistence and Degradability

Ammonium hydroxide (1336-21-6)	
Persistence and Degradability	Biodegradation of ammonia occurs in water under aerobic conditions.

12.3. Bioaccumulative Potential

Ammonium hydroxide (1336-21-6)	
Log Pow	-1.14
Bioaccumulative Potential	Not established.

Ammonia (7664-41-7)	
Log Pow	-1.14 (at 25 °C)

12.4. Mobility in Soil

Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.
Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.
Additional Information: Prevent runoff from entering drains, sewers or waterways.
Ecology – Waste Materials: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8

Packing Group : III
ERG Number : 154
CERCLA RQ : Ammonium Hydroxide = 1,000 lbs
Additional Information : Marine Pollutant

14.2. In Accordance with IMDG

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Packing Group : III
Label Codes : 8 + MP(P)
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-B

Additional Information : Marine Pollutant, Classified as HME per MARPOL Annex V

14.3. In Accordance with IATA

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Packing Group : III

ERG Code (IATA) : 8L

14.4. In Accordance with TDG

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Packing Group : III
Additional Information : Marine Pollutant

14.5. Classified in Accordance with MX-SCT

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Additional Information : Marine Pollutant

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Ammonium hydroxide (1336-21-6)	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

Ammonia (7664-41-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on the United States SARA Section 302 Listed on United States SARA Section 313	
SARA Section 302 Threshold Planning Quantity (TPQ)	500
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Sudden release of pressure hazard

SARA Section 313 - Emission Reporting	1.0 % (includes anhydrous Ammonia and aqueous Ammonia from water dissociable Ammonium salts and other sources, 10% of total aqueous Ammonia is reportable under this listing)

Water (7732-18-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ammonium hydroxide (1336-21-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State Regulations

Ammonia (7664-41-7)
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Acute
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Connecticut - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Toxic Endpoints
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Florida - Essential Chemicals List
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)
U.S. - Idaho - Occupational Exposure Limits - TWAs
U.S. - Louisiana - Reportable Quantity List for Pollutants
U.S. - Maine - Air Pollutants - Criteria Pollutants
U.S. - Massachusetts - Allowable Ambient Limits (AALs)
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Threshold Effects Exposure Limits (TELs)
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Occupational Exposure Limits - STELs
U.S. - Michigan - Polluting Materials List
U.S. - Michigan - Process Safety Management Highly Hazardous Chemicals
U.S. - Minnesota - Chemicals of High Concern
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - STELs
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)
U.S. - New Mexico - Precursor Chemicals
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

U.S. - North Carolina - Control of Toxic Air Pollutants
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 1-Hour
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Ohio - Extremely Hazardous Substances - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Oregon - Precursor Chemicals
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 24-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual
U.S. - Rhode Island - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Tennessee - Occupational Exposure Limits - STELs
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Permissible Exposure Limits - STELs
U.S. - Virginia - Water Quality Standards - Acute Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Acute Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Public Water Supply Effluent Limits
U.S. - Virginia - Water Quality Standards - Surface Waters Not Used for the Public Water Supply Effluent Limits
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet
U.S. - Wyoming - Process Safety Management - Highly Hazardous Chemicals
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Marine Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Marine Water
U.S. - Alaska - Ambient Air Quality Standards

Ammonium hydroxide (1336-21-6)

U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Louisiana - Reportable Quantity List for Pollutants
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Polluting Materials List
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

15.3. Canadian Regulations

Ammonium hydroxide (1336-21-6)	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects

Ammonia (7664-41-7)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects Class E - Corrosive Material

Water (7732-18-5)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

Ammonium hydroxide (1336-21-6)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision B - Toxic material causing immediate and serious toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 4 June 2024

Revision Comments : This version contains updates/revisions to the following sections:

- Updated company address

GHS Full Text Phrases:

Acute Tox. 3 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 3
Acute Tox. 4 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Compressed gas	Gases under pressure Compressed gas

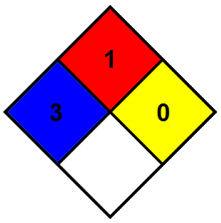
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Flam. Gas 2	Flammable gases Category 2
Skin Corr. 1A	Skin corrosion/irritation Category 1A
Skin Corr. 1B	Skin corrosion/irritation Category 1B
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H221	Flammable gas
H280	Contains gas under pressure; may explode if heated
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H331	Toxic if inhaled
H332	Harmful if inhaled
H335	May cause respiratory irritation
H400	Very toxic to aquatic life
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

NFPA Rating

Health Hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

Fire Hazard : 1 - Must be moderately heated or exposed to relatively high temperature before ignition can occur.

Reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 1 Slight Hazard

Physical : 0 Minimal Hazard

Party Responsible for the Preparation of This Document
CF Industries, Corporate EHS Department, 847-405-2400

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

CF believes the information contained herein is accurate; however, CF makes no guarantees or warranties with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein by CF is not intended to be and should not be construed as legal advice or as ensuring compliance by other parties. Judgments as to the suitability of the information contained herein for the party's own use or purposes are solely the responsibility of that party. Any party handling, transferring, transporting, storing, applying or otherwise using this product should review thoroughly all applicable laws, rules, regulations, standards and good engineering practices. Such thorough review should occur before the party handles, transfers, transports, stores, applies or otherwise uses this product.

North America GHS US 2012 & WHMIS 2

ATTACHMENT I

EMISSION UNITS TABLE

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
1S-117S	1E-117E	Engine 1 through Engine 117	2026	28,194 HP	New	1C-117C
118S-157S	118E-157E	ULSD Tank TK1-TK40	2026	170,000 gal	New	NA
De minimis	De minimis	Hydrous Ammonia Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Caustic Soda Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sulfuric Acid Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sodium Chlorite Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sodium Hydrosulfide Tanks 1-39	2026	4,600 gal	New	NA

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, or other appropriate designation.

ATTACHMENT J

EMISSION POINTS DATA SUMMARY SHEET

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/ Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
Worst case yearly emissions all engines (with 5 startups and shutdowns)															
1E-117E	Vertical	1S to 117S	Engines 1 to 117	1C to 117C	Control System	NA	NA	NO_X	NA	13,494	NA	194.30	Gas	Manufacturer	NA
								PM/PM10/PM2.5	NA	248.69	NA	186.53	Solid		NA
								CO	NA	11,174	NA	205.62	Gas		NA
								VOC	NA	11,517	NA	116.59	Gas		NA
								SO2	NA	495	NA	9.93	Gas		NA
								Total HAPS	NA	85.77	NA	0.86	Gas		NA
Normal Operations Single Engine (See emission discussion in Attachment L for different operating scenarios)															
1E to 117E	Vertical	1S to 117S	Engine 1 to 117	1C to 117C	Control System	NA	NA	NO_X	13.89	60.83	0.14	0.61	Gas	Manufacturer	NA
								PM/PM10/PM2.5	0.45	1.99	0.34	1.49	Solid		NA
								CO	22.36	97.92	0.34	1.47	Gas		NA
								VOC	22.63	99.12	0.23	0.99	Gas		NA
								SO2	0.74	3.25	0.01	0.03	Gas		NA
								Total HAPS	1.31	0.75	0.54	0.01	Gas		NA

See Emissions Discussion in Attachment L and Emissions Estimate in Attachment N for other emissions scenarios.

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/ Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
118E to 157E	Vertical	118S to 157S	ULSD Tanks 1-40	None	None	NA	NA	VOC (per tank)	0.18	0.02	0.18	0.02	Gas	Tanks 4.09.d	

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1E-117E	4.6	111	32,287	32.37	~1,718	98	4,179.00211	401.42022
118E-157E	NA	Ambient	NA	NA	~1,718	40	4,179.00211	401.42022

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions, which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ Yes ☐ No ☒ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No Leak Source Count is in Attachment N. ☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	PM/PM10/PM2.5	2.88/0.58/0.15	7.16/1.43/0.38	2.88/0.58/0.15	7.16/1.43/0.38	AP-42
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks (See fittings count in Attachment N)	VOC Hexane (C6+)	Does Not Apply	0.3120 0.0053	Does Not Apply	0.3120 0.0053	EE
General Clean-up VOC Emissions						
Other						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT L

EMISSION UNIT DATA SHEET(S)

REDACTED
Information Claimed Confidential by
TransGas Development Systems, LLC
March 24, 2025

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 1S-117S

1. Name or type and model of proposed affected source:

[redacted] 28,194 Horsepower Compression Ignition Engines. See attached engine details and emissions.

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

1. Name(s) and maximum amount of proposed process material(s) charged per hour:

Dual Fuel Modes
1. Natural Gas at 98% with Diesel at 2%.
2. Diesel at 100%.

Engine can be retrofit to burn other fuels.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

25 MWe Generators

5. Give chemical reactions, if applicable, that will be involved in the generation of air Pollutants:

Not Applicable

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

See fuel use during different operating modes in the attached document and in Attachment N.

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Natural gas will be pipeline quality natural gas.
Diesel fuel will be ultra-low sulfur diesel.

(c) Theoretical combustion air requirement (ACF/unit of fuel): NA

@ °F and psia.

(d) Percent excess air: NA

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

Compression Ignition Engines

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

NA

(g) Proposed maximum design heat input: 135.44 (Maximum) × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

See the attached document and Attachment N.

a.	NO_X	See Attached and Attachment N	lb/hr	See Attached and Attachment N	Ton/yr
b.	SO_2		lb/hr		Ton/yr
c.	CO		lb/hr		Ton/yr
d.	PM_{10}		lb/hr		Ton/yr
e.	Hydrocarbons		lb/hr		Ton/yr
f.	VOCs (Ethane & Methane)		lb/hr		Ton/yr
g.	Pb		lb/hr		Ton/yr
h.	Specify other(s)				
	Total HAPS	See Attached and Attachment N	lb/hr	See Attached and Attachment N	Ton/yr
			lb/hr		Ton/yr
			lb/hr		Ton/yr
			lb/hr		Ton/yr

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Monitoring as required by 40CFR60, Subpart IIII.	Recordkeeping as required by 40CFR60, Subpart IIII.
REPORTING	**TESTING**
Reporting as required by 40CFR60, Subpart IIII.	Testing as required by 40CFR60, Subpart IIII.

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

The engines are designed to run as proposed. Procedures will be provided upon delivery of the engines.

REDACTED
Information Claimed Confidential by
TransGas Development Systems, LLC
March 24, 2025

Engine Model and Manufacturer

The engines deployed will be [redacted]. These are [redacted] dual fuel engines. The engines will be built in license by the following engine builders:

[redacted]

Performance Data

The [redacted] offers very high, single-cycle efficiency. In the selected configuration and rating, one engine will produce a maximum 21,000 kW (or 28,194 HP) mechanical power at the shaft. The engines are Dual-Fuel capable, for maximum flexibility. The advantage of these engines among high efficiency and reliability is that they can be upgraded to ammonia engines, increasing the power output to 26,000 kW each, and minimizing the CO_2 per kWh to 66 g, once the fuel is available.

[redacted]

Figure 1: Picture of an [redacted]

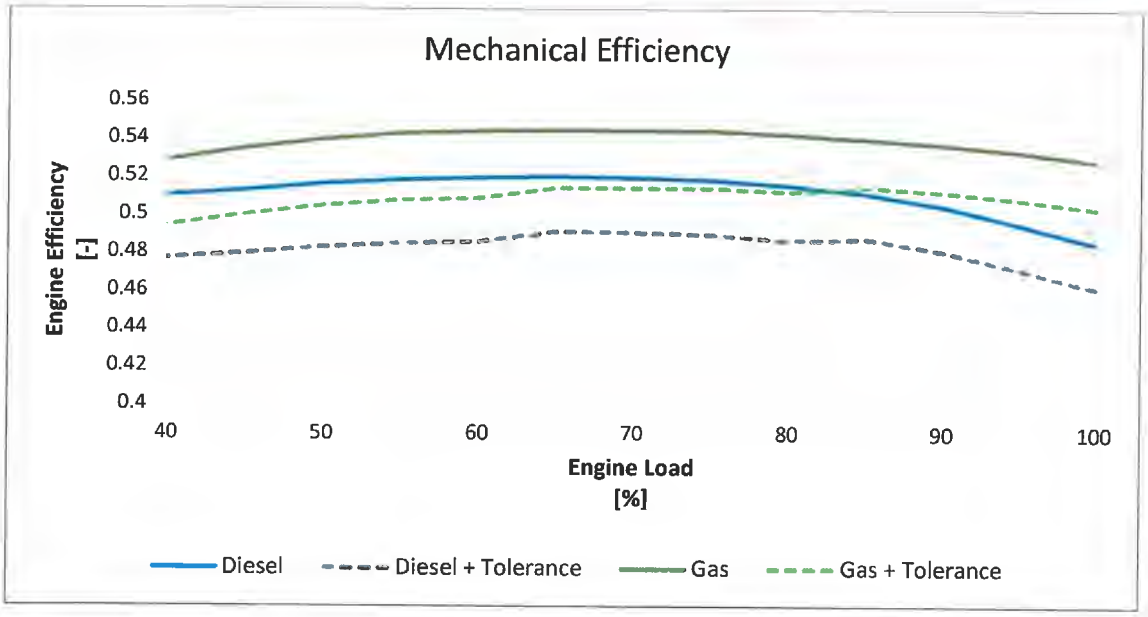


Figure 2: Efficiency of the engine as a function of the load

Power

On the permitting site there will be a total of 117 engines. With the maximum power output of 21 MW per engine, the installed theoretical power output is 2,457 MW. The effective and continuously delivered power output will be 1,795 MW, for 8,760 hours per year.

Fuel Types

In their Dual-Fuel configuration, the engines operate on natural gas and on diesel fuels or can be operated on diesel fuel only, in backup mode. Under normal operation the engines consume gas as their primary fuel with a pilot injection of Ultra-Low Sulfur Diesel. For this application the gas has the following properties (lower heat rate 976.94 BTU/ft³):

Date	BTU	SG	CO2	N2	Methane	Ethane	Propane	I-Butane	N-Butane	I-Pentane	N-Pentane	c6+
Average	1082.2	0.61	0.20	0.44	90.33	8.44	0.52	0.02	0.03	0.01	0.00	0.01
STD in % of average	0.66	0.78	11.09	5.04	0.85	8.17	57.48	20.82	24.96	33.90	55.06	63.08

Under gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% for emergency operation. The fuel used in this application will be Ultra-Low Sulfur Diesel (ULSD), with a sulfur Content: ≤ 15 parts per million (ppm) and a heat rate of 130,613 BTU/gal.

Operational profiles

Normal Operation

To ensure peak operation conditions, the engines will be regularly serviced. With 1-2 weeks of downtime per engine per year, 3 engines are going to be off-line at any time of the year. Under normal operations, the engines will be run at 75% power only. Therefore, the continuously delivered power will be 1,796 MW.

Compensation Mode

In case of one or – in the unrealistic, but foreseen case of - up to 29 engines out of service, the rest of the field will compensate, increasing their power output to 100%. For the calculation of the yearly emissions the worst case is assumed, when 29 engines go offline and the remaining 85 are operated at 100%.

Emergency Mode

In case the pipeline is down, or the gas cannot be delivered for any other reason, the engines can switch to *diesel fuel mode* immediately and are then operated on diesel fuel only. Apart from the different fuel type, the engines are controlled in the same way as in *Normal Operation*.

Startup Mode

To start an engine and bring power production online, several steps are necessary. In the first phase the emission control system is not operational temperature, therefore the control rate is not optimal. The following is a simplification and a representation of the worst case for emissions emission-wise. The different steps can be reduced to four main sub-modes:

- Speed up
- Fuel Switch
- Generator switched on
- Load up cold control

Speed up

Bring the engine from stand still to nominal speed (89 rpm). This is done in diesel mode. The emission control system is still offline at this point, as it is not at optimal temperature. Once nominal speed is set and the minimum load for a fuel switch is reached (less than 5 minutes), the system initiates the next sub mode: Fuel Changeover

Fuel Changeover
For about two minutes the load is kept constant, and the fuel is changed from 100% diesel to 98% gas & 2% diesel.

Generator switched on
On gas operation, the load is further increased until the generator can by energized and synchronized with the rest of the engine fleet. This takes no more than 5 minutes. For the emissions calculation of all these steps the emission control system is looked at as non-operational, even though the exhaust gases will have heated it already and some abatement is taking place, even at a reduced level.

Load up cold control
Once the generator is online and synchronized, then the engine is powered up to its set point (75% in normal operation mode). For reasons of simplicity and to ensure a conservative view on the problem, during engine load up the control system is looked at as cold and operational at 25% only. This even though in reality the system was heated up constantly by the exhaust gases and reaching operational condition during the load up.

Shut Down

The shut down procedure consists of three phases:

- Ramp down
- Min Load
- Spin out

Ramp down
The load is constantly reduced to a minimum load.

Min Load
At minimum load the generator is decoupled from the grid and the engine's load and speed setting are zero.

Spin out
Due to the zero-load setting the injection systems are turned off and the engine is spun out until full stop. In this entire sequence the emission control system is still operational due to its thermal inertia. Therefore, until the injection is stopped the emissions are treated.

All these steps are represented in Figure 3.

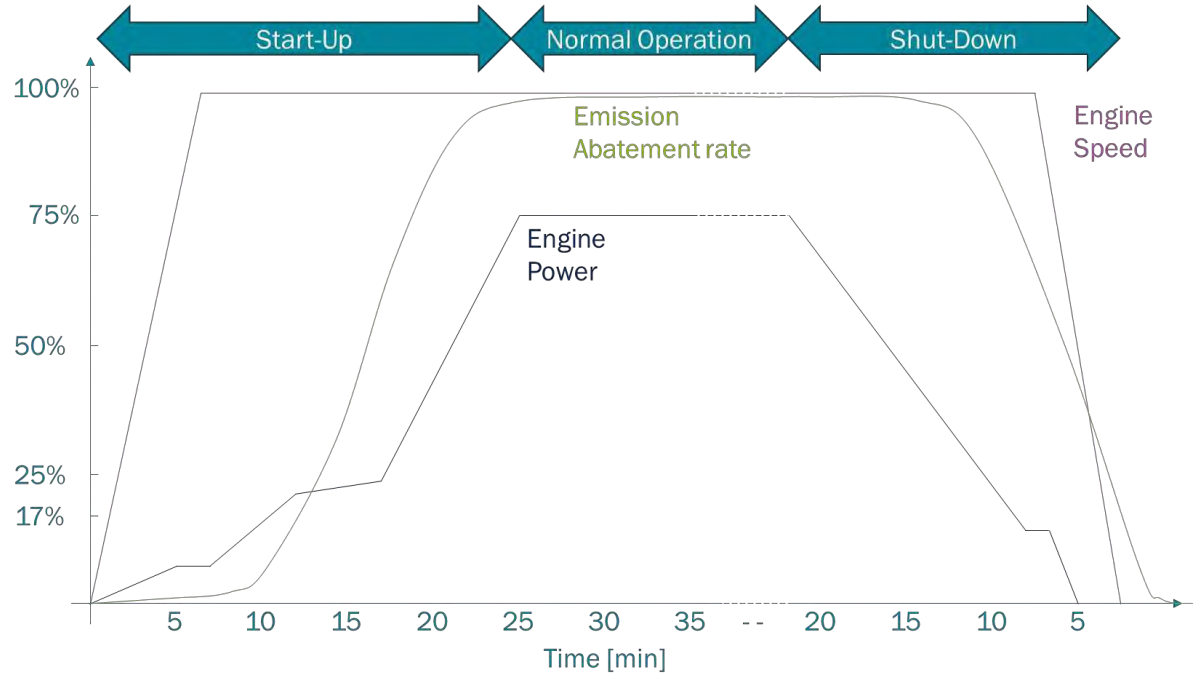


Figure 3: Simplified representation of the Start-Up and Shut-Down phases. Purple: Speed, dark blue: Power and green the efficiency of the emission control system

Emission Levels

For this application the engines are operated in two fuel modes, *Gas mode*, and Diesel mode, where 100% of the energy come from diesel. In Gas mode, where 98% of the energy comes from Natural Gas and 2% from diesel fuel injection (Ultra Low Sulfur Diesel), the engine's raw emissions going into the emission control system are listed in Table 1.

Gas mode		100	75	50	25	20	10
NOx	g/kWh	1.0	0.4	0.4	0.8	0.9	1.0
PM (Filterable)	mg/Nm3	5.7	4.2	5.3	8.6	9.3	10.6
PM10 (Filterable + Condensable)	mg/Nm3	5.4	4.1	5.1	8.1	8.8	10.1
PM2.5 (Filterable + Condensable)	mg/Nm3	5.4	4.1	5.1	8.1	8.8	10.1
CO	ppm	180	166	178	154	149	139
VOC	ppm	79	76	78	88	90	94
N2O	ppm	2	1	1	1	1	1
CH4	ppm	644	616	638	732	750	788
CO2	g/kWh	383	373	377	400	405	416
SO2	g/kWh	0.025	0.023	0.021	0.021	0.021	0.022

Table 1: Engine raw emissions in Gas mode

For redundancy the engine can switch to *Diesel mode* as a backup, with 100% of the energy coming from diesel fuel (ULSD), in case there is a problem with the gas supply system. The corresponding emissions are listed in Table 2.

Diesel mode		100	75	50	25	20	10
NOx	g/kWh	11.6	14.9	17.1	18.5	18.8	19.3
PM (Filterable)	mg/Nm3	8.4	12.1	11.6	8.6	8.0	6.8
PM10 (Filterable + Condensable)	mg/Nm3	8.4	12.1	11.6	8.6	8.0	6.8
PM2.5 (Filterable + Condensable)	mg/Nm3	8.0	11.7	11.3	8.1	7.6	6.5
CO	ppm	83	36	36	39	40	41
VOC	ppm	91	103	119	171	181	202
N2O	ppm	4	2	1	1	1	1
CO2	g/kWh	439	426	430	454	460	471
SO2	g/kWh	0.353	0.330	0.330	0.336	0.401	0.440

Table 2: Engine raw emissions in Diesel mode

[redacted] Emission Control System

A detailed description of the system can be found in document *21801.24.0.TGT-PL TGT Process description.pdf*

On a high level the emission abatement, or control system, consists of two main systems, the dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, downstream the turbocharger.

The dry system consists of an oxydation catalyst and and an SCR catalyst. The catalytic reduction of **CO** has an **efficiency** of over **99%**. The same system oxidises **VOC** emission with a conversion **efficiency** of **99%** The de-NOx unit is a classic, urea-based **SCR**-technology, the **efficiency** is expected to be higher than **90%**. Doing so the dry system **consumes 13.2 l/h of NH_3** (aq).

The wet system consists of 4 stages, which take further care of the **NOx with 90.9%** efficiency and the **SOx with 70% efficiency**. The four stages consume the following chemicals:

Chemical	%w	lb/gal	[gal/h]	[lb/h]
NH_3 (aq.)	19%	7.51	3.49	26.2
NaOH	50%	12.52	29.91	374.5
NaHS (reducing agent)	45%	10.85	0.11	1.1
NaClO2 (oxidizing agent)	25%	10.01	0.40	4.0
H_2SO_4	36%	10.68	0.10	1.1

Table 3: Use of chemicals for the emission control system

Normal Operation

Under normal circumstances the engines operate on gas at 75% load, at their peak efficiency, hence with lowest specific fuel consumption. They are stopped once a year for servicing, while another engine takes up this load. In *Normal Operation* mode one single engine consumes 4,574.1 lb/h of gas (98,924 ft^3/h) and 27.8 lb/h (3.91 gal/h) of ULSD.

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Doing so, it produces the following raw emissions:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
13.89	0.45	22.36	22.63	0.74	12,634	47.60	0.25	14,035

Table 4: Emissions of a single engine in Normal Operation
** with Global Warming Potential of 28 for Methane and 265 for laughing gas*

While one individual engine never sees a total run time of 8760 hours per year, there are 114 engines that do experience this as a collective. One single engine of the operated collective therefore consumes 20,035 short tons of gas per year (866,574,112 ft³/a) and 122 tons (34,273 gal/a) of ULSD per year and produces the following raw emissions:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
60.83	1.99	97.92	99.12	3.25	55,339	208	1.1	61,472

Table 5: Emissions of 1 engine under Normal Operation (8760 hours)

The abatement system reduces the emissions the following:

	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]
Speed up	0%	0%	0%	0%	95%
Fuel Changeover	0%	0%	0%	0%	99%
Generator switched on	0%	0%	0%	0%	99%
Load up cold control	25%	0%	25%	25%	99%
Normal Operation	99%	25%	99%	99%	99%
Compensation Mode	99%	25%	95%	99%	99%
Ramp down	99%	25%	94%	99%	99%
Min load	70%	0%	50%	70%	70%
Spin out	40%	0%	35%	40%	40%
Emergency Mode	98%	25%	91%	99%	99%

Table 6: Emission abatement efficiency for each individual emission type

Resulting in the total yearly emissions per engine of:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
0.61	1.49	1.47	0.99	0.03	55,339	208	1.1	61,472

Table 7: Total yearly emissions of a single engine after emission treatment

Start up and Shut down operation

Additionally, one start up and shut down is foreseen. During the individual sequences one engine produces the following emissions:

	Load [%]	Abat.* [%]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
Speed up	10%	0.00%	89.54	0.34	2.50	19.49	0.10	3,217	0	0.12	3,274
Fuel Switch	10%	0.00%	4.81	0.53	8.65	13.07	0.00	1,807	28.03	0.12	2,740
Generator on	20%	0.00%	8.15	0.46	9.25	12.48	0.00	3,535	26.7	0.12	4,529
Load up	25%	25%	9.26	0.43	9.54	12.19	0.00	4,370	26.03	0.12	5,386
Ramp down	40%	100%	10.37	0.32	13.79	14.95	0.00	6,777	31.74	0.15	8,063
Min load	20%	70%	8.15	0.46	9.25	12.48	0.07	3,535	26.7	0.12	4,529
Spin out	10%	40%	4.81	0.53	8.65	13.07	0.07	1,807	28.03	0.12	2,740

Table 8: Emission during the different stages of Startup and Shut down phase
**of the efficiencies mentioned above in Table 6.*

In total during one startup and a shutdown sequence one single engine emits the following:

NOx [t]	PM [t]	CO [t]	VOC [t]	SOx [t]	CO2 [t]	Methane [t]	N2O [t]	CO2_eq [t]
0.0049	0.0002	0.0016	0.0026	0.0000	1.9675	0.0104	0.0001	2.2724
[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]
9.74	0.31	3.22	5.12	0.02	3,935	20.77	0.11	4,545

Table 9: Emissions during a startup and shutdown sequence for one single engine.

Normal Operation Scenario

Therefore, under normal circumstances the 117 engines emit the following over one year, including one startup and shutdown sequence, each:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
69.9	169.9	167.6	113.3	3.7	6,308,872	23,768	127.1	7,008,055

Table 10: Entire yearly emissions for the entire plant und normal circumstances.

To do so, the entire plant consumes 2,284,014.5 tons of natural gas (98,792,705,589 ft^3) coming in a pipeline and 13,876 tons of diesel (3,908,687 gal) which will be shipped on site.

Emergency Mode

In case when no gas is available, the engines can be operated in so called emergency mode and the power comes from diesel. In this mode a single engine consumes 5666.8 lb/h (798 gal/h) and emits the following:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
10.35	1.29	0.58	0.29	0.11	17,896	0.00	0.67	18,073

Table 11: Controlled hourly emissions per engine in Emergency Mode

Compensation Mode

In case some engines should for any reason fail, the remaining engines will compensate for the loss of power, by increasing their power output. Here the worst case, of each engine ramping up to 100% load, is looked at. Under such conditions the engines consume 6,386 lb of natural gas per hour (138,112 ft³) and 27.8 lb/h of ULSD (3.91 gal/h). The following emissions result from this kind of operation:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
0.46	0.20	1.41	0.27	0.01	17,605	57.73	0.59	19,378

Table 12: Controlled hourly emissions per engine in Compensation Mode

Worst case scenario

As shown earlier, under Normal Operation conditions the engines stay well below the 250 t/year limit for all the regulated emissions. But to ensure that the power plant can be operated under worst case conditions, the following, unrealistic but not impossible scenario was looked at:

The pipeline is out for 8 days (192 hours); hence the power plant is operated on diesel. In the same year an unforeseeable event takes down 31 engines (26% of the entire plant) and the remaining 86 engines will compensate for by delivering the full power, increasing their output to 99.4% load. This situation lasts 24 days (567 hours). Additionally, the engines have to be started up and shut down 5 times, instead of once per year.

The engines are therefore for the following number of hours operated in the corresponding mode:

Speed up	0.42
Fuel Switch	0.17
Generator switched on	0.42
Load up cold control	0.83
Normal Operation	7996.80
Compensation Mode	567.20
Ramp down	1.67
Min load	0.42
Spin out	0.08
Emergency Mode	192.00
Total operational time	**8760**

Table 13: Operational time in hours for each engine mode under worst case scenario

Under this scenario and the consequent operational profiles, the entire plant will emit the following emissions per year:

	Gas	Diesel	NOx	PM	CO	VOC	SO2	CO2_e
	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]
Speed up	0.00	24.19	2.13	0.01	0.06	0.46	0.00	77
Fuel Switch	6.56	0.10	0.05	0.01	0.08	0.12	0.00	25
Generator switched on	32.02	0.40	0.19	0.01	0.22	0.30	0.00	102
Load up cold control	79.11	0.88	0.33	0.02	0.34	0.43	0.00	244
Normal Operation	213,6163	12,661	63.31	155.11	152.86	103.15	3.38	6397261
Compensation Mode	208,133	898	14.97	17.22	45.53	8.84	0.33	626484
Ramp down	244.63	2.11	0.01	0.03	0.08	0.01	0.00	732
Min load	32.02	0.40	0.06	0.01	0.11	0.09	0.00	102
Spin out	3.28	0.05	0.01	0.00	0.03	0.04	0.00	12
Emergency Mode	0.00	61,751	113.24	14.11	6.31	3.15	6.22	197796
Total	**2,291,799**	**75,605**	**194**	**187**	**206**	**117**	**10**	**7,222,837**

Table 14: Total yearly emissions of the entire power plant under worst case scenario

Hazardous emissions

The hazardous emissions are calculated based on the distribution described in EPA AP-42, Table 3.2-1, 3.2-3 and 3.2-4.
The emissions are calculated as a percentage of the VOC (NMHC) emissions.

NMHC	Benzene	Toluene	Xylenes	Formaldehyde	Acrolein	Acetaldehyde	Naphthalene
0.2	0.000776	0.000281	0.000193	0.0000789	0.00000788	0.0000225	0.00013
100%	**0.388%**	**0.141%**	**0.097%**	**0.039%**	**0.004%**	**0.011%**	**0.065%**

Table 15: Hazardous emission according to EPA AP-42 in lb/MMBtu and as a percentage of the Non-Methane Hydrocarbons

With a reduction factor of 99% the Benzene emissions on an hourly basis per engine, and on a yearly basis for the entire plant are the following:

Benzene, 0.388% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.07564	0.00036	0.0%	0.07564	0.00036
Fuel Switch	0.03	13.07	0.05070	0.00010	0.0%	0.05070	0.00010
Generator switched	0.08	12.48	0.04844	0.00023	0.0%	0.04844	0.00023
Load up cold control	0.17	12.19	0.04731	0.00045	25.0%	0.03548	0.00034
Normal Operation	8000	22.63	0.08780	40.03794	99.0%	0.00088	0.40038
Compensation Mode	567	27.34	0.10608	3.42968	99.0%	0.00106	0.03430
Ramp down	0.33	14.95	0.05802	0.00110	99.0%	0.00058	0.00001
Min load	0.08	12.48	0.04844	0.00023	70.0%	0.01453	0.00007
Spin out	0.02	13.07	0.05070	0.00005	0.0%	0.05070	0.00005
Emergency Mode	192	28.75	0.11156	1.22087	99.0%	0.00112	0.01221

Table 16: Calculation of the Benzene hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Benzene emissions of 896 pounds per year.

Toluene, 0.141% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.02739	0.00013	0.0%	0.02739	0.00013
Fuel Switch	0.03	13.07	0.01836	0.00003	0.0%	0.01836	0.00003
Generator switched	0.08	12.48	0.01754	0.00008	0.0%	0.01754	0.00008
Load up cold control	0.17	12.19	0.01713	0.00016	25.0%	0.01285	0.00012
Normal Operation	8000	22.63	0.03179	14.49827	99.0%	0.00032	0.14498
Compensation Mode	567	27.34	0.03841	1.24193	99.0%	0.00038	0.01242
Ramp down	0.33	14.95	0.02101	0.00040	99.0%	0.00021	0.00000
Min load	0.08	12.48	0.01754	0.00008	70.0%	0.00526	0.00002
Spin out	0.02	13.07	0.01836	0.00002	0.0%	0.01836	0.00002
Emergency Mode	192	28.75	0.04040	0.44209	99.0%	0.00040	0.00442

Table 17: Calculation of the Toluene hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Toluene emissions of 325 pounds per year.

Xylenes, 0.097% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.01881	0.00009	0.0%	0.01881	0.00009
Fuel Switch	0.03	13.07	0.01261	0.00002	0.0%	0.01261	0.00002
Generator switched	0.08	12.48	0.01205	0.00006	0.0%	0.01205	0.00006
Load up cold control	0.17	12.19	0.01177	0.00011	25.0%	0.00882	0.00008
Normal Operation	8000	22.63	0.02184	9.95789	99.0%	0.00022	0.09958
Compensation Mode	567	27.34	0.02638	0.85300	99.0%	0.00026	0.00853
Ramp down	0.33	14.95	0.01443	0.00027	99.0%	0.00014	0.00000
Min load	0.08	12.48	0.01205	0.00006	70.0%	0.00361	0.00002
Spin out	0.02	13.07	0.01261	0.00001	0.0%	0.01261	0.00001
Emergency Mode	192	28.75	0.02775	0.30364	99.0%	0.00028	0.00304

Table 18: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Xylenes emissions of 223 pounds per year.

Formaldehyde, 0.039% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.00769	0.00004	0.0%	0.00769	0.00004
Fuel Switch	0.03	13.07	0.00515	0.00001	0.0%	0.00515	0.00001
Generator switched	0.08	12.48	0.00492	0.00002	0.0%	0.00492	0.00002
Load up cold control	0.17	12.19	0.00481	0.00005	25.0%	0.00361	0.00003
Normal Operation	8000	22.63	0.00893	4.07087	99.0%	0.00009	0.04071
Compensation Mode	567	27.34	0.01079	0.34871	99.0%	0.00011	0.00349
Ramp down	0.33	14.95	0.00590	0.00011	99.0%	0.00006	0.00000
Min load	0.08	12.48	0.00492	0.00002	70.0%	0.00148	0.00001
Spin out	0.02	13.07	0.00515	0.00000	0.0%	0.00515	0.00000
Emergency Mode	192	28.75	0.01134	0.12413	99.0%	0.00011	0.00124

Table 19: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Formaldehyde emissions of 92 pounds per year.

Acrolein, 0.004% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.00077	0.000004	0.0%	0.00077	0.000004
Fuel Switch	0.03	13.07	0.00051	0.000001	0.0%	0.00051	0.000001
Generator switched	0.08	12.48	0.00049	0.000002	0.0%	0.00049	0.000002
Load up cold control	0.17	12.19	0.00048	0.000005	25.0%	0.00036	0.000003
Normal Operation	8000	22.63	0.00089	0.406571	99.0%	0.00001	0.004066
Compensation Mode	567	27.34	0.00108	0.034827	99.0%	0.00001	0.000348
Ramp down	0.33	14.95	0.00059	0.000011	99.0%	0.00001	0.000000
Min load	0.08	12.48	0.00049	0.000002	70.0%	0.00015	0.000001
Spin out	0.02	13.07	0.00051	0.000000	0.0%	0.00051	0.000000
Emergency Mode	192	28.75	0.00113	0.012397	99.0%	0.00001	0.000124

Table 20: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acrolein emissions of 9 pounds per year.

Acetaldehyde, 0.011% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.00219	0.000010	0.0%	0.00219	0.000010
Fuel Switch	0.03	13.07	0.00147	0.000003	0.0%	0.00147	0.000003
Generator switched	0.08	12.48	0.00140	0.000007	0.0%	0.00140	0.000007
Load up cold control	0.17	12.19	0.00137	0.000013	25.0%	0.00103	0.000010
Normal Operation	8000	22.63	0.00255	1.160894	99.0%	0.00003	0.011609
Compensation Mode	567	27.34	0.00308	0.099443	99.0%	0.00003	0.000994
Ramp down	0.33	14.95	0.00168	0.000032	99.0%	0.00002	0.000000
Min load	0.08	12.48	0.00140	0.000007	70.0%	0.00042	0.000002
Spin out	0.02	13.07	0.00147	0.000001	0.0%	0.00147	0.000001
Emergency Mode	192	28.75	0.00323	0.035399	99.0%	0.00003	0.000354

Table 21: Calculation of the Acetaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acetaldehyde emissions below 26 pounds per year.

Naphthalene, 0.065% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.01267	0.00006	0.0%	0.01267	0.00006
Fuel Switch	0.03	13.07	0.00849	0.00002	0.0%	0.00849	0.00002
Generator switched	0.08	12.48	0.00811	0.00004	0.0%	0.00811	0.00004
Load up cold control	0.17	12.19	0.00793	0.00008	25.0%	0.00594	0.00006
Normal Operation	8000	22.63	0.01471	6.70739	99.0%	0.00015	0.06707
Compensation Mode	567	27.34	0.01777	0.57456	99.0%	0.00018	0.00575
Ramp down	0.33	14.95	0.00972	0.00018	99.0%	0.00010	0.00000
Min load	0.08	12.48	0.00811	0.00004	70.0%	0.00243	0.00001
Spin out	0.02	13.07	0.00849	0.00001	0.0%	0.00849	0.00001
Emergency Mode	192	28.75	0.01869	0.20453	99.0%	0.00019	0.00205

Table 22: Calculation of the Acetaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acetaldehyde emissions below 150 pounds per year.

Liquid and fuel handling

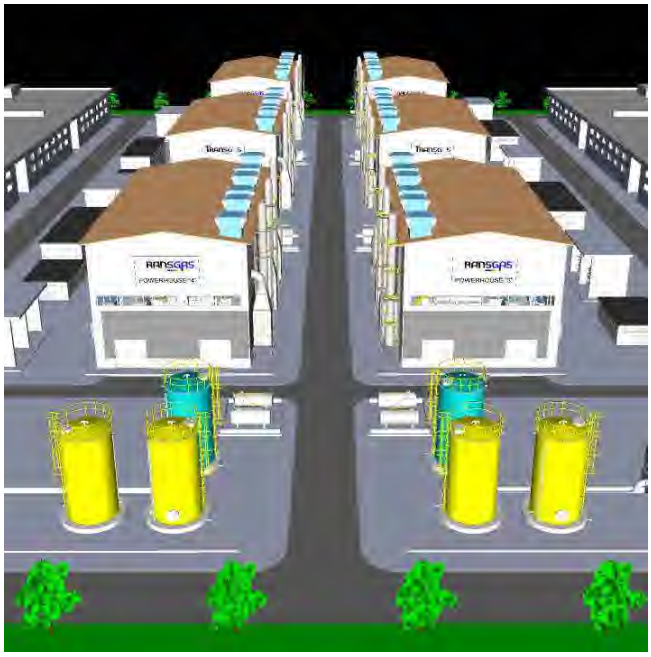


Figure 4: Liquid Storage in front of a set of power houses:
Yellow: Diesel tanks,
Greenish: Water tanks
White: Oil and component tanks

On-site Water Storage

For fire protection and supplementary cooling, the facility maintains an on-site water storage capacity of 2,641,721 gallons, distributed over the entire plant in 14 tanks with 26 feet in diameter and 44 feet in height.

Ultra Low Sulfur Diesel

The engines consume 13,876 tons of ULSD per year (10,704 gal/day) which will be transported on site. To ensure fire safety and to protect the valuable hardware within the data center, the volume of flammable liquids stored on-site will be minimized. For emergency preparedness, a three-day supply of 25,000 tons will be maintained in multiple smaller storage tanks. The rest will be in strategic locations nearby.

The diesel will be stored in 40 tanks distributed across the entire plant, 26 feet in diameter and 44 feet in height.

Lubrication Oil

The engines consume about 2,025 tons of lubrication oil per year (1563 gal/day), which will be shipped on site. Additionally, about 20 tons will be stored on site, in tanks of 160 gallon in each power house.

Natural Gas

The gaseous fuel will be transported by pipeline.

Emission Control Components

For the emission abatement system liquids are transported to the site. A 3-day storage will be kept on site.

Component	Consumption		Storage
-	[t/a]	[gal/h]	[t]
NH_3 (aq)	13’078	3.49	108
NaOH	186’984	29.91	1537
NaHS (reducing agent)	572	0.11	5
NaClO2 (oxidizing agent)	1’995	0.40	17
H_2SO_4	535	0.10	5

Table 23: List of chemicals yearly used, and amount stored on site

The Storage will be in the corresponding standard tanks for these liquids, horizontally arranged tanks of 16 feet length and 7 feet diameter.

Chemicals in Use

- Hydrous Ammonia
- Caustic Soda NaOH
- Sulfuric Acid H2SO4
- NaClO2 (oxidizing agent)
- NaHS (reducing agent)

ANNEX

The 117 engines will be arranged according to the plan on Figure 5. It shows the map of the site, with 7 pods. Every pod holds two large buildings on the outer side, housing the data centers and 6 power houses in the middle (magenta/pink). A powerhouse holds three engine-generator setups (genset), auxiliaries and parts of the emission control systems. This gives theoretically space for 7 x 6 x 3 = 126 gensets. The remaining three buildings will be used for logistical and storage purposes though (spare parts, fluid preparation etc.)

Figure 5: Site plan showing the 7 pods

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Fuel Storage - Site Wide	2. Tank Name 40
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) T1 through T40 (118S - 157S)	4. Emission Point Identification No. (as assigned on *Equipment List Form*)
5. Date of Commencement of Construction (for existing tanks) 2026	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Not Applicable	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). Not Applicable	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): None	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 170,000 gallons	
9A. Tank Internal Diameter (ft) 26	9B. Tank Internal Height (or Length) (ft) 44
10A. Maximum Liquid Height (ft) 43 ft.	10B. Average Liquid Height (ft) NA
11A. Maximum Vapor Space Height (ft) 1 ft.	11B. Average Vapor Space Height (ft) NA
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 170,000 gallons	

13A. Maximum annual throughput (gal/yr) 3.907 MM gal/yr total for all tanks (Normal Operation)	13B. Maximum daily throughput (gal/day) 10,704 gal/day total all tanks	
14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume) Average of 4 turnover/tank per year		
15. Maximum tank fill rate (gal/min)		
16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading		
17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply		
17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year	

18. Type of tank (check all that apply):
- ☒ Fixed Roof — X vertical — ___ horizontal — ___ flat roof — ___ cone roof — X dome roof — ___ other (describe)
- ☐ External Floating Roof — ___ pontoon roof — ___ double deck roof
- ☐ Domed External (or Covered) Floating Roof
- ☐ Internal Floating Roof — ___ vertical column support — ___ self-supporting
- ☐ Variable Vapor Space — ___ lifter roof — ___ diaphragm
- ☐ Pressurized — ___ spherical — ___ cylindrical
- ☐ Underground
- ☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: Tank construction not selected yet. See TANKS Summary Sheet attached. ☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)		
20A. Shell Color	20B. Roof Color	20C. Year Last Painted
21. Shell Condition (if metal and unlined): ☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable		
22A. Is the tank heated? ☐ YES ☐ NO		
22B. If YES, provide the operating temperature (°F)		
22C. If YES, please describe how heat is provided to tank.		
23. Operating Pressure Range (psig): to		
24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply		
24A. For dome roof, provide roof radius (ft)		
24B. For cone roof, provide slope (ft/ft)		
25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply		
25A. Year Internal Floaters Installed:		
25B. Primary Seal Type: (check one) ☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal ☐ Vapor Mounted Resilient Seal ☐ Other (describe):		
25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO		
25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):		
25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO		

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. See TANKS Summary Sheet
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid: See TANKS Summary Sheet	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☒ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
See TANKS Summary Sheet					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☐ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tanks 1-40
City:	Charleston
State:	West Virginia
Company:	Transgas
Type of Tank:	Vertical Fixed Roof Tank
Description:	Diesel Tanks

Tank Dimensions

Shell Height (ft):	44.00
Diameter (ft):	26.00
Liquid Height (ft) :	43.00
Avg. Liquid Height (ft):	21.50
Volume (gallons):	170,000.00
Turnovers:	4.00
Net Throughput(gal/yr):	680,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	26.00

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	56.67	51.31	62.04	55.00	0.0058	0.0048	0.0070	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	25.2731
Vapor Space Volume (cu ft):	12,211.8942
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0417
Vented Vapor Saturation Factor:	0.9929
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	12,211.8942
Tank Diameter (ft):	26.0000
Vapor Space Outage (ft):	23.0010
Tank Shell Height (ft):	44.0000
Average Liquid Height (ft):	21.5000
Roof Outage (ft):	0.5010
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5010
Dome Radius (ft):	26.0000
Shell Radius (ft):	13.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Daily Avg. Liquid Surface Temp. (deg. R):	516.3441
Daily Average Ambient Temp. (deg. F):	54.9833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	514.6733
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,250.5726
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0417
Daily Vapor Temperature Range (deg. R):	21.4567
Daily Vapor Pressure Range (psia):	0.0022
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0070
Daily Avg. Liquid Surface Temp. (deg R):	516.3441
Daily Min. Liquid Surface Temp. (deg R):	510.9799
Daily Max. Liquid Surface Temp. (deg R):	521.7082
Daily Ambient Temp. Range (deg. R):	21.5333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9929
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.0058
Vapor Space Outage (ft):	23.0010
Working Losses (lb):	12.2809
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Annual Net Throughput (gal/yr.):	680,000.0000
Annual Turnovers:	4.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	170,000.0000
Maximum Liquid Height (ft):	43.0000
Tank Diameter (ft):	26.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	37.5540

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	12.28	25.27	37.55

ATTACHMENT M

AIR POLLUTION CONTROL DEVICE(S)

REDACTED
Information Claimed Confidential by
TransGas Development Systems, LLC
March 24, 2025

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table): 1C – 117C

Equipment Information

1. Manufacturer: [redacted] Model No. NA	2. Control Device Name: Control System Type: Various
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: 100%	
8. Attached efficiency curve and/or other efficiency information. See Attached	
9. Design inlet volume: See Attached SCFM	10. Capacity: See Attached
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any. This emission abatement system is multi-phase and includes DeCO, DeNO$_x$, DeSO$_x$, and We-NO$_x$. The system controls VOC (VOC HAPs), NOx, PM, CO, and SO$_x$ emissions. A description of the system and each stage is provided on the attachment to this form.	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment. See Attached	
13. Description of method of handling the collected material(s) for reuse of disposal. Spent catalyst and other discardable materials are removed from the site.	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	☒ No
Are particulates present?	☒ Yes	☐ No
Are metals present?	☒ Yes	☐ No

15. Inlet Emission stream parameters:	Maximum	Typical
Pressure (mmHg):		
Heat Content (BTU/scf):	See Attached	
Oxygen Content (%):		
Moisture Content (%):		
Relative Humidity (%):		

16. Type of pollutant(s) controlled: ☒ SO_x ☐ Odor
☒ Particulate (type): Combustion Byproducts ☒ Other NO_x, VOC (VOC HAPs), CO

17. Inlet gas velocity: See Attached ft/sec	18. Pollutant specific gravity: NA
19. Gas flow into the collector: See Attached ACF @ °F and PSIA	20. Gas stream temperature: See Attached Inlet: °F Outlet: °F
21. Gas flow rate: See Attached Design Maximum: ACFM Average Expected: ACFM	22. Particulate Grain Loading in grains/scf: See Attached Inlet: Outlet:

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant		Emission Capture Efficiency %	OUT Pollutant		Control Efficiency %
	lb/hr	grains/acf		lb/hr	grains/acf	
A	See attached document for a description of each control stage.					
B						
C						
D						
E						

24. Dimensions of stack: Height ft. Diameter ft.

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.

Particulate Distribution

26. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	**Weight % for Size Range**	**Weight % for Size Range**
0 – 2		
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12	See Attached	
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

See Attached

28. Describe the collection material disposal system:

Spent or collected material is shipped offsite for disposal or regeneration/reuse.

29. Have you included ***Other Collectores Control Device*** in the Emissions Points Data Summary Sheet?

30. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING: Amount of emissions control fluids utilized.	RECORDKEEPING: Amount of emissions control fluids utilized.
REPORTING: None	TESTING: As requested by the permit.

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

31. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

See Attached

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

See Attached

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

The controls are designed to operate within the operational ranges of the engines.

PROCESS DESCRIPTION for

POLLUTION CONTROL for

NATURAL GAS ENGINE EMISSIONS

Abatement system Package

Prepared for

Transgas – Adams Fork project
February 10, 2025
Rev. 03

1. Introduction

Below is a description of the basic concept on which the proposed system is based, together with some preliminary evaluations about the foreseen chemicals consumption.

The overall process scheme is presented in the **attachment 1 – OVERALL PROCESS SCHEME** and detailed below.

The configuration and equipment sizing has been studied for the maximum flow rate – corresponding to 100% load of the engine with iCER, 21.000 kW of mechanical power at shaft when engine runs in compensation mode, and the maximum load of pollutants.

The system described below will be installed individually for each engine.

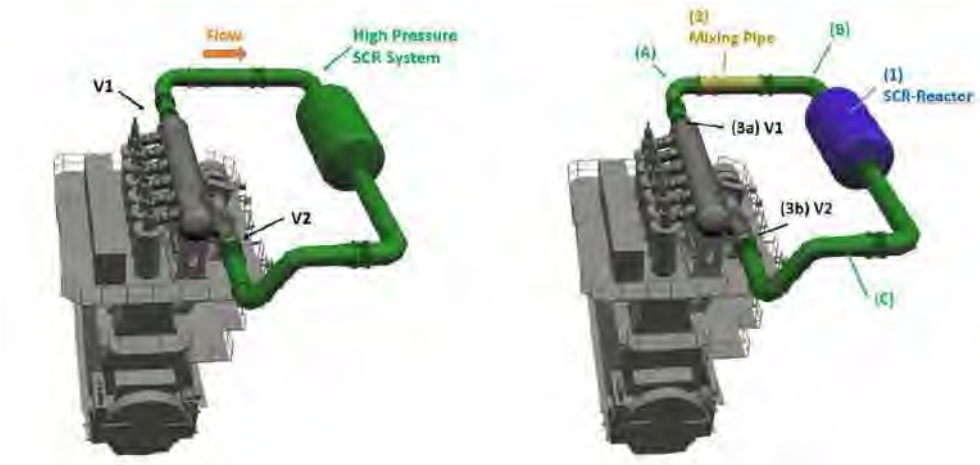
Attachment 2 rev 02– EMISSION ABATEMENT STEPS shows the pollutant flow at each stage (A to D), as indicated in the overall process scheme, with the target of reaching the maximum total emission level of:

- NOx < 250 tpy (short)
- CO < 250 tpy (short)
- SOx < 250 tpy (short)
- PM < 250 tpy (short)

for a total of 114 engines operating at the same time and continuously at maximum load.

2. Description of the dry deCO + deNOx system

Dry flue gas treatment system is installed before the turbocharger, so at high pressure. An example of such an installation is shown in the picture below (please note that the picture shows the deNOx reactor only and not the deCO).



The first stage of the dry deCO and deNOx system is the catalytic removal of CO in a dedicated deCO reactor.

Here the data at deCO reactor inlet when engine is in Normal Operation are summarized:

Data	unit	NORMAL OPERATION
Flow rate	kg/s kg/h	34.4 123,840
Gas density	kg/mc	1.27
Vol. flow rate	Am^3/h	241.878
Normalized flow	Nm^3/h	97,512
Static Pressure IN	barg	4,12
Temperature	°C	360
NOx Load	kg/hr	6.3
NOx Ratio	$NO:NO_2$	90:10
CO load	kg/hr	19.82
VOCs load	Kg/hr	39,5
H_2O	Vol%	7.8%
N_2	Vol%	77.1%
O_2	Vol%	4%
CO2	Vol%	6.8%
SO_2	Kg/h	0,74

Table 1 – Exhaust features at Genset outlet (before turbine)–

Flue gas is distributed to a layer of oxidation catalyst where CO is removed according to the following reaction:

(1) $2CO + O_2 \rightarrow 2\ CO_2$

CO catalytic removal can reach efficiency close to 100%. In this case, the catalyst will be selected to reach up to 98% efficiency when running in Normal Operation mode with natural gas and iCER system.

DeCO reactor has also the function to oxidize VOCs to CO_2 and H_2O; in particular, formaldehyde, by far the most important VOC, will be removed with efficiency >99%.

After deCO reactor, flue gas flows to another reactor equipped with deNOx catalyst. In the space between deCO reactor and deNOx reactor, urea ($CO(NH_2)_2$) or ammonia solution is injected. The system for reagent injection is mainly composed by:

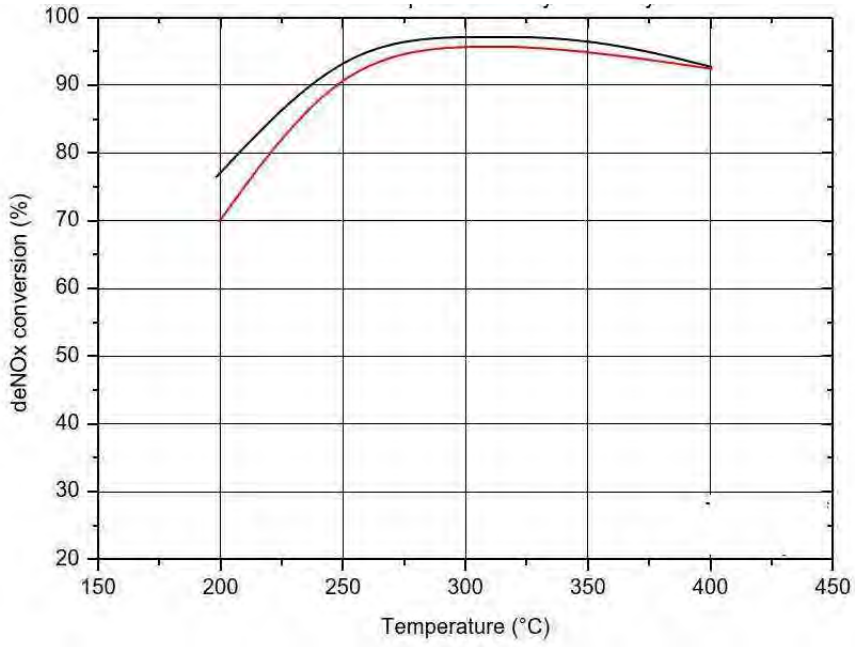
- *Flow Control Unit (FCU)* Complete Control skid to feed the injection lances with pneumatic control valve, MID flow meter, Manometers and valves complete mounted on a skid
- *Evaporator System* (if urea is used as reagent) with Ambient Air Blower, Pneumatic On-Off-Damper, Flowmeter, Pressure and Temperature Transmitter, Air Preheater and Spray Evaporator with Injection Lance. This is needed because for removing NO_x, urea must be heated to be converted to NH_3, CO_2 and H_2O.
- *Reagent / Compressed Air - Direct Injection Lances* (if ammonia solution is used as reagent) for installation into flue gas duct. Compressed air is used for generating very fine reagent droplet by means of specially design nozzles (see pictures of lance and nozzle below)

- *Detailed 3D CFD-Optimization* is needed for Complete flue gas ductwork design from deCO reactor exit till catalyst outlet including Reagent Direct Injection, Static Mixing System, and guide vanes (if required). Results of velocity, pressures NOx-NH_3 distribution values on top of first catalyst layer till all guarantees are met.
- *Static Mixer System* based on final CFD optimization to mix NH_3 and NO_x.

After reagent injection and mixing, in presence of catalyst based on vanadium pentoxide (V_2O_5) NOx are removed by NH_3 according to the following reactions (with several secondary and intermediate reactions), that occur at temperatures between 180°C and 500°C

(2) $2NO + 2NH_3 + ½\ O_2 \rightarrow 2N_2 + 3H_2O$
(3) $NO_2 + 2NH_3 + ½\ O_2 \rightarrow 3/2\ N_2 + 3H_2O$
(4) $NO + NO_2 + 2NH_3 + ½\ O_2 \rightarrow 2\ N_2 + 3H_2O$

Catalytic nitrogen oxides removal can achieve very high efficiency as shown in the graph below:



NO_x removal at Adam Forks occurs in the best temperature range, where efficiency higher that 90% is possible; anyway, it is assumed that maximum 90% removal is reached in deNO_x catalytic

reactor. A quantity of 13.2 lt/h of ammonia, in its typical aqueous solution at 19%, is needed to achieve the reaction when engine is running in Normal Operation.

After the deNOx, the gas is sent to the turbocharger and then it is split into two streams. One part, after being cooled, goes back to the engine, mixing with combustion air (flue gas recirculation); the remaining part, with a flow of 17.6 kg/s, represents the exhaust that is first quenched to 58°C, and then enters into the We-NOx system for SOx and NOx wet abatement.

3. Description of the wet system

The We-NOx system is a multistage plant:

- The first stage is designed for the removal of SOx and any other acids carried over by exhaust gases.
- The second and third stages are for the removal of NOx. These stages are based on an ORP process, an oxidation-reduction mechanism that converts NOx into gaseous nitrogen (N_2), achieving a "zero instrumental" concentration at the stack if required.
- The fourth stage serves as the finishing and control unit to complete the process.

For better understanding, we would like to refer to the case at hand and describe step by step the entire process of NOx removal from the exhaust:

3.1 AVAILABLE DATA (inlet data to the De-SOx/We-NOx, downstream the dry treatment):

Data	unit	Normal Operation – 75% gas
Flow rate	kg/s kg/h	17,6 63.360
Gas density	kg/Nmc	1,27
Vol. flow rate	ACMH	95.798
Normalized flow	Nmc/h	49.890
Static Pressure IN	mm.w.g	700
Temperature	°C	215
NOx Load	kg/hr	0,322
NOx Ratio	NO:NO_2	90:10
SO_2	Kg/h	0,380
H_2O	Vol %	17,87
N_2	Vol %	72.04
O_2	Vol %	3.74
CO_2	Vol %	6.35

Table 2 – Exhaust features at engine outlet–

All following data have been calculated based upon Normal Operation 75% gas.

3.2 REQUESTED EFFICIENCY AT NORMAL OPERATION

- NOx = 80,45% [$0,322_{IN}$; $0,063_{OUT}$]
- SOx = 70.0% [$0,380_{IN}$; $0,152_{OUT}$]

The above efficiencies have been evaluated in the worst-case scenario. Of course, the same results in terms of removal efficiency can be achieved also in any other scenario.

Anyway, real removal efficiency of wet deSOx system will be much higher than the requested one, to avoid elemental sulfur formation in the following steps on treatment process.

3.3 CHEMICALS IN USE

- Caustic NaOH
- Sulfuric Acid H_2SO_4
- $NaClO_2$ (oxidizing agent)
- NaHS (reducing agent)

4. Wet Stage 1 (De-SOx)

This is a chemical-physical absorption unit where the acidic pollutants carried out by the exhaust are removed. Sulfur oxides, hydrogen halides, and any other acidic components are removed. The chemical in use is Caustic. Just as an example let's analyze one of the several reactions that happen at this stage:

(5) $SO_2 + NaOH \rightarrow NaHSO_3$

Acting opportunely on the operation parameters also the following reaction may take place in this stage:

(6) $SO_2 + 2NaOH \rightarrow Na_2SO_3 + H_2O$

With a similar mechanism, the other acids are also neutralized and removed from the exhaust.

With such a mass transfer from Gas phase to Liquid phase a gaseous pollutant (SO_2) is changed into a dissolved solids and carried over from the system through the liquid waste of the stage.

4.1 Performance of the wet stage 1 (De-SOx/We-NOx)

Pollutant	Inlet load (kg/h)	Abatement efficiency (%)	Outlet (kg/h)	Outlet on a yearly basis (kg/y)
SO_2	0.38	* *	0.036	sent to stages 3 and 4
NO	NA	NA	NA	NA
NO_2	0.03	* *	0.027 (sent to stage 3 and 4)	sent to stages 3 and 4

Table 3 – Performance of stage 1 –

4.2 Expected consumption of chemicals in wet stage 1

Chemical	Consumption (liters/hour)	Consumption on a yearly basis (m^3/y)
NaOH (50% w) (*)	~~40,8~~ 4.16	~~358~~ 36

(**) Compare tabulated values in ATTACHMENT2

H_2SO_4 (36%% w)	0.0	0.0
$NaClO_2$ (20% w)	0.0	0.0
NaHS (45% w)	0.0	0.0

Table 4 – Expected consumption of chemicals in stage 1 –

(*) keeping the pH at low level 7.8 for lower absorption of CO2 (1.53 kg/hr only). With such pH value the neutralization is slower, but a much smaller consumption of caustic is ensured.

5. Wet stage 2

The main nitrogen oxides emitted during combustion processes are nitric oxide (NO), nitrogen dioxide (NO_2), and nitrous oxide (N_2O). Since the primary contribution in combustion processes comes from the first two, NOx is generally considered the sum of NO and NO_2. Other nitrogen oxides, such as NO_3 and N_2O_5, are present in much lower concentrations compared to the first two.

However, all the species mentioned above, when subjected to the We-NOx process, will be converted into atmospheric nitrogen. Specifically:

- NO and N_2O will be oxidized to NO_2.

This will occur through the following half-reactions:

(7) NO: $N^{2+} \rightarrow N^{4+} + 2e^-$
(8) N_2O: $N^{1+} \rightarrow N^{4+} + 3e^-$

To achieve the perfect completion of the reactions (7) and (8) a strong oxidizing agent must be used.

The kinetics of the reactions (7) and (8) are instantaneous so that at the exit of the second stage the residual NOx forms are: NO_2, NO_3, N_2O_5, which will be removed in the third stage.

5.1 Performance of wet stage 2

Pollutant	Inlet load (kg/h)	Abatement efficiency (%)	Outlet (kg/h)	Outlet on a yearly basis
SO_2	0.03	0	0.03	sent to stages 3 and 4
NO	0.29	* *	0.013	Sent to next stages
NO_2	0.027	NA	0.45(*)	Sent to stages 3 and 4

Table 5 – Performance of wet stage 2 –

(*) the increase is due to the conversion of NO to NO_2 in the reactor of stage 2

5.2 Expected chemical consumption in wet stage 2

Chemical	Consumption (liters/hour)	Consumption on a yearly basis (m^3/y)

(**) Compare tabulated values in ATTACHMENT2

NaOH (50% w)	0.0	0.0
H_2SO_4 (36%% w)	0.38	3.3
$NaClO_2$ (20% w)	1.51	13.3
NaHS (45% w)	0.0	0.0

Table 6 – Expected consumption of chemicals in stage 2 –

6. Wet stage 3

In the third stage the residual NOx forms NO_2, NO_3, N_2O_5 are chemically reduced to gaseous nitrogen N_2, through the following partial ionic reaction:

(9) $N^{4+} + 4e^- \rightarrow N^0$
(10) $N^{6+} + 6e^- \rightarrow N^0$
(11) $N^{5+} + 5e^- \rightarrow N^0$

N^0 is the oxidation state of gaseous nitrogen. At the completion of this stage the We-NOx process will have given nitrogen back to the atmosphere as before the combustion reaction of fuel with air excess in the NOx source (as an endothermic engine or a furnace or oven). To achieve the perfect completion of the reactions (9), (10) and (11), a strong reducing agent must be used.

NOTE: the oxidizing and reducing agents are fundamental and have been chosen with accuracy, to avoid any undesired by-product to be produced during the process. The We-NOx process is Ozone-free, and no ozone is developed or produced during the process.

6.1 Performance of wet stage 3

Pollutant	Inlet load (kg/h)	Abatement efficiency (%)	Outlet (kg/h)	Outlet on a yearly basis
SO_2	0.03	99.99	traces	End
NO	0.013	NA	0.013	Sent to next stages
NO_2	0.45	* *	0.018	sent to stage 4

Table 7 – Performance of wet stage 3 –

6.2 Expected chemicals consumption in wet stage 3

Chemical	Consumption (liters/hour)	Consumption on a yearly basis (m^3/y)
NaOH (50% w) (*)	~~223~~ 68.58	~~1953~~ 600.7
H_2SO_4 (36%% w)	0.0	0.0
$NaClO_2$ (20% w)	0.0	0.0
NaHS (45% w)	0.4	3.5

Table 8 – Expected chemicals consumption in wet stage 3 –

(*) Keeping the pH at 8.5 instead of 9 reduces the caustic consumption. The recommended value is pH = 9. However, it is possible to manage also with pH = 8.5 with a closer control.

(**) Compare tabulated values in ATTACHMENT2

7. Wet stage 4

This is a finishing stage where the eventual excess of reactants coming from the previous stages carried over by the exhaust (chemical mists, by-products etc.) is removed so to send the purified exhaust straight to the stack with no further pollutants except traces allowed by the regulations. The chemical in use in wet stage 4 is just caustic soda NaOH to keep the pH high enough to remove acidic traces carried over from the previous stages.

7.1 Performance of wet stage 4

Pollutant	Inlet load (kg/h)	Abatement efficiency (%)	Outlet (kg/h)	Outlet on a yearly basis
SO_2	<0,001	-	<0,001	<0,1
NO	0.013	NA	0.013	113,9
NO_2	0.018	* *	0.009	35,0

Table 9 – Performance of wet stage 4 –

7.2 Expected chemicals consumption in wet stage 4

Chemical	Consumption (liters/hour)	Consumption on a yearly basis (m^3/y)
NaOH (50% w)	40,5	354.7
H_2SO_4 (36%% w)	0.0	0.0
$NaClO_2$ (20% w)	0.0	0.0
NaHS (45% w)	0.0	0.0

Table 10 – Expected chemicals consumption in wet stage 4 –

8. Total chemicals consumption

In the case described by tables 1 and 2, the foreseen overall consumption of the chemicals for all stages will be:

- Aqueous ammonia for SCR reaction: 13.2 lt/h
- Caustic soda (aqueous sol. 50% w): ~~304.3~~ 113.24 lt/h
- NaHS (aqueous sol. 45%): 0.4 lt/h
- $NaClO_2$ (aqueous sol. 25%): 1.51 lt/h
- Sulfuric acid (aqueous sol. 36%): 0.38 lt/h

Warning: the above figure is indicative for chemical consumption and is based upon the preliminary input data obtained. It may undergo modifications during the design phase of execution.

(**) Compare tabulated values in ATTACHMENT2

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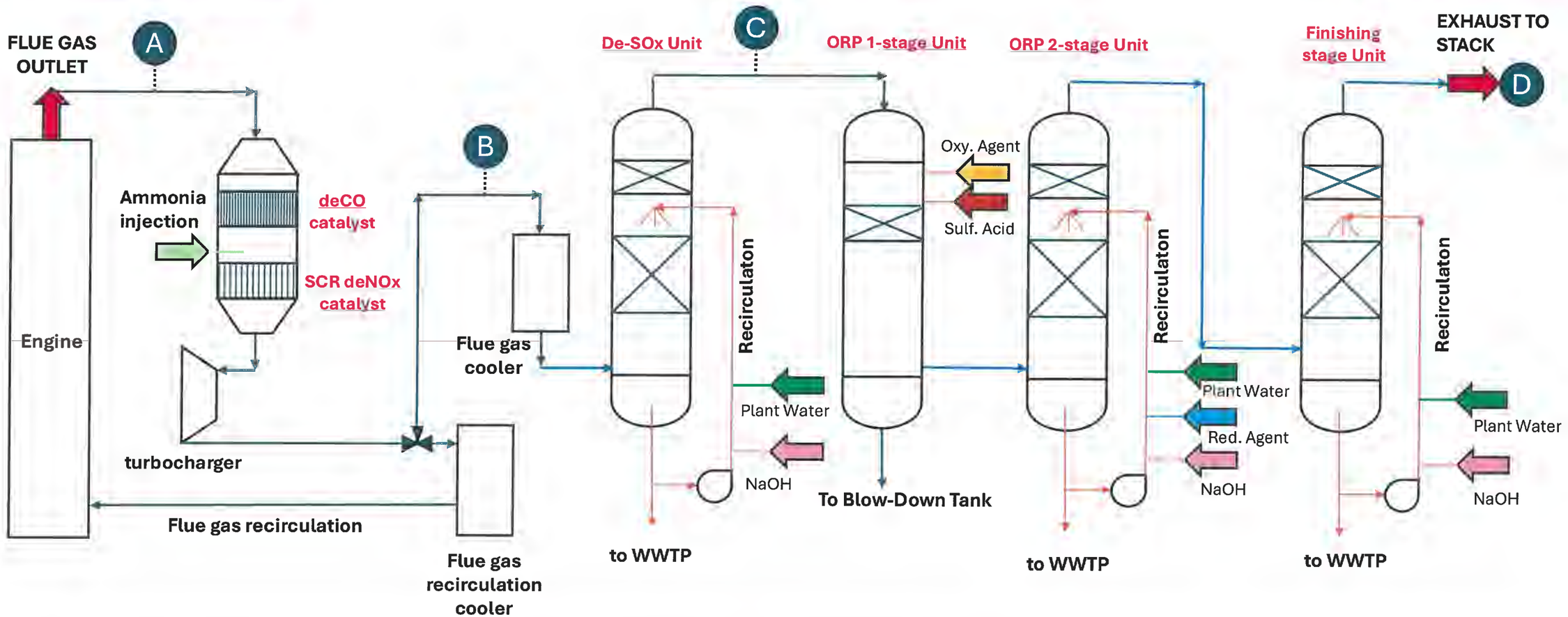
TransGas Development Systems, LLC
March 24, 2025

[redacted]

ATTACHMENT 1 – OVERALL PROCESS SCHEME

[redacted]



CO removed + 1st NOx removal → SOx removed → NO oxidized to NO_2 → NO_2 reduced to N_2 → Exhaust purification finishing

05/02/2025 *rev 02*

ATTACHMENT 2 – EMISSION ABATEMENT STEPS

Normal operation with natural gas **75% load =** **15750 kW** **(mechanical power at the engine shaft)** Operational 8000 h/y

Flow rate 34,4 kg/s - before recirculation 17,6 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	6,30	*90,0%*	0,32	*0,0%*	0,32	*80,45%*	0,063	*99,00%*
CO	19,82	*98,0%*	0,21	*0,0%*	0,21	*0,00%*	0,206	*98,96%*
SOx	0,74	*0,0%*	0,38	*90,5%*	0,04	*99,90%*	0,000	*99,99%*
VOC	39,50	*99,0%*	0,20	*0,0%*	0,20	*0,00%*	0,202	*99,49%*
PM	0,38	*25,0%*	0,10	*0,0%*	0,10	*0,00%*	0,098	*25,0%*

Speed up with Diesel fuel **10% load =** **2100 kW** **(mechanical power at the engine shaft)** Operational 0,4 h/y

Flow rate 15,1 kg/s - before recirculation 15,1 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	40,61	*0,0%*	40,61	*0,0%*	40,61	*0,0%*	40,614	*0,00%*
CO	2,14	*0,0%*	2,14	*0,0%*	2,144	*0,0%*	2,144	*0,00%*
SOx	0,93	*0,0%*	0,93	*90,5%*	0,09	*99,90%*	0,000	*99,99%*
VOC	18,21	*0,0%*	18,21	*0,0%*	18,21	*0,0%*	18,208	*0,00%*
PM	0,27	*0,0%*	0,27	*0,0%*	0,27	*0,0%*	0,274	*0,00%*

Fuel Switch **10% load =** **2100 kW** **(mechanical power at the engine shaft)** Operational 0,15 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	2,18	*0,0%*	1,13	*0,0%*	1,13	*0,0%*	1,134	*48,08%*
CO	7,56	*0,0%*	3,92	*0,0%*	3,923	*0,0%*	3,923	*48,08%*
SOx	0,12	*0,0%*	0,06	*90,5%*	0,01	*99,90%*	0,000	*99,99%*
VOC	22,66	*0,0%*	11,77	*0,0%*	11,77	*0,0%*	11,766	*48,08%*
PM	0,44	*0,0%*	0,23	*0,0%*	0,23	*0,0%*	0,228	*0,0%*

Generator switched on **20% load =** **4200 kW** **(mechanical power at the engine shaft)** Operational 0,15 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	2,18	*0,0%*	1,13	*0,0%*	1,13	*0,0%*	1,134	*48,08%*
CO	7,56	*0,0%*	3,92	*0,0%*	3,923	*0,0%*	3,923	*48,08%*
SOx	0,12	*0,0%*	0,06	*90,5%*	0,01	*99,90%*	0,000	*99,99%*
VOC	22,66	*50,0%*	5,88	*0,0%*	5,88	*0,0%*	5,883	*74,04%*
PM	0,44	*0,0%*	0,23	*0,0%*	0,23	*0,0%*	0,228	*0,0%*

Load up cold control **25% load =** **5250 kW** **(mechanical power at the engine shaft)** Operational 0,85 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	removal efficiency	B	removal efficiency	C	removal efficiency	D	removal efficiency
	kg/h	on deCO/SCR deNOx unit	kg/h	De-SOx Unit	kg/h	Wet De-NOx Unit	kg/h	overall%
NOx	4,20	80,0%	0,44	0,0%	0,44	80,0%	0,087	97,92%
CO	8,34	25,0%	3,25	0,0%	3,247	0,0%	3,247	61,06%
SOx	0,27	0,0%	0,14	90,5%	0,01	99,90%	0,000	99,99%
VOC	21,10	99,0%	0,11	0,0%	0,11	0,0%	0,110	99,48%
PM	0,36	0,0%	0,18	0,0%	0,18	0,0%	0,185	0,0%

Compensation mode **100% load =** **21000 kW** **(mechanical power at the engine shaft)** Operational 567 h/y

Flow rate 42,1 kg/s - before recirculation 20,4 kg/s - after recirculation

	A	removal efficiency	B	removal efficiency	C	removal efficiency	D	removal efficiency
	kg/h	on deCO/SCR deNOx unit	kg/h	De-SOx Unit	kg/h	Wet De-NOx Unit	kg/h	overall%
NOx	4,20	90,0%	0,20	0,0%	0,20	90,0%	0,020	99,52%
CO	8,93	90,0%	0,43	0,0%	0,433	0,0%	0,433	95,15%
SOx	0,29	0,0%	0,14	90,5%	0,01	99,90%	0,000	99,99%
VOC	22,61	99,0%	0,11	0,0%	0,11	0,0%	0,110	99,52%
PM	0,38	25,0%	0,09	0,0%	0,09	0,0%	0,092	25,0%

Ramp down **40% load =** **8400 kW** **(mechanical power at the engine shaft)** Operational 1,65 h/y

Flow rate 20,8 kg/s - before recirculation 10,7 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	4,70	*90,0%*	0,24	*0,0%*	0,24	*90,0%*	0,024	*99,49%*
CO	12,16	*90,0%*	0,63	*0,0%*	0,625	*0,0%*	0,625	*94,86%*
SOx	0,42	*0,0%*	0,21	*90,5%*	0,02	*99,90%*	0,000	*99,99%*
VOC	26,06	*99,0%*	0,13	*0,0%*	0,13	*0,0%*	0,134	*99,49%*
PM	0,36	*25,0%*	0,09	*0,0%*	0,09	*0,0%*	0,094	*25,0%*

Min Load **20% load =** **4200 kW** **(mechanical power at the engine shaft)** Operational 0,4 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	3,70	*80,0%*	0,38	*0,0%*	0,38	*90,0%*	0,038	*98,96%*
CO	8,08	*25,0%*	3,15	*0,0%*	3,145	*0,0%*	3,145	*61,06%*
SOx	0,22	*0,0%*	0,12	*90,5%*	0,01	*99,90%*	0,000	*99,99%*
VOC	21,62	*70,0%*	3,37	*0,0%*	3,37	*0,0%*	3,368	*84,42%*
PM	0,38	*0,0%*	0,20	*0,0%*	0,20	*0,0%*	0,199	*0,0%*

Spin out **10% load =** **2100 kW** **(mechanical power at the engine shaft)** Operational 0,1 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	removal efficiency	B	removal efficiency	C	removal efficiency	D	removal efficiency
	kg/h	on deCO/SCR deNOx unit	kg/h	De-SOx Unit	kg/h	Wet De-NOx Unit	kg/h	overall%
NOx	2,18	0,0%	1,13	0,0%	1,13	90,0%	0,113	94,81%
CO	7,56	0,0%	3,92	0,0%	3,923	0,0%	3,923	48,08%
SOx	0,12	0,0%	0,06	90,5%	0,01	99,90%	0,000	99,99%
VOC	22,66	0,0%	11,77	0,0%	11,77	0,0%	11,766	48,08%
PM	0,44	0,0%	0,23	0,0%	0,23	0,0%	0,228	0,0%

Emergency Mode **75% load with Diesel and iCER =** **15750 kW** **(mechanical power at the engine shaft)** Operational 192 h/y

Flow rate 37,8 kg/s - before recirculation 32,4 kg/s - after recirculation

	A	removal efficiency	B	removal efficiency	C	removal efficiency	D	removal efficiency
	kg/h	on deCO/SCR deNOx unit	kg/h	De-SOx Unit	kg/h	Wet De-NOx Unit	kg/h	overall%
NOx	234,68	90,0%	20,12	0,0%	20,12	80,5%	3,932	98,32%
CO	4,73	90,0%	0,41	0,0%	0,406	0,0%	0,406	91,43%
SOx	6,03	0,0%	5,17	90,5%	0,49	99,90%	0,000	99,99%
VOC	23,18	99,0%	0,20	0,0%	0,20	0,0%	0,199	99,14%
PM	1,21	25,0%	0,52	0,0%	0,52	0,0%	0,519	25,0%

Inlet pollutant data design basis:

File "PermittingProcess[redacted]n January 23rd

Efficiency on VOCs is valid considering VOCs to be composed minimum for 99.5% by formaldehyde

Pollutants mass flow decrease from Step A to Step B considers both removal efficiency of air pollution control system and pollutants mass flow reduction due to the fact that part of flue gas is recirculated

Overall efficiency takes into account also pollutants mass flow reduction due to partial flue gas recirculation when running with iCER

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TransGas Development Systems, LLC
March 24, 2024

ATTACHMENT N

SUPPORTING EMISSIONS CALCULATIONS

By: PEW
Date: 3/20/2025

Checked By: KBK
Date: 03/21/2025

Facility Total

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	255.85	193.69
PM10	250.12	187.96
PM2.5	249.07	186.91
SO2	495.46	9.93
NOx	13,493.81	194.30
CO	11,173.65	205.62
VOC	11,517.84	117.66
Total HAPS	85.78	0.87

Engines (Worst Case)

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	248.69	186.53
PM10	248.69	186.53
PM2.5	248.69	186.53
SO2	495	9.93
NOx	13,494	194.30
CO	11,174	205.62
VOC	11,517	116.59
Total HAPS	85.77	0.86

Tanks

Emission Type	Uncontrolled	Controlled
	tpy	tpy
VOC	0.75	0.75

Haulroads and Fugitive Leaks

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	7.16	7.16
PM10	1.43	1.43
PM2.5	0.38	0.38
VOC	0.31	0.31
Total HAPS	0.0053	0.0053

US! All tons are short tons!
907.18 kg/t_s
Pounds!
2.20 lb/kg
Convert lb=> t_s
2000 lb/t_s
Gas density
0.0462 lb/ft³
Diesel Density
7.10 lb/gal
MJ => MMBTU
0.00095 MMBTU/MJ

Number of engines operated	114	[-]	
Engine Power	21,000	[kW]	
Total mechanical Power (theoretic)	2,394	[MW]	
Effective mech. Power	1,796	[MW]	
Total Power electr.	2,298	[MW]	
Effective electr. Power	1,724	[MW]	
Yearly Produced Electricity	15,101	[GWh]	

Fuel Choices
Diesel
Gas

Calculations provided by Engine Supplier with edits by POTESTA

weight Nm3 air
1.293 [kg/Nm3]

Single Engine	Time	Time	Time	Load	Load	Electricity	Fuel type	Fuel Consumption		before Turbine		Enthalpy		Oil consumption	NOx					PM										
								Gas	Diesel	Temp	mass flow	Temp	Engine Out mass flow	mass flow	NOx_gas	NOx_diesel	NOx_engine	**Abat. Eff.**	NOx_stack	PM_gas	PM_diesel	PM_engine	**Abat. Eff.**	PM_stack					
	[d]	[h]	[min]	[%]	[kW]	[GWh/a]	[-]	[kg/h]	[kg/h]	[°C]	[kg/s]	[°C]	[kg/s]	[kg/h]	[g/kWh]	[g/kWh]	[kg/h]	**[%]**	[kg/h]	[mg/Nm³]	[mg/Nm³]	[kg/h]	**[%]**	[kg/h]					
Position in emiss. Abat. Schem										MP800	MP800	MP820A	MP820A		MP800				MP850					MP820A				MP850	
Speed up	0	0.08	5	10%	2100	0	Diesel	0	462.0	187		15.1	172	8	0.37	1.04	19.34	40.614	**0.0%**	40.614	10.626	6.85	0.152486311	**0.0%**	0.152486311					
Fuel Switch	0	0.03	2	10%	2100	0	Gas	294	4.6	194		15.6	172	8.1	0.37	1.04	19.34	2.184	**0.0%**	2.184	10.626	6.85	0.239639722	**0.0%**	0.239639722					
Generator switched on	0	0.08	5	20%	4200	0	Gas	576	7.6	248		15.6	208	8.1	0.6	0.88	18.78	3.696	**0.0%**	3.696	9.282	8.02	0.209329559	**0.0%**	0.209329559					
Load up cold control	0	0.17	10	25%	5250	0	Gas	713	8.4	275		15.6	226	8.1	0.73	0.80	18.50	4.2	**25.0%**	3.15	8.61	8.61	0.194174478	**0.0%**	0.194174478					
Normal Operation	333	8000	480000	75.0%	15750	121	Gas	2075	12.6	360		34.4	215	17.6	1.84	0.40	14.90	6.3	**99.0%**	0.063	4.2	12.08	0.205809745	**25.0%**	0.154357309					
Compensation Mode	24	567	34032	100%	21000	11	Gas	2897	12.6	406		42.1	231	20.4	2.4	1.00	11.60	21	**99.0%**	0.21	5.67	8.40	0.322045476	**25.0%**	0.241534107					
Ramp down	0	0.33	20	40%	8400	0	Gas	1109	10.1	319		20.8	236	10.7	1.08	0.56	17.66	4.704	**99.0%**	0.04704	6.594	10.37	0.196443063	**25.0%**	0.147332297					
Min load	0	0.08	5	20%	4200	0	Gas	576	7.6	248		15.6	208	8.1	0.6	0.88	18.78	3.696	**70.0%**	1.1088	9.282	8.02	0.209329559	**0.0%**	0.209329559					
Spin out	0	0.02	1	10%	2100	0	Gas	294	4.6	194		15.6	172	8.1	0.37	1.04	19.34	2.184	**40.0%**	1.3104	10.626	6.85	0.239639722	**0.0%**	0.239639722					
Emergency Mode	8	192	11520	75%	15750	3	Diesel	0	2570.4	351		38.5	198	23.2	1.84	0.40	14.90	234.675	**98.0%**	4.6935	4.2	12.08	0.779972158	**25.0%**	0.584979118					
Operational time	365	**8760**																												

Start-Up / Shut-Down

Sulphur content

gas	diesel	lub oil
0.000143	0.002	0.008

Single Engine	CO_dry							VOC_wet								SO2					
	CO_gas		CO_diesel		CO_engine	**Abat. Eff.**	CO_stack	THC_gas	CH4_gas	VOC_gas	THC_diesel	VOC_diesel	VOC_engine	**Abat. Eff.**	VOC_stack	gas	diesel	lub oil	Total	Abatement	Total
	[ppm]	[mg/Nm3]	[ppm]	[mg/Nm3]	[kg/h]	**[%]**	[kg/h]	[ppm]	[ppm]	[mg/Nm3]	[ppm]	[mg/Nm3]	[kg/h]	**[%]**	[kg/h]	[kg/h]	[kg/h]	[kg/h]	[kg/h]	**[%]**	[kg/h]
Position in emiss. Abat. Schem	MP820A						MP850					MP820A			MP850	MP820A					MP850
Speed up	139	174.0	41	51.0	1.135658791	**0.0%**	1.135658791	921	788	262.8	202	397.0	8.842766514	**0.0%**	8.842766514	0	0.924	0.00296	0.92696	**95.0%**	0.046348
Fuel Switch	139	174.0	41	51.0	3.923033089	**0.0%**	3.923033089	921	788	262.8	202	397.0	5.92666448	**0.0%**	5.92666448	0.04197238	0.00924	0.00296	0.054172378	**99.0%**	0.000541724
Generator switched on	149	186.0	40	49.5	4.193587096	**0.0%**	4.193587096	878	750	251.1	181	356.2	5.662606142	**0.0%**	5.662606142	0.08235628	0.01512	0.0048	0.102276281	**99.0%**	0.001022763
Load up cold control	154	191.9	39	48.7	4.328864099	**25.0%**	3.246648074	856	732	245.2	171	335.8	5.530576973	**25.0%**	4.147932729	0.10195256	0.0168	0.00584	0.124592555	**99.0%**	0.001245926
Normal Operation	166	206.9	36	45.0	10.14076497	**98.5%**	0.152111475	722	616	209.5	103	201.9	10.26458552	**99.0%**	0.102645855	0.29669339	0.0252	0.01472	0.336613391	**99.0%**	0.003366134
Compensation Mode	180	224.9	83	103.1	12.7761614	**95.0%**	0.63880807	755	644	218.3	91	179.2	12.40156502	**99.0%**	0.12401565	0.41422521	0.0252	0.0192	0.458625213	**99.0%**	0.004586252
Ramp down	168	209.9	37	46.5	6.254473785	**94.0%**	0.375268427	791	675	227.7	140	274.7	6.782597194	**99.0%**	0.067825972	0.15860305	0.02016	0.00864	0.187403046	**99.0%**	0.00187403
Min load	149	186.0	40	49.5	4.193587096	**50.0%**	2.096793548	878	750	251.1	181	356.2	5.662606142	**70.0%**	1.698781843	0.08235628	0.01512	0.0048	0.102276281	**99.0%**	0.001022763
Spin out	139	174.0	41	51.0	3.923033089	**35.0%**	2.549971508	921	788	262.8	202	397.0	5.92666448	**40.0%**	3.555998688	0.04197238	0.00924	0.00296	0.054172378	**99.0%**	0.000541724
Emergency Mode	166	206.9	36	45.0	2.905950437	**91.0%**	0.261535539	722	616	209.5	103	201.9	13.04146662	**99.0%**	0.130414666	0	5.1408	0.01472	5.15552	**95.0%**	0.257776

Hazardous emissions
Fraction of NMHC (AP-42, Table 3.4-3)

NMHC	Benzene	Toluene	Xylenes	Formaldehyde	Acrolein	Acetaldehyde	Naphthalene
0.2	0.000776	0.000281	0.000193	0.0000789	0.00000788	0.0000225	0.00013
100%	**0.388%**	**0.141%**	**0.097%**	**0.039%**	**0.004%**	**0.011%**	**0.065%**

CO2-Content 2.743 | GHG-factor 28 | 265

Single Engine	CO2_equivalent						NMHC	**Benzene**				**Toluene**				**Xylenes**				**Formaldehyde**			
	CO2_gas	CO2_diesel	Methane	N2O	N2O	CO2_eq		Uncontrolled	Abatement	Controlled		Uncontrolled	Abatement	Controlled		Uncontrolled	Abatement	Controlled		Uncontrolled	Abatement	Controlled	
	[kg/h]	[kg/h]	[kg/h]	[ppm]	[kg/h]	[kg/h]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Position in emiss. Abat. Schem	MP850	MP850	MP850	MP850	MP850	MP850	MP820A	MP820A		MP850	MP850	MP820A		MP850	MP850	MP820A		MP850	MP850	MP820A		MP850	MP850	MP820A		MP850	MP850
Speed up	0.00	1459.00	0.00	1.20	0.05	1473	19.49	0.07564	0.00036	0.0%	0.07564	0.00036	0.02739	0.00013	0.0%	0.02739	0.00013	0.01881	0.00009	0.0%	0.01881	0.00009	0.00769	0.00004	0.0%	0.00769	0.00004
Fuel Switch	805.11	14.59	12.72	1.20	0.05	1190	13.07	0.05070	0.00010	0.0%	0.05070	0.00010	0.01836	0.00003	0.0%	0.01836	0.00003	0.01261	0.00002	0.0%	0.01261	0.00002	0.00515	0.00001	0.0%	0.00515	0.00001
Generator switched on	1579.74	23.87	12.11	1.20	0.05	1957	12.48	0.04844	0.00023	0.0%	0.04844	0.00023	0.01754	0.00008	0.0%	0.01754	0.00008	0.01205	0.00006	0.0%	0.01205	0.00006	0.00492	0.00002	0.0%	0.00492	0.00002
Load up cold control	1955.64	26.53	11.81	1.20	0.05	2327	12.19	0.04731	0.00045	25.0%	0.03548	0.00034	0.01713	0.00016	25.0%	0.01285	0.00012	0.01177	0.00011	25.0%	0.00882	0.00008	0.00481	0.00005	25.0%	0.00361	0.00003
Normal Operation	5691.12	39.79	21.59	1.20	0.12	6366	22.63	0.08780	40.03794	99.0%	0.00088	0.40038	0.03179	14.49827	99.0%	0.00032	0.14498	0.02184	9.95789	99.0%	0.00022	0.09958	0.00893	4.07087	99.0%	0.00009	0.04071
Compensation Mode	7945.59	39.79	26.19	2.40	0.27	8790	27.34	0.10608	3.42968	99.0%	0.00106	0.03430	0.03841	1.24193	99.0%	0.00038	0.01242	0.02638	0.85300	99.0%	0.00026	0.00853	0.01079	0.34871	99.0%	0.00011	0.00349
Ramp down	3042.29	31.83	14.40	1.20	0.07	3496	14.95	0.05802	0.00110	99.0%	0.00058	0.00001	0.02101	0.00040	99.0%	0.00021	0.00000	0.01443	0.00027	99.0%	0.00014	0.00000	0.00590	0.00011	99.0%	0.00006	0.00000
Min load	1579.74	23.87	12.11	1.20	0.05	1957	12.48	0.04844	0.00023	70.0%	0.01453	0.00007	0.01754	0.00008	70.0%	0.00526	0.00002	0.01205	0.00006	70.0%	0.00361	0.00002	0.00492	0.00002	70.0%	0.00148	0.00001
Spin out	805.11	14.59	12.72	1.20	0.05	1190	13.07	0.05070	0.00005	40.0%	0.03042	0.00003	0.01836	0.00002	40.0%	0.01101	0.00001	0.01261	0.00001	40.0%	0.00757	0.00001	0.00515	0.00000	40.0%	0.00309	0.00000
Emergency Mode	0.00	8117.32	0.00	2.40	0.30	8198	28.75	0.11156	1.22087	99.0%	0.00112	0.01221	0.04040	0.44209	99.0%	0.00040	0.00442	0.02775	0.30364	99.0%	0.00028	0.00304	0.01134	0.12413	99.0%	0.00011	0.00124
									Yearly Emissions	[t/a]	0.448016526			Yearly Emissions	[t/a]	0.162232789			Yearly Emissions	[t/a]	0.111426791			Yearly Emissions	[t/a]	0.045552196
									Yearly Emissions	[lb/a]	896.0330527			Yearly Emissions	[lb/a]	324.4655771			Yearly Emissions	[lb/a]	222.8535814			Yearly Emissions	[lb/a]	91.10439157

Single Engine	**Acrolein**					**Acetaldehyde**					**Naphthalene**					Total HAPS					
	Uncontrolled		Abatement		Controlled	Uncontrolled		Abatement		Controlled	Uncontrolled		Abatement		Controlled	Uncontrolled			Controlled		
	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]	[lb/h]	[t/a]	[t/a]	[lb/h]	[t/a]	[t/a]
Position in emiss. Abat. Schem	MP820A	MP820A		MP850	MP850	MP820A	MP820A		MP850	MP850	MP820A	MP820A		MP850	MP850	per engine	per engine	all engines	per engine	per engine	all engines
Speed up	0.00077	0.000004	0.0%	0.00077	0.000004	0.00219	0.000010	0.0%	0.00219	0.000010	0.01267	0.00006	0.0%	0.01267	0.00006	0.14517	0.00001	0.00069	0.14517	0.00001	0.00069
Fuel Switch	0.00051	0.000001	0.0%	0.00051	0.000001	0.00147	0.000003	0.0%	0.00147	0.000003	0.00849	0.00002	0.0%	0.00849	0.00002	0.09729	0.00000	0.00018	0.09729	0.00000	0.00018
Generator switched on	0.00049	0.000002	0.0%	0.00049	0.000002	0.00140	0.000007	0.0%	0.00140	0.000007	0.00811	0.00004	0.0%	0.00811	0.00004	0.09296	0.00000	0.00044	0.09296	0.00000	0.00044
Load up cold control	0.00048	0.000005	25.0%	0.00036	0.000003	0.00137	0.000013	25.0%	0.00103	0.000010	0.00793	0.00008	25.0%	0.00594	0.00006	0.09079	0.00001	0.00086	0.06809	0.00001	0.00065
Normal Operation	0.00089	0.406571	99.0%	0.00001	0.004066	0.00255	1.160894	99.0%	0.00003	0.011609	0.01471	6.70739	99.0%	0.00015	0.06707	0.16851	0.67403	76.83982	0.00169	0.00674	0.76840
Compensation Mode	0.00108	0.034827	99.0%	0.00001	0.000348	0.00308	0.099443	99.0%	0.00003	0.000994	0.01777	0.57456	99.0%	0.00018	0.00575	0.20359	0.05774	6.58215	0.00204	0.00058	0.06582
Ramp down	0.00059	0.000011	99.0%	0.00001	0.000000	0.00168	0.000032	99.0%	0.00002	0.000000	0.00972	0.00018	99.0%	0.00010	0.00000	0.11135	0.00002	0.00212	0.00111	0.00000	0.00002
Min load	0.00049	0.000002	70.0%	0.00015	0.000001	0.00140	0.000007	70.0%	0.00042	0.000002	0.00811	0.00004	70.0%	0.00243	0.00001	0.09296	0.00000	0.00044	0.02789	0.00000	0.00013
Spin out	0.00051	0.000000	40.0%	0.00031	0.000000	0.00147	0.000001	40.0%	0.00088	0.000001	0.00849	0.00001	40.0%	0.00510	0.00000	0.09729	0.00000	0.00009	0.05838	0.00000	0.00006
Emergency Mode	0.00113	0.012397	99.0%	0.00001	0.000124	0.00323	0.035399	99.0%	0.00003	0.000354	0.01869	0.20453	99.0%	0.00019	0.00205	0.21410	0.02055	2.34306	0.00214	0.00021	0.02343
			Yearly Emissions	[t/a]	0.004549446			Yearly Emissions	[t/a]	0.0129902			Yearly Emissions	[t/a]	0.075054315	**1.31**	**0.75**	**85.77**	**0.50**	**0.01**	**0.86**
			Yearly Emissions	[lb/a]	9.09889234			Yearly Emissions	[lb/a]	25.98034			Yearly Emissions	[lb/a]	150.10863						

Worst case

Entire Plant, worst case

Startups per year: 5 [-]

			Gas [t/a]	Diesel [t/a]	NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SO2 [t/a]	CO2_e [t/a]
Speed up	0	0.42	25	0.00	24.19	2.13	0.01	0.06	0.46	0.00	77
Fuel Switch	0	0.17	10	6.15	0.10	0.05	0.01	0.08	0.12	0.00	25
Generator switched on	0	0.42	25	30.15	0.40	0.19	0.01	0.22	0.30	0.00	102
Load up cold control	0	0.83	50	74.66	0.88	0.33	0.02	0.34	0.43	0.00	244
Normal Operation	333	7996.80	479808	2084957.39	12661.81	63.31	155.11	152.86	103.15	3.38	6397261
Compensation Mode	24	567.20	34032	206464.71	898.08	14.97	17.22	45.53	8.84	0.33	626484
Ramp down	0	1.67	100	232.29	2.11	0.01	0.03	0.08	0.01	0.00	732
Min load	0	0.42	25	30.15	0.40	0.06	0.01	0.11	0.09	0.00	102
Spin out	0	0.08	5	3.07	0.05	0.01	0.00	0.03	0.04	0.00	12
Emergency Mode	8	192.00	11520	0.00	62017.04	113.24	14.11	6.31	3.15	6.22	197796
Total		**8760.00**		**2,291,799**	**75,605**	**194**	**187**	**206**	**117**	**10**	**7,222,837**

Entire Plant, worst case UNCONTROLLED

Startups per year: 5 [-]

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SO2 [t/a]	CO2_e [t/a]
2.13	0.01	0.06	0.46	0.05	77
0.05	0.01	0.08	0.12	0.00	25
0.19	0.01	0.22	0.30	0.01	102
0.44	0.02	0.45	0.58	0.01	244
6330.91	206.82	10190.51	10314.94	338.26	6397261
1496.80	22.95	910.64	883.94	32.69	626484
0.99	0.04	1.31	1.42	0.04	732
0.19	0.01	0.22	0.30	0.01	102
0.02	0.00	0.04	0.06	0.00	12
5662.10	18.82	70.11	314.66	124.39	197796
13,494	**249**	**11,174**	**11,517**	**495**	**7,222,837**

Raw Emissions [pounds/hour]

Hourly base

Single Engine raw emissions

	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]	Heat Input MMBtu/hr
Speed up	10%	0.0	0	1018.5	143.46	89.54	0.34	2.50	19.49	2.04	3,217	0.00	0.12	3,247	18.74
Fuel Changeover	10%	647.1	13994	10.2	1.43	4.81	0.53	8.65	13.07	0.12	1,807	28.03	0.12	2,623	13.86
Generator switched on	20%	1269.7	27459	16.7	2.35	8.15	0.46	9.25	12.48	0.23	3,535	26.70	0.12	4,314	27.13
Load up cold control	25%	1571.8	33993	18.5	2.61	9.26	0.43	9.54	12.19	0.27	4,370	26.03	0.12	5,130	33.55
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]	
Normal Operation	75%	4574.1	98924	27.8	3.91	13.89	0.45	22.36	22.63	0.74	12,634	47.60	0.25	14,035	97.15
Compensation Mode	100%	6386.1	138112	27.8	3.91	46.30	0.71	28.17	27.34	1.01	17,605	57.73	0.59	19,378	135.44
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]	
Ramp down	40%	2445.2	52882	22.2	3.13	10.37	0.43	13.79	14.95	0.41	6,777	31.74	0.15	7,707	52.07
Min load	20%	1269.7	27459	16.7	2.35	8.15	0.46	9.25	12.48	0.23	3,535	26.70	0.12	4,314	27.13
Spin out	10%	647.1	13994	10.2	1.43	4.81	0.53	8.65	13.07	0.12	1,807	28.03	0.12	2,623	13.86
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]	
Emergency Mode	75%	0.0	0	5666.8	798.13	517.37	1.72	6.41	28.75	11.37	17,896	0.00	0.67	18,073	104.25

Emission Control [%]

	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]	CO2 [%]	Methane [%]	N2O [%]	0 [%]
Speed up	0%	0%	0%	0%	95%	0%	0%	0%	0%
Fuel Changeover	0%	0%	0%	0%	99%	0%	0%	0%	0%
Generator switched on	0%	0%	0%	0%	99%	0%	0%	0%	0%
Load up cold control	25%	0%	25%	25%	99%	0%	0%	0%	0%
	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]	CO2 [%]	Methane [%]	N2O [%]	0 [%]
Normal Operation	99%	25%	99%	99%	99%	0%	0%	0%	0%
Compensation Mode	99%	25%	95%	99%	99%	0%	0%	0%	0%
	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]	CO2 [%]	Methane [%]	N2O [%]	0 [%]
Ramp down	99%	25%	94%	99%	99%	0%	0%	0%	0%
Min load	70%	0%	50%	70%	70%	0%	0%	0%	0%
Spin out	40%	0%	35%	40%	40%	0%	0%	0%	0%
	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]	CO2 [%]	Methane [%]	N2O [%]	0 [%]
Emergency Mode	98%	25%	91%	99%	99%	0%	0%	0%	0%

Controlled Emissions [pounds/hour]

Hourly base

Single Engine controlled emissions

	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Speed up	10%	0.0		1018.5	143.46	89.54	0.34	2.50	19.49	0.10	3,217	0.00	0.12	3,247
Fuel Changeover	10%	647.1	13994	10.2	1.43	4.81	0.53	8.65	13.07	0.00	1,807	28.03	0.12	2,623
Generator switched on	20%	1269.7	27459	16.7	2.35	8.15	0.46	9.25	12.48	0.00	3,535	26.70	0.12	4,314
Load up cold control	25%	1571.8	33993	18.5	2.61	6.94	0.43	7.16	9.14	0.00	4,370	26.03	0.12	5,130
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Normal Operation	75%	4574.1	98924	27.8	3.91	0.14	0.34	0.34	0.23	0.01	12,634	47.60	0.25	14,035
Compensation Mode	100%	6386.1	138112	27.8	3.91	0.46	0.53	1.41	0.27	0.01	17,605	57.73	0.59	19,378
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Ramp down	40%	2445.2	52882	22.2	3.13	0.10	0.32	0.83	0.15	0.00	6,777	31.74	0.15	7,707
Min load	20%	1269.7	27459	16.7	2.35	2.44	0.46	4.62	3.75	0.07	3,535	26.70	0.12	4,314
Spin out	10%	647.1	13994	10.2	1.43	2.89	0.53	5.62	7.84	0.07	1,807	28.03	0.12	2,623
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Emergency Mode	75%	0.0		5666.8	798.13	10.35	1.29	0.58	0.29	0.11	17,896	0.00	0.67	18,073

Raw Emissions [tons / year]

1

Yearly base															
Single Engine raw emissions	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Speed up	0.08	0	-	0.04	11.95	0.004	0.000	0.000	0.001	0.000	0.134	0.000	0.00000	0.135	
Fuel Changeover	0.03	0.01	466	0.00	0.05	0.000	0.000	0.000	0.000	0.000	0.030	0.000	0.00000	0.044	
Generator switched on	0.08	0.1	2,288	0.00	0.20	0.000	0.000	0.000	0.001	0.000	0.147	0.001	0.00000	0.180	
Load up cold control	0.17	0.1	5,666	0.00	0.43	0.001	0.000	0.001	0.001	0.000	0.364	0.002	0.00001	0.427	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Normal Operation	8760	20034.6	866,574,112	121.67	34273	60.83	1.99	97.92	99.12	3.25	55339	208	1.1	61472	
Compensation Mode	567	1811.1	78,336,919	7.88	2219	13.13	0.20	7.99	7.75	0.29	4993	16	0.2	5495	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Ramp down	0.33	0.4	17,627	0.00	1.04	0.002	0.000	0.002	0.002	0.000	1.130	0.005	0.00003	1.285	
Min load	0.08	0.1	2,288	0.00	0.20	0.000	0.000	0.000	0.001	0.000	0.147	0.001	0.00000	0.180	
Spin out	0.02	0.0	233	0.00	0.02	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.00000	0.022	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Emergency Mode	192.00	0.0	-	544.01	153242	49.67	0.17	0.62	2.76	1.09	1718	0	0.1	1735	

Start / Stop controlled

Yearly base															
Single Engine raw emissions	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	0	0	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Speed up	0.08	0	-	0.04	11.95	0.004	0.000	0.000	0.001	0.000	0.134	0.000	0.00000	0.135	
Fuel Changeover	0.03	0.01	466	0.00	0.05	0.000	0.000	0.000	0.000	0.000	0.030	0.000	0.00000	0.044	
Generator switched on	0.08	0.1	2,288	0.00	0.20	0.000	0.000	0.000	0.001	0.000	0.147	0.001	0.00000	0.180	
Load up cold control	0.17	0.1	5,666	0.00	0.43	0.001	0.000	0.001	0.001	0.000	0.364	0.002	0.00001	0.427	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	0	0	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Normal Operation	8000	20034.6	866,574,112	121.67	34273	0.608	1.491	1.469	0.991	0.033	55339.012	208.479	1.11498	61471.893	
Compensation Mode	567	1811.1	78,336,919	7.88	2219	0.131	0.151	0.399	0.078	0.003	4992.703	16.372	0.16736	5495.468	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	0	0	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Ramp down	0.33	0.4	17,627	0.00	1.04	0.000	0.000	0.000	0.000	0.000	1.130	0.005	0.00003	1.285	
Min load	0.08	0.1	2,288	0.00	0.20	0.000	0.000	0.000	0.000	0.000	0.147	0.001	0.00000	0.180	
Spin out	0.02	0.0	233	0.00	0.02	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.00000	0.022	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	0	0	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Emergency Mode	192.00	0.0	-	544.01	153242	0.99	0.12	0.06	0.03	0.01	1718	0	0.1	1735	
TOTAL	8760.00	21846.31	944,939,599	673.60	189747.69	1.74	1.77	1.93	1.10	0.05	62052	225	1.3	68705	
						198.1163256									

Best case

Yearly base	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	0	0	CO2_eq	
Single Engine raw emissions	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Normal Operation	8760	20035	866574112	122	34273	60.83	1.99	97.92	99.12	3.25	55339	208	1.1	61472	
Normal Operation w. abatement						0.61	1.49	1.47	0.99	0.03	55339	208	1.1	61472	
Operation of 114 engines						69.35	169.92	167.45	112.99	3.71	6,308,647	23,767	127	7,007,796	

1 Start Up / Shut down	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq
all engines	[h]	[t]	[ft³]	[t]	[gal]	[t]	[t]	[t]	[t]	[t]	[t]	[t]	[t]	[t]
all engines	0.80	75.30	3256871	5.62	1584	0.5555	0.0177	0.1833	0.2917	0.0010	224.2974	1.1839	0.0060	259.0492
Single engine	[h]	[t]	[ft³]	[t]	[gal]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]
Single engine	0.80	0.66	28569	0.05	14	9.74	0.31	3.22	5.12	0.02	3935.04	20.77	0.11	4544.72

Best case	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq
8760h@75% plus 1 Start/Stop	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]
	8760.8	2,284,015	98,792,705,589	13,876	3,908,687	69.9	169.9	167.6	113.3	3.7	6308871.7	23767.8	127.1	7008054.9

By: PEW
Date: 3/20/2025

Checked By: KBK
Date: 03/21/2025

Tanks

Tank	I.D.	Volume	Turnovers	Yearly Throughput	Fixed Roof Losses		VOC Emissions				
					Working	Breathing	Uncontrolled			Controlled	
		(gal)	(No.)	(gal/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/hr)(1)	(tpy)	(lbs/hr)(1)	(tpy)
Diesel Tank	TK1-40	170,000	4	680,000	12.28	25.27	37.55	0.18	0.02	0.18	0.02
Total Emissions (40 tanks)					491.2	1,010.80	1,502.00	7.34	0.75	7.34	0.75
						Total VOC =		7.34	0.75	7.34	0.75

Notes:
1. Emissions based on breathing losses divided by 8,760 hours per year and working losses divided by total throughput multiplied by one truck delivery to the tanks of 10,000 gallons.
2. Number of USLD tanks at the site = 40

Natural Gas (Vapor Sources)

Source Type	Number of Sources	Emission Factor(1) (kg/hr/source)	TOC Emissions (lb/hr)	TOC Emissions (ton/yr)	Uncontrolled VOC Emissions (lb/hr)	Uncontrolled VOC Emissions (ton/yr)	Control Efficiency (%)	Controlled VOC Emissions (lb/hr)	Controlled VOC Emissions (ton/yr)
Valves	176	0.000131	0.050829	0.222632	0.0003	0.0013	0	0.0003	0.0013
Pressure Relief Valves	120	0.0447	11.825474	51.795578	0.0698	0.3056	0	0.0698	0.3056
Connectors (Flanges)	917	0.0000810	0.163751	0.717230	0.0010	0.0042	0	0.0010	0.0042
Compressor Seals	0	0.0894	0.000000	0.000000	0.0000	0.0000	0	0.0000	0.0000
Light Liquid Pumps	0	0.00187	0.000000	0.000000	0.0000	0.0000	0	0.0000	0.0000
Sample Connections (2)	1	0.0150	0.033069	0.144842	0.0002	0.0009	0	0.0002	0.0009
				Total VOC =	0.0712	0.3120		0.0712	0.3120

	Uncontrolled Hexane Emissions (lb/hr)	Uncontrolled Hexane Emissions (ton/yr)	Control Efficiency (%)	Controlled Hexane Emissions (lb/hr)	Controlled Hexane Emissions (ton/yr)
	0.000005	0.000022	0	0.000005	0.000022
	0.001183	0.005180	0	0.001183	0.005180
	0.000016	0.000072	0	0.000016	0.000072
	0.000000	0.000000	0	0.000000	0.000000
	0.000000	0.000000	0	0.000000	0.000000
	0.000003	0.000014	0	0.000003	0.000014
Total	0.001	0.0053		0.001	0.0053

Sample Natural Gas Composition							
Gas Composition Key		BTU	S.G.	Non-VOC	Non-VOC	Non-VOC	Non-VOC
				Carbon Dioxide	Nitrogen	Methane	Ethane
Gas Sample - TransCanada		1082.2	0.6100	0.2000	0.4400	90.3300	8.4400
						Total Non-VOC =	99.4100

Sample Natural Gas Composition							
Gas Composition Key	VOC	VOC	VOC	VOC	VOC	VOC	VOC/HAP
	Propane	N Butane	Iso Butane	Pentane	Iso Pentane	Neo Pentane	Hexane
Gas Sample - TransCanada	0.5200	0.0300	0.0200	0.0001	0.0100	0.0000	0.0100
Max value	0.5200	0.0300	0.0200	0.0001	0.0100	0.0000	0.0100
						Total VOC =	0.5901
						Total HAP =	0.0100

1. AP42, Chapter 5, Protocol for Equipment Leak Emission Estimates, Table 2-1 and 2-5.
2. Sight Glass lb/kg = 2.2046

By: PEW
Date: 3/20/2025

Checked By: KBK
Date: 03/21/2025

Vehicle Activity (VA)

Paved Roadway: Trucks delivering fluids, fuel, and miscellaneous deliveries and removal of materials (estimated).

Emission Factor Equation from AP-42 Section 13.2.1, Paved Roads (January 2011):
E = [k * (sL/2)^0.91 * (W)^1.02] * (1 - 1.2P/4N) = lb / Vehicle Mile Traveled (VMT)

	PM	PM10	PM2.5	
k =	0.011	0.0022	0.00054	dimensionless, particle size multiplier
sL =	9.7	9.7	9.7	surface material silt content (g/m^2)
W =	26.8	26.8	26.8	tons, mean vehicle weight
P =	157	157	157	no. days/year with 0.01 in of rain
e =	1.15	0.23	0.06	lb/VMT

Rounding to 2

Pollutant	No. of Vehicles		Miles Per Trip (1)	Control Device		Emissions			
						Uncontrolled		Controlled	
	Per Hour	Per Year	(mi)	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
PM	2	9,963	1.25	N	0	2.88	7.16	2.88	7.16
PM10	2	9,963	1.25	N	0	0.58	1.43	0.58	1.43
PM2.5	2	9,963	1.25	N	0	0.15	0.38	0.15	0.38

Tankers/Trucks

Product	Empty Weight lbs	Loaded Weight lbs	Gallons Per Load	Average Weight tons	Gallons Per Hour	Gallons Per Year	Trucks Per Hour	Trucks Per Year
Delivery of Fluids	27,000	80,000	10,000	26.750	673	55,824,392	1	5,583
Miscellaneous Trucking							1	4,380
						Total =	2	9,963

1. Trip Distance - Round trip on outside of property from access road to the site = 1.25
2. Miscellaneous trucking is for deliveries and shipping of materials other than the fluid identified below. Trucking volume is assumed at one truck per hour and 4,380 trucks per year. Truck weighs are assumed to be the same mean weight as liquid trucking.

Estimated Delivery of Fluids			
Material	gal/hr	gal/day	gal/yr
ULSD	446.00	10,704.00	21,297,198.81
Lubricant Oil	65.13	1,563.00	570,495.00
NH3(aq)	16.57	397.58	3,482,822.90
NaOH	142.07	3,409.78	29,869,648.56
NaHS	0.50	12.04	105,437.79
NaClO2	1.90	45.50	398,601.40
H2SO4	0.48	11.44	100,187.27
Total	672.64	16,143.34	55,824,391.73

kJ/BTU	m³/ft³
1.055056	0.028317

Information provided by Engine Supplier

Gas	49.15 MJ/kg	976.94	BTU/ft³
Diesel	42.7 MJ/kg	130613.5	BTU/gal

For Export

Gas mode		100	75	50	25	20	10
NOx	g/kWh	1.0	0.4	0.4	0.8	0.9	1.0
PM (Filterable)	mg/Nm3	5.7	4.2	5.3	8.6	9.3	10.6
PM10 (Filterable +	mg/Nm3	5.4	4.1	5.1	8.1	8.8	10.1
PM2.5 (Filterable +	mg/Nm3	5.4	4.1	5.1	8.1	8.8	10.1
CO	ppm	180	166	178	154	149	139
VOC	ppm	79	76	78	88	90	94
N2O	ppm	2	1	1	1	1	1
CH4	0	644	616	638	732	750	788
CO2	g/kWh	383	373	377	400	405	416
SO2	g/kWh	0.025	0.023	0.021	0.021	0.021	0.022

Diesel mode		100	75	50	25	20	10
NOx	g/kWh	11.6	14.9	17.1	18.5	18.8	19.3
PM (Filterable)	mg/Nm3	8.4	12.1	11.6	8.6	8.0	6.8
PM10 (Filterable +	mg/Nm3	8.4	12.1	11.6	8.6	8.0	6.8
PM2.5 (Filterable +	mg/Nm3	8.0	11.7	11.3	8.1	7.6	6.5
CO	ppm	83	36	36	39	40	41
VOC	ppm	91	103	119	171	181	202
N2O	ppm	4	2	1	1	1	1
CO2	g/kWh	439	426	430	454	460	471
SO2	g/kWh	0.353	0.330	0.330	0.336	0.401	0.440

SO2 [g/kWh]

		21000	15750	10500	5250	4200	2100
Sulphur content		**100**	**75**	**50**	**25**	**20**	**10**
gas	0.00014	0.02	0.02	0.02	0.02	0.02	0.02
diesel	0.002	0.35	0.33	0.33	0.34	0.40	0.44
lub oil	0.008	0.0050	0.0032	0.0018	0.0009	0.0006	0.0003
	Diesel	**0.353**	**0.330**	**0.330**	**0.336**	**0.401**	**0.440**
	Gas	**0.025**	**0.023**	**0.021**	**0.021**	**0.021**	**0.022**
CO2 gas	2.743	383.32	372.74	376.79	399.75	405.09	415.76
CO2 Diese	3.158	439.13	426.23	430.16	454.41	459.83	470.67

Gas, iCER, Tier III

NOx g/kWh	PM mg/Nm3	CO ppm	THC ppm	CH4 ppm	N2O ppm	General Power %	Power kW	Speed rpm	BMEP bar	Mps m/s	ISO Power %	Power kW	Bypass %	BSFC g/kWh	BSPC g/kWh	pExh bar	pExhRel bar g	BSEF kg/kWh	tEaT °C	tEaTm °C
1.00	**5.67**	**180**	**755**	**644**	**2**	**100**	21000	89	16.1	9.2	100	21000	0	137.937	0.6	3.97	2.97	7.22	231	
0.88	5.38	177	749	638	2	95	19950	87.5	15.56	9	95	19950	0	136.208	0.6	3.81	2.81	7.34	226	
0.76	5.08	174	742	633	2	90	18900	85.9	15	8.8	90	18900	0	134.885	0.7	3.65	2.65	7.47	222	
0.64	4.79	171	735	627	2	**85**	17850	84.3	14.44	8.7	85	17850	0	133.665	0.7	3.48	2.48	7.6	219	
0.64	4.78	171	735	627	2	84.9	17829	84.3	14.43	8.7	84.9	17829	0	133.665	0.7	3.47	2.47	7.6	219	
0.52	4.49	168	729	621	1	80	16800	82.6	13.87	8.5	80	16800	0	132.648	0.7	3.31	2.31	7.73	217	
0.40	**4.20**	**166**	**722**	**616**	**1**	**75**	15750	80.9	13.29	8.3	75	15750	0	131.732	0.8	3.14	2.14	7.86	215	
0.40	4.41	168	727	620	1	70	14700	79	12.69	8.1	70	14700	0	131.122	0.8	2.97	1.97	8.01	215	
0.40	4.55	170	731	623	1	66.6	13986	77.7	12.28	8	66.6	13986	0	130.613	0.9	2.86	1.86	8.12	215	
0.40	4.62	170	732	624	1	65	13650	77.1	12.08	7.9	65	13650	0	130.41	0.9	2.8	1.8	8.17	216	
0.40	4.83	173	737	629	1	60	12600	75.1	11.45	7.7	60	12600	0	129.901	0.9	2.63	1.63	8.32	217	
0.40	5.04	175	742	633	1	55	11550	72.9	10.81	7.5	55	11550	0	129.596	1	2.46	1.46	8.47	221	
0.40	**5.3**	**178**	**748**	**638**	**1**	**50**	10500	70.6	10.14	7.3	50	10500	0	129.698	1	2.28	1.28	8.63	224	
0.48	5.92	173	769	656	1	45	9450	68.2	9.45	7	45	9450	0	130.613	1.1	2.1	1.1	8.77	230	
0.56	6.59	168	791	675	1	40	8400	65.6	8.74	6.7	40	8400	0	132.037	1.2	1.92	0.92	8.91	236	
0.64	7.27	163	813	694	1	35	7350	62.7	7.99	6.5	35	7350	0	133.258	1.3	1.73	0.73	9.02	246	
0.80	**8.6**	**154**	**856**	**732**	**1**	**25**	5250	56.1	6.39	5.8	25	5250	0	135.801	1.6	1.5	0.5	10.71	226	
0.88	9.28	149	878	750	1	**20**	4200							137.123	1.8				208	
0.96	9.95	144	900	769	1	15	3150							138.446	2				190	
1.04	10.63	139	921	788	1	**10**	2100							139.768	2.2				172	

BSEC kJ/kWh	Tur Flov kg/s	EtaTC %	tEbB °C	BSAC kg/kWh	tEbT °C	pScav bar	SAC LT kW	Cylinder kW	Lub. Oil kW	Radiation kW	SPP kW	tAaC °C	tScav °C	Com Flow kg/s	mScav kg/s	pScavRel bar g	Cond. watt kg/h	tEaE °C	Steam kg/h	mEco kg/s	mEgr kg/s	EGR rate %	Load %	Oil Feed [kg/h]
231	6808	42.1	69.6	229	3.42857	406	4.22	8625	2300	1405	360	1150	218	34	41.7	41.3	3.22	1565	180	1640	20.4	21.3	51%	100	2.4
226	6744	40.7	69.9	224	3.55489	396	4.02	8075	2260	1390	350	1025	212	33.7	40.3	39.9	3.02	1450	180	1460	20.1	20.2	50%	95	2.29
222	6697	39.2	70	220	3.6381	386	3.85	7530	2235	1375	340	905	205	33.4	38.9	38.5	2.85	1360	180	1280	19.4	19.4	50%	90	2.18
219	6663	37.7	70	217	3.73109	377	3.68	6965	2210	1370	330	820	199	33.1	37.4	37	2.68	1250	180	1150	18.9	18.5	49%	85	2.06
219	6663	37.6	70	217	3.77587	377	3.67	6945	2215	1375	330	825	199	33.1	37.3	37	2.67	1240	180	1160	19	18.3	49%	84.9	2.06
217	6633	36.1	70	215	3.83571	368	3.5	6395	2170	1360	320	740	192	32.9	35.8	35.4	2.5	1145	180	1040	18.2	17.5	49%	80	1.95
215	6608	34.4	69.8	213	3.95429	360	3.32	5820	2135	1350	310	690	184	32.6	34.1	33.8	2.32	1035	180	960	17.6	16.5	48%	75	1.84
215	6608	32.7	69.6	213	4.06531	353	3.14	5270	2065	1320	300	660	177	32.3	32.4	32.2	2.14	930	180	920	16.9	15.6	48%	70	1.73
215	6608	31.5	69.5	213	4.1184	348	3.03	4905	2015	1310	290	640	172	32.1	31.3	31	2.03	865	180	900	16.3	15	48%	66.6	1.5452
216	6608	31	69.4	214	4.16703	346	2.97	4735	1995	1300	290	630	169	32	30.7	30.5	1.97	830	180	890	16	14.7	48%	65	1.62
217	6616	29.1	69	215	4.22857	340	2.79	4185	1920	1280	275	625	161	31.7	28.9	28.7	1.79	730	180	880	15	13.9	48%	60	1.5
221	6629	27.2	68.6	219	4.3013	335	2.61	3630	1850	1260	265	635	152	31.4	26.9	26.7	1.61	630	180	890	14	12.9	48%	55	1.39
224	6669	25.2	68.1	222	4.38857	329	2.42	3090	1770	1235	255	640	142	31.1	24.9	24.8	1.42	525	180	910	13	12	48%	50	1.27
230	6729	23	67.5	228	4.49524	324	2.23	2535	1670	1210	240	655	131	30.8	22.8	22.7	1.23	415	180	930	11.9	10.9	48%	45	1.18
236	6808	20.8	66.8	234	4.54286	319	2.03	2000	1575	1180	225	675	118	30.4	20.5	20.5	1.03	305	180	960	10.7	9.9	48%	40	1.08
246	6883	18.4	65.9	244	4.60408	316	1.83	1480	1465	1150	210	695	104	30	18.2	18.1	0.83	195	180	1000	9.5	8.7	48%	35	0.97
244	6961	16.6	65.2	242	4.85714	302	1.68	1100	1295	1070	195	610	92	29.6	16.4	16.4	0.68	110	180	880	8.6	7.9	48%	30	0.85
226	7045	15.6	64.6	224	5.48571	275	1.58	845	1065	940	180	415	82	29.3	15.4	15.4	0.58	45	180	590	8.1	7.4	48%	25	0.73
	7129	15.6			6.42857	248										14.4					8.1	6.9		20	0.6
	7213	15.6			8	221										13.4					8.1	6.4		15	0.51
	7297	15.6			11.1429	194										12.4					8.1	5.9		10	0.37

Diesel, iCER, Tier III

NOx g/kWh	PM mg/Nm3	CO ppm	THC ppm	CH4 ppm	N2O ppm	General Power %	Power kW	Speed rpm	BMEP bar	Mps m/s	ISO Power %	Power kW	Bypass %	BSFC g/kWh	BSPC g/kWh	pExh bar	pExhRel bar g	BSEF kg/kWh	tEaT °C	tEaTm °C
11.6	**8.4**	**82.5**	**91.08**		**3.6**	100	21000	89	16.1	9.2	100	21000	0	174.2	0.4	4.54	3.54	8.37	227	
12.26	9.14	73.20	93.39		3.36	95	19950	87.5	15.56	9	95	19950	0	170.7	0.4	4.19	3.19	8.28	211	
12.92	9.87	63.90	95.70		3.12	90	18900	85.9	15	8.8	90	18900	0	167.5	0.4	3.94	2.94	8.31	205	
13.58	10.61	54.60	98.01		2.88	85	17850	84.3	14.44	8.7	85	17850	0	165.4	0.4	3.75	2.75	8.43	201	
13.59	10.62	54.41	98.06		2.88	84.9	17829	84.3	14.43	8.7	84.9	17829	0	165.4	0.4	3.74	2.74	8.43	200	
14.24	11.34	45.30	100.32		2.64	80	16800	82.6	13.87	8.5	80	16800	0	164.1	0.5	3.56	2.56	8.56	198	
14.9	**12.1**	**36**	**102.63**		**2.4**	75	15750	80.9	13.29	8.3	75	15750	0	163.2	0.5	3.41	2.41	8.8	198	
15.34	11.97	36.00	105.89		2.16	70	14700	79	12.69	8.1	70	14700	0	162.9	0.5	3.22	2.22	8.95	197	
15.64	11.90	36.00	108.10		2.00	66.6	13986	77.7	12.28	8	66.6	13986	0	162.9	0.5	3.08	2.08	9.01	198	
15.78	11.87	36.00	109.14		1.92	65	13650	77.1	12.08	7.9	65	13650	0	162.8	0.5	3.01	2.01	9.04	199	
16.22	11.76	36.00	112.40		1.68	60	12600	75.1	11.45	7.7	60	12600	0	163	0.6	2.8	1.8	9.14	200	
16.66	11.66	36.00	115.65		1.44	55	11550	72.9	10.81	7.5	55	11550	0	163.4	0.6	2.59	1.59	9.22	203	
17.1	**11.6**	**36**	**118.91**		**1.2**	50	10500	70.6	10.14	7.3	50	10500	0	164.1	0.7	2.37	1.37	9.24	209	
17.38	10.96	36.60	129.27		1.20	45	9450	68.2	9.45	7	45	9450	0	165.2	0.7	2.14	1.14	9.24	216	
17.66	10.37	37.20	139.63		1.20	40	8400	65.6	8.74	6.7	40	8400	0	166.1	0.8	1.92	0.92	9.17	226	
17.94	9.79	37.80	150.00		1.20	35	7350	62.7	7.99	6.5	35	7350	0	166.8	0.9	1.7	0.7	9.04	239	
18.22	9.20	38.40	160.36		1.20	30	6300	59.6	7.21	6.1	30	6300	0	167.9	1	1.55	0.55	9.38	237	
18.5	**8.6**	**39**	**170.72**		**1.2**	25	5250	56.1	6.39	5.8	25	5250	0	167.7	1.1	1.44	0.44	10.27	223	
18.78	8.02	39.60	181.08		1.20	20	4200							200					206	
19.06	7.43	40.20	191.44		1.20	15	3150							210					189	
19.34	6.85	40.80	201.81		1.20	10	2100							220					172	

BSEC kJ/kWh	Tur Flov kg/s	EtaTC %	tEbB °C	BSAC kg/kWh	tEbT °C	pScav bar	SAC LT kW	Cylinder kW	Lub. Oil kW	Radiation kW	SPP kW	tAaC °C	tScav °C	Com Flow kg/s	mScav kg/s	pScavRel bar g	Cond. watt kg/h	tEaE °C	Steam kg/h	mEco kg/s	mEgr kg/s	EGR rate %
227	7439	48.8	67.8	225	-	414	4.74	10265	2355	1435	360	1690	231	33.9	48.2	47.8	3.74	1230	180	2400	32.4	16.4	34%
211	7290	45.9	69.2	209	-	389	4.38	9195	2430	1475	350	1030	221	33.4	45.2	44.9	3.38	1115	180	1430	30.2	15.6	35%
205	7153	43.6	69.7	203	-	376	4.13	8430	2465	1490	340	770	213	33.1	43	42.7	3.13	1070	180	1050	28.1	15.5	36%
201	7064	41.8	70	199	-	365	3.93	7800	2450	1495	330	605	206	32.9	41.3	41	2.93	1020	180	810	26.5	15.3	37%
200	7062	41.8	70	198	-	365	3.93	7790	2435	1490	330	600	206	32.9	41.2	40.9	2.93	1020	180	800	26.5	15.3	37%
198	7008	39.9	70	196	-	357	3.74	7180	2385	1475	320	510	199	32.6	39.4	39.2	2.74	965	180	670	24.9	15	38%
198	6970	38.5	70	196	-	351	3.59	6730	2280	1430	310	460	193	32.5	38	37.8	2.59	955	180	600	23.2	15.2	40%
197	6957	36.5	69.9	195	-	342	3.39	6075	2220	1405	300	410	185	32.2	36.1	35.9	2.39	860	180	530	22.1	14.4	40%
198	6954	35	69.8	196	-	338	3.24	5615	2210	1415	290	415	179	32	34.6	34.4	2.24	810	180	550	20.9	14.1	41%
199	6953	34.3	69.7	197	-	336	3.17	5400	2205	1420	290	420	177	31.9	33.9	33.7	2.17	780	180	550	20.4	13.9	41%
200	6961	32	69.4	198	-	328	2.97	4720	2175	1420	275	420	167	31.6	31.6	31.4	1.97	675	180	560	19	13	41%
203	6978	29.6	68.9	201	-	322	2.74	4030	2125	1420	265	455	157	31.3	29.2	29	1.74	570	180	610	17.4	12.1	41%
209	7008	27	68.4	207	-	317	2.52	3340	2065	1415	255	500	145	30.9	26.6	26.5	1.52	460	180	690	15.7	11.2	42%
216	7055	24.3	67.7	214	-	312	2.28	2660	2005	1420	240	555	132	30.6	23.9	23.8	1.28	355	180	780	13.9	10.3	43%
226	7093	21.4	66.8	224	-	308	2.04	2005	1935	1420	225	615	118	30.2	21.1	21	1.04	250	180	870	12.1	9.3	44%
239	7123	18.5	65.8	237	-	306	1.8	1395	1860	1425	210	665	102	29.8	18.2	18.1	0.8	140	180	960	10.2	8.2	45%
237	7170	16.4	65	235	-	292	1.65	990	1690	1360	195	565	88	29.4	16.1	16.1	0.65	60	180	810	8.9	7.4	46%
223	7162	15	64.3	221	-	267	1.53	710	1465	1245	180	385	77	29.1	14.7	14.7	0.53	5	180	540	8	6.9	47%
		15.1				241															8		
		15.1				214															8		
		15.1				187															8		

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, TESTING PLANS

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, AND TESTING PLANS

TransGas Development Systems, LLC will work with the Division of Air Quality to identify and address Monitoring, Recordkeeping, Reporting, and Testing Plans. Requirements that are identified in the permit will be implemented.

ATTACHMENT P

PUBLIC NOTICE

ATTACHMENT P

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that TransGas Development Systems, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for the Adams Fork Harless Data Center Energy Campus located on 22 Mine Road near Holden in Mingo County, West Virginia. The latitude and longitude coordinates are: 37.753020 and -82.119050.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: NO_x of 194.30 tons per year (tpy), SO2 of 9.93 tpy, CO of 205.62, tpy, VOC of 117.66 which includes fugitives of 0.31 tpy, PM of 193.69 tpy which includes fugitives of 7.16 tpy, PM10 of 187.96 which includes fugitives of 1.43 tpy, PM2.5 of 186.91 tpy which includes fugitives of 0.30 tpy, and total HAPS of 0.87 tpy.

Startup of operations is planned to begin on or about the 1st day of January 2027. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice. Written comments will also be received via email at DEPAirQualityPermitting@WV.gov.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, Extension 41281, during normal business hours.

Dated this the **(Insert Date)** day of March 2025.

By: TransGas Development Systems, LLC
Adam Victor
President
630 First Avenue, Suite 30C
New York, New York 10016-3799

ATTACHMENT Q

BUSINESS CONFIDENTIAL CLAIMS

Cover Document
Confidential Information

This sample form contains each of the required elements for the cover document required under 45CSR31. The person submitting this form may wish to attach an additional page(s) to provide adequate justification under the "Rationale" section of the form.

Company Name	TransGas Development Systems, LLC	Responsible Official		Adam Victor, President
Company Address	630 First Avenue, Suite 30C New York, NY 10016-3799	Confidential Information Designee in State of WV	Name	Patrick Ward
			Title	Senior Engineer
			Address	7012 MacCorkle Ave, SE Charleston, WV 25304
Person/Title *Submitting* Confidential Information	Adam Victor			
	President		Phone	(304) 342-1400
			Fax	(304) 343-9031

Reason for Submittal of Confidential Information: Initial permitting.

Identification of Confidential Information	Rationale for Confidential Claim	Confidential Treatment Time Period
All Marked Confidential Information.	Provide justification that the criteria set forth in § 45CSR31-4.1.a - e have been met. The information contained within the application is fully protected under non-disclosure and confidentiality agreements by all parties involved in the application process and design of the facility. See Page Q2 of Q2.	This information is to be maintained confidential. There is no timeframe for expiration of confidential treatment.

Responsible Official Signature:	
Responsible Official Title:	President
Date Signed:	3/24/25

NOTE: Must be signed and dated in **BLUE INK**.

Precautionary Notice — Claims of Confidentiality
WVDEP-DAQ: Revised March 23, 2020

Provide justification that the criteria set forth in § 45CSR31-4.1.a - e have been met.

4.1.a. The claim of confidentiality has not expired by its terms, nor been waived or withdrawn;

The confidentiality agreements do not have an expiration date due to the nature of the information contained in the application.

4.1.b. The person asserting the claim of confidentiality has satisfactorily shown that it has taken reasonable measures to protect the confidentiality of the information, and that it intends to continue to take such measures;

The information contained within the application is fully protected under non-disclosure and confidentiality agreements by all parities involved in the original development of the processes, the design of the facility, and the permit application process.

4.1.c. The information claimed confidential is not, and has not been, reasonably obtainable without the person's consent by other persons (other than governmental bodies) by use of legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding);

The information available herein is not available and is not to be made available to outside parties.

4.1.d. No statute specifically requires disclosure of the information; and

Applicant believes there are no statutes that require disclosure of the information.

4.1.e. Either--

4.1.e.1. The person has satisfactorily shown that disclosure of the information is likely to cause substantial harm to the business's competitive position; or

This is a unique facility with many parties involved in preparing and providing information on the systems. Release of this information could cause substantial harm to Applicant's competitive position in the market.

4.1.e.2. The information is voluntarily submitted information, and its disclosure would likely to impair the State's ability to obtain necessary information in the future.

The State should not disclose this information to anyone.

4. Revised Permit Application R13-3715

Division of Air Quality Permit Application Submittal

Please find attached a permit application for : TransGas Development Systems, LLC
[Company Name; Facility Location]

- DAQ Facility ID (for existing facilities only): New Facility
- Current 45CSR13 and 45CSR30 (Title V) permits associated with this process (for existing facilities only): New Facility

- Type of NSR Application (check all that apply):
  - ☑ Construction
  - ☐ Modification
  - ☐ Class I Administrative Update
  - ☐ Class II Administrative Update
  - ☐ Relocation
  - ☐ Temporary
  - ☐ Permit Determination

- Type of 45CSR30 (TITLE V) Application:
  - ☐ Title V Initial
  - ☐ Title V Renewal
  - ☐ Administrative Amendment**
  - ☐ Minor Modification**
  - ☐ Significant Modification**
  - ☐ Off Permit Change

****If the box above is checked, include the Title V revision information as ATTACHMENT S to the combined NSR/Title V application.**

- Payment Type:
  - ☑ Credit Card (Instructions to pay by credit card will be sent in the Application Status email.)
  - ☐ Check (Make checks payable to: WVDEP – Division of Air Quality)
    Mail checks to:
    WVDEP – DAQ – Permitting
    Attn: NSR Permitting Secretary
    601 57th Street, SE
    Charleston, WV 25304

Please wait until DAQ emails you the Facility ID Number and Permit Application Number. Please add these identifiers to your check or cover letter with your check.

- If the permit writer has any questions, please contact (all that apply):
  - ☑ Responsible Official/Authorized Representative
    - Name: Adam Victor
    - Email: adam@tgds.com
    - Phone Number: (917) 816-3700
  - ☑ Company Contact
    - Name: Adam Victor, Jr.
    - Email: avj@adamsforkenergy.com
    - Phone Number: (917) 816-3700
  - ☑ Consultant
    - Name: Patrick Ward
    - Email: PEWard@potesta.com
    - Phone Number: (304) 342-1400

REGULATION 13 PERMIT APPLICATION FOR THE CONSTRUCTION OF ADAMS FORK DATA CENTER ENERGY CAMPUS MINGO COUNTY, WEST VIRGINIA

REDACTED VERSION

Prepared for:

TransGas Development Systems, LLC
630 First Avenue, Suite 30C
New York, New York 10016-3799

Prepared by:

Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
Email: potesta@potesta.com

Project No. 0101-22-0132-003A

March 24, 2025

POTESTA

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Fugitive Emissions Data Summary Sheet..... ATTACHMENT K

Emissions Unit Data Sheet(s) ..... ATTACHMENT L

Air Pollution Control Device(s)..... ATTACHMENT M

Supporting Emissions Calculations ..... ATTACHMENT N

Monitoring/Recordkeeping/Reporting/Testing Plans ..... ATTACHMENT O

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Attachments not applicable to this submission: Attachment R, Authority Forms and Attachment S, Title V Permit Revision Information.

SECTION I - III

APPLICATION FOR NSR PERMIT

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
TransGas Development Systems, LLC

2. Federal Employer ID No. ***(FEIN):***
20343110

3. Name of facility *(if different from above):*
Adams Fork Data Center Energy Campus

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
630 First Avenue, Suite 30C
New York, New York 10016-3799

5B. Facility's present physical address:
2002 Twisted Gun Road
Wharncliffe, WV 25651

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

➪ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

➪ If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: No

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☐ **YES** ☐ **NO**

➪ If **YES,** please explain: Applicant has an option on the site with the current owner.

➪ If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Off-grid Power Generation

10. North American Industry Classification System **(NAICS)** code for the facility:
221112

11A. DAQ Plant ID No. (for existing facilities only):
New Facility

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
New Facility

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

12A.

- ➪ For **Modifications, Administrative Updates** or **Temporary permits** at an existing facility, please provide directions to the *present location* of the facility from the nearest state road;
- ➪ For **Construction** or **Relocation permits,** please provide directions to the *proposed new site location* from the nearest state road. Include a **MAP** as **Attachment B**.

The facility will be located on the property currently occupied by the Twisted Gun Golf Course near Wharncliffe, West Virginia. The site can be accessed from WV Route 52 headed toward Gilbert. Turn right onto Gilbert Creek Road, then right onto Right Fork Bens Creek Road to Twisted Gun Road. Proceed to the end of Twisted Gun Road for the site.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Not Applicable	Wharncliffe	Mingo
12.E. UTM Northing (KM): 4,161.72229	12F. UTM Easting (KM): 415.70631	12G. UTM Zone: 17

13. Briefly describe the proposed change(s) at the facility:
This application is for the construction of the facility.

14A. Provide the date of anticipated installation or change: 01/01/2026 ➪ If this is an **After-The-Fact** permit application, provide the date upon which the proposed change did happen: / /	14B. Date of anticipated Start-Up if a permit is granted: 01/01/2027

14C. Provide a **Schedule** of the planned **Installation** of/**Change** to and **Start-Up** of each of the units proposed in this permit application as **Attachment C** (if more than one unit is involved).

15. Provide maximum projected **Operating Schedule** of activity/activities outlined in this application:
24 Hours Per Day 7 Days Per Week Weeks Per Year 52

16. Is demolition or physical renovation at an existing facility involved? ☐ **YES** ☒ **NO**

17**. Risk Management Plans.** If this facility is subject to 112(r) of the 1990 CAAA, or will become subject due to proposed changes (for applicability help see www.epa.gov/ceppo), submit your **Risk Management Plan (RMP)** to U. S. EPA Region III.

18**. Regulatory Discussion.** List all Federal and State air pollution control regulations that you believe are applicable to the proposed process *(if known).* A list of possible applicable requirements is also included in Attachment S of this application (Title V Permit Revision Information). Discuss applicability and proposed demonstration(s) of compliance *(if known).* Provide this information as **Attachment D.**

Section II. Additional attachments and supporting documents.

19. Include a check payable to WVDEP – Division of Air Quality with the appropriate **application fee** (per 45CSR22 and 45CSR13).

20. Include a **Table of Contents** as the first page of your application package.

21. Provide a **Plot Plan,** e.g. scaled map(s) and/or sketch(es) showing the location of the property on which the stationary source(s) is or is to be located as **Attachment E** (Refer to ***Plot Plan Guidance***) **.**

➪ Indicate the location of the nearest occupied structure (e.g. church, school, business, residence).

22. Provide a **Detailed Process Flow Diagram(s)** showing each proposed or modified emissions unit, emission point and control device as **Attachment F.**

23. Provide a **Process Description** as **Attachment G.**

➪ Also describe and quantify to the extent possible all changes made to the facility since the last permit review (if applicable).

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

24. Provide **Material Safety Data Sheets (MSDS)** for all materials processed, used or produced as **Attachment H.**

➪ For chemical processes, provide a MSDS for each compound emitted to the air.

25. Fill out the **Emission Units Table** and provide it as **Attachment I.**

26. Fill out the **Emission Points Data Summary Sheet (Table 1 and Table 2)** and provide it as **Attachment J.**

27. Fill out the **Fugitive Emissions Data Summary Sheet** and provide it as **Attachment K.**

28. Check all applicable **Emissions Unit Data Sheets** listed below:

☐ Bulk Liquid Transfer Operations	☐ Haul Road Emissions	☐ Quarry
☐ Chemical Processes	☐ Hot Mix Asphalt Plant	☐ Solid Materials Sizing, Handling and Storage Facilities
☐ Concrete Batch Plant	☐ Incinerator	☒ Storage Tanks
☐ Grey Iron and Steel Foundry	☐ Indirect Heat Exchanger	

☒ General Emission Unit, specify Engines 1 through 117.

Fill out and provide the **Emissions Unit Data Sheet(s)** as **Attachment L.**

29. Check all applicable **Air Pollution Control Device Sheets** listed below:

☐ Absorption Systems	☐ Baghouse	☒ Flare
☐ Adsorption Systems	☐ Condenser	☐ Mechanical Collector
☐ Afterburner	☐ Electrostatic Precipitator	☐ Wet Collecting System

☒ Other Collectors, specify Control System

Fill out and provide the **Air Pollution Control Device Sheet(s)** as **Attachment M.**

30. Provide all **Supporting Emissions Calculations** as **Attachment N,** or attach the calculations directly to the forms listed in Items 28 through 31.

31. **Monitoring, Recordkeeping, Reporting and Testing Plans.** Attach proposed monitoring, recordkeeping, reporting and testing plans in order to demonstrate compliance with the proposed emissions limits and operating parameters in this permit application. Provide this information as **Attachment O.**

➢ Please be aware that all permits must be practically enforceable whether or not the applicant chooses to propose such measures. Additionally, the DAQ may not be able to accept all measures proposed by the applicant. If none of these plans are proposed by the applicant, DAQ will develop such plans and include them in the permit.

32. **Public Notice.** At the time that the application is submitted, place a **Class I Legal Advertisement** in a newspaper of general circulation in the area where the source is or will be located (See 45CSR§13-8.3 through 45CSR§13-8.5 and ***Example Legal Advertisement*** for details). Please submit the **Affidavit of Publication** as **Attachment P** immediately upon receipt.

33. **Business Confidentiality Claims.** Does this application include confidential information (per 45CSR31)?

☒ **YES** ☐ **NO**

➢ If **YES,** identify each segment of information on each page that is submitted as confidential and provide justification for each segment claimed confidential, including the criteria under 45CSR§31-4.1, and in accordance with the DAQ's ***"Precautionary Notice – Claims of Confidentiality"*** guidance found in the ***General Instructions*** as **Attachment Q.**

Section III. Certification of Information

34. **Authority/Delegation of Authority.** Only required when someone other than the responsible official signs the application. Check applicable **Authority Form** below: Not Required

☐ Authority of Corporation or Other Business Entity	☐ Authority of Partnership
☐ Authority of Governmental Agency	☐ Authority of Limited Partnership

Submit completed and signed **Authority Form** as **Attachment R.**

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

35A. **Certification of Information.** To certify this permit application, a Responsible Official (per 45CSR§13-2.22 and 45CSR§30-2.28) or Authorized Representative shall check the appropriate box and sign below.

Certification of Truth, Accuracy, and Completeness

I, the undersigned ☒ **Responsible Official** / ☐ **Authorized Representative,** hereby certify that all information contained in this application and any supporting documents appended hereto, is true, accurate, and complete based on information and belief after reasonable inquiry I further agree to assume responsibility for the construction, modification and/or relocation and operation of the stationary source described herein in accordance with this application and any amendments thereto, as well as the Department of Environmental Protection, Division of Air Quality permit issued in accordance with this application, along with all applicable rules and regulations of the West Virginia Division of Air Quality and W.Va. Code § 22-5-1 et seq. (State Air Pollution Control Act). If the business or agency changes its Responsible Official or Authorized Representative, the Director of the Division of Air Quality will be notified in writing within 30 days of the official change.

Compliance Certification

Except for requirements identified in the Title V Application for which compliance is not achieved, I, the undersigned hereby certify that, based on information and belief formed after reasonable inquiry, all air contaminant sources identified in this application are in compliance with all applicable requirements.

SIGNATURE _____ DATE: 3/24/25

(Please use blue ink) *(Please use blue ink)*

35B. Printed name of signee: Adam Victor		35C. Title: President
35D. E-mail: adam@tgds.com	36E. Phone: (917) 816-3700	36F. FAX: Use Email
36A. Printed name of contact person (if different from above): Same as above		36B. Title:
36C. E-mail:	36D. Phone:	36E. FAX:

PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:

- ☒ Attachment A: Business Certificate
- ☒ Attachment B: Map(s)
- ☒ Attachment C: Installation and Start Up Schedule
- ☒ Attachment D: Regulatory Discussion
- ☒ Attachment E: Plot Plan
- ☒ Attachment F: Detailed Process Flow Diagram(s)
- ☒ Attachment G: Process Description
- ☒ Attachment H: Material Safety Data Sheets (MSDS)
- ☒ Attachment I: Emission Units Table
- ☒ Attachment J: Emission Points Data Summary Sheet
- ☒ Attachment K: Fugitive Emissions Data Summary Sheet
- ☒ Attachment L: Emissions Unit Data Sheet(s)
- ☒ Attachment M: Air Pollution Control Device Sheet(s)
- ☒ Attachment N: Supporting Emissions Calculations
- ☒ Attachment O: Monitoring/Recordkeeping/Reporting/Testing Plans
- ☒ Attachment P: Public Notice
- ☒ Attachment Q: Business Confidential Claims
- ☐ Attachment R: Authority Forms
- ☐ Attachment S: Title V Permit Revision Information
- ☒ Application Fee

Please mail an original and three (3) copies of the complete permit application with the signature(s) to the DAQ, Permitting Section, at the address listed on the first page of this application. Please DO NOT fax permit applications.

FOR AGENCY USE ONLY – IF THIS IS A TITLE V SOURCE:

- ☐ *Forward 1 copy of the application to the Title V Permitting Group and:*
- ☐ *For Title V Administrative Amendments:*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit,*
- ☐ *For Title V Minor Modifications:*
  - ☐ *Title V permit writer should send appropriate notification to EPA and affected states within 5 days of receipt,*
  - ☐ *NSR permit writer should notify Title V permit writer of draft permit.*
- ☐ *For Title V Significant Modifications processed in parallel with NSR Permit revision:*
  - ☐ *NSR permit writer should notify a Title V permit writer of draft permit,*
  - ☐ *Public notice should reference both 45CSR13 and Title V permits,*
  - ☐ *EPA has 45 day review period of a draft permit.*

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

ATTACHMENT A

BUSINESS CERTIFICATE

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
TRANSGAS DEVELOPMENT SYSTEMS, LLC
630 1ST AVE APT 30G
NEW YORK, NY 10016-3799

BUSINESS REGISTRATION ACCOUNT NUMBER: **2218-0756**

This certificate is issued on: 06/29/2010

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with W.Va. Code § 11-12.

The person or organization identified on this certificate is registered to conduct business in the State of West Virginia at the location above.

This certificate is not transferrable and must be displayed at the location for which issued.

This certificate shall be permanent until cessation of the business for which the certificate of registration was granted or until it is suspended, revoked or cancelled by the Tax Commissioner.

Change in name or change of location shall be considered a cessation of the business and a new certificate shall be required.

TRAVELING/STREET VENDORS: Must carry a copy of this certificate in every vehicle operated by them. CONTRACTORS, DRILLING OPERATORS, TIMBER/LOGGING OPERATIONS: Must have a copy of this certificate displayed at every job site within West Virginia.

atL006 v.1
L1333508864

ATTACHMENT B

SITE LOCATION MAP

Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE, Charleston, WV 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
E-Mail: potesta@potesta.com

TransGas Development Systems, LLC
Adams Fork Data Center Energy Campus
Wharncliffe, West Virginia
Project No. 0101-22-0132-003A

ATTACHMENT C

INSTALLATION AND STARTUP SCHEDULE

ATTACHMENT C

INSTALLATION AND START UP SCHEDULE

Construction of the facility will begin after receipt of Construction Permit from West Virginia Department of Environmental Protection, Division of Air Quality, and other necessary regulatory approvals on or near January 1, 2026. Operations will commence approximately 12 months after the beginning of construction.

ATTACHMENT D

REGULATORY DISCUSSION

ATTACHMENT D

REGULATORY DISCUSSION

The facility proposed herein, or portions of the facility, may be subject to the following regulations based on a review of potential air quality regulations (see No. 1 and 2). Additionally, there are a few regulations which the source may not be subject to which are also listed below in No. 3.

1. State Regulations

   A. 45CSR4 – "To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors"

   B. 45CSR13 – "Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation"

   C. 45CSR16 – "Standards of Performance for New Stationary Sources"

   D. 45CSR20 – "Good Engineering Practice as Applies to Stack Heights"

   E. 45SCR30 – "Requirements for Operation Permits"

   F. 45CSR31 – "Confidential Information"
   This application contains confidential information. This claim of confidentiality is made in accordance with the requirements of 45CSR31.

   G. 45CSR34 – "Emission Standards for Hazardous Air Pollutants"

2. Federal Regulations

   A. 40CFR60 Subpart A – General Provisions

   B. 40CFR60 Subpart IIII - Standard of Performance for Stationary Compression Ignition Internal Combustion Engines

   C. 40CFR63, Subpart ZZZZ – National Emissions Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

3. Non-Applicable Regulations or Exemptions Apply

A. 45CSR40 – Contol of Ozone Season Nitrogen Oxide Emissions
The reciprocating internal combustion engines proposed for this facility do not appear to be considered as a unit per the definition contained in section 2.30 where a unit is defined as a stationary fossil fuel-fired boiler, combustion turbine, or combined cycle system. The engines also have a maximum heat input of less than 250 MMBtu/hr as stated in Section 4.1. Furthermore, the units do not appear to be subject to 40CFR97.

B. 40CFR97, Subpart DDDDD - CSAPR SO2 Group 2 Trading Program and Subpart EEEEE – CSAPR Nox Ozone Season Group 2 Trading Program. The nameplate capacity of the generators attached to each unit is 25 MWe. Also, the units (reciprocating internal combustion engines) do not appear to be regulated by the rule.

C. 45CSR33 – Acid Rain Provisions and Permits
This rule does not appear to apply due to the New Unit Exemption in 40CFR72.

D. 40CFR72, Acid Rain Program, Subpart A, Section 72.7, New Unit Exemption, appears to exempt the units from applicability based on serving a generator of 25 MWe or less, not burning coal or coal-derived fuel, and burns fuel with sulfur of 0.05 percent or less by weight.

E. 40CFR60 Subpart Kc – Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced After October 4, 2023. Does not apply due to low vapor pressure of diesel.

ATTACHMENT E

PLOT PLANS

ENGINES			
Power House	**Engine IDs**	**Emission ID**	**Control ID**
1	ENG1, ENG2, ENG3	E1, E2, E3	C1, C2, C3
2	ENG4, ENG5, ENG6	E4, E5, E6	C4, C5, C6
3	ENG7, ENG8, ENG9	E7, E8, E9	C7, C8, C9
4	ENG10, ENG11, ENG12	E10, E11, E12	C10, C11, C12
5	ENG13, ENG14, ENG15	E13, E14, E15	C13, C14, C15
6	ENG16, ENG17, ENG18	E16, E17, E18	C16, C17, C18
7	ENG19, ENG20, ENG21	E19, E20, E21	C19, C20, C21
8	ENG22, ENG23, ENG24	E22, E23, E24	C22, C23, C24
9	ENG25, ENG26, ENG27	E25, E26, E27	C25, C26, C27
10	ENG28, ENG29, ENG30	E28, E29, E30	C28, C29, C30
11	ENG31, ENG32, ENG33	E31, E32, E33	C31, C32, C33
12	ENG34, ENG35, ENG36	E34, E35, E36	C34, C35, C36
13	ENG37, ENG38, ENG39	E37, E38, E39	C37, C38, C39
14	ENG40, ENG41, ENG42	E40, E41, E42	C40, C41, C42
15	ENG43, ENG44, ENG45	E43, E44, E45	C43, C44, C45
16	ENG46, ENG47, ENG48	E46, E47, E48	C46, C47, C48
17	ENG49, ENG50, ENG51	E49, E50, E51	C49, C50, C51
18	ENG52, ENG53, ENG54	E52, E53, E54	C52, C53, C54
19	ENG55, ENG56, ENG57	E55, E56, E57	C55, C56, C57
20	ENG58, ENG59, ENG60	E58, E59, E60	C58, C59, C60
21	ENG61, ENG62, ENG63	E61, E62, E63	C61, C62, C63
22	ENG64, ENG65, ENG66	E64, E65, E66	C64, C65, C66
23	ENG67, ENG68, ENG69	E67, E68, E69	C67, C68, C69
24	ENG70, ENG71, ENG72	E70, E71, E72	C70, C71, C72
25	ENG73, ENG74, ENG75	E73, E74, E75	C73, C74, C75
26	ENG76, ENG77, ENG78	E76, E77, E78	C76, C77, C78
27	ENG79, ENG80, ENG81	E79, E80, E81	C79, C80, C81
28	ENG82, ENG83, ENG84	E82, E83, E84	C82, C83, C84
29	ENG85, ENG86, ENG87	E85, E86, E87	C85, C86, C87
30	ENG88, ENG89, ENG90	E88, E89, E90	C88, C89, C90
31	ENG91, ENG92, ENG93	E91, E92, E93	C91, C92, C93
32	ENG94, ENG95, ENG96	E94, E95, E96	C94, C95, C96
33	ENG97, ENG98, ENG99	E97, E98, E99	C97, C98, C99
34	ENG100, ENG101, ENG102	E100, E101, E102	C100, C101, C102
35	ENG103, ENG104, ENG105	E103, E104, E105	C103, C104, C105
36	ENG106, ENG107, ENG108	E106, E107, E108	C106, C107, C108
37	ENG109, ENG110, ENG111	E109, E110, E111	C109, C110, C111
38	ENG112, ENG113, ENG114	E112, E113, E114	C112, C113, C114
39	ENG115, ENG116, ENG117	E115, E116, E117	C115, C116, C117

TANKS

1. Ultra Low Sulfur Diesel will be stored in 40 tanks located on the property near each powerhouse. The tanks are uncontrolled. The tank identification numbers are TK1 – TK40 (118S through 157S with emission points 118E through 157E).
2. Each powerhouse 1 through 39 will have one set of emission control fluid tanks for Hydrous Ammonia, Caustic Soda, Sulfuric Acid, Sodium Chloride, and Sodium Hydrosulfide. These tanks are de minimis.

POTESTA
7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

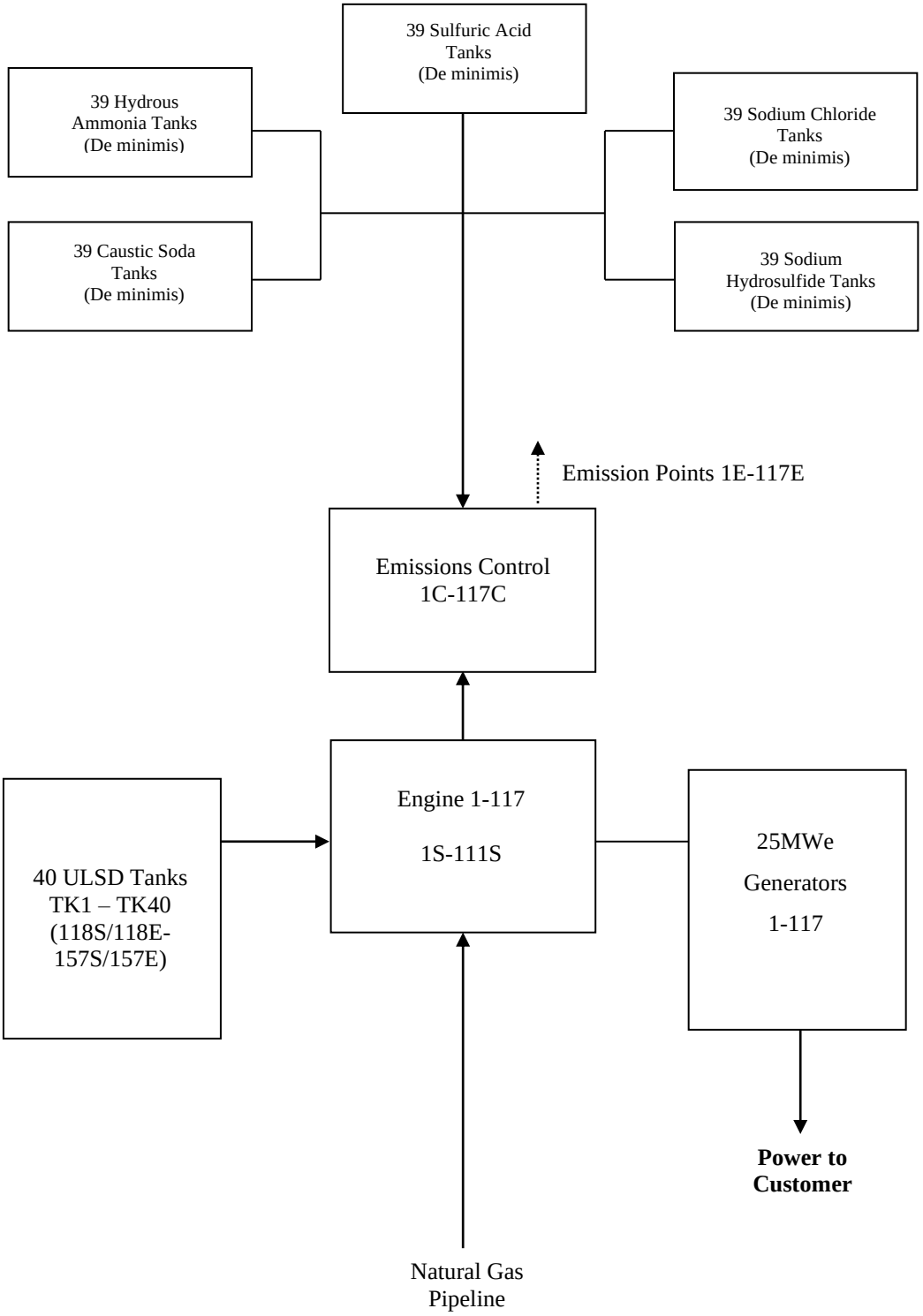
PLOT PLAN

TransGas Development Systems, LLC

Adams Fork Data Center Energy Campus
Wharncliffe, West Virginia
Project No. 0101-22-0132-003A

ATTACHMENT F

PROCESS FLOW DIAGRAM(S)



Potesta & Associates, Inc.
7012 MacCorkle Avenue, SE, Charleston, WV 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
E-Mail: potesta@potesta.com

TransGas Development Systems, LLC
Adams Fork Data Center Energy Campus
Wharncliffe, West Virginia
Project No. 0101-22-0132-003A

ATTACHMENT G

PROCESS DESCRIPTION

ATTACHMENT G

PROCESS DESCRIPTION

The facility proposed herein is a unique, off-grid, electric generating facility designed to provide power to adjacent data center operations. The facility encompasses 117 engines (Source Numbers 1S through 117S) with 114 engines operating full-time and 3 engines in reserve. Each engine has a proposed control strategy (Control Numbers 1C through 117C) and vent through their own exhaust stack (Emissions Point 1E through 117E). The facility will contain 39 powerhouses with each containing 3 generator setups with each generator having a nameplate capacity of 25 MWe. Actual power generation will depend on the operating mode of the engines. The operating modes of the engines are more fully described in Attachment L. The control systems for each engine are described in Attachment M.

The engines will operate on ultra-low sulfur diesel and natural gas depending on the operating status. Ultra-low sulfur diesel will be stored in 40 tanks (TK1 through TK40, 118S-157S, 118E-157E) on the property. Natural gas will be delivered via pipeline. Tanks for control device liquids will be located at each powerhouse so there will be 39 tanks of each of hydrous ammonia, caustic soda, sulfuric acid, sodium chlorite, and sodium hydrosulfide. These tanks are considered de minimis. Liquids and supplies will be trucked to the site.

There is no steam-power production at the site. Cooling will be provided by mine pool water as needed; therefore, there is no requirement for cooling towers.

ATTACHMENT H

MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet

Sodium hydrosulfide solution

MSDS Number 8000TDC (Revised: 1/23/04) 6 Pages

Section 1: CHEMICAL PRODUCT and COMPANY IDENTIFICATION

1.1 Product Name .....**Sodium hydrosulfide solution**
Chemical Family ..... Inorganic salt solution
Synonyms ..... KI-300 depressant, NaHS, sodium hydrogen sulfide
Formula ..... NaHS

1.2 Manufacturer .....Tessenderlo Davison Chemicals, LLC.
1916 Farmerville Highway
Ruston, Louisiana 71270
Information ..... (318) 242-5305

1.3 Emergency Contact ..... (800) 877-1737 (Tessenderlo Kerley)
(800) 424-9300 (CHEMTREC)

Section 2: COMPOSITION, INFORMATION ON INGREDIENTS

2.1 Chemical Ingredients (% by wt.)

Sodium hydrosulfide	CAS #:16721-80-5	20-45%
Water	CAS #:7732-18-5	55-80%

(See Section 8 for exposure guidelines)

Section 3: HAZARDS IDENTIFICATION

NFPA: Health - 3 Flammability - 2 Reactivity - 1

EMERGENCY OVERVIEW

Warning: Solution is highly alkaline
Contains hydrogen sulfide , a highly toxic gas.
Eye contact will cause marked eye irritation and possibly severe corneal damage. Skin contact will result in irritation and possible corrosion of the skin. Ingestion will irritate/burn mouth, throat and gastrointestinal tract. Contact with stomach acid will cause hydrogen sulfide vapors to be released. Heating or acid will cause hydrogen sulfide gas to evolve. Dilution of NaHS with water will also cause increased evolution of hydrogen sulfide.

Section 3: HAZARDS IDENTIFICATION, Cont.

3.1 POTENTIAL HEALTH EFFECTS

EYE: Contact with the eyes will cause marked eye irritation and possibly severe corneal damage.

SKIN CONTACT: Contact with the skin will cause skin irritation or burning sensation. Prolonged contact will result in corrosion of the skin.

SKIN ABSORPTION: Absorption is unlikely to occur.

INGESTION: Ingestion will result in severe burning and corrosion of mouth, throat and the gastrointestinal tract. If the ingested material contacts stomach acid, highly toxic hydrogen sulfide gas will be evolved.

INHALATION: Product solution and vapors contain highly toxic hydrogen sulfide gas. Exposure to this gas causes, headaches, nausea, dizziness and vomiting. Continued exposure can lead to loss of consciousness and death..

CHRONIC EFFECTS/CARCINOGENICITY: Not listed as a carcinogen by NTP, IARC or OSHA.

Section 4: FIRST AID MEASURES

4.1 EYES: Immediately flush with large quantities of water for 15 minutes. Hold eyelids apart during irrigation to insure thorough flushing of the entire area of the eye. Obtain immediate medical attention.

4.2 SKIN: Immediately flush with large quantities of water. Remove contaminated clothing under a safety shower. Obtain immediate medical attention

4.3 INGESTION: DO NOT INDUCE VOMITING. If victim is conscious, immediately give 2 to 4 glasses of water. If vomiting does occur, repeat fluid administration. Obtain immediate medical attention.

4.4 INHALATION: Remove victim from contaminated atmosphere. If breathing is labored, administer oxygen. If breathing has ceased, clear airway and start mouth to mouth resuscitation. If heart has stopped beating, external heart massage should be applied. Obtain immediate medical attention.

Section 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

FLASH POINT: Not flammable **METHOD USED:** NA

5.2 FLAMMABLE LIMITS **Hydrogen sulfide** **LFL**: 4% **UFL**: 44%

5.3 EXTINGUISHING MEDIA: Water spray or foam or as appropriate for combustibles involved in fire.

5.4 FIRE & EXPLOSIVE HAZARDS: Solution is non-flammable. However if these solutions are exposed to heat or acids, hydrogen sulfide will be released and may form explosive mixtures with air (see above).

Keep containers/storage vessels in fire area cooled with water spray. Heating may cause the release of hydrogen sulfide vapors.

Section 5: FIRE FIGHTING MEASURES (Cont.)

5.5 FIRE FIGHTING EQUIPMENT: Because of the possible presence of toxic gases and the corrosive nature of the product, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

Section 6: ACCIDENTAL RELEASE MEASURES

6.1 Small releases: Confine and absorb small releases on sand earth or other inert absorbent. Oxidize residual reactive sulfides with a weak (3-5%) hydrogen peroxide solution.

6.2 Large releases: Wear proper protective equipment. Confine area to qualified personnel. Shut off release if safe to do so. Dike spill area to prevent runoff into sewers, drains (potential explosive mixtures of hydrogen sulfide in confined spaces) or surface waterways (potential aquatic toxicity). Recover as much of the solution as possible. Treat remaining material as a small release (above).

Section 7: HANDLING and STORAGE

7.1 Handling: Wear proper protective equipment (See Section 8). Avoid breathing product vapors. Avoid contact with skin and eyes. Use only in a well ventilated area. Dilute product only in enclosed containers. Wash thoroughly after handling.

7.2 Storage: Store in well ventilated areas. Do not store combustibles in the area of storage vessels. Keep away from any sources of heat or flame. Store tote and smaller containers out of direct sunlight at moderate temperatures [<80º F (27º C)]. (See Section 10.4 for materials of construction)

Section 8: EXPOSURE CONTROLS, PERSONAL PROTECTION

8.1 RESPIRATORY PROTECTION: If working near open container or storage vessel opening or open tank truck dome cover, wear self-contained breathing apparatus, pressure demand, MSHA/NIOSH (approved or equivalent).

8.2 SKIN PROTECTION: Neoprene rubber gloves, chemical suit and boots should be worn to prevent contact with the liquid. Wash contaminated clothing prior to reuse. Contaminated leather shoes cannot be cleaned and should be discarded.

8.3 EYE PROTECTION: Chemical goggles and a full face shield.

8.4 EXPOSURE GUIDELINES:

	OSHA		ACGIH	
	TWA	STEL	TLV	STEL
Hydrogen sulfide	20 ppm (ceiling)		10 ppm (ceiling)	

8.5 ENGINEERING CONTROLS: Use adequate exhaust ventilation to prevent inhalation of product vapors. Where feasible scrub process or storage vessel vapors with caustic solution.
Maintain eyewash/safety shower in areas where chemical is handled.

Section 9: PHYSICAL and CHEMICAL PROPERTIES

9.1 APPEARANCE:	Yellow to dark green liquid.
9.2 ODOR:	Strong hydrogen sulfide (rotten egg) odor.
9.3 BOILING POINT:	253 °F(122.8 °C) - 269 °F (131.7 °C)
9.4 VAPOR PRESSURE:	17 mm Hg @ 68 °F (20 °C)
9.5 VAPOR DENSITY: (Air = 1.0)	1.17
9.6 SOLUBILITY IN WATER:	Complete
9.7 SPECIFIC GRAVITY:	1.152 - 1.303 (9.6 - 10.9 lbs/gal)
9.8 FREEZING POINT:	0° F (-17.8° C) - 20% 56º F (13.3º C) - 45%
9.9 pH:	11.5 - 12.5
9.10 VOLATILE:	Not applicable

Section 10: STABILITY and REACTIVITY

10.1 STABILITY: This is a stable material

10.2 HAZARDOUS POLYMERIZATION: Will not occur.

10.3 HAZARDOUS DECOMPOSITION PRODUCTS: Heating this product will evolve hydrogen sulfide. Fire conditions will also cause the production of sulfur dioxide. Hydrogen sulfide (4-44%) may form flammable mixtures with air.

10.4 INCOMPATIBILITY: Acids will cause the release of highly toxic hydrogen sulfide. Sodium hydrosulfide solution is not compatible with copper, zinc, aluminum or their alloys (i.e. bronze, brass, galvanized metals, etc.). Corrosive to steel above 150º F (65.5º C). These materials of construction should not be used in handling systems or storage containers for this product (SEE Section 7.2, Storage). Dilution of NaHS with water will increase the evolution of hydrogen sulfide. Dilution should be done in an enclosed container.

Section 11: TOXICOLOGICAL INFORMATION

11.1 ORAL: Data not available

11.2 DERMAL: Data not available

11.3 INHALATION: INH-RAT LC_{50}: 444 ppm (hydrogen sulfide)
INH-MOUSE LC_{50}: 1,500 mg/m^3 18 minutes
INH-RAT LC_{50}: 1,500 mg/m^3 14 minutes

11.4 CHRONIC/CARCINOGENICITY: No evidence available

11.5 TERATOLOGY: Data not available

11.6 REPRODUCTION: Data not available

11.7 MUTAGENICITY: Data not available

Section 12: ECOLOGICAL INFORMATION

Static acute 96 hour-LC_{50} for mosquito fish is 206 mg/L. (Tl_m - fresh water)
LC_{50} fly inhalation 1,500 mg/m^3, 7 minutes
TL_m Gammarus 0.84 mg/L, 96 hours (hydrogen sulfide)
TL_m Ephemera 0.316 mg/L, 96 hours (hydrogen sulfide)
TL_m Flathead minnow 0.071 – 0.55 mg/L @ 6-24ºC, 96 hour flow through bioassay (hydrogen sulfide)
TL_m Bluegill 0.0090 – 0.0140 mg/L @ 20-22ºC, 96 hour flow through bioassay (hydrogen sulfide)
TL_m Brook trout 0.0216 – 0.0308 mg/L @ 8-12.5ºC, 96 hour flow through bioassay (hydrogen sulfide)

Section 13: DISPOSAL CONSIDERATIONS

If released to the environment for other than its intended purpose, this product contains some reactive sulfides which may be in sufficient quantity to meet the definition of a D003, hazardous waste.

Section 14: TRANSPORT INFORMATION

14.1 DOT Shipping Name:	Corrosive liquids, toxic, n.o.s.
14.2 DOT Hazard Class:	8
14.3 UN/NA Number:	UN2922 UN2949 (IMDG - over water)
14.4 Packing Group:	II
14.5 DOT Placard:	Corrosive
14.6 DOT Label(s):	Corrosive Toxic
14.7 IMO Shipping Name:	Sodium hydrosulphide solution
14.8 RQ (Reportable Quantity):	5,000 lbs (2268 Kg) 100% basis [2,604 gal (20%) 1,019 gal (45%)]
14.9 RR STCC Number:	28-123-33/49-352-04 (international)

Section 15: REGULATORY INFORMATION

15.1 OSHA: This product is listed as a hazardous material under criteria of the Federal OSHA Hazard Communication Standard, 29 CFR 1910.1200.

15.2 SARA TITLE III: a. **EHS** (Extremely Hazardous Substance) List: No

Section 15: REGULATORY INFORMATION (Cont.)

b.	Section 311/312, (Tier I,II) Categories:	Immediate (acute)	Yes
		Fire	Yes
		Sudden release	No
		Reactivity	Yes
		Delayed (chronic)	No
c.	Section 313 (Toxic Release Report-Form R):		No
d.	**TPQ** (Threshold Planning Quantity):		No

15.3 CERCLA/SUPERFUND: RQ (Reportable Quantity) — 5,000 lbs (2270 Kg)

15.4 TSCA (Toxic Substance Control Act) Inventory List: Yes

15.5 RCRA (Resource Conservation and Recovery Act) Status: D003 (See Section 13)

15.6 WHMIS (Canada) Hazard Classification: E, D1

15.7 DOT Hazardous Material: (See Section 14) Yes

15.8 CAA Hazardous Air Pollutant (HAP) No

Section 16: OTHER INFORMATION

REVISIONS: The entire MSDS was reformatted to comply to ANSI Standard Z400.1-1993.

Revised Sections 1.1, 8.3, 11, 12, 5/7/02
Revised pH range in Section 8, 6/19/02
Revised shipping info & RQ data, 1/15/03
Revised Section 3, Emergency Overview & Section 10.4 to include dilution caution. 1/23/04

THE INFORMATION PUBLISHED IN THIS MATERIAL SAFETY DATA SHEET HAS BEEN COMPILED FROM OUR EXPERIENCE AND OSHA, ANSI, NFPA, DOT, ERG, AND CHRIS. IT IS THE USER'S RESPONSIBILITY TO DETERMINE THE SUITABILITY OF THIS INFORMATION FOR THE ADOPTION OF NECESSARY SAFETY PRECAUTIONS. WE RESERVE THE RIGHT TO REVISE MATERIAL SAFETY DATA SHEETS PERIODICALLY AS NEW INFORMATION BECOMES AVAILABLE.

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Version 7.11
Revision Date 15.10.2024
Print Date 16.10.2024
GENERIC EU MSDS - NO COUNTRY SPECIFIC DATA - NO OEL DATA

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifiers

Product name	:	Sodium chlorite (25% solution in water) for synthesis
Product Number	:	8.14815
Catalogue No.	:	814815
Brand	:	Millipore
UFI	:	CW60-J6H9-Q99X-S01A
REACH No.	:	This product is a mixture. REACH Registration Number see section 3.

1.2 Relevant identified uses of the substance or mixture and uses advised against

Identified uses	:	Chemical for synthesis

1.3 Details of the supplier of the safety data sheet

Company	:	Sigma-Aldrich Chemical Pvt Limited Industrial Area, Anekal Taluka Plot No 12, 12 Bommasandra - Jigani Link Road 560100 BANGALORE INDIA

1.4 Emergency telephone

Emergency Phone #	:	000 800 1007 141 (CHEMTREC)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Corrosive to Metals, (Category 1)	H290: May be corrosive to metals.
Acute toxicity, (Category 4)	H302: Harmful if swallowed.
Acute toxicity, (Category 3)	H311: Toxic in contact with skin.
Skin corrosion, (Category 1)	H314: Causes severe skin burns and eye damage.
Serious eye damage, (Category	H318: Causes serious eye damage.

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1)

Specific target organ toxicity - repeated exposure, (Category 2), spleen	H373: May cause damage to organs through prolonged or repeated exposure.
Short-term (acute) aquatic hazard, (Category 1)	H400: Very toxic to aquatic life.
Long-term (chronic) aquatic hazard, (Category 1)	H410: Very toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008

Pictogram

Signal Word	Danger

Hazard Statements

H290	May be corrosive to metals.
H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.
H373	May cause damage to organs (spleen) through prolonged or repeated exposure.
H410	Very toxic to aquatic life with long lasting effects.

Precautionary Statements

P273	Avoid release to the environment.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312	IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/ attention if you feel unwell.

Supplemental Hazard information (EU)

EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

Reduced Labeling (<= 125 ml)

Pictogram

Signal Word	Danger

Hazard Statements

H311	Toxic in contact with skin.
H314	Causes severe skin burns and eye damage.

Precautionary Statements

P280	Wear protective gloves/ protective clothing/ eye protection/ face

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protection.

P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard information (EU)

EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.
Toxicological information:
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Component		Classification	Concentration
sodium chlorite			
CAS-No. EC-No.	7758-19-2 231-836-6 *	Ox. Sol. 1; Acute Tox. 3; Acute Tox. 2; Skin Corr. 1B; Eye Dam. 1; STOT RE 2; Aquatic Acute 1; Aquatic Chronic 1; H271, H301, H310, H314, H318, H373, H400, H410	>= 25 - < 30 %

*A registration number is not available for this substance as the substance or its use are exempted from registration according to Article 2 REACH Regulation (EC) No 1907/2006, or the annual tonnage does not require a registration.

For the full text of the H-Statements mentioned in this Section, see Section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Call in physician.

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In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Unsuitable extinguishing media
For this substance/mixture no limitations of extinguishing agents are given.

5.2 Special hazards arising from the substance or mixture
Hydrogen chloride gas
Sodium oxides
Not combustible.
Fire may cause evolution of:
Hydrogen chloride gas
Ambient fire may liberate hazardous vapours.

5.3 Advice for firefighters
Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Suppress (knock down) gases/vapors/mists with a water spray jet. Prevent fire extinguishing water from contaminating surface water or the ground water system.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Evacuate the danger area, observe emergency procedures, consult an expert.
For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains.

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6.3 Methods and materials for containment and cleaning up

Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections

For disposal see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling

Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Hygiene measures

Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance.
For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities

Storage conditions

No metal containers. No metal containers.
Protected from light.Tightly closed. Keep in a well-ventilated place. Keep locked up or in an area accessible only to qualified or authorized persons.
Do not store near acids.

Recommended storage temperature see product label.

Storage class

Storage class (TRGS 510): 6.1D: Non-combustible, acute toxic Cat.3 / toxic hazardous materials or hazardous materials causing chronic effects

7.3 Specific end use(s)

Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Ingredients with workplace control parameters

8.2 Exposure controls

Personal protective equipment

Eye/face protection

Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).

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Full contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Nitrile rubber
Minimum layer thickness: 0,11 mm
Break through time: 480 min
Material tested:KCL 741 Dermatril® L

Body Protection
protective clothing

Respiratory protection
Recommended Filter type: Filter B-(P3)

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Control of environmental exposure
Do not let product enter drains.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

a)	Physical state	liquid
b)	Color	colorless
c)	Odor	weak
d)	Melting point/freezing point	Melting point: < -3 °C
e)	Initial boiling point and boiling range	ca.>= 100 °C at 1.013 hPa
f)	Flammability (solid, gas)	No data available
g)	Upper/lower flammability or explosive limits	No data available
h)	Flash point	Not applicable
i)	Autoignition temperature	Not applicable
j)	Decomposition temperature	No data available
k)	pH	ca.12 - 13 at 20 °C

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l)	Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: No data available
m)	Water solubility	at 20 °C soluble
n)	Partition coefficient: n-octanol/water	Not applicable
o)	Vapor pressure	ca.20 hPa at 20 °C
p)	Density	ca.1,2 g/cm3 at 20 °C
	Relative density	No data available
q)	Relative vapor density	No data available
r)	Particle characteristics	No data available
s)	Explosive properties	Not classified as explosive.
t)	Oxidizing properties	Oxidizing potential

9.2 Other safety information
No data available

SECTION 10: Stability and reactivity

10.1 Reactivity
explosible after loss of solvent content.
Contact with acids liberates very toxic gas.

10.2 Chemical stability
The product is chemically stable under standard ambient conditions (room temperature) .

10.3 Possibility of hazardous reactions
Generates dangerous gases or fumes in contact with:
Acids
Release of:
chlorine dioxide
Violent reactions possible with:
combustible substances
Cyanides
sulfur
ammonium compounds
phosphorus
Organic Substances
oxidisable substances
Chlorine
Metals
in powder form
Violent reactions possible with:
Generates dangerous gases or fumes in contact with:
Acids
The generally known reaction partners of water.

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10.4 Conditions to avoid
no information available

10.5 Incompatible materials
Contact with metals liberates hydrogen gas.Metals

10.6 Hazardous decomposition products
In the event of fire: see section 5

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Mixture

Acute toxicity
Acute toxicity estimate Oral - 1.114 mg/kg
(Calculation method)
Symptoms: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the esophagus and the stomach.
Symptoms: Possible symptoms:, mucosal irritations, Cough, Shortness of breath, Possible damages:, damage of respiratory tract
Acute toxicity estimate Dermal - 525,49 mg/kg
(Calculation method)

Skin corrosion/irritation
No data available

Serious eye damage/eye irritation
Remarks: Mixture causes serious eye damage.
Risk of blindness!

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
No data available

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
Mixture may cause damage to organs through prolonged or repeated exposure.
- spleen

Aspiration hazard
No data available

11.2 Additional Information

Endocrine disrupting properties

Product:

Assessment	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article

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57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Other dangerous properties can not be excluded.

Handle in accordance with good industrial hygiene and safety practice.

Components

sodium chlorite

Acute toxicity
LD50 Oral - Rat - male and female - 284 mg/kg
(OECD Test Guideline 401)
Acute toxicity estimate Oral - 284 mg/kg
(ATE value derived from LD50/LC50 value)
Inhalation: No data available
LD50 Dermal - Rabbit - male and female - 134 mg/kg
(US-EPA)
Acute toxicity estimate Dermal - 134 mg/kg
(ATE value derived from LD50/LC50 value)

Skin corrosion/irritation
Skin - Rabbit
Result: Corrosive after 3 minutes to 1 hour of exposure - 4 h
(US-EPA)

Serious eye damage/eye irritation
Eyes - Rabbit
Result: Irreversible effects on the eye
Remarks: Aqueous solution
(ECHA)

Respiratory or skin sensitization
Maximization Test - Guinea pig
Result: Does not cause skin sensitization.
(OECD Test Guideline 406)

Germ cell mutagenicity
Method: OECD Test Guideline 475
Species: Mouse - male and female - Bone marrow
Result: negative

Carcinogenicity
No data available

Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
May cause damage to organs through prolonged or repeated exposure.
- spleen

Aspiration hazard
No data available

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SECTION 12: Ecological information

12.1 Toxicity

Mixture
No data available

12.2 Persistence and degradability
No data available

12.3 Bioaccumulative potential
No data available

12.4 Mobility in soil
No data available

12.5 Results of PBT and vPvB assessment
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties
Product:

Assessment	:	The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects
No data available

Components

sodium chlorite

Toxicity to fish	flow-through test LC50 - Cyprinodon variegatus (sheepshead minnow) - 105 mg/l - 96 h (US-EPA)
Toxicity to daphnia and other aquatic invertebrates	static test EC50 - Daphnia magna (Water flea) - < 1 mg/l - 48 h (OECD Test Guideline 202)
Toxicity to algae	static test ErC50 - Pseudokirchneriella subcapitata (green algae) - 21,5 mg/l - 72 h (OECD Test Guideline 201)
	static test EC10 - Pseudokirchneriella subcapitata (green algae) - 4,8 mg/l - 72 h (OECD Test Guideline 201)
Toxicity to bacteria	Respiration inhibition EC50 - activated sludge - > 100 mg/l - 3 h (OECD Test Guideline 209)

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SECTION 13: Disposal considerations

13.1 Waste treatment methods
No data available

SECTION 14: Transport information

14.1 UN number
ADR/RID: 1908 IMDG: 1908 IATA: 1908

14.2 UN proper shipping name
ADR/RID: CHLORITE SOLUTION
IMDG: CHLORITE SOLUTION
IATA: Chlorite solution

14.3 Transport hazard class(es)
ADR/RID: 8 IMDG: 8 IATA: 8

14.4 Packaging group
ADR/RID: II IMDG: II IATA: II

14.5 Environmental hazards
ADR/RID: no IMDG Marine pollutant: no IATA: no

14.6 Special precautions for user
Tunnel restriction code : (E)

Further information : No data available

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

National legislation

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	E1	ENVIRONMENTAL HAZARDS

Other regulations

Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable.

Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment
For this product a chemical safety assessment was not carried out

SECTION 16: Other information

Full text of H-Statements

H271	May cause fire or explosion; strong oxidizer.
H301	Toxic if swallowed.

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H310	Fatal in contact with skin.
H314	Causes severe skin burns and eye damage.
H318	Causes serious eye damage.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
EUH032	Contact with acids liberates very toxic gas.
EUH071	Corrosive to the respiratory tract.

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - Agreement concerning the International Carriage of Dangerous Goods by Road; AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Classification of the mixture		**Classification procedure:**
Met. Corr.1	H290	Based on product data or assessment
Acute Tox.4	H302	Calculation method
Acute Tox.3	H311	Calculation method
Skin Corr.1	H314	Based on product data or assessment
Eye Dam.1	H318	Based on product data or assessment

The life science business of Merck operates as MilliporeSigma in the US and Canada

STOT RE2	H373	Calculation method
Aquatic Acute1	H400	Calculation method
Aquatic Chronic1	H410	Calculation method

Further information

The information is believed to be correct but is not exhaustive and will be used solely as a guideline, which is based on current knowledge of the chemical substance or mixture and is applicable to appropriate safety precautions for the product. It does not represent any guarantee of the properties of the product. Sigma-Aldrich Corporation and its Affiliates shall not be held liable for any damage resulting from handling or from contact with the above product. See www.sigma-aldrich.com and/or the reverse side of invoice or packing slip for additional terms and conditions of sale.

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Safety Data Sheet

Sulfuric Acid 36-37% (w/w)

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sulfuric Acid 36-37% (w/w)

Synonyms/Generic Names: Battery Acid, Dihydrogen Sulfate, Oil of Vitriol

Product Number: 9624

Product Use: Industrial, Manufacturing or Laboratory use

Manufacturer: Columbus Chemical Industries, Inc.
N4335 Temkin Rd.
Columbus, WI. 53925

For More Information: 920-623-2140 (Monday-Friday 8:00-4:30)
www.columbuschemical.com

In Case of Emergency Call: CHEMTREC - 800-424-9300 or 703-527-3887 (24 Hours/Day, 7 Days/Week)

2. HAZARDS IDENTIFICATION

Hazard Not Otherwise Classified (HNOC): None

Signal Words: Danger

Pictograms:

GHS Classification:

Skin corrosion	Category 1A
Serious eye damage	Category 1
Acute aquatic toxicity	Category 3

GHS Label Elements, including precautionary statements:

Hazard Statements:

H314	Causes severe skin burns and eye damage.
H402	Harmful to aquatic life.

Precautionary Statements:

P260	Do not breathe mists.
P264	Wash hands thoroughly after handling.
P273	Avoid release to the environment.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P301+P330+P331	IF SWALLOWED: Rinse mouth. Do not induce vomiting.

P303+P361+P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304+P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER/doctor/physician.
P363	Wash contaminated clothing before reuse.
P405	Store locked up.
P501	Dispose of contents/container in accordance with local regulations.

Potential Health Effects

Eyes	Causes severe eye burns.
Inhalation	May be harmful if inhaled. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract.
Skin	Causes skin burns.
Ingestion	May be harmful if swallowed.

NFPA Ratings

Health	3
Flammability	0
Reactivity	2
Specific hazard	W

HMIS Ratings

Health	3
Fire	0
Reactivity	2

3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	Weight %	CAS #	EINECS# / ELINCS#	Formula	Molecular Weight
Sulfuric Acid	36-37	7664-93-9	231-939-5	H_2SO_4	98.08 g/mol
Water	Balance	7732-18-5	231-791-2	H_2O	18.00 g/mol

4. FIRST-AID MEASURES

Eyes	Immediately rinse with plenty of water for at least 15 minutes and get medical attention immediately.
Inhalation	Move casualty to fresh air and keep at rest. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention immediately.
Skin	Immediately flush with plenty of water for at least 15 minutes while removing contaminated clothing and wash using soap. Get medical attention immediately.
Ingestion	**Do Not Induce Vomiting!** Never give anything by mouth to an unconscious person. If conscious, wash out mouth with water. Get medical attention immediately.

5. FIRE-FIGHTING MEASURES

Suitable (and unsuitable) extinguishing media	Product is not flammable. Use appropriate media for adjacent fire. Cool unopened containers with water.
Special protective equipment and precautions for firefighters	Wear self-contained, approved breathing apparatus and full protective clothing, including eye protection and boots.
Specific hazards arising from the chemical	Emits toxic fumes (sulfur oxides, hydrogen sulfide gas) under fire conditions. (See also Stability and Reactivity section).

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures	See section 8 for recommendations on the use of personal protective equipment.
Environmental precautions	Prevent spillage from entering drains. Any release to the environment may be subject to federal/national or local reporting requirements.
Methods and materials for containment and cleaning up	Neutralize spill with sodium bicarbonate or lime. Absorb spill with noncombustible absorbent material, then place in a suitable container for disposal. Clean surfaces thoroughly with water to remove residual contamination. Dispose of all waste and cleanup materials in accordance with regulations.

7. HANDLING AND STORAGE

Precautions for safe handling
See section 8 for recommendations on the use of personal protective equipment. Use with adequate ventilation. Wash thoroughly after using. Keep container closed when not in use. Avoid formation of aerosols.

Conditions for safe storage, including any incompatibilities
Store in a cool, dry, well ventilated area. Keep away from incompatible materials (see section 10 for incompatibilities).

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Occupational exposure controls:

Component	Exposure Limits	Basis	Entity
Sulfuric Acid	0.2 mg/m^3	TLV	ACGIH
	1 mg/m^3	PEL	OSHA
	1 mg/m^3`	REL	NIOSH
	15 mg/m^3	IDLH	OSHA

TWA: Time Weighted Average over 8 hours of work.
TLV: Threshold Limit Value over 8 hours of work.
REL: Recommended Exposure Limit
PEL: Permissible Exposure Limit
STEL: Short Term Exposure Limit during x minutes.
IDLH: Immediately Dangerous to Life or Health
WEEL: Workplace Environmental Exposure Levels
CEIL: Ceiling

Personal Protection

Eyes	Wear chemical safety glasses or goggles, and face shield.
Inhalation	Provide local exhaust, preferably mechanical. If exposure levels are excessive, use an approved respirator.
Skin	Wear nitrile or rubber gloves, and full body suit. The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.
Other	Not Available

Other Recommendations
Provide eyewash stations, quick-drench showers and washing facilities accessible to areas of use and handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance (physical state, color, etc.)	Clear, colorless liquid.
Odor	Odorless.
Odor threshold	Not Available
pH	~1
Melting point/freezing point	Not Available
Initial boiling point and boiling range	Not Available
Flash point	Not Flammable
Evaporation rate	Not Available
Flammability (solid, gas)	Not Flammable
Upper/lower flammability or explosive limit	Not Explosive
Vapor pressure	Not Available
Vapor density	Not Available
Specific gravity	1.2720
Solubility (ies)	Soluble in water.
Partition coefficient: n-octanol/water	Not Available
Auto-ignition temperature	Not Available
Decomposition temperature	Not Available

10. STABILITY AND REACTIVITY

Chemical Stability	Stable
Possibility of Hazardous Reactions	Will not occur.
Conditions to Avoid	Moisture.
Incompatible Materials	Bases, halides, organic material, carbides, chlorates, fulminates, nitrates, picrates, cyanides, cyclopentadiene, cyclopentanone oxime, nitroaryl amines, hexalithium disilicide, phosphorus (III) oxide, powdered metals.
Hazardous Decomposition Products	Sulfur oxides, hydrogen sulfide gas.

11. TOXICOLOGICAL INFORMATION

Acute Toxicity

Skin	Not Available
Eyes	Not Available
Respiratory	Not Available
Ingestion	Not Available

Carcinogenicity

IARC	1: Carcinogenic to humans (sulfuric acid aerosol).
ACGIH	A2: Suspected human carcinogen (sulfuric acid aerosol).
NTP	No components of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.
OSHA	No components of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

Signs & Symptoms of Exposure

Skin	Burning, itching, redness, inflammation upon exposed tissue.
Eyes	Eye burns, watering eyes.
Respiratory	Burning, choking, coughing, shortness of breath.
Ingestion	Nausea, vomiting, diarrhea, burning, severe pain.

Chronic Toxicity	May cause bleeding of nose and gums, nasal and oral mucosal ulceration, conjunctivitis, yellowing of teeth and erosion of tooth enamel.
Teratogenicity	Not Available
Mutagenicity	Not Available
Embryotoxicity	Not Available
Target Organ(s)	Teeth, Lungs
Reproductive Toxicity	Not Available
Respiratory/Skin Sensitization	Not Available

12. ECOLOGICAL INFORMATION

Ecotoxicity

Aquatic Vertebrate	Not Available
Aquatic Invertebrate	Not Available
Terrestrial	Not Available

Persistence and Degradability	Not Available
Bioaccumulative Potential	Does not accumulate.
Mobility in Soil	Not Available
PBT and vPvB Assessment	Not Available
Other Adverse Effects	Not Available

13. DISPOSAL CONSIDERATIONS

Waste Product or Residues	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product or residue.
Product Containers	Users should review their operations in terms of the applicable federal/national or local regulations and consult with appropriate regulatory agencies if necessary before disposing of waste product container.

The information offered in section 13 is for the product as shipped. Use and/or alterations to the product may significantly change the characteristics of the material and alter the waste classification and proper disposal methods.

14. TRANSPORTATION INFORMATION

US DOT	UN2796, Sulfuric acid, 8, pg II
TDG	UN2796, SULFURIC ACID, 8, PG II
IMDG	UN2796, SULFURIC ACID, 8, PG II
Marine Pollutant	No
IATA/ICAO	UN2796, Sulfuric acid, 8, pg II

15. REGULATORY INFORMATION

TSCA Inventory Status	All ingredients are listed on the TSCA Active inventory.
DSL / NDSL	All ingredients are listed on the DSL inventory.
California Proposition 65	Not Listed
Rhode Island: Hazardous Substance List	Listed: Sulfuric Acid

Massachusetts: Toxic or Hazardous Substance List, Right to Know	Not Listed
Pennsylvania: Hazardous Substance List	Listed: Sulfuric Acid
New Jersey: Right to Know Hazardous Substance List	Listed: Sulfuric Acid
SARA 302	Listed: Sulfuric Acid
SARA 304	Listed: Sulfuric Acid
SARA 311	Acute Health Hazard.
SARA 312	Acute Health Hazard.
SARA 313	Listed: Sulfuric Acid (aerosol forms only)
WHMIS Canada	Class D1A: Poisonous and infectious material – Immediate and serious effects – Very toxic. Class E: Corrosive material.

16. OTHER INFORMATION

Revision	Date
Original	03/27/2013
Revision 1	12/13/2016
Revision 2	11/29/2021

Disclaimer: The information provided in this Safety Data Sheet (“SDS”) is correct to the best of our knowledge, information, and belief at the date of publication. The information in this SDS relates only to the specific Product identified under Section 1, and does not relate to its use in combination with other materials or products, or its use as to any particular process. Those handling, storing, or using the Product should satisfy themselves that they have current information regarding the particular way the Product is handled, stored or used and that the same is done in accordance with federal, state and local law. WE DO NOT MAKE ANY WARRANTY, EXPRESS OR IMPLIED, INCLUDING (WITHOUT LIMITATION) WARRANTIES WITH RESPECT TO THE COMPLETENESS OR CONTINUING ACCURACY OF THE INFORMATION CONTAINED HEREIN OR WITH RESPECT TO FITNESS FOR ANY PARTICULAR USE. WE DO NOT ASSUME RESPOSIBILITY AND EXPRESSLY DISCLAIM LIABILITY FOR LOSS, INJURY, DAMAGE OR EXPENSE ARISING OUT OF OR IN ANY WAY CONNECTED WITH THE HANDLING, STORAGE, USE OR DISPOSAL OF THIS PRODUCT.

SODIUM HYDROXIDE, 50%

SECTION 1 — CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Manufacturer:	**Shintech Louisiana, LLC** 3 Greenway Plaza, Suite 1150 Houston, TX 77046 (713) 965-0713
PRODUCT NAME:	Sodium Hydroxide Solution, 50%
CAS#:	1310-73-2
CHEMICAL FOMULA:	NaOH(50)
Synonyms	Caustic Soda Liquid 50%, Soda Lye, Lye, Liquid Caustic, Sodium Hydrate
Product Use:	Neutralizing agent, industrial cleaner, pulping and bleaching, soap manufacturing

For information regarding a chemical emergency involving a spill or leak, call:

24 — Hour Emergency Contact:

U.S.: 1-800-424-9300 — CHEMTREC

SECTION 2 — HAZARDS IDENTIFICATION

Global Harmonization System (GHS) Classification:

Category 1	Corrosive to metals
Category 1	Skin corrosion/irritation
Category 1	Serious eye damage/eye irritation
Category 3	Hazardous to the aquatic environment, long-term (chronic) hazard
Category 4	Acute toxicity, inhalation
Category 4	Acute toxicity, oral

National Fire Protection Association (NFPA) Rating Hazardous Materials Identification Systems (HMIS) Rating

	NFPA	HMIS
Health	3	3
Fire	0	0
Reactivity	1	1

4 = Extreme/Severe
3 = High/Serious
2 = Moderate
1 = Slight
0 = Minimum

W – Water Reactive

DANGER! Causes severe eye burns. Causes severe skin burns. Avoid contact with skin and eyes. Causes burns of the mouth and throat. Causes respiratory tract irritation. Avoid breathing vapors or mist. Aspiration hazard. Can enter lungs and cause damage. May react with water. Keep upwind of spill and use in adequate ventilation.

Emergency Overview:

Color:	Colorless
Odor:	Odorless
Physical State	Liquid above freezing point
Signal Word	DANGER

GHS Label Elements:

GHS Hazard Statements:

H290 - May be corrosive to metals

H314 – Causes severe skin burns and eye

H318 – Causes serious eye damage

H412 – Harmful to aquatic life with long lasting effects

H332 – Harmful if inhaled

H302 – Harmful if swallowed

GHS Precautionary Statements:

Storage:	Keep container closed. Keep in original container. Store in a secure manner.
Ventilation Controls:	Do not breathe (dust, vapor or spray mist).
Hygiene Measures:	When using, do not smoke, eat, or drink. Wash thoroughly after handling. Avoid contact with skin and eyes.
Personal Protective Equipment:	Wear suitable protective clothing, gloves, and eye/face protection.
Spills:	**NEVER** direct water jet on liquid. Dike the area to contain the spill. Collect in suitable and properly labeled containers. Attempt to neutralize by adding material such as Acetic acid.
First Aid (See Section 4):	In case of accident by inhalation, move person to fresh air. If swallowed, do not induce vomiting: seek medical advice immediately and show label to doctor. After contact with skin, immediately take off all contaminated clothing and wash immediately with plenty of water. In case of contact with eyes, rinse immediately with plenty of water. In all cases, if irritation develops and persists, get medical attention. In all cases, call a poison control center or doctor for further treatment advice.
Environmental Protection:	Use appropriate containment to avoid environmental contamination.
Disposal:	Dispose of contents and container in accordance with applicable local, regional, national, and/or international regulations.

POTENTIAL HEALTH EFFECTS:

EYE CONTACT	May cause severe irritation with corneal injury which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Mist may cause eye irritation.
Short Term Exposure	
Long Term Exposure:	
SKIN CONTACT	Brief contact may cause severe skin burns. Symptoms may include pain, severe local redness and tissue damage.
SKIN ABSORPTION	Prolonged skin contact is unlikely to result in absorption of harmful amounts.
INHALATION:	Mist may cause severe irritation of upper respiratory tract (nose and throat). May cause chemical burns to the respiratory tract.
INGESTION	Swallowing may result in burns of the mouth and throat. Swallowing may result in gastrointestinal irritation, ulceration, nausea and/or vomiting. Aspiration into the lungs may occur during ingestion or vomiting, causing tissue damage or lung injury.
CONDITIONS AGGRAVATED BY EXPOSURE	Respiratory disorders, pre-existing skin disorders, eye/vision disorders.
TARGET ORGANS EFFECTED:	Skin, Eyes, Respiratory System.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous ingredients (specific)	Typical %	CAS Number	EC Number
Water	50	7732-18-5	7732-18-5
Sodium Hydroxide	50	1310-73-2	7732-18-5
Sodium Chloride	< 1	7647-14-5	231-598-3

Common Names/Synonyms: Caustic Soda Liquid 50%, Soda Lye, Lye, Liquid Caustic, Sodium Hydrate

SECTION 4 – FIRST AID MEASURES

Eye Contact: Immediately flush eyes with water for at least 30 minutes, and up to 60 minutes if necessary. Hold eyelids open during flushing. If irritation persists, repeat flushing. Obtain medical attention IMMEDIATELY. Do not transport victim until the recommended flushing period is completed unless flushing can be continued during transport.

Skin Contact: Immediately flush skin with water for at least 30 minutes, and up to 60 minutes if necessary. Under water remove contaminated clothing, jewelry, and shoes. If irritation persists, repeat flushing. Obtain medical attention immediately. Handle contaminated clothing and shoes in a manner which limits further exposure.

Ingestion: DO NOT INDUCE VOMITING. If victim is alert and not convulsing, rinse mouth and give as much water as possible to dilute material (8 to 10 oz. or 240 to 300 mL). If spontaneous vomiting occurs, have victim lean forward with head down, rinse mouth and administer more water. IMMEDIATELY transport victim to an emergency facility. Do not give anything to an unconscious person.

Inhalation: Move victim to fresh air. If breathing is difficult, oxygen may be beneficial if administered by trained personnel, preferably on a doctor's advice. Give artificial respiration ONLY if breathing has stopped. Do not use mouth-to-mouth method if victim ingested or inhaled the substance: induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Obtain medical attention IMMEDIATELY. Symptoms of pulmonary edema can be delayed up to 48 hours after exposure.

SECTION 5 – FIRE FIGHTING MEASURES

Extinguishing Media: This material does not burn. If exposed to fire from another source, use suitable extinguishing agent for that fire. Do not use water jet.

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Remove containers from fire, if possible, and cool containers with water. When material comes in contact with water, large amounts of heat may be generated and ignite adjacent combustible materials. **This material does not burn.** Fight fire for other material that is burning.

Special Protective Equipment for Firefighters:	Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). Avoid contact with this material during fire fighting operations. If contact is likely, wear full chemical resistant clothing with self-contained breathing apparatus and fight fire from a remote location. For protective equipment in post-fire or non-fire clean-up situations, refer to the relevant sections.
Unusual Fire and Explosion Hazards:	Product reacts with water. Reaction may produce heat and/or gases. This reaction may be violent. Violent steam generation or eruption may occur upon application of direct water stream to hot liquids.
Hazardous Combustion Products:	Not applicable.

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Steps to be taken if material is released or spilled:	Contain spilled material if possible. Small spills: Dilute with water and neutralize with dilute acid; absorb and collect. Large spills: Dike the area to contain the spill. Collect in suitable and properly labeled containers. Attempt to neutralize by adding material such as Acetic acid. See Section 13, Disposal Considerations, for additional information.
Personnel Precautions:	Evacuate area. Only trained and properly protected personnel must be involved in clean-up operations. Refer to Section 7, Handling, for additional precautionary measures. Keep upwind of spill. Ventilate area of leak or spill. See Section 10 for more specific information. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.
Environmental Precautions:	Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

SECTION 7 – HANDLING AND STORAGE

Handling:

Do not get in eyes. Do not get on skin or clothing. Do not swallow. Avoid breathing mist. Keep container closed. Use with adequate ventilation.

1. ALWAYS add caustic soda solution to water with constant agitation. NEVER add water to the caustic soda solution.
2. The water should be lukewarm (27°-38°C or 80°-100°F). NEVER start with hot or cold water. The addition of the caustic soda to liquid will cause a rise in temperature. If caustic soda becomes concentrated in one area, is added too rapidly, or is added to hot or cold liquid, a rapid temperature increase can result in DANGEROUS mists, boiling or spattering which may cause an immediate VIOLENT ERUPTION. See Section 8, Exposure Controls and Personal Protection.

Storage:

Keep container closed. Do not store in: Zinc, Aluminum, Brass, or Tin. See Section 10 for more specific information.

Storage temperature: >16°C

Shelf life: Use within 24 months

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Preventive Measures:

Recommendations listed in this section indicate the type of equipment which will provide protection against over exposure to this product. Conditions of use, adequacy of engineering or other control measures, and actual exposures will dictate the need for specific protective devices at your workplace.

Engineering Controls:

Local exhaust ventilation should be applied wherever there is an incidence of point source emissions or dispersion of regulated contaminants in the work area. Ventilation control of the contaminant as close to its point of generation is both the most economical and safest method to minimize personnel exposure to airborne contaminants. The most effective measures are the total enclosure of processes and the mechanization of handling procedures to prevent all personal contact.

Personal Protective Equipment:	Maintain eye wash station and safety shower facilities in work area. Detailed requirements for personal protective equipment should be established on a site-specific basis.
Eye/Face Protection:	Wear full face-shield and chemical safety goggles when there is potential for contact.
Skin/Body Protection:	Wear appropriate personal protective clothing to prevent skin contact that is chemically resistant to this material. Wear rubber boots and chemical resistant gloves. Remove contaminated clothing immediately, wash skin area with soap and water and launder clothing before reuse or dispose of properly.
Respiratory Protection:	Up to 10mg/m³: Supplied Air Respirator (SAR) operated in a continuous-flow mode, eye protection needed; or full face-piece respirator with high-efficiency particulate filter(s); or powered air-purifying respirator with dust and mist filter(s), eye protection needed; or full face-piece Self-Contained Breathing Apparatus (SCBA); or full face-piece SAR. Emergency or Planned Entry into Unknown Concentrations of IDLH Conditions: Positive pressure, full face-piece SAR; or positive pressure, full face-piece SAR with an auxiliary positive pressure SAR.
Guidelines for Sodium Hydroxide Solutions, 30-70%:	**RECOMMENDED** (resistance to breakthrough longer than 8 hours): Butyl rubber; natural rubber, neoprene rubber, nitrile rubber, polyethylene, polyvinyl chloride, Teflon(TM), Viton(TM), Saranex(TM), 4H(TM), Barricade(TM), CPF 3(TM), Responder(TM), Trellchem HPS(TM), Tychem 10000(TM). **NOT RECOMMENDED** for use (resistance to breakthrough less than 1 hour): Polyvinyl alcohol.
Escape:	Full face-piece respirator with high-efficiency particulate filter(s); or escape-type SCBA.
Exposure Guidelines:	
PRODUCT:	**Sodium hydroxide** ACGIH Ceiling Exposure Limit (TLV-C): 2mg/m³ OSHA PEL-TWA & PEL-C: 2mg/m³ NIOSH IDLH: 10mg/m³ NIOSH REL-C: 2mg/m³

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Physical State	Liquid above freezing point
Physical Form	Liquid
Color	Colorless
Odor	Odorless
Odor Threshold	No data available
Flash Point – Closed Cup	None
Flammable Limits in Air	Lower: Not applicable Upper: Not applicable
Autoignition Temperature	Not applicable
Vapor pressure	1.5 mmHg @ 20°C *Literature*
Boiling Point (760 mmHg)	145°C (293°F) *Literature*
Vapor Density (air=1)	Not applicable
Specific Gravity (H20=1)	1.52 *Literature*
Liquid Density	1.5 g/cm3 @ 20°C *Literature*
Freezing Point	14°C (57°F) *Literature*
Melting Point	14°C (57°F) *Literature*
Solubility in Water (by weight)	Water solution
pH	Strong Basic
Evaporation Rate	No data available
Partition Coefficient n-octanol/water	No data available
Decomposition Temperature	No data available
Molecular Weight	40 g/mol
Volatility	No data available
Kinematic Viscosity	0.35 St @ 25° *Calculated*

* This data is based on 50% Caustic

SECTION 10 – STABILITY AND REACTIVITY

Stability/Instability: Stable under recommended storage conditions. See Storage, Section 7.

Conditions to avoid: Avoid moisture. Product absorbs carbon dioxide from the air. Avoid mixing with water, strong acids, or other incompatible materials. Will react with some metals and create a flammable hydrogen gas.

Incompatible Materials: Heat is generated when mixed with water. Spattering and boiling can occur. Caustic soda solution reacts readily with various reducing sugars (i.e. fructose, galactose, maltose, dry whey solids) to produce CO. Take precautions including monitoring the tank atmosphere for CO to ensure safety of personnel before vessel entry. Avoid contact with:

	acids, glycols and halogenated organics. Organic nitro compounds. Flammable hydrogen may be generated from contact with metals such as: Zinc, Aluminum, Tin, or Brass.
Hazardous Polymerization:	Will not occur.
Thermal Decomposition:	Does not decompose.

SECTION 11 – TOXICOLOGICAL INFORMATION

Acute Toxicity:	**Ingestion:**	Single dose oral LD50 has not been determined.
	Skin Absorption:	The dermal LD50 has not been determined.
		The severity of injury depends on the concentration and duration of exposure to the substance. This material is toxic to the skin, eyes, and mucous membranes. It may cause destructive effects on tissues that it contacts. Inhalation will cause irritation to the respiratory tract and difficulty breathing. Eye contact will cause irritation and may cause severe burns and possible blindness. Contact with skin will cause irritation and may cause corrosion of the tissue.
Repeated Dose Toxicity:		Based on available data, repeated exposures are not anticipated to cause additional significant adverse effects.
Genetic Toxicology:		For the major component(s): In vitro genetic toxicity studies were negative.
Carcinogenicity:		Not a known carcinogen.

SECTION 12 – ECOLOGICAL INFORMATION

Fate and Transport:

Sodium Hydroxide:	**Movement**	No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).

Persistence and Degradability		Biodegradation is not applicable.
Sodium Chloride:	**Movement**	No bioconcentration is expected because of the relatively high water solubility. Potential for mobility in soil is very high (Koc between 0 and 50).
Persistence and Degradability		Biodegradation is not applicable.

Ecotoxicity:

Sodium Hydroxide:	Material is slightly toxic to aquatic organisms on an acute basis (LC50/EC50 between 10 and 100 mg/L in the most sensitive species tested). May increase pH of aquatic systems to >pH 10 which may be toxic to aquatic organisms.
Fish Acute & Prolonged Toxicity	LC50, rainbow trout (Oncorhynchus mykiss), 96h: 45.5 mg/L
Aquatic Invertebrate Acute Toxicity	LC50, water flea Daphnia magna: 40-240 mg/L
Sodium Chloride:	Material is practically non-toxic to aquatic organisms on an acute basis (IC50/EC50>100 mg/L in the most sensitive species tested).
Fish Acute & Prolonged Toxicity	LC50, fathead minnow (Pimephales promelas): 10,610 mg/L
Aquatic Invertebrate Acute Toxicity	LC50, water flea Daphnia magna: 4,571 mg/L

SECTION 13 – DISPOSAL CONSIDERATIONS

Dispose in accordance with all applicable Federal, State/Provincial and local laws and regulations. Waste characterization and compliance with applicable laws and regulations are the responsibility of the waste generator. Do not dispose of waste with normal garbage, or to sewer systems.

SHINTECH LOUISIANA, LLC HAS NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR

USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN SDS SECTION.

SECTION 14 – TRANSPORT INFORMATION

U.S. DOT 49 CFR 172.101:

	BULK / NON BULK
Shipping Name	SODIUM HYDROXIDE SOLUTION
Hazard Class/Division	8
Identification No.	UN1824
Packing Group	PG II
DOT RQ (lbs)	RQ 1000 lbs. (Sodium Hydroxide)

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

SECTION 15 – REGULATORY INFORMATION

USA Classification

OSHA Hazard Communication Standard: This product is a “Hazardous Chemical” as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	Yes
Sudden Release of Pressure Hazard	No
OSHA Process Safety (29CFR1910.119)	No
CERCLA Section 103 (40CFR302.4)	Yes

Reportable Quantity (RQ) under CERCLA	1,000 lbs. (454kg)
TSCA Inventory Status	Yes

This product does not contain nor is it manufactured with ozone depleting substances

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List and/or Pennsylvania Environmental Hazardous Substance List:

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Sodium Hydroxide	1310-73-2	<=51.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US Toxic Substances Control Act:

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 710.30.

CEPA – Domestic Substances List (DSL):

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

Immediate (Acute) Health Hazard	Yes
Delayed (Chronic) Health Hazard	No
Fire Hazard	No
Reactive Hazard	Yes
Sudden Release of Pressure Hazard	No
OSHA Process Safety (29CFR1910.119)	No
CERCLA Section 103 (40CFR302.4)	Yes
Reportable Quantity (RQ) under CERCLA	1,000 lbs. (454kg)
TSCA Inventory Status	Yes

This product does not contain nor is it manufactured with ozone depleting substances.

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

The following product components are cited in the Pennsylvania Hazardous Substance List and/or the Pennsylvania Environmental Substance List, and are present at levels which require reporting.

Component	CAS #	Amount
Sodium Hydroxide	1310-73-2	<=51.0%

Pennsylvania (Worker and Community Right-To-Know Act): Pennsylvania Hazardous Substances List:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986):

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

US Toxic Substances Control Act:

All components of this product are on the TSCA Inventory or are exempt from TSCA Inventory requirements under 40 CFR 710.30

CEPA – Domestic Substances List (DSL):

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

SECTION 16 – OTHER INFORMATION

IMPORTANT: The information presented herein, while not guaranteed, was prepared by competent technical personnel and is true and accurate to the best of our knowledge. NO WARRANTY OF MERCHANT ABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR WARRANTY OR GUARANTY OF ANY OTHER KIND, EXPRESS OR IMPLIED, IS MADE REGARDING PERFORMANCE, SUITABILITY, STABILITY OR OTHERWISE. The information included herein is not intended to be all-inclusive as to the appropriate manner and/or conditions of use, handling and/or storage. Factors pertaining to certain conditions of storage, handling, or use of this product may involve other or additional safety or performance considerations. While our technical personnel will be happy to respond to questions regarding safe handling and use procedures, safe handling and use remains the responsibility of the customer. No suggestions for use are intended to, and nothing herein shall be construed as a recommendation to, infringe any existing patents or violate any laws, rules, regulations or ordinances of any governmental entity.

Shintech Louisiana, LLC urges each customer or recipient of this SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as to the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product.

Revisions:

- **January 2011 - no information changed in this MSDS. This MSDS was reviewed for accuracy.**
- **April 2014 – The MSDS was updated to follow new Global Harmonization Guidelines. The MSDS are now called Safety Data Sheets (SDS).**
- **January 2016 – Corrections to improve nomenclature and technical data.**
- **February 2020 – No information changed in this SDS. This SDS was reviewed for accuracy.**
- **July 2022 – Section 2 was updated to include the GHS Classification Category 1 – Corrosive to Metals and Category 4 – Acute toxicity - inhalation. Section 2 - GHS Hazard Statements have been revised to indicate that this material is harmful if inhaled.**
- **November 2022 – Section 2 GHS Classifications and Hazard Statements updated.**
- **January 2023 – Removal of health hazard pictogram based on updated hazard statements.**

SDS Status: *Revision Date:* *1/25/2023*
Supersedes: *11/15/2022*

Aqua Ammonia 19%

Safety Data Sheet

Classified according to the UN-GHS as adopted in the US Hazard Communication Standard (HCS 2012), the Canada Hazardous Products Regulations (WHMIS 2015) and Mexico NOM-018-STPS-2015.

Revision Date: 4 June 2024 Date of issue: 4 June 2024 Supersedes Date: 23 June 2023 Version: 3.1

SECTION 1: IDENTIFICATION

1.1. Product Identifier

Product Name: Aqua Ammonia 19%

CAS No: 1336-21-6

Synonyms: Ammonia water, Aqueous ammonia, Household ammonia, Ammonium hydrate, Ammonium hydroxide

STCC: 4935280

1.2. Intended Use of the Product

Uses of the substance/mixture: Fertilizer

Uses advised against: Consumer use

1.3. Name, Address, and Telephone of the Responsible Party

Company

CF Industries
2375 Waterview Drive
Northbrook, Illinois, USA
847-405-2400
www.cfindustries.com

1.4. Emergency Telephone Number

Emergency Number : 800-424-9300
For Chemical Emergency, Spill, Leak, Fire, Exposure, or Accident, call CHEMTREC – Day or Night

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification (GHS-US)

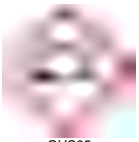
Acute Tox. 4 (Oral)	H302
Acute Tox. 4 (Inhalation:gas)	H332
Skin Corr. 1A	H314
Eye Dam. 1	H318
STOT SE 3	H335
Aquatic Acute 1	H400
Aquatic Chronic 3	H412

Full text of H-phrases: see section 16

2.2. Label Elements

GHS-US Labeling

Hazard Pictograms (GHS-US) :


GHS05

GHS07

GHS09

Signal Word (GHS-US) : Danger

Hazard Statements (GHS-US) : H302+H332 - Harmful if swallowed or if inhaled.
H314 - Causes severe skin burns and eye damage.
H318 - Causes serious eye damage.
H335 - May cause respiratory irritation.
H400 - Very toxic to aquatic life.
H412 - Harmful to aquatic life with long lasting effects.

Precautionary Statements (GHS-US) : P260 - Do not breathe mist, spray, vapors, gas.
P261 - Avoid breathing vapors, mist, or spray.
P264 - Wash hands, forearms, and exposed areas thoroughly after handling.
P270 - Do not eat, drink or smoke when using this product.
P271 - Use only outdoors or in a well-ventilated area.
P273 - Avoid release to the environment.
P280 - Wear eye protection, protective clothing, protective gloves, face protection.

P301+P330+P331+P310 - IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Immediately call a poison center or doctor.
P303+P361+P353+P310 - IF ON SKIN (OR HAIR): Take off immediately all contaminated clothing. Rinse skin with water/shower. Immediately call a poison center or doctor.
P304+P340+P310 - IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Immediately call a poison center or doctor.
P305+P351+P338+P310 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a poison center or doctor.
P363 - Wash contaminated clothing before reuse.
P391 - Collect spillage.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P405 - Store locked up.
P501 - Dispose of contents/container in accordance with local, regional, provincial, territorial, national, and international regulations.

2.3. Other Hazards

Ammonium hydroxide is very volatile and may release ammonia as a gas. Ammonia vapor, in concentrations of 16-25% volume by weight in air, is flammable, toxic by inhalation and corrosive. Take all appropriate precautions.

2.4. Unknown Acute Toxicity (GHS-US)

No data available.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixture

Name	Product Identifier	% (w/w)	Classification (GHS-US)
Ammonium hydroxide	(CAS No) 1336-21-6	100	Acute Tox. 4 (Oral), H302 Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400
Contains	**Product Identifier**	**% (w/w)**	**Classification (GHS-US)**
Water	(CAS No) 7732-18-5	80.5-81.5	Not classified
Ammonia	(CAS No) 7664-41-7	18.5-19.5	Flam. Gas 2, H221 Compressed gas, H280 Acute Tox. 3 (Inhalation:gas), H331 Skin Corr. 1B, H314 Eye Dam. 1, H318 Aquatic Acute 1, H400 Aquatic Chronic 2, H411

Full text of H-phrases: see section 16

SECTION 4: FIRST AID MEASURES

4.1. Description of First Aid Measures

General: Never give anything by mouth to an unconscious person. Seek medical attention immediately. Show label if possible.

Inhalation: When symptoms occur: go into open air and ventilate suspected area. Immediately call a POISON CENTER or doctor/physician.

Skin Contact: Immediately flush skin with plenty of water for at least 60 minutes. Remove/Take off immediately all contaminated clothing. Immediately call a POISON CENTER or doctor/physician. Wash contaminated clothing before reuse.

Eye Contact: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing for at least 60 minutes. Immediately call a POISON CENTER or doctor/physician.

Ingestion: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor/physician.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

General: Harmful if swallowed. Corrosive to eyes, respiratory system and skin. Harmful if inhaled.

Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Damage to lungs. Harmful if inhaled.

Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.

Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.

Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.

Chronic Symptoms: None known.

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention.

SECTION 5: FIRE-FIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media: Water spray, fog.

Unsuitable Extinguishing Media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard: Ammonia vapor concentrations in the range of 16-25% by volume in air can be ignited if heated to the auto-ignition temperature. Oil or other combustible materials increases the fire hazard. Emits toxic fumes under fire conditions.

Explosion Hazard: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions.

Reactivity: Corrosive to copper, brass, silver, zinc and galvanized steel.

5.3. Advice for Firefighters

Precautionary Measures Fire: Exercise caution when fighting any chemical fire.

Firefighting Instructions: Stop leak if safe to do so. Use water spray or fog for cooling exposed containers. In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.

Protection During Firefighting: Firefighters must use full bunker gear including NIOSH-approved positive-pressure self-contained breathing apparatus to protect against potential hazardous combustion and decomposition products.

Hazardous Combustion Products: Nitrogen oxides. Ammonia.

Reference to Other Sections

Refer to section 9 for flammability properties.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures: Keep away from open flames, hot surfaces and sources of ignition. No smoking. Avoid all contact with skin, eyes, or clothing. Do NOT breathe vapor, mist, spray.

6.1.1. For Non-Emergency Personnel

Protective Equipment: Use appropriate personal protection equipment (PPE).

Emergency Procedures: Evacuate unnecessary personnel. Eliminate ignition sources.

6.1.2. For Emergency Personnel

Protective Equipment: Equip cleanup crew with proper protection.

Emergency Procedures: Stop leak if safe to do so. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters. Notify authorities if product enters sewers or public waters.

6.3. Methods and Material for Containment and Cleaning Up

For Containment: Stop the flow of material, if this is without risk. Ventilate area. Contain any spills with dikes or absorbents.

Methods for Cleaning Up: Clear up spills immediately and dispose of waste safely. Never neutralize spill with acid. Absorb and/or contain spill with inert material, then place in suitable container. Use only non-sparking tools. After cleaning, flush traces away with water.

6.4. Reference to Other Sections

See heading 8, Exposure Controls and Personal Protection. See Section 13, Disposal Considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed: Do NOT enter (storage areas, confined spaces) unless adequately ventilated. Emits ammonia vapors. Flammable gas. Ammonium hydroxide reacts with many heavy metals and their salts forming explosive compounds. It may attack metals forming flammable/explosive gas. The solution in water is a strong base, it reacts violently with acids.

Hygiene Measures: Handle in accordance with good industrial hygiene and safety procedures. Wash hands and other exposed areas with mild soap and water before eating, drinking, or smoking and again when leaving work.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures: Any proposed use of this product in elevated-temperature processes should be thoroughly evaluated to assure that safe operating conditions are established and maintained. Ensure adequate ventilation. Comply with applicable regulations.

Storage Conditions: Store in a dry, cool and well-ventilated place. Detached outside storage is preferable. Keep in fireproof place. Store away from oxidizers, combustible materials, and all ignition sources. Store in corrosive resistant container with a resistant inner liner. Storage containers should have safety relief valves. Store locked up.

Incompatible Materials: Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

Storage Area: Post readily visible warning signs in the storage area listing emergency measures. Water hoses should be readily available to disperse vapors in case of a spill.

7.3. Specific End Use(s)

Fertilizer

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

For substances listed in section 3 that are not listed here, there are no established Exposure limits from the manufacturer, supplier, importer, or the appropriate advisory agency including: ACGIH (TLV), NIOSH (REL), OSHA (PEL), Canadian provincial governments, or the Mexican government.

Ammonia (7664-41-7)		
Mexico	OEL TWA (mg/m³)	18 mg/m³
Mexico	OEL TWA (ppm)	25 ppm
Mexico	OEL STEL (mg/m³)	27 mg/m³
Mexico	OEL STEL (ppm)	35 ppm
USA ACGIH	ACGIH TWA (ppm)	25 ppm
USA ACGIH	ACGIH STEL (ppm)	35 ppm
USA OSHA	OSHA PEL (TWA) (mg/m³)	35 mg/m³
USA OSHA	OSHA PEL (TWA) (ppm)	50 ppm
USA NIOSH	NIOSH REL (TWA) (mg/m³)	18 mg/m³
USA NIOSH	NIOSH REL (TWA) (ppm)	25 ppm
USA NIOSH	NIOSH REL (STEL) (mg/m³)	27 mg/m³
USA NIOSH	NIOSH REL (STEL) (ppm)	35 ppm
USA IDLH	US IDLH (ppm)	300 ppm
Alberta	OEL STEL (mg/m³)	24 mg/m³
Alberta	OEL STEL (ppm)	35 ppm
Alberta	OEL TWA (mg/m³)	17 mg/m³
Alberta	OEL TWA (ppm)	25 ppm
British Columbia	OEL STEL (ppm)	35 ppm
British Columbia	OEL TWA (ppm)	25 ppm
Manitoba	OEL STEL (ppm)	35 ppm
Manitoba	OEL TWA (ppm)	25 ppm
New Brunswick	OEL STEL (mg/m³)	24 mg/m³
New Brunswick	OEL STEL (ppm)	35 ppm
New Brunswick	OEL TWA (mg/m³)	17 mg/m³
New Brunswick	OEL TWA (ppm)	25 ppm
Newfoundland &	OEL STEL (ppm)	35 ppm

Labrador		
Newfoundland & Labrador	OEL TWA (ppm)	25 ppm
Nova Scotia	OEL STEL (ppm)	35 ppm
Nova Scotia	OEL TWA (ppm)	25 ppm
Nunavut	OEL STEL (mg/m³)	24 mg/m³
Nunavut	OEL STEL (ppm)	35 ppm
Nunavut	OEL TWA (mg/m³)	17 mg/m³
Nunavut	OEL TWA (ppm)	25 ppm
Northwest Territories	OEL STEL (mg/m³)	24 mg/m³
Northwest Territories	OEL STEL (ppm)	35 ppm
Northwest Territories	OEL TWA (mg/m³)	17 mg/m³
Northwest Territories	OEL TWA (ppm)	25 ppm
Ontario	OEL STEL (ppm)	35 ppm
Ontario	OEL TWA (ppm)	25 ppm
Prince Edward Island	OEL STEL (ppm)	35 ppm
Prince Edward Island	OEL TWA (ppm)	25 ppm
Québec	VECD (mg/m³)	24 mg/m³
Québec	VECD (ppm)	35 ppm
Québec	VEMP (mg/m³)	17 mg/m³
Québec	VEMP (ppm)	25 ppm
Saskatchewan	OEL STEL (ppm)	35 ppm
Saskatchewan	OEL TWA (ppm)	25 ppm
Yukon	OEL STEL (mg/m³)	30 mg/m³
Yukon	OEL STEL (ppm)	40 ppm
Yukon	OEL TWA (mg/m³)	18 mg/m³
Yukon	OEL TWA (ppm)	25 ppm

8.2. Exposure Controls

Appropriate Engineering Controls: Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Gas detectors should be used when toxic gases may be released. Use explosion-proof equipment.

Personal Protective Equipment: Gloves. Protective goggles. Insufficient ventilation: wear respiratory protection. Protective clothing. Face shield.

Materials for Protective Clothing: Chemically resistant materials and fabrics.

Hand Protection: Wear chemically resistant protective gloves.

Eye Protection: Chemical safety goggles and face shield.

Skin and Body Protection: Wear suitable protective clothing.

Respiratory Protection: If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn.

Other Information: When using, do not eat, drink, or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	:	Liquid
Appearance	:	Colorless
Odor	:	Pungent
Odor Threshold	:	1 - 50 ppm
pH	:	10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Evaporation Rate	:	Not available
Melting Point	:	- 77 °C (-106 °F) (< 44% NH_3)

Freezing Point	:	-38 °C (-36 °F)
Boiling Point	:	37.4 °C (99.3°F) (25% NH_3)
Flash Point	:	Not available
Auto-ignition Temperature	:	651 °C (1,204°F) (ammonia vapor)
Decomposition Temperature	:	Not available
Flammability (solid, gas)	:	Not available
Lower Flammable Limit	:	16 % (ammonia vapor)
Upper Flammable Limit	:	25 % (ammonia vapor)
Vapor Pressure	:	49642.2 Pa at 68°F (20°C)
Relative Vapor Density at 20 °C	:	0.6 (for ammonia vapor over aqua ammonia at 0°C and 760 mm Hg)
Relative Density	:	Not available
Specific Gravity	:	0.90 at 60 °F (19% NH_3)
Solubility	:	Soluble in water.
Partition Coefficient: N-Octanol/Water	:	-1.14 at 25° C
Viscosity	:	Not available
Explosion Data – Sensitivity to Mechanical Impact	:	Not expected to present an explosion hazard due to mechanical impact.
Explosion Data – Sensitivity to Static Discharge	:	Not expected to present an explosion hazard due to static discharge.

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity
Forms explosive compounds with calcium hypochlorite, bleaches, gold, mercury, silver, chlorine and other halogens. Contact with strong oxidizers can result in fires and explosions. Corrosive to copper, brass, silver, zinc and galvanized steel.

10.2. Chemical Stability
Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of Hazardous Reactions
Hazardous polymerization will not occur.

10.4. Conditions to Avoid
Direct sunlight. Extremely high or low temperatures. Heat. Sources of ignition.

10.5. Incompatible Materials
Strong acids. Strong bases. Strong oxidizers. Hypochlorites.

10.6. Hazardous Decomposition Products
Thermal decomposition generates: Carbon oxides (CO, CO2). Nitrogen oxides. Emits ammonia vapors.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on Toxicological Effects - Product
Acute Toxicity: Oral: Harmful if swallowed. Inhalation:gas: Harmful if inhaled.

LD50 and LC50 Data:

Ammonium hydroxide 1336-21-6	
ATE US (oral)	350.00 mg/kg body weight
ATE US (gases)	10,256.41 ppmV/4h

Skin Corrosion/Irritation: Causes severe skin burns and eye damage.
pH: 10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Serious Eye Damage/Irritation: Causes serious eye damage.
pH: 10.6 - 11.6 (0.02-1.7% aqueous ammonia solution)
Respiratory or Skin Sensitization: Not classified
Germ Cell Mutagenicity: Not classified
Teratogenicity: Not available
Carcinogenicity: Not classified
Specific Target Organ Toxicity (Repeated Exposure): Not classified
Reproductive Toxicity: Not classified
Specific Target Organ Toxicity (Single Exposure): May cause respiratory irritation.

Aspiration Hazard: Not classified
Symptoms/Injuries After Inhalation: Symptoms may include: Sneezing, coughing, burning sensation of throat with constricting sensation of the larynx and difficulty in breathing. Damage to lungs. Harmful if inhaled.
Symptoms/Injuries After Skin Contact: Corrosive. Causes burns. Symptoms may include: Redness. Pain. Serious skin burns. Blisters.
Symptoms/Injuries After Eye Contact: Causes serious eye damage. Symptoms may include: Redness. Pain. Blurred vision. Severe burns. Causes permanent damage to the cornea, iris, or conjunctiva.
Symptoms/Injuries After Ingestion: Harmful if swallowed. May cause burns or irritation of the linings of the mouth, throat, and gastrointestinal tract.
Chronic Symptoms: None known.

11.2. Information on Toxicological Effects - Ingredient(s)

LD50 and LC50 Data:

Ammonia (7664-41-7)	
LC50 Inhalation Rat	5.1 mg/l (Exposure time: 1 h)
LC50 Inhalation Rat	2000 ppm/4h (Exposure time: 4 h)

Water (7732-18-5)	
LD50 Oral Rat	> 90000 mg/kg

Ammonium hydroxide (1336-21-6)	
LD50 Oral Rat	350 mg/kg

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - General: Toxic to aquatic life. Harmful to aquatic life with long lasting effects.

Ammonia (7664-41-7)	
LC50 Fish 1	0.44 mg/l (Exposure time: 96 h - Species: Cyprinus carpio)
EC50 Daphnia 1	25.4 mg/l (Exposure time: 48 h - Species: Daphnia magna)
LC 50 Fish 2	0.26 - 4.6 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus)

Ammonium hydroxide (1336-21-6)	
LC50 Fish 1	8.2 mg/l (Exposure time: 96 h - Species: Pimephales promelas)
EC50 Daphnia 1	0.66 mg/l (Exposure time: 48 h - Species: water flea)
EC50 Daphnia 2	0.66 mg/l (Exposure time: 48 h - Species: Daphnia pulex)

12.2. Persistence and Degradability

Ammonium hydroxide (1336-21-6)	
Persistence and Degradability	Biodegradation of ammonia occurs in water under aerobic conditions.

12.3. Bioaccumulative Potential

Ammonium hydroxide (1336-21-6)	
Log Pow	-1.14
Bioaccumulative Potential	Not established.

Ammonia (7664-41-7)	
Log Pow	-1.14 (at 25 °C)

12.4. Mobility in Soil

Not available

12.5. Other Adverse Effects

Other Information: Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Sewage Disposal Recommendations: Do not empty into drains; dispose of this material and its container in a safe way.
Waste Disposal Recommendations: Dispose of waste material in accordance with all local, regional, national, provincial, territorial and international regulations.
Additional Information: Prevent runoff from entering drains, sewers or waterways.
Ecology – Waste Materials: This material is hazardous to the aquatic environment. Keep out of sewers and waterways.

SECTION 14: TRANSPORT INFORMATION

14.1. In Accordance with DOT

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8

Packing Group : III
ERG Number : 154
CERCLA RQ : Ammonium Hydroxide = 1,000 lbs
Additional Information : Marine Pollutant

14.2. In Accordance with IMDG

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Packing Group : III
Label Codes : 8 + MP(P)
EmS-No. (Fire) : F-A
EmS-No. (Spillage) : S-B

Additional Information : Marine Pollutant, Classified as HME per MARPOL Annex V

14.3. In Accordance with IATA

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Packing Group : III

ERG Code (IATA) : 8L

14.4. In Accordance with TDG

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Packing Group : III
Additional Information : Marine Pollutant

14.5. Classified in Accordance with MX-SCT

Proper Shipping Name : AMMONIA SOLUTION (with more than 10% but not more than 35% ammonia)
Hazard Class : 8
Identification Number : UN2672
Label Codes : 8
Additional Information : Marine Pollutant

SECTION 15: REGULATORY INFORMATION

15.1. US Federal Regulations

Ammonium hydroxide (1336-21-6)	
SARA Section 311/312 Hazard Classes	Immediate (acute) health hazard

Ammonia (7664-41-7)	
Listed on the United States TSCA (Toxic Substances Control Act) inventory Listed on the United States SARA Section 302 Listed on United States SARA Section 313	
SARA Section 302 Threshold Planning Quantity (TPQ)	500
SARA Section 311/312 Hazard Classes	Fire hazard Immediate (acute) health hazard Sudden release of pressure hazard

SARA Section 313 - Emission Reporting	1.0 % (includes anhydrous Ammonia and aqueous Ammonia from water dissociable Ammonium salts and other sources, 10% of total aqueous Ammonia is reportable under this listing)

Water (7732-18-5)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

Ammonium hydroxide (1336-21-6)
Listed on the United States TSCA (Toxic Substances Control Act) inventory

15.2. US State Regulations

Ammonia (7664-41-7)
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Acute
U.S. - California - SCAQMD - Toxic Air Contaminants - Non-Cancer Chronic
U.S. - California - Toxic Air Contaminant List (AB 1807, AB 2728)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (30 min)
U.S. - Connecticut - Hazardous Air Pollutants - HLVs (8 hr)
U.S. - Connecticut - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Connecticut - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Delaware - Accidental Release Prevention Regulations - Sufficient Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Threshold Quantities
U.S. - Delaware - Accidental Release Prevention Regulations - Toxic Endpoints
U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Florida - Essential Chemicals List
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Acceptable Ambient Concentrations
U.S. - Idaho - Non-Carcinogenic Toxic Air Pollutants - Emission Levels (ELs)
U.S. - Idaho - Occupational Exposure Limits - TWAs
U.S. - Louisiana - Reportable Quantity List for Pollutants
U.S. - Maine - Air Pollutants - Criteria Pollutants
U.S. - Massachusetts - Allowable Ambient Limits (AALs)
U.S. - Massachusetts - Allowable Threshold Concentrations (ATCs)
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Threshold Effects Exposure Limits (TELs)
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Occupational Exposure Limits - STELs
U.S. - Michigan - Polluting Materials List
U.S. - Michigan - Process Safety Management Highly Hazardous Chemicals
U.S. - Minnesota - Chemicals of High Concern
U.S. - Minnesota - Hazardous Substance List
U.S. - Minnesota - Permissible Exposure Limits - STELs
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - 24-Hour
U.S. - New Hampshire - Regulated Toxic Air Pollutants - Ambient Air Levels (AALs) - Annual
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
U.S. - New Jersey - Environmental Hazardous Substances List
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New Jersey - Water Quality - Ground Water Quality Criteria
U.S. - New Jersey - Water Quality - Practical Quantitation Levels (PQLs)
U.S. - New Mexico - Precursor Chemicals
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

U.S. - North Carolina - Control of Toxic Air Pollutants
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 1-Hour
U.S. - North Dakota - Air Pollutants - Guideline Concentrations - 8-Hour
U.S. - Ohio - Accidental Release Prevention - Threshold Quantities
U.S. - Ohio - Extremely Hazardous Substances - Threshold Quantities
U.S. - Oregon - Permissible Exposure Limits - TWAs
U.S. - Oregon - Precursor Chemicals
RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 1-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - 24-Hour
U.S. - Rhode Island - Air Toxics - Acceptable Ambient Levels - Annual
U.S. - Rhode Island - Water Quality Standards - Acute Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Acute Saltwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Freshwater Aquatic Life Criteria
U.S. - Rhode Island - Water Quality Standards - Chronic Saltwater Aquatic Life Criteria
U.S. - Tennessee - Occupational Exposure Limits - STELs
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term
U.S. - Vermont - Permissible Exposure Limits - STELs
U.S. - Virginia - Water Quality Standards - Acute Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Acute Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Freshwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Chronic Saltwater Aquatic Life
U.S. - Virginia - Water Quality Standards - Public Water Supply Effluent Limits
U.S. - Virginia - Water Quality Standards - Surface Waters Not Used for the Public Water Supply Effluent Limits
U.S. - Washington - Permissible Exposure Limits - STELs
U.S. - Washington - Permissible Exposure Limits - TWAs
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 25 Feet to Less Than 40 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 40 Feet to Less Than 75 Feet
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights 75 Feet or Greater
U.S. - Wisconsin - Hazardous Air Contaminants - All Sources - Emissions From Stack Heights Less Than 25 Feet
U.S. - Wyoming - Process Safety Management - Highly Hazardous Chemicals
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Fresh Water
U.S. - Alaska - Water Quality Standards - Acute Aquatic Life Criteria for Marine Water
U.S. - Alaska - Water Quality Standards - Chronic Aquatic Life Criteria for Marine Water
U.S. - Alaska - Ambient Air Quality Standards

Ammonium hydroxide (1336-21-6)

U.S. - Delaware - Pollutant Discharge Requirements - Reportable Quantities
U.S. - Louisiana - Reportable Quantity List for Pollutants
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Groundwater Reportable Concentration - Reporting Category 2
U.S. - Massachusetts - Oil & Hazardous Material List - Reportable Quantity
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 1
U.S. - Massachusetts - Oil & Hazardous Material List - Soil Reportable Concentration - Reporting Category 2
RTK - U.S. - Massachusetts - Right To Know List
U.S. - Massachusetts - Toxics Use Reduction Act
U.S. - Michigan - Polluting Materials List
U.S. - New Jersey - Discharge Prevention - List of Hazardous Substances
RTK - U.S. - New Jersey - Right to Know Hazardous Substance List
U.S. - New Jersey - Special Health Hazards Substances List
U.S. - New Jersey - TCPA - Extraordinarily Hazardous Substances (EHS)
U.S. - New York - Reporting of Releases Part 597 - List of Hazardous Substances

RTK - U.S. - Pennsylvania - RTK (Right to Know) - Environmental Hazard List
RTK - U.S. - Pennsylvania - RTK (Right to Know) List
U.S. - Texas - Effects Screening Levels - Long Term
U.S. - Texas - Effects Screening Levels - Short Term

15.3. Canadian Regulations

Ammonium hydroxide (1336-21-6)	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects

Ammonia (7664-41-7)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class A - Compressed Gas Class B Division 1 - Flammable Gas Class D Division 1 Subdivision A - Very toxic material causing immediate and serious toxic effects Class E - Corrosive Material

Water (7732-18-5)	
Listed on the Canadian DSL (Domestic Substances List)	
WHMIS Classification	Uncontrolled product according to WHMIS classification criteria

Ammonium hydroxide (1336-21-6)	
Listed on the Canadian DSL (Domestic Substances List) Listed on the Canadian IDL (Ingredient Disclosure List)	
IDL Concentration 1 %	
WHMIS Classification	Class E - Corrosive Material Class D Division 1 Subdivision B - Toxic material causing immediate and serious toxic effects

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by CPR.

SECTION 16: OTHER INFORMATION, INCLUDING DATE OF PREPARATION OR LAST REVISION

Revision Date : 4 June 2024

Revision Comments : This version contains updates/revisions to the following sections:

- Updated company address

GHS Full Text Phrases:

Acute Tox. 3 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 3
Acute Tox. 4 (Inhalation:gas)	Acute toxicity (inhalation:gas) Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral) Category 4
Aquatic Acute 1	Hazardous to the aquatic environment - Acute Hazard Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment - Chronic Hazard Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment - Chronic Hazard Category 3
Compressed gas	Gases under pressure Compressed gas

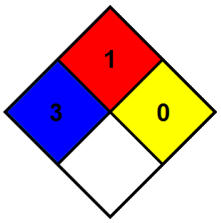
Eye Dam. 1	Serious eye damage/eye irritation Category 1
Flam. Gas 2	Flammable gases Category 2
Skin Corr. 1A	Skin corrosion/irritation Category 1A
Skin Corr. 1B	Skin corrosion/irritation Category 1B
STOT SE 3	Specific target organ toxicity (single exposure) Category 3
H221	Flammable gas
H280	Contains gas under pressure; may explode if heated
H302	Harmful if swallowed
H314	Causes severe skin burns and eye damage
H318	Causes serious eye damage
H331	Toxic if inhaled
H332	Harmful if inhaled
H335	May cause respiratory irritation
H400	Very toxic to aquatic life
H411	Toxic to aquatic life with long lasting effects
H412	Harmful to aquatic life with long lasting effects

NFPA Rating

Health Hazard : 3 - Short exposure could cause serious temporary or residual injury even though prompt medical attention was given.

Fire Hazard : 1 - Must be moderately heated or exposed to relatively high temperature before ignition can occur.

Reactivity : 0 - Normally stable, even under fire exposure conditions, and are not reactive with water.



HMIS III Rating

Health : 3 Serious Hazard - Major injury likely unless prompt action is taken and medical treatment is given

Flammability : 1 Slight Hazard

Physical : 0 Minimal Hazard

Party Responsible for the Preparation of This Document
CF Industries, Corporate EHS Department, 847-405-2400

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

CF believes the information contained herein is accurate; however, CF makes no guarantees or warranties with respect to such accuracy and assumes no liability in connection with the use of the information contained herein by any party. The provision of the information contained herein by CF is not intended to be and should not be construed as legal advice or as ensuring compliance by other parties. Judgments as to the suitability of the information contained herein for the party's own use or purposes are solely the responsibility of that party. Any party handling, transferring, transporting, storing, applying or otherwise using this product should review thoroughly all applicable laws, rules, regulations, standards and good engineering practices. Such thorough review should occur before the party handles, transfers, transports, stores, applies or otherwise uses this product.

North America GHS US 2012 & WHMIS 2

ATTACHMENT I

EMISSION UNITS TABLE

Attachment I

Emission Units Table

(includes all emission units and air pollution control devices that will be part of this permit application review, regardless of permitting status)

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
1S-117S	1E-117E	Engine 1 through Engine 117	2026	28,194 HP	New	1C-117C
118S-157S	118E-157E	ULSD Tank TK1-TK40	2026	170,000 gal	New	NA
De minimis	De minimis	Hydrous Ammonia Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Caustic Soda Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sulfuric Acid Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sodium Chlorite Tanks 1-39	2026	4,600 gal	New	NA
De minimis	De minimis	Sodium Hydrosulfide Tanks 1-39	2026	4,600 gal	New	NA

[1] For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S, or other appropriate designation.
[2] For Emission Points use the following numbering system: 1E, 2E, 3E, or other appropriate designation.
[3] New, modification, removal
[4] For Control Devices use the following numbering system: 1C, 2C, 3C, or other appropriate designation.

ATTACHMENT J

EMISSION POINTS DATA SUMMARY SHEET

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/ Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
Worst case yearly emissions all engines (with 5 startups and shutdowns)															
1E-117E	Vertical	1S to 117S	Engines 1 to 117	1C to 117C	Control System	NA	NA	NO_X	NA	13,494	NA	194.30	Gas	Manufacturer	NA
								PM/PM10/PM2.5	NA	248.69	NA	186.53	Solid		NA
								CO	NA	11,174	NA	205.62	Gas		NA
								VOC	NA	11,517	NA	116.59	Gas		NA
								SO2	NA	495	NA	9.93	Gas		NA
								Total HAPS	NA	85.77	NA	0.86	Gas		NA
Normal Operations Single Engine (See emission discussion in Attachment L for different operating scenarios)															
1E to 117E	Vertical	1S to 117S	Engine 1 to 117	1C to 117C	Control System	NA	NA	NO_X	13.89	60.83	0.14	0.61	Gas	Manufacturer	NA
								PM/PM10/PM2.5	0.45	1.99	0.34	1.49	Solid		NA
								CO	22.36	97.92	0.34	1.47	Gas		NA
								VOC	22.63	99.12	0.23	0.99	Gas		NA
								SO2	0.74	3.25	0.01	0.03	Gas		NA
								Total HAPS	1.31	0.75	0.54	0.01	Gas		NA
See Emissions Discussion in Attachment L and Emissions Estimate in Attachment N for other emissions scenarios.															

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/ Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
118E to 157E	Vertical	118S to 157S	ULSD Tanks 1-40	None	None	NA	NA	VOC (per tank)	0.18	0.02	0.18	0.02	Gas	Tanks 4.09.d	

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that uncaptured process emission unit emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET. Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions). Please complete the FUGITIVE EMISSIONS DATA SUMMARY SHEET for fugitive emission activities.

[1] Please add descriptors such as upward vertical stack, downward vertical stack, horizontal stack, relief vent, rain cap, etc.

[2] Indicate by "C" if venting is continuous. Otherwise, specify the average short-term venting rate with units, for intermittent venting (ie., 15 min/hr). Indicate as many rates as needed to clarify frequency of venting (e.g., 5 min/day, 2 days/wk).

[3] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. **LIST** Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, all applicable Greenhouse Gases (including CO_2 and methane), etc. **DO NOT LIST** H_2, H_2O, N_2, O_2, and Noble Gases.

[4] Give maximum potential emission rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[5] Give maximum potential emission rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[6] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

[7] Provide for all pollutant emissions. Typically, the units of parts per million by volume (ppmv) are used. If the emission is a mineral acid (sulfuric, nitric, hydrochloric or phosphoric) use units of milligram per dry cubic meter (mg/m^3) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1E-117E	4.6	111	32,287	32.37	~1,718	98	4,161.72229	415.70631
118E-157E	NA	Ambient	NA	NA	~1,718	40	4,161.72229	415.70631

[1] Give at operating conditions. Include inerts.
[2] Release height of emissions above ground level.

ATTACHMENT K

FUGITIVE EMISSIONS DATA SUMMARY SHEET

FUGITIVE EMISSIONS DATA SUMMARY SHEET

The FUGITIVE EMISSIONS SUMMARY SHEET provides a summation of fugitive emissions. Fugitive emissions are those emissions, which could not reasonably pass through a stack, chimney, vent or other functionally equivalent opening. Note that uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

Please note that total emissions from the source are equal to all vented emissions, all fugitive emissions, plus all other emissions (e.g. uncaptured emissions).

APPLICATION FORMS CHECKLIST - FUGITIVE EMISSIONS
1.) Will there be haul road activities? ☒ Yes ☐ No ☒ If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? ☐ Yes ☒ No ☐ If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? ☐ Yes ☒ No ☐ If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
5.) Will there be Equipment Leaks (e.g. leaks from pumps, compressors, in-line process valves, pressure relief devices, open-ended valves, sampling connections, flanges, agitators, cooling towers, etc.)? ☒ Yes ☐ No Leak Source Count is in Attachment N. ☒ If YES, complete the LEAK SOURCE DATA SHEET section of the CHEMICAL PROCESSES EMISSIONS UNIT DATA SHEET.
6.) Will there be General Clean-up VOC Operations? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? ☐ Yes ☒ No ☐ If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET or the most appropriate form.
If you answered "NO" to all of the items above, it is not necessary to complete the following table, "Fugitive Emissions Summary."

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads	PM/PM10/PM2.5	11.50/2.30/0.60	28.64/5.73/1.50	11.50/2.30/0.60	28.64/5.73/1.50	AP-42
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks (See fittings count in Attachment N)	VOC Hexane (C6+)	Does Not Apply	0.3120 0.0053	Does Not Apply	0.3120 0.0053	EE
General Clean-up VOC Emissions						
Other						

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS_2, VOCs, H_2S, Inorganics, Lead, Organics, O_3, NO, NO_2, SO_2, SO_3, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

[2] Give rate with no control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[3] Give rate with proposed control equipment operating. If emissions occur for less than 1 hr, then record emissions per batch in minutes (e.g. 5 lb VOC/20 minute batch).

[4] Indicate method used to determine emission rate as follows: MB = material balance; ST = stack test (give date of test); EE = engineering estimate; O = other (specify).

ATTACHMENT L

EMISSION UNIT DATA SHEET(S)

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Information Claimed Confidential by
TransGas Development Systems, LLC
March 24, 2025

Attachment L
EMISSIONS UNIT DATA SHEET
GENERAL

To be used for affected sources other than asphalt plants, foundries, incinerators, indirect heat exchangers, and quarries.

Identification Number (as assigned on *Equipment List Form*): 1S-117S

1. Name or type and model of proposed affected source:

[redacted] 28,194 Horsepower Compression Ignition Engines. See attached engine details and emissions.

2. On a separate sheet(s), furnish a sketch(es) of this affected source. If a modification is to be made to this source, clearly indicated the change(s). Provide a narrative description of all features of the affected source which may affect the production of air pollutants.

1. Name(s) and maximum amount of proposed process material(s) charged per hour:

Dual Fuel Modes
1. Natural Gas at 98% with Diesel at 2%.
2. Diesel at 100%.

Engine can be retrofit to burn other fuels.

4. Name(s) and maximum amount of proposed material(s) produced per hour:

25 MWe Generators

5. Give chemical reactions, if applicable, that will be involved in the generation of air Pollutants:

Not Applicable

* The identification number which appears here must correspond to the air pollution control device identification number appearing on the *List Form*.

6. Combustion Data (if applicable):

(a) Type and amount in appropriate units of fuel(s) to be burned:

See fuel use during different operating modes in the attached document and in Attachment N.

(b) Chemical analysis of proposed fuel(s), excluding coal, including maximum percent sulfur and ash:

Natural gas will be pipeline quality natural gas.
Diesel fuel will be ultra-low sulfur diesel.

(c) Theoretical combustion air requirement (ACF/unit of fuel): NA

@ °F and psia.

(d) Percent excess air: NA

(e) Type and BTU/hr of burners and all other firing equipment planned to be used:

Compression Ignition Engines

(f) If coal is proposed as a source of fuel, identify supplier and seams and give sizing of the coal as it will be fired:

NA

(g) Proposed maximum design heat input: 135.44 (Maximum) × 10^6 BTU/hr.

7. Projected operating schedule:

Hours/Day	24	Days/Week	7	Weeks/Year	52

8. Projected amount of pollutants that would be emitted from this affected source if no control devices were used:

See the attached document and Attachment N.

a.	NO_X	See Attached and Attachment N	lb/hr	See Attached and Attachment N	Ton/yr
b.	SO_2		lb/hr		Ton/yr
c.	CO		lb/hr		Ton/yr
d.	PM_{10}		lb/hr		Ton/yr
e.	Hydrocarbons		lb/hr		Ton/yr
f.	VOCs (Ethane & Methane)		lb/hr		Ton/yr
g.	Pb		lb/hr		Ton/yr
h.	Specify other(s)				
	Total HAPS	See Attached and Attachment N	lb/hr	See Attached and Attachment N	Ton/yr
			lb/hr		Ton/yr
			lb/hr		Ton/yr
			lb/hr		Ton/yr

NOTE: (1) An Air Pollution Control Device Sheet must be completed for any air pollution device(s) used to control emissions from this affected source.

(2) Complete the Emission Points Data Sheet.

9. Proposed Monitoring, Recordkeeping, Reporting, and Testing
Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING	RECORDKEEPING
Monitoring as required by 40CFR60, Subpart IIII.	Recordkeeping as required by 40CFR60, Subpart IIII.
REPORTING	**TESTING**
Reporting as required by 40CFR60, Subpart IIII.	Testing as required by 40CFR60, Subpart IIII.

MONITORING. PLEASE LIST AND DESCRIBE THE PROCESS PARAMETERS AND RANGES THAT ARE PROPOSED TO BE MONITORED IN ORDER TO DEMONSTRATE COMPLIANCE WITH THE OPERATION OF THIS PROCESS EQUIPMENT OPERATION/AIR POLLUTION CONTROL DEVICE.

RECORDKEEPING. PLEASE DESCRIBE THE PROPOSED RECORDKEEPING THAT WILL ACCOMPANY THE MONITORING.

REPORTING. PLEASE DESCRIBE THE PROPOSED FREQUENCY OF REPORTING OF THE RECORDKEEPING.

TESTING. PLEASE DESCRIBE ANY PROPOSED EMISSIONS TESTING FOR THIS PROCESS EQUIPMENT/AIR POLLUTION CONTROL DEVICE.

10. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty

The engines are designed to run as proposed. Procedures will be provided upon delivery of the engines.

Engine Model and Manufacturer

The engines deployed will be [redacted]. These are [redacted] dual fuel engines. The engines will be built in license by the following engine builders:

[redacted]

Performance Data

The [redacted] offers very high, single-cycle efficiency. In the selected configuration and rating, one engine will produce a maximum 21,000 kW (or 28,194 HP) mechanical power at the shaft. The engines are Dual-Fuel capable, for maximum flexibility. The advantage of these engines among high efficiency and reliability is that they can be upgraded to ammonia engines, increasing the power output to 26,000 kW each, and minimizing the CO_2 per kWh to 66 g, once the fuel is available.

[redacted]

Figure 1: Picture of an [redacted]

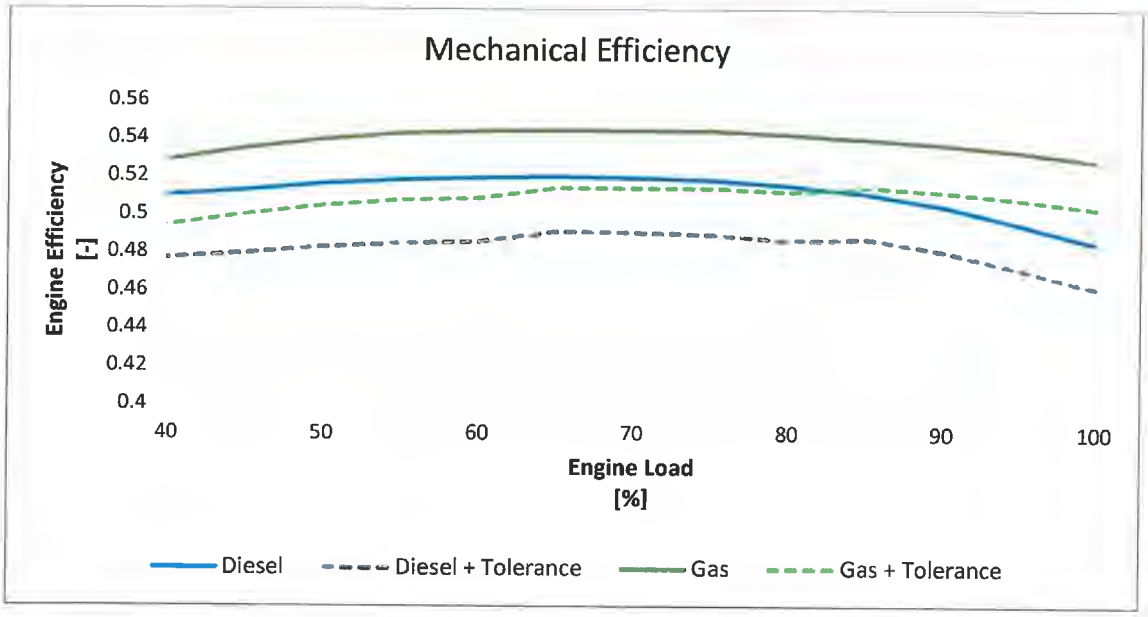

Figure 2: Efficiency of the engine as a function of the load

Power

On the permitting site there will be a total of 117 engines. With the maximum power output of 21 MW per engine, the installed theoretical power output is 2,457 MW. The effective and continuously delivered power output will be 1,795 MW, for 8,760 hours per year.

Fuel Types

In their Dual-Fuel configuration, the engines operate on natural gas and on diesel fuels or can be operated on diesel fuel only, in backup mode. Under normal operation the engines consume gas as their primary fuel with a pilot injection of Ultra-Low Sulfur Diesel. For this application the gas has the following properties (lower heat rate 976.94 BTU/ft³):

Date	BTU	SG	CO2	N2	Methane	Ethane	Propane	I-Butane	N-Butane	I-Pentane	N-Pentane	c6+
Average	1082.2	0.61	0.20	0.44	90.33	8.44	0.52	0.02	0.03	0.01	0.00	0.01
STD in % of average	0.66	0.78	11.09	5.04	0.85	8.17	57.48	20.82	24.96	33.90	55.06	63.08

Under gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% for emergency operation. The fuel used in this application will be Ultra-Low Sulfur Diesel (ULSD), with a sulfur Content: ≤ 15 parts per million (ppm) and a heat rate of 130,613 BTU/gal.

Operational profiles

Normal Operation

To ensure peak operation conditions, the engines will be regularly serviced. With 1-2 weeks of downtime per engine per year, 3 engines are going to be off-line at any time of the year. Under normal operations, the engines will be run at 75% power only. Therefore, the continuously delivered power will be 1,796 MW.

Compensation Mode

In case of one or – in the unrealistic, but foreseen case of - up to 29 engines out of service, the rest of the field will compensate, increasing their power output to 100%. For the calculation of the yearly emissions the worst case is assumed, when 29 engines go offline and the remaining 85 are operated at 100%.

Emergency Mode

In case the pipeline is down, or the gas cannot be delivered for any other reason, the engines can switch to *diesel fuel mode* immediately and are then operated on diesel fuel only. Apart from the different fuel type, the engines are controlled in the same way as in *Normal Operation*.

Startup Mode

To start an engine and bring power production online, several steps are necessary. In the first phase the emission control system is not operational temperature, therefore the control rate is not optimal. The following is a simplification and a representation of the worst case for emissions emission-wise. The different steps can be reduced to four main sub-modes:

- Speed up
- Fuel Switch
- Generator switched on
- Load up cold control

Speed up

Bring the engine from stand still to nominal speed (89 rpm). This is done in diesel mode. The emission control system is still offline at this point, as it is not at optimal temperature. Once nominal speed is set and the minimum load for a fuel switch is reached (less than 5 minutes), the system initiates the next sub mode: Fuel Changeover

Fuel Changeover
For about two minutes the load is kept constant, and the fuel is changed from 100% diesel to 98% gas & 2% diesel.

Generator switched on
On gas operation, the load is further increased until the generator can by energized and synchronized with the rest of the engine fleet. This takes no more than 5 minutes. For the emissions calculation of all these steps the emission control system is looked at as non-operational, even though the exhaust gases will have heated it already and some abatement is taking place, even at a reduced level.

Load up cold control
Once the generator is online and synchronized, then the engine is powered up to its set point (75% in normal operation mode). For reasons of simplicity and to ensure a conservative view on the problem, during engine load up the control system is looked at as cold and operational at 25% only. This even though in reality the system was heated up constantly by the exhaust gases and reaching operational condition during the load up.

Shut Down

The shut down procedure consists of three phases:

- Ramp down
- Min Load
- Spin out

Ramp down
The load is constantly reduced to a minimum load.

Min Load
At minimum load the generator is decoupled from the grid and the engine's load and speed setting are zero.

Spin out
Due to the zero-load setting the injection systems are turned off and the engine is spun out until full stop. In this entire sequence the emission control system is still operational due to its thermal inertia. Therefore, until the injection is stopped the emissions are treated.

All these steps are represented in Figure 3.

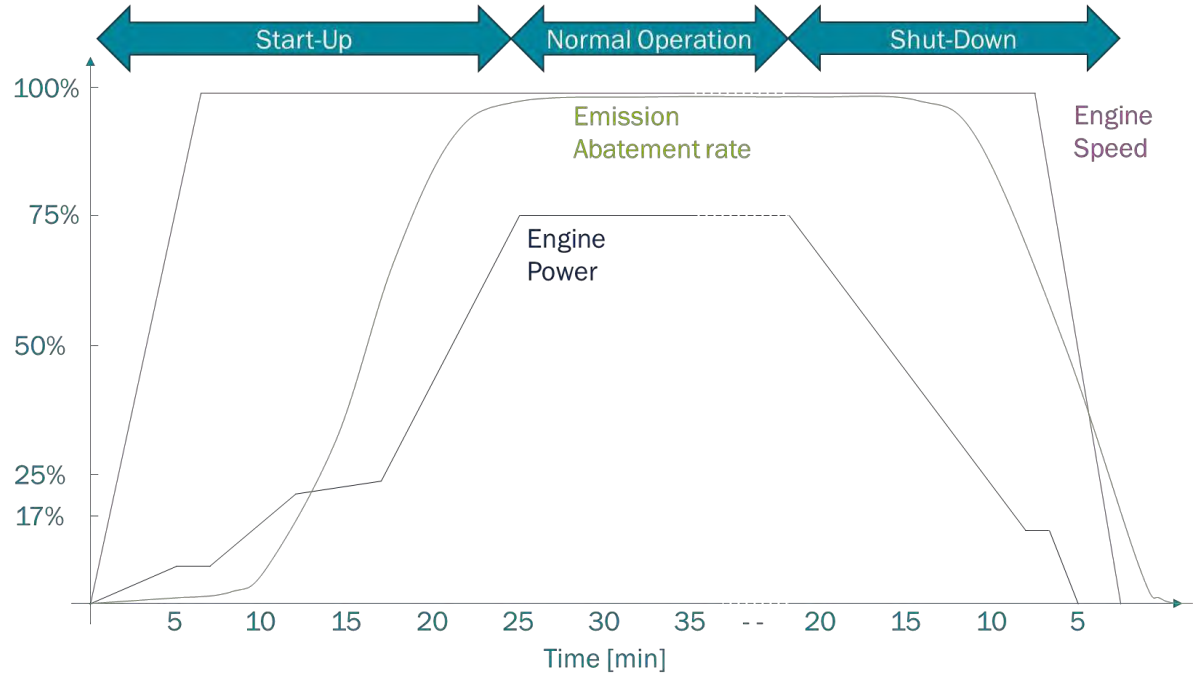

Figure 3: Simplified representation of the Start-Up and Shut-Down phases. Purple: Speed, dark blue: Power and green the efficiency of the emission control system

Emission Levels

For this application the engines are operated in two fuel modes, *Gas mode*, and Diesel mode, where 100% of the energy come from diesel. In Gas mode, where 98% of the energy comes from Natural Gas and 2% from diesel fuel injection (Ultra Low Sulfur Diesel), the engine's raw emissions going into the emission control system are listed in Table 1.

Gas mode		100	75	50	25	20	10
NOx	g/kWh	1.0	0.4	0.4	0.8	0.9	1.0
PM (Filterable)	mg/Nm3	5.7	4.2	5.3	8.6	9.3	10.6
PM10 (Filterable + Condensable)	mg/Nm3	5.4	4.1	5.1	8.1	8.8	10.1
PM2.5 (Filterable + Condensable)	mg/Nm3	5.4	4.1	5.1	8.1	8.8	10.1
CO	ppm	180	166	178	154	149	139
VOC	ppm	79	76	78	88	90	94
N2O	ppm	2	1	1	1	1	1
CH4	ppm	644	616	638	732	750	788
CO2	g/kWh	383	373	377	400	405	416
SO2	g/kWh	0.025	0.023	0.021	0.021	0.021	0.022

Table 1: Engine raw emissions in Gas mode

For redundancy the engine can switch to *Diesel mode* as a backup, with 100% of the energy coming from diesel fuel (ULSD), in case there is a problem with the gas supply system. The corresponding emissions are listed in Table 2.

Diesel mode		100	75	50	25	20	10
NOx	g/kWh	11.6	14.9	17.1	18.5	18.8	19.3
PM (Filterable)	mg/Nm3	8.4	12.1	11.6	8.6	8.0	6.8
PM10 (Filterable + Condensable)	mg/Nm3	8.4	12.1	11.6	8.6	8.0	6.8
PM2.5 (Filterable + Condensable)	mg/Nm3	8.0	11.7	11.3	8.1	7.6	6.5
CO	ppm	83	36	36	39	40	41
VOC	ppm	91	103	119	171	181	202
N2O	ppm	4	2	1	1	1	1
CO2	g/kWh	439	426	430	454	460	471
SO2	g/kWh	0.353	0.330	0.330	0.336	0.401	0.440

Table 2: Engine raw emissions in Diesel mode

[redacted] Emission Control System

A detailed description of the system can be found in document *21801.24.0.TGT-PL TGT Process description.pdf*

On a high level the emission abatement, or control system, consists of two main systems, the dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, downstream the turbocharger.

The dry system consists of an oxydation catalyst and and an SCR catalyst. The catalytic reduction of **CO** has an **efficiency** of over **99%**. The same system oxidises **VOC** emission with a conversion **efficiency** of **99%** The de-NOx unit is a classic, urea-based **SCR**-technology, the **efficiency** is expected to be higher than **90%**. Doing so the dry system **consumes 13.2 l/h of NH_3** (aq).

The wet system consists of 4 stages, which take further care of the **NOx with 90.9%** efficiency and the **SOx with 70% efficiency**. The four stages consume the following chemicals:

Chemical	%w	lb/gal	[gal/h]	[lb/h]
NH_3 (aq.)	19%	7.51	3.49	26.2
NaOH	50%	12.52	29.91	374.5
NaHS (reducing agent)	45%	10.85	0.11	1.1
NaClO2 (oxidizing agent)	25%	10.01	0.40	4.0
H_2SO_4	36%	10.68	0.10	1.1

Table 3: Use of chemicals for the emission control system

Normal Operation

Under normal circumstances the engines operate on gas at 75% load, at their peak efficiency, hence with lowest specific fuel consumption. They are stopped once a year for servicing, while another engine takes up this load. In *Normal Operation* mode one single engine consumes 4,574.1 lb/h of gas (98,924 ft^3/h) and 27.8 lb/h (3.91 gal/h) of ULSD.

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March 24, 2025

Doing so, it produces the following raw emissions:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
13.89	0.45	22.36	22.63	0.74	12,634	47.60	0.25	14,035

Table 4: Emissions of a single engine in Normal Operation
** with Global Warming Potential of 28 for Methane and 265 for laughing gas*

While one individual engine never sees a total run time of 8760 hours per year, there are 114 engines that do experience this as a collective. One single engine of the operated collective therefore consumes 20,035 short tons of gas per year (866,574,112 ft³/a) and 122 tons (34,273 gal/a) of ULSD per year and produces the following raw emissions:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
60.83	1.99	97.92	99.12	3.25	55,339	208	1.1	61,472

Table 5: Emissions of 1 engine under Normal Operation (8760 hours)

The abatement system reduces the emissions the following:

	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]
Speed up	0%	0%	0%	0%	95%
Fuel Changeover	0%	0%	0%	0%	99%
Generator switched on	0%	0%	0%	0%	99%
Load up cold control	25%	0%	25%	25%	99%
Normal Operation	99%	25%	99%	99%	99%
Compensation Mode	99%	25%	95%	99%	99%
Ramp down	99%	25%	94%	99%	99%
Min load	70%	0%	50%	70%	70%
Spin out	40%	0%	35%	40%	40%
Emergency Mode	98%	25%	91%	99%	99%

Table 6: Emission abatement efficiency for each individual emission type

Resulting in the total yearly emissions per engine of:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
0.61	1.49	1.47	0.99	0.03	55,339	208	1.1	61,472

Table 7: Total yearly emissions of a single engine after emission treatment

Start up and Shut down operation

Additionally, one start up and shut down is foreseen. During the individual sequences one engine produces the following emissions:

	Load [%]	Abat.* [%]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
Speed up	10%	0.00%	89.54	0.34	2.50	19.49	0.10	3,217	0	0.12	3,274
Fuel Switch	10%	0.00%	4.81	0.53	8.65	13.07	0.00	1,807	28.03	0.12	2,740
Generator on	20%	0.00%	8.15	0.46	9.25	12.48	0.00	3,535	26.7	0.12	4,529
Load up	25%	25%	9.26	0.43	9.54	12.19	0.00	4,370	26.03	0.12	5,386
Ramp down	40%	100%	10.37	0.32	13.79	14.95	0.00	6,777	31.74	0.15	8,063
Min load	20%	70%	8.15	0.46	9.25	12.48	0.07	3,535	26.7	0.12	4,529
Spin out	10%	40%	4.81	0.53	8.65	13.07	0.07	1,807	28.03	0.12	2,740

Table 8: Emission during the different stages of Startup and Shut down phase
**of the efficiencies mentioned above in Table 6.*

In total during one startup and a shutdown sequence one single engine emits the following:

NOx [t]	PM [t]	CO [t]	VOC [t]	SOx [t]	CO2 [t]	Methane [t]	N2O [t]	CO2_eq [t]
0.0049	0.0002	0.0016	0.0026	0.0000	1.9675	0.0104	0.0001	2.2724
[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]
9.74	0.31	3.22	5.12	0.02	3,935	20.77	0.11	4,545

Table 9: Emissions during a startup and shutdown sequence for one single engine.

Normal Operation Scenario

Therefore, under normal circumstances the 117 engines emit the following over one year, including one startup and shutdown sequence, each:

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SOx [t/a]	CO2 [t/a]	Methane [t/a]	N2O [t/a]	CO2_eq [t/a]
69.9	169.9	167.6	113.3	3.7	6,308,872	23,768	127.1	7,008,055

Table 10: Entire yearly emissions for the entire plant und normal circumstances.

To do so, the entire plant consumes 2,284,014.5 tons of natural gas (98,792,705,589 ft^3) coming in a pipeline and 13,876 tons of diesel (3,908,687 gal) which will be shipped on site.

Emergency Mode

In case when no gas is available, the engines can be operated in so called emergency mode and the power comes from diesel. In this mode a single engine consumes 5666.8 lb/h (798 gal/h) and emits the following:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
10.35	1.29	0.58	0.29	0.11	17,896	0.00	0.67	18,073

Table 11: Controlled hourly emissions per engine in Emergency Mode

Compensation Mode

In case some engines should for any reason fail, the remaining engines will compensate for the loss of power, by increasing their power output. Here the worst case, of each engine ramping up to 100% load, is looked at. Under such conditions the engines consume 6,386 lb of natural gas per hour (138,112 ft^3) and 27.8 lb/h of ULSD (3.91 gal/h). The following emissions result from this kind of operation:

NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]
0.46	0.20	1.41	0.27	0.01	17,605	57.73	0.59	19,378

Table 12: Controlled hourly emissions per engine in Compensation Mode

Worst case scenario

As shown earlier, under Normal Operation conditions the engines stay well below the 250 t/year limit for all the regulated emissions. But to ensure that the power plant can be operated under worst case conditions, the following, unrealistic but not impossible scenario was looked at:

The pipeline is out for 8 days (192 hours); hence the power plant is operated on diesel. In the same year an unforeseeable event takes down 31 engines (26% of the entire plant) and the remaining 86 engines will compensate for by delivering the full power, increasing their output to 99.4% load. This situation lasts 24 days (567 hours). Additionally, the engines have to be started up and shut down 5 times, instead of once per year.

The engines are therefore for the following number of hours operated in the corresponding mode:

Speed up	0.42
Fuel Switch	0.17
Generator switched on	0.42
Load up cold control	0.83
Normal Operation	7996.80
Compensation Mode	567.20
Ramp down	1.67
Min load	0.42
Spin out	0.08
Emergency Mode	192.00
Total operational time	**8760**

Table 13: Operational time in hours for each engine mode under worst case scenario

Under this scenario and the consequent operational profiles, the entire plant will emit the following emissions per year:

	Gas	Diesel	NOx	PM	CO	VOC	SO2	CO2_e
	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]
Speed up	0.00	24.19	2.13	0.01	0.06	0.46	0.00	77
Fuel Switch	6.56	0.10	0.05	0.01	0.08	0.12	0.00	25
Generator switched on	32.02	0.40	0.19	0.01	0.22	0.30	0.00	102
Load up cold control	79.11	0.88	0.33	0.02	0.34	0.43	0.00	244
Normal Operation	213,6163	12,661	63.31	155.11	152.86	103.15	3.38	6397261
Compensation Mode	208,133	898	14.97	17.22	45.53	8.84	0.33	626484
Ramp down	244.63	2.11	0.01	0.03	0.08	0.01	0.00	732
Min load	32.02	0.40	0.06	0.01	0.11	0.09	0.00	102
Spin out	3.28	0.05	0.01	0.00	0.03	0.04	0.00	12
Emergency Mode	0.00	61,751	113.24	14.11	6.31	3.15	6.22	197796
Total	**2,291,799**	**75,605**	**194**	**187**	**206**	**117**	**10**	**7,222,837**

Table 14: Total yearly emissions of the entire power plant under worst case scenario

Hazardous emissions

The hazardous emissions are calculated based on the distribution described in EPA AP-42, Table 3.2-1, 3.2-3 and 3.2-4.
The emissions are calculated as a percentage of the VOC (NMHC) emissions.

NMHC	Benzene	Toluene	Xylenes	Formaldehyde	Acrolein	Acetaldehyde	Naphthalene
0.2	0.000776	0.000281	0.000193	0.0000789	0.00000788	0.0000225	0.00013
100%	**0.388%**	**0.141%**	**0.097%**	**0.039%**	**0.004%**	**0.011%**	**0.065%**

Table 15: Hazardous emission according to EPA AP-42 in lb/MMBtu and as a percentage of the Non-Methane Hydrocarbons

With a reduction factor of 99% the Benzene emissions on an hourly basis per engine, and on a yearly basis for the entire plant are the following:

Benzene, 0.388% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.07564	0.00036	0.0%	0.07564	0.00036
Fuel Switch	0.03	13.07	0.05070	0.00010	0.0%	0.05070	0.00010
Generator switched	0.08	12.48	0.04844	0.00023	0.0%	0.04844	0.00023
Load up cold control	0.17	12.19	0.04731	0.00045	25.0%	0.03548	0.00034
Normal Operation	8000	22.63	0.08780	40.03794	99.0%	0.00088	0.40038
Compensation Mode	567	27.34	0.10608	3.42968	99.0%	0.00106	0.03430
Ramp down	0.33	14.95	0.05802	0.00110	99.0%	0.00058	0.00001
Min load	0.08	12.48	0.04844	0.00023	70.0%	0.01453	0.00007
Spin out	0.02	13.07	0.05070	0.00005	0.0%	0.05070	0.00005
Emergency Mode	192	28.75	0.11156	1.22087	99.0%	0.00112	0.01221

Table 16: Calculation of the Benzene hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Benzene emissions of 896 pounds per year.

Toluene, 0.141% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.02739	0.00013	0.0%	0.02739	0.00013
Fuel Switch	0.03	13.07	0.01836	0.00003	0.0%	0.01836	0.00003
Generator switched	0.08	12.48	0.01754	0.00008	0.0%	0.01754	0.00008
Load up cold control	0.17	12.19	0.01713	0.00016	25.0%	0.01285	0.00012
Normal Operation	8000	22.63	0.03179	14.49827	99.0%	0.00032	0.14498
Compensation Mode	567	27.34	0.03841	1.24193	99.0%	0.00038	0.01242
Ramp down	0.33	14.95	0.02101	0.00040	99.0%	0.00021	0.00000
Min load	0.08	12.48	0.01754	0.00008	70.0%	0.00526	0.00002
Spin out	0.02	13.07	0.01836	0.00002	0.0%	0.01836	0.00002
Emergency Mode	192	28.75	0.04040	0.44209	99.0%	0.00040	0.00442

Table 17: Calculation of the Toluene hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Toluene emissions of 325 pounds per year.

Xylenes, 0.097% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.01881	0.00009	0.0%	0.01881	0.00009
Fuel Switch	0.03	13.07	0.01261	0.00002	0.0%	0.01261	0.00002
Generator switched	0.08	12.48	0.01205	0.00006	0.0%	0.01205	0.00006
Load up cold control	0.17	12.19	0.01177	0.00011	25.0%	0.00882	0.00008
Normal Operation	8000	22.63	0.02184	9.95789	99.0%	0.00022	0.09958
Compensation Mode	567	27.34	0.02638	0.85300	99.0%	0.00026	0.00853
Ramp down	0.33	14.95	0.01443	0.00027	99.0%	0.00014	0.00000
Min load	0.08	12.48	0.01205	0.00006	70.0%	0.00361	0.00002
Spin out	0.02	13.07	0.01261	0.00001	0.0%	0.01261	0.00001
Emergency Mode	192	28.75	0.02775	0.30364	99.0%	0.00028	0.00304

Table 18: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Xylenes emissions of 223 pounds per year.

Formaldehyde, 0.039% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.00769	0.00004	0.0%	0.00769	0.00004
Fuel Switch	0.03	13.07	0.00515	0.00001	0.0%	0.00515	0.00001
Generator switched	0.08	12.48	0.00492	0.00002	0.0%	0.00492	0.00002
Load up cold control	0.17	12.19	0.00481	0.00005	25.0%	0.00361	0.00003
Normal Operation	8000	22.63	0.00893	4.07087	99.0%	0.00009	0.04071
Compensation Mode	567	27.34	0.01079	0.34871	99.0%	0.00011	0.00349
Ramp down	0.33	14.95	0.00590	0.00011	99.0%	0.00006	0.00000
Min load	0.08	12.48	0.00492	0.00002	70.0%	0.00148	0.00001
Spin out	0.02	13.07	0.00515	0.00000	0.0%	0.00515	0.00000
Emergency Mode	192	28.75	0.01134	0.12413	99.0%	0.00011	0.00124

Table 19: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Formaldehyde emissions of 92 pounds per year.

Acrolein, 0.004% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.00077	0.000004	0.0%	0.00077	0.000004
Fuel Switch	0.03	13.07	0.00051	0.000001	0.0%	0.00051	0.000001
Generator switched	0.08	12.48	0.00049	0.000002	0.0%	0.00049	0.000002
Load up cold control	0.17	12.19	0.00048	0.000005	25.0%	0.00036	0.000003
Normal Operation	8000	22.63	0.00089	0.406571	99.0%	0.00001	0.004066
Compensation Mode	567	27.34	0.00108	0.034827	99.0%	0.00001	0.000348
Ramp down	0.33	14.95	0.00059	0.000011	99.0%	0.00001	0.000000
Min load	0.08	12.48	0.00049	0.000002	70.0%	0.00015	0.000001
Spin out	0.02	13.07	0.00051	0.000000	0.0%	0.00051	0.000000
Emergency Mode	192	28.75	0.00113	0.012397	99.0%	0.00001	0.000124

Table 20: Calculation of the formaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acrolein emissions of 9 pounds per year.

Acetaldehyde, 0.011% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.00219	0.000010	0.0%	0.00219	0.000010
Fuel Switch	0.03	13.07	0.00147	0.000003	0.0%	0.00147	0.000003
Generator switched	0.08	12.48	0.00140	0.000007	0.0%	0.00140	0.000007
Load up cold control	0.17	12.19	0.00137	0.000013	25.0%	0.00103	0.000010
Normal Operation	8000	22.63	0.00255	1.160894	99.0%	0.00003	0.011609
Compensation Mode	567	27.34	0.00308	0.099443	99.0%	0.00003	0.000994
Ramp down	0.33	14.95	0.00168	0.000032	99.0%	0.00002	0.000000
Min load	0.08	12.48	0.00140	0.000007	70.0%	0.00042	0.000002
Spin out	0.02	13.07	0.00147	0.000001	0.0%	0.00147	0.000001
Emergency Mode	192	28.75	0.00323	0.035399	99.0%	0.00003	0.000354

Table 21: Calculation of the Acetaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acetaldehyde emissions below 26 pounds per year.

Naphthalene, 0.065% of NMHC

Mode	Time	NMHC	Uncontrolled		Abatement	Controlled	
[-]	[h/a]	[lb/h]	[lb/h]	[t/a]	[%]	[lb/h]	[t/a]
Speed up	0.08	19.49	0.01267	0.00006	0.0%	0.01267	0.00006
Fuel Switch	0.03	13.07	0.00849	0.00002	0.0%	0.00849	0.00002
Generator switched	0.08	12.48	0.00811	0.00004	0.0%	0.00811	0.00004
Load up cold control	0.17	12.19	0.00793	0.00008	25.0%	0.00594	0.00006
Normal Operation	8000	22.63	0.01471	6.70739	99.0%	0.00015	0.06707
Compensation Mode	567	27.34	0.01777	0.57456	99.0%	0.00018	0.00575
Ramp down	0.33	14.95	0.00972	0.00018	99.0%	0.00010	0.00000
Min load	0.08	12.48	0.00811	0.00004	70.0%	0.00243	0.00001
Spin out	0.02	13.07	0.00849	0.00001	0.0%	0.00849	0.00001
Emergency Mode	192	28.75	0.01869	0.20453	99.0%	0.00019	0.00205

Table 22: Calculation of the Acetaldehyde hourly emissions for each engine and yearly basis for the entire plant per operation mode

Resulting in Acetaldehyde emissions below 150 pounds per year.

Liquid and fuel handling

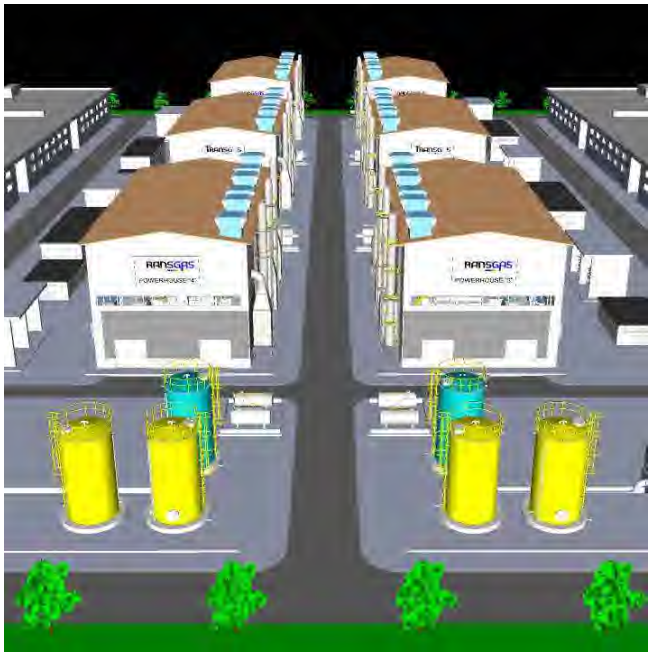


Figure 4: Liquid Storage in front of a set of power houses:
Yellow: Diesel tanks,
Greenish: Water tanks
White: Oil and component tanks

On-site Water Storage

For fire protection and supplementary cooling, the facility maintains an on-site water storage capacity of 2,641,721 gallons, distributed over the entire plant in 14 tanks with 26 feet in diameter and 44 feet in height.

Ultra Low Sulfur Diesel

The engines consume 13,876 tons of ULSD per year (10,704 gal/day) which will be transported on site. To ensure fire safety and to protect the valuable hardware within the data center, the volume of flammable liquids stored on-site will be minimized. For emergency preparedness, a three-day supply of 25,000 tons will be maintained in multiple smaller storage tanks. The rest will be in strategic locations nearby.

The diesel will be stored in 40 tanks distributed across the entire plant, 26 feet in diameter and 44 feet in height.

Lubrication Oil

The engines consume about 2,025 tons of lubrication oil per year (1563 gal/day), which will be shipped on site. Additionally, about 20 tons will be stored on site, in tanks of 160 gallon in each power house.

Natural Gas

The gaseous fuel will be transported by pipeline.

Emission Control Components

For the emission abatement system liquids are transported to the site. A 3-day storage will be kept on site.

Component	Consumption		Storage
-	[t/a]	[gal/h]	[t]
NH_3 (aq)	13’078	3.49	108
NaOH	186’984	29.91	1537
NaHS (reducing agent)	572	0.11	5
NaClO2 (oxidizing agent)	1’995	0.40	17
H_2SO_4	535	0.10	5

Table 23: List of chemicals yearly used, and amount stored on site

The Storage will be in the corresponding standard tanks for these liquids, horizontally arranged tanks of 16 feet length and 7 feet diameter.

Chemicals in Use

- Hydrous Ammonia
- Caustic Soda NaOH
- Sulfuric Acid H2SO4
- NaClO2 (oxidizing agent)
- NaHS (reducing agent)

ANNEX

The 117 engines will be arranged according to the plan on Figure 5. It shows the map of the site, with 7 pods. Every pod holds two large buildings on the outer side, housing the data centers and 6 power houses in the middle (magenta/pink). A powerhouse holds three engine-generator setups (genset), auxiliaries and parts of the emission control systems. This gives theoretically space for 7 x 6 x 3 = 126 gensets. The remaining three buildings will be used for logistical and storage purposes though (spare parts, fluid preparation etc.)

Figure 5: Site plan showing the 7 pods

Attachment L
EMISSIONS UNIT DATA SHEET
STORAGE TANKS

Provide the following information for each new or modified bulk liquid storage tank as shown on the *Equipment List Form* and other parts of this application. A tank is considered modified if the material to be stored in the tank is different from the existing stored liquid.

IF USING US EPA'S TANKS EMISSION ESTIMATION PROGRAM (AVAILABLE AT **www.epa.gov/tnn/tanks.html**), APPLICANT MAY ATTACH THE SUMMARY SHEETS IN LIEU OF COMPLETING SECTIONS III, IV, & V OF THIS FORM. HOWEVER, SECTIONS I, II, AND VI OF THIS FORM MUST BE COMPLETED. US EPA'S AP-42, SECTION 7.1, "ORGANIC LIQUID STORAGE TANKS," MAY ALSO BE USED TO ESTIMATE VOC AND HAP EMISSIONS (**http://www.epa.gov/tnn/chief/**).

I. GENERAL INFORMATION (required)

1. Bulk Storage Area Name Fuel Storage - Site Wide	2. Tank Name 40
3. Tank Equipment Identification No. (as assigned on *Equipment List Form*) T1 through T40 (118S - 157S)	4. Emission Point Identification No. (as assigned on *Equipment List Form*)
5. Date of Commencement of Construction (for existing tanks) 2026	
6. Type of change ☒ New Construction ☐ New Stored Material ☐ Other Tank Modification	
7. Description of Tank Modification (if applicable) Not Applicable	
7A. Does the tank have more than one mode of operation? (e.g. Is there more than one product stored in the tank?) ☐ Yes ☒ No	
7B. If YES, explain and identify which mode is covered by this application (Note: A separate form must be completed for each mode). Not Applicable	
7C. Provide any limitations on source operation affecting emissions, any work practice standards (e.g. production variation, etc.): None	

II. TANK INFORMATION (required)

8. Design Capacity (specify barrels or gallons). Use the internal cross-sectional area multiplied by internal height. 170,000 gallons	
9A. Tank Internal Diameter (ft) 26	9B. Tank Internal Height (or Length) (ft) 44
10A. Maximum Liquid Height (ft) 43 ft.	10B. Average Liquid Height (ft) NA
11A. Maximum Vapor Space Height (ft) 1 ft.	11B. Average Vapor Space Height (ft) NA
12. Nominal Capacity (specify barrels or gallons). This is also known as "working volume" and considers design liquid levels and overflow valve heights. 170,000 gallons	

13A. Maximum annual throughput (gal/yr) 3.907 MM gal/yr total for all tanks (Normal Operation)	13B. Maximum daily throughput (gal/day) 10,704 gal/day total all tanks

14. Number of Turnovers per year (annual net throughput/maximum tank liquid volume)
Average of 4 turnover/tank per year

15. Maximum tank fill rate (gal/min)

16. Tank fill method ☐ Submerged ☐ Splash ☒ Bottom Loading

17. Complete 17A and 17B for Variable Vapor Space Tank Systems ☒ Does Not Apply

17A. Volume Expansion Capacity of System (gal)	17B. Number of transfers into system per year

18. Type of tank (check all that apply):
☒ Fixed Roof X vertical ___ horizontal ___ flat roof ___ cone roof X dome roof
___ other (describe)
☐ External Floating Roof ___ pontoon roof ___ double deck roof
☐ Domed External (or Covered) Floating Roof
☐ Internal Floating Roof ___ vertical column support ___ self-supporting
☐ Variable Vapor Space ___ lifter roof ___ diaphragm
☐ Pressurized ___ spherical ___ cylindrical
☐ Underground
☐ Other (describe)

III. TANK CONSTRUCTION & OPERATION INFORMATION (optional if providing TANKS Summary Sheets)

19. Tank Shell Construction: Tank construction not selected yet. See TANKS Summary Sheet attached.
☐ Riveted ☐ Gunite lined ☐ Epoxy-coated rivets ☐ Other (describe)

20A. Shell Color	20B. Roof Color	20C. Year Last Painted

21. Shell Condition (if metal and unlined):
☐ No Rust ☐ Light Rust ☐ Dense Rust ☐ Not applicable

22A. Is the tank heated? ☐ YES ☐ NO

22B. If YES, provide the operating temperature (°F)

22C. If YES, please describe how heat is provided to tank.

23. Operating Pressure Range (psig): to

24. Complete the following section for **Vertical Fixed Roof Tanks** ☐ Does Not Apply

24A. For dome roof, provide roof radius (ft)

24B. For cone roof, provide slope (ft/ft)

25. Complete the following section for **Floating Roof Tanks** ☐ Does Not Apply

25A. Year Internal Floaters Installed:

25B. Primary Seal Type: (check one)
☐ Metallic (Mechanical) Shoe Seal ☐ Liquid Mounted Resilient Seal
☐ Vapor Mounted Resilient Seal ☐ Other (describe):

25C. Is the Floating Roof equipped with a Secondary Seal? ☐ YES ☐ NO

25D. If YES, how is the secondary seal mounted? (check one) ☐ Shoe ☐ Rim ☐ Other (describe):

25E. Is the Floating Roof equipped with a weather shield? ☐ YES ☐ NO

25F. Describe deck fittings; indicate the number of each type of fitting:		
ACCESS HATCH		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
AUTOMATIC GAUGE FLOAT WELL		
BOLT COVER, GASKETED:	UNBOLTED COVER, GASKETED:	UNBOLTED COVER, UNGASKETED:
COLUMN WELL		
BUILT-UP COLUMN – SLIDING COVER, GASKETED:	BUILT-UP COLUMN – SLIDING COVER, UNGASKETED:	PIPE COLUMN – FLEXIBLE FABRIC SLEEVE SEAL:
LADDER WELL		
PIP COLUMN – SLIDING COVER, GASKETED:	PIPE COLUMN – SLIDING COVER, UNGASKETED:	
GAUGE-HATCH/SAMPLE PORT		
SLIDING COVER, GASKETED:	SLIDING COVER, UNGASKETED:	
ROOF LEG OR HANGER WELL		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	SAMPLE WELL-SLIT FABRIC SEAL (10% OPEN AREA)
VACUUM BREAKER		
WEIGHTED MECHANICAL ACTUATION, GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
RIM VENT		
WEIGHTED MECHANICAL ACTUATION GASKETED:	WEIGHTED MECHANICAL ACTUATION, UNGASKETED:	
DECK DRAIN (3-INCH DIAMETER)		
OPEN:	90% CLOSED:	
STUB DRAIN		
1-INCH DIAMETER:		
OTHER (DESCRIBE, ATTACH ADDITIONAL PAGES IF NECESSARY)		

26. Complete the following section for Internal Floating Roof Tanks ☐ Does Not Apply	
26A. Deck Type: ☐ Bolted ☐ Welded	
26B. For Bolted decks, provide deck construction:	
26C. Deck seam: ☐ Continuous sheet construction 5 feet wide ☐ Continuous sheet construction 6 feet wide ☐ Continuous sheet construction 7 feet wide ☐ Continuous sheet construction 5 × 7.5 feet wide ☐ Continuous sheet construction 5 × 12 feet wide ☐ Other (describe)	
26D. Deck seam length (ft)	26E. Area of deck (ft^2)
For column supported tanks: 26F. Number of columns:	26G. Diameter of each column:

IV. SITE INFORMANTION (optional if providing TANKS Summary Sheets)

27. Provide the city and state on which the data in this section are based. See TANKS Summary Sheet
28. Daily Average Ambient Temperature (°F)
29. Annual Average Maximum Temperature (°F)
30. Annual Average Minimum Temperature (°F)
31. Average Wind Speed (miles/hr)
32. Annual Average Solar Insulation Factor (BTU/(ft^2·day))
33. Atmospheric Pressure (psia)

V. LIQUID INFORMATION (optional if providing TANKS Summary Sheets)

34. Average daily temperature range of bulk liquid: See TANKS Summary Sheet	
34A. Minimum (°F)	34B. Maximum (°F)
35. Average operating pressure range of tank:	
35A. Minimum (psig)	35B. Maximum (psig)
36A. Minimum Liquid Surface Temperature (°F)	36B. Corresponding Vapor Pressure (psia)
37A. Average Liquid Surface Temperature (°F)	37B. Corresponding Vapor Pressure (psia)
38A. Maximum Liquid Surface Temperature (°F)	38B. Corresponding Vapor Pressure (psia)

39. Provide the following for <u>each</u> liquid or gas to be stored in tank. Add additional pages if necessary.			
39A. Material Name or Composition			
39B. CAS Number			
39C. Liquid Density (lb/gal)			
39D. Liquid Molecular Weight (lb/lb-mole)			
39E. Vapor Molecular Weight (lb/lb-mole)			

Maximum Vapor Pressure 39F. True (psia) 39G. Reid (psia)			
Months Storage per Year 39H. From 39I. To			

VI. EMISSIONS AND CONTROL DEVICE DATA (required)

40. Emission Control Devices (check as many as apply): ☒ Does Not Apply

- ☐ Carbon Adsorption[1]
- ☐ Condenser[1]
- ☐ Conservation Vent (psig)
  - Vacuum Setting — Pressure Setting
- ☐ Emergency Relief Valve (psig)
- ☐ Inert Gas Blanket of
- ☐ Insulation of Tank with
- ☐ Liquid Absorption (scrubber)[1]
- ☐ Refrigeration of Tank
- ☐ Rupture Disc (psig)
- ☐ Vent to Incinerator[1]
- ☐ Other[1] (describe):

[1] Complete appropriate Air Pollution Control Device Sheet.

41. Expected Emission Rate (submit Test Data or Calculations here or elsewhere in the application).

Material Name & CAS No.	Breathing Loss (lb/hr)	Working Loss Amount	Working Loss Units	Annual Loss (lb/yr)	Estimation Method[1]
See TANKS Summary Sheet					

[1] EPA = EPA Emission Factor, MB = Material Balance, SS = Similar Source, ST = Similar Source Test, Throughput Data, O = Other (specify)

☐ Remember to attach emissions calculations, including TANKS Summary Sheets if applicable.

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Tanks 1-40
City:	Charleston
State:	West Virginia
Company:	Transgas
Type of Tank:	Vertical Fixed Roof Tank
Description:	Diesel Tanks

Tank Dimensions

Shell Height (ft):	44.00
Diameter (ft):	26.00
Liquid Height (ft) :	43.00
Avg. Liquid Height (ft):	21.50
Volume (gallons):	170,000.00
Turnovers:	4.00
Net Throughput(gal/yr):	680,000.00
Is Tank Heated (y/n):	N

Paint Characteristics

Shell Color/Shade:	White/White
Shell Condition	Good
Roof Color/Shade:	White/White
Roof Condition:	Good

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	26.00

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Charleston, West Virginia (Avg Atmospheric Pressure = 14.25 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Distillate fuel oil no. 2	All	56.67	51.31	62.04	55.00	0.0058	0.0048	0.0070	130.0000			188.00	Option 1: VP50 = .0045 VP60 = .0065

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

Annual Emission Calcaulations	
Standing Losses (lb):	25.2731
Vapor Space Volume (cu ft):	12,211.8942
Vapor Density (lb/cu ft):	0.0001
Vapor Space Expansion Factor:	0.0417
Vented Vapor Saturation Factor:	0.9929
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	12,211.8942
Tank Diameter (ft):	26.0000
Vapor Space Outage (ft):	23.0010
Tank Shell Height (ft):	44.0000
Average Liquid Height (ft):	21.5000
Roof Outage (ft):	0.5010
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5010
Dome Radius (ft):	26.0000
Shell Radius (ft):	13.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0001
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Daily Avg. Liquid Surface Temp. (deg. R):	516.3441
Daily Average Ambient Temp. (deg. F):	54.9833
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	514.6733
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,250.5726
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.0417
Daily Vapor Temperature Range (deg. R):	21.4567
Daily Vapor Pressure Range (psia):	0.0022
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	0.0048
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	0.0070
Daily Avg. Liquid Surface Temp. (deg R):	516.3441
Daily Min. Liquid Surface Temp. (deg R):	510.9799
Daily Max. Liquid Surface Temp. (deg R):	521.7082
Daily Ambient Temp. Range (deg. R):	21.5333
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.9929
Vapor Pressure at Daily Average Liquid:	
Surface Temperature (psia):	0.0058
Vapor Space Outage (ft):	23.0010
Working Losses (lb):	12.2809
Vapor Molecular Weight (lb/lb-mole):	130.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	0.0058
Annual Net Throughput (gal/yr.):	680,000.0000
Annual Turnovers:	4.0000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	170,000.0000
Maximum Liquid Height (ft):	43.0000
Tank Diameter (ft):	26.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	37.5540

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Tanks 1-40 - Vertical Fixed Roof Tank
Charleston, West Virginia

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Distillate fuel oil no. 2	12.28	25.27	37.55

ATTACHMENT M

AIR POLLUTION CONTROL DEVICE(S)

REDACTED
Information Claimed Confidential by
TransGas Development Systems, LLC
March 24, 2025

Attachment M
Air Pollution Control Device Sheet
(OTHER COLLECTORS)

Control Device ID No. (must match Emission Units Table): 1C – 117C

Equipment Information

1. Manufacturer: [redacted] Model No. NA	2. Control Device Name: Control System Type: Various
3. Provide diagram(s) of unit describing capture system with duct arrangement and size of duct, air volume, capacity, horsepower of movers. If applicable, state hood face velocity and hood collection efficiency.	
4. On a separate sheet(s) supply all data and calculations used in selecting or designing this collection device.	
5. Provide a scale diagram of the control device showing internal construction.	
6. Submit a schematic and diagram with dimensions and flow rates.	
7. Guaranteed minimum collection efficiency for each pollutant collected: 100%	
8. Attached efficiency curve and/or other efficiency information. See Attached	
9. Design inlet volume: See Attached SCFM	10. Capacity: See Attached
11. Indicate the liquid flow rate and describe equipment provided to measure pressure drop and flow rate, if any. This emission abatement system is multi-phase and includes DeCO, DeNO$_x$, DeSO$_x$, and We-NO$_x$. The system controls VOC (VOC HAPs), NOx, PM, CO, and SO$_x$ emissions. A description of the system and each stage is provided on the attachment to this form.	
12. Attach any additional data including auxiliary equipment and operation details to thoroughly evaluate the control equipment. See Attached	
13. Description of method of handling the collected material(s) for reuse of disposal. Spent catalyst and other discardable materials are removed from the site.	

Gas Stream Characteristics

14. Are halogenated organics present?	☐ Yes	☒ No
Are particulates present?	☒ Yes	☐ No
Are metals present?	☒ Yes	☐ No

15. Inlet Emission stream parameters:	Maximum	Typical
Pressure (mmHg):		
Heat Content (BTU/scf):	See Attached	
Oxygen Content (%):		
Moisture Content (%):		
Relative Humidity (%):		

16. Type of pollutant(s) controlled: ☒ SO_x ☐ Odor ☒ Particulate (type): Combustion Byproducts ☒ Other NO_x, VOC (VOC HAPs), CO	
17. Inlet gas velocity: See Attached ft/sec	18. Pollutant specific gravity: NA
19. Gas flow into the collector: See Attached ACF @ °F and PSIA	20. Gas stream temperature: See Attached Inlet: °F Outlet: °F
21. Gas flow rate: See Attached Design Maximum: ACFM Average Expected: ACFM	22. Particulate Grain Loading in grains/scf: See Attached Inlet: Outlet:

23. Emission rate of each pollutant (specify) into and out of collector:

Pollutant	IN Pollutant		Emission Capture Efficiency %	OUT Pollutant		Control Efficiency %
	lb/hr	grains/acf		lb/hr	grains/acf	
A	See attached document for a description of each control stage.					
B						
C						
D						
E						

24. Dimensions of stack: Height ft. Diameter ft.

25. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 130 percent of design rating of collector.

Particulate Distribution

26. Complete the table:	Particle Size Distribution at Inlet to Collector	Fraction Efficiency of Collector
Particulate Size Range (microns)	**Weight % for Size Range**	**Weight % for Size Range**
0 – 2		
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12	See Attached	
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

27. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):

See Attached

28. Describe the collection material disposal system:

Spent or collected material is shipped offsite for disposal or regeneration/reuse.

29. Have you included ***Other Collectores Control Device*** in the Emissions Points Data Summary Sheet?

30. **Proposed Monitoring, Recordkeeping, Reporting, and Testing**

Please propose monitoring, recordkeeping, and reporting in order to demonstrate compliance with the proposed operating parameters. Please propose testing in order to demonstrate compliance with the proposed emissions limits.

MONITORING: Amount of emissions control fluids utilized.	RECORDKEEPING: Amount of emissions control fluids utilized.
REPORTING: None	TESTING: As requested by the permit.

MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.
REPORTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.
TESTING:	Please describe any proposed emissions testing for this process equipment on air pollution control device.

31. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

See Attached

32. Manufacturer's Guaranteed Control Efficiency for each air pollutant.

See Attached

33. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.

The controls are designed to operate within the operational ranges of the engines.

PROCESS DESCRIPTION for

POLLUTION CONTROL for

NATURAL GAS ENGINE EMISSIONS

Abatement system Package

Prepared for

Transgas – Adams Fork project
February 10, 2025
Rev. 03

1. Introduction

Below is a description of the basic concept on which the proposed system is based, together with some preliminary evaluations about the foreseen chemicals consumption.

The overall process scheme is presented in the **attachment 1 – OVERALL PROCESS SCHEME** and detailed below.

The configuration and equipment sizing has been studied for the maximum flow rate – corresponding to 100% load of the engine with iCER, 21.000 kW of mechanical power at shaft when engine runs in compensation mode, and the maximum load of pollutants.

The system described below will be installed individually for each engine.

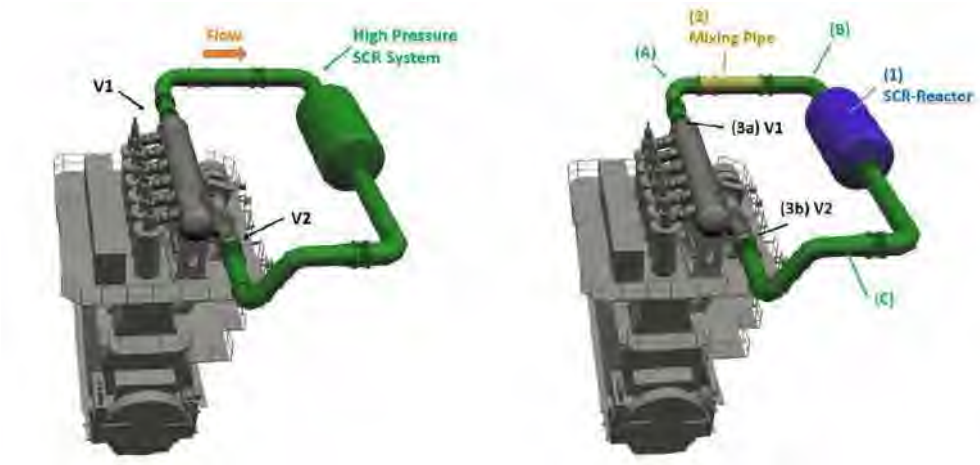
Attachment 2 rev 02– EMISSION ABATEMENT STEPS shows the pollutant flow at each stage (A to D), as indicated in the overall process scheme, with the target of reaching the maximum total emission level of:

- NOx < 250 tpy (short)
- CO < 250 tpy (short)
- SOx < 250 tpy (short)
- PM < 250 tpy (short)

for a total of 114 engines operating at the same time and continuously at maximum load.

2. Description of the dry deCO + deNOx system

Dry flue gas treatment system is installed before the turbocharger, so at high pressure. An example of such an installation is shown in the picture below (please note that the picture shows the deNOx reactor only and not the deCO).



The first stage of the dry deCO and deNOx system is the catalytic removal of CO in a dedicated deCO reactor.

Here the data at deCO reactor inlet when engine is in Normal Operation are summarized:

Data	unit	NORMAL OPERATION
Flow rate	kg/s kg/h	34.4 123,840
Gas density	kg/mc	1.27
Vol. flow rate	Am^3/h	241.878
Normalized flow	Nm^3/h	97,512
Static Pressure IN	barg	4,12
Temperature	°C	360
NOx Load	kg/hr	6.3
NOx Ratio	$NO:NO_2$	90:10
CO load	kg/hr	19.82
VOCs load	Kg/hr	39,5
H_2O	Vol%	7.8%
N_2	Vol%	77.1%
O_2	Vol%	4%
CO2	Vol%	6.8%
SO_2	Kg/h	0,74

Table 1 – Exhaust features at Genset outlet (before turbine)–

Flue gas is distributed to a layer of oxidation catalyst where CO is removed according to the following reaction:

(1) $2CO + O_2 \rightarrow 2\ CO_2$

CO catalytic removal can reach efficiency close to 100%. In this case, the catalyst will be selected to reach up to 98% efficiency when running in Normal Operation mode with natural gas and iCER system.

DeCO reactor has also the function to oxidize VOCs to CO_2 and H_2O; in particular, formaldehyde, by far the most important VOC, will be removed with efficiency >99%.

After deCO reactor, flue gas flows to another reactor equipped with deNOx catalyst. In the space between deCO reactor and deNOx reactor, urea ($CO(NH_2)_2$) or ammonia solution is injected. The system for reagent injection is mainly composed by:

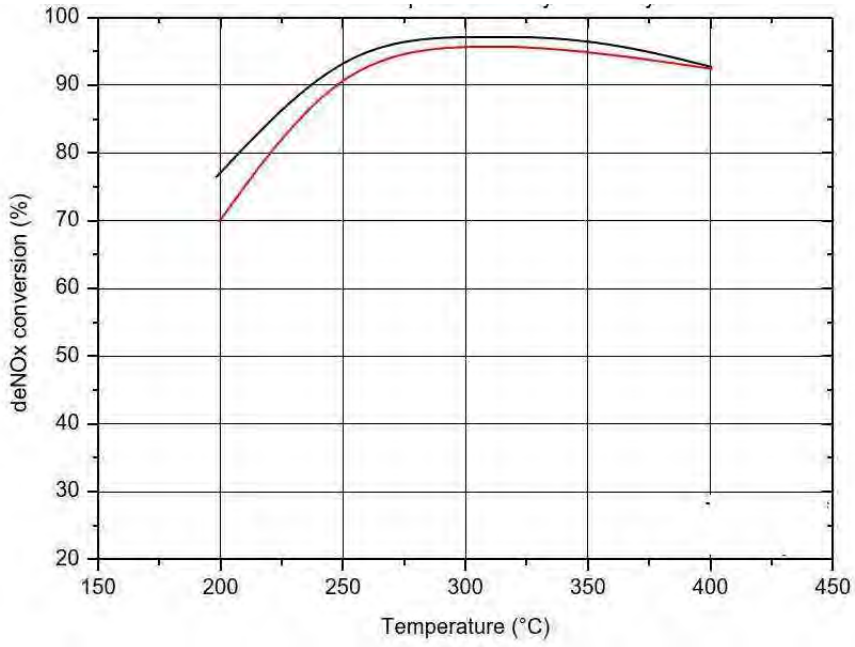
- *Flow Control Unit (FCU)* Complete Control skid to feed the injection lances with pneumatic control valve, MID flow meter, Manometers and valves complete mounted on a skid
- *Evaporator System* (if urea is used as reagent) with Ambient Air Blower, Pneumatic On-Off-Damper, Flowmeter, Pressure and Temperature Transmitter, Air Preheater and Spray Evaporator with Injection Lance. This is needed because for removing NO_x, urea must be heated to be converted to NH_3, CO_2 and H_2O.
- *Reagent / Compressed Air - Direct Injection Lances* (if ammonia solution is used as reagent) for installation into flue gas duct. Compressed air is used for generating very fine reagent droplet by means of specially design nozzles (see pictures of lance and nozzle below)

- *Detailed 3D CFD-Optimization* is needed for Complete flue gas ductwork design from deCO reactor exit till catalyst outlet including Reagent Direct Injection, Static Mixing System, and guide vanes (if required). Results of velocity, pressures NOx-NH_3 distribution values on top of first catalyst layer till all guarantees are met.
- *Static Mixer System* based on final CFD optimization to mix NH_3 and NO_x.

After reagent injection and mixing, in presence of catalyst based on vanadium pentoxide (V_2O_5) NOx are removed by NH_3 according to the following reactions (with several secondary and intermediate reactions), that occur at temperatures between 180°C and 500°C

(2) $2NO + 2NH_3 + ½\ O_2 \rightarrow 2N_2 + 3H_2O$
(3) $NO_2 + 2NH_3 + ½\ O_2 \rightarrow 3/2\ N_2 + 3H_2O$
(4) $NO + NO_2 + 2NH_3 + ½\ O_2 \rightarrow 2\ N_2 + 3H_2O$

Catalytic nitrogen oxides removal can achieve very high efficiency as shown in the graph below:



NO_x removal at Adam Forks occurs in the best temperature range, where efficiency higher that 90% is possible; anyway, it is assumed that maximum 90% removal is reached in deNO_x catalytic

reactor. A quantity of 13.2 lt/h of ammonia, in its typical aqueous solution at 19%, is needed to achieve the reaction when engine is running in Normal Operation.

After the deNOx, the gas is sent to the turbocharger and then it is split into two streams. One part, after being cooled, goes back to the engine, mixing with combustion air (flue gas recirculation); the remaining part, with a flow of 17.6 kg/s, represents the exhaust that is first quenched to 58°C, and then enters into the We-NOx system for SOx and NOx wet abatement.

3. Description of the wet system

The We-NOx system is a multistage plant:

- The first stage is designed for the removal of SOx and any other acids carried over by exhaust gases.
- The second and third stages are for the removal of NOx. These stages are based on an ORP process, an oxidation-reduction mechanism that converts NOx into gaseous nitrogen (N_2), achieving a "zero instrumental" concentration at the stack if required.
- The fourth stage serves as the finishing and control unit to complete the process.

For better understanding, we would like to refer to the case at hand and describe step by step the entire process of NOx removal from the exhaust:

3.1 AVAILABLE DATA (inlet data to the De-SOx/We-NOx, downstream the dry treatment):

Data	unit	Normal Operation – 75% gas
Flow rate	kg/s kg/h	17,6 63.360
Gas density	kg/Nmc	1,27
Vol. flow rate	ACMH	95.798
Normalized flow	Nmc/h	49.890
Static Pressure IN	mm.w.g	700
Temperature	°C	215
NOx Load	kg/hr	0,322
NOx Ratio	NO:NO_2	90:10
SO_2	Kg/h	0,380
H_2O	Vol %	17,87
N_2	Vol %	72.04
O_2	Vol %	3.74
CO_2	Vol %	6.35

Table 2 – Exhaust features at engine outlet–

All following data have been calculated based upon Normal Operation 75% gas.

3.2 REQUESTED EFFICIENCY AT NORMAL OPERATION

- NOx = 80,45% [$0,322_{IN}$; $0,063_{OUT}$]
- SOx = 70.0% [$0,380_{IN}$; $0,152_{OUT}$]

The above efficiencies have been evaluated in the worst-case scenario. Of course, the same results in terms of removal efficiency can be achieved also in any other scenario.

Anyway, real removal efficiency of wet deSOx system will be much higher than the requested one, to avoid elemental sulfur formation in the following steps on treatment process.

3.3 CHEMICALS IN USE

- Caustic NaOH
- Sulfuric Acid H_2SO_4
- $NaClO_2$ (oxidizing agent)
- NaHS (reducing agent)

4. Wet Stage 1 (De-SOx)

This is a chemical-physical absorption unit where the acidic pollutants carried out by the exhaust are removed. Sulfur oxides, hydrogen halides, and any other acidic components are removed. The chemical in use is Caustic. Just as an example let's analyze one of the several reactions that happen at this stage:

(5) $SO_2 + NaOH \rightarrow NaHSO_3$

Acting opportunely on the operation parameters also the following reaction may take place in this stage:

(6) $SO_2 + 2NaOH \rightarrow Na_2SO_3 + H_2O$

With a similar mechanism, the other acids are also neutralized and removed from the exhaust.

With such a mass transfer from Gas phase to Liquid phase a gaseous pollutant (SO_2) is changed into a dissolved solids and carried over from the system through the liquid waste of the stage.

4.1 Performance of the wet stage 1 (De-SOx/We-NOx)

Pollutant	Inlet load (kg/h)	Abatement efficiency (%)	Outlet (kg/h)	Outlet on a yearly basis (kg/y)
SO_2	0.38	* *	0.036	sent to stages 3 and 4
NO	NA	NA	NA	NA
NO_2	0.03	* *	0.027 (sent to stage 3 and 4)	sent to stages 3 and 4

Table 3 – Performance of stage 1 –

4.2 Expected consumption of chemicals in wet stage 1

Chemical	Consumption (liters/hour)	Consumption on a yearly basis (m^3/y)
NaOH (50% w) (*)	~~40,8~~ 4.16	~~358~~ 36

(**) Compare tabulated values in ATTACHMENT2

H_2SO_4 (36%% w)	0.0	0.0
$NaClO_2$ (20% w)	0.0	0.0
NaHS (45% w)	0.0	0.0

Table 4 – Expected consumption of chemicals in stage 1 –

(*) keeping the pH at low level 7.8 for lower absorption of CO2 (1.53 kg/hr only). With such pH value the neutralization is slower, but a much smaller consumption of caustic is ensured.

5. Wet stage 2

The main nitrogen oxides emitted during combustion processes are nitric oxide (NO), nitrogen dioxide (NO_2), and nitrous oxide (N_2O). Since the primary contribution in combustion processes comes from the first two, NOx is generally considered the sum of NO and NO_2. Other nitrogen oxides, such as NO_3 and N_2O_5, are present in much lower concentrations compared to the first two.

However, all the species mentioned above, when subjected to the We-NOx process, will be converted into atmospheric nitrogen. Specifically:

- NO and N_2O will be oxidized to NO_2.

This will occur through the following half-reactions:

(7) NO: $N^{2+} \rightarrow N^{4+} + 2e^-$
(8) N_2O: $N^{1+} \rightarrow N^{4+} + 3e^-$

To achieve the perfect completion of the reactions (7) and (8) a strong oxidizing agent must be used.

The kinetics of the reactions (7) and (8) are instantaneous so that at the exit of the second stage the residual NOx forms are: NO_2, NO_3, N_2O_5, which will be removed in the third stage.

5.1 Performance of wet stage 2

Pollutant	Inlet load (kg/h)	Abatement efficiency (%)	Outlet (kg/h)	Outlet on a yearly basis
SO_2	0.03	0	0.03	sent to stages 3 and 4
NO	0.29	* *	0.013	Sent to next stages
NO_2	0.027	NA	0.45(*)	Sent to stages 3 and 4

Table 5 – Performance of wet stage 2 –

(*) the increase is due to the conversion of NO to NO_2 in the reactor of stage 2

5.2 Expected chemical consumption in wet stage 2

Chemical	Consumption (liters/hour)	Consumption on a yearly basis (m^3/y)

(**) Compare tabulated values in ATTACHMENT2

NaOH (50% w)	0.0	0.0
H_2SO_4 (36%% w)	0.38	3.3
$NaClO_2$ (20% w)	1.51	13.3
NaHS (45% w)	0.0	0.0

Table 6 – Expected consumption of chemicals in stage 2 –

6. Wet stage 3

In the third stage the residual NOx forms NO_2, NO_3, N_2O_5 are chemically reduced to gaseous nitrogen N_2, through the following partial ionic reaction:

(9) $N^{4+} + 4e^- \rightarrow N^0$
(10) $N^{6+} + 6e^- \rightarrow N^0$
(11) $N^{5+} + 5e^- \rightarrow N^0$

N^0 is the oxidation state of gaseous nitrogen. At the completion of this stage the We-NOx process will have given nitrogen back to the atmosphere as before the combustion reaction of fuel with air excess in the NOx source (as an endothermic engine or a furnace or oven). To achieve the perfect completion of the reactions (9), (10) and (11), a strong reducing agent must be used.

NOTE: the oxidizing and reducing agents are fundamental and have been chosen with accuracy, to avoid any undesired by-product to be produced during the process. The We-NOx process is Ozone-free, and no ozone is developed or produced during the process.

6.1 Performance of wet stage 3

Pollutant	Inlet load (kg/h)	Abatement efficiency (%)	Outlet (kg/h)	Outlet on a yearly basis
SO_2	0.03	99.99	traces	End
NO	0.013	NA	0.013	Sent to next stages
NO_2	0.45	* *	0.018	sent to stage 4

Table 7 – Performance of wet stage 3 –

6.2 Expected chemicals consumption in wet stage 3

Chemical	Consumption (liters/hour)	Consumption on a yearly basis (m^3/y)
NaOH (50% w) (*)	~~223~~ 68.58	~~1953~~ 600.7
H_2SO_4 (36%% w)	0.0	0.0
$NaClO_2$ (20% w)	0.0	0.0
NaHS (45% w)	0.4	3.5

Table 8 – Expected chemicals consumption in wet stage 3 –

(*) Keeping the pH at 8.5 instead of 9 reduces the caustic consumption. The recommended value is pH = 9. However, it is possible to manage also with pH = 8.5 with a closer control.

(**) Compare tabulated values in ATTACHMENT2

7. Wet stage 4

This is a finishing stage where the eventual excess of reactants coming from the previous stages carried over by the exhaust (chemical mists, by-products etc.) is removed so to send the purified exhaust straight to the stack with no further pollutants except traces allowed by the regulations. The chemical in use in wet stage 4 is just caustic soda NaOH to keep the pH high enough to remove acidic traces carried over from the previous stages.

7.1 Performance of wet stage 4

Pollutant	Inlet load (kg/h)	Abatement efficiency (%)	Outlet (kg/h)	Outlet on a yearly basis
SO_2	<0,001	-	<0,001	<0,1
NO	0.013	NA	0.013	113,9
NO_2	0.018	* *	0.009	35,0

Table 9 – Performance of wet stage 4 –

7.2 Expected chemicals consumption in wet stage 4

Chemical	Consumption (liters/hour)	Consumption on a yearly basis (m^3/y)
NaOH (50% w)	40,5	354.7
H_2SO_4 (36%% w)	0.0	0.0
$NaClO_2$ (20% w)	0.0	0.0
NaHS (45% w)	0.0	0.0

Table 10 – Expected chemicals consumption in wet stage 4 –

8. Total chemicals consumption

In the case described by tables 1 and 2, the foreseen overall consumption of the chemicals for all stages will be:

- Aqueous ammonia for SCR reaction: 13.2 lt/h
- Caustic soda (aqueous sol. 50% w): ~~304.3~~ 113.24 lt/h
- NaHS (aqueous sol. 45%): 0.4 lt/h
- $NaClO_2$ (aqueous sol. 25%): 1.51 lt/h
- Sulfuric acid (aqueous sol. 36%): 0.38 lt/h

Warning: the above figure is indicative for chemical consumption and is based upon the preliminary input data obtained. It may undergo modifications during the design phase of execution.

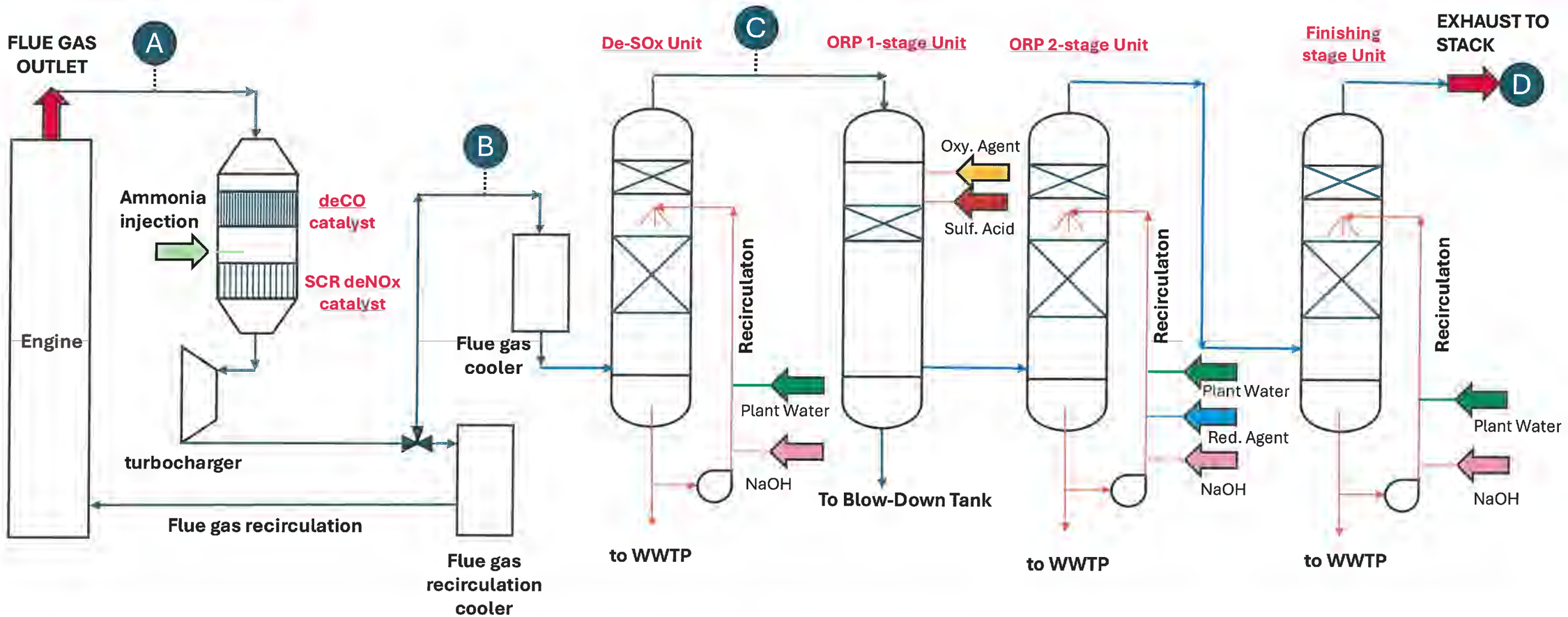
(**) Compare tabulated values in ATTACHMENT2

REDACTED
Information Claimed Confidential by
TransGas Development Systems, LLC
March 24, 2025

[redacted]

ATTACHMENT 1 – OVERALL PROCESS SCHEME

[redacted]



CO removed + 1st NOx removal → SOx removed → NO oxidized to NO_2 → NO_2 reduced to N_2 → Exhaust purification finishing

05/02/2025 *rev 02*

ATTACHMENT 2 – EMISSION ABATEMENT STEPS

Normal operation with natural gas **75% load =** **15750 kW** **(mechanical power at the engine shaft)** Operational 8000 h/y

Flow rate 34,4 kg/s - before recirculation 17,6 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	6,30	*90,0%*	0,32	*0,0%*	0,32	*80,45%*	0,063	*99,00%*
CO	19,82	*98,0%*	0,21	*0,0%*	0,21	*0,00%*	0,206	*98,96%*
SOx	0,74	*0,0%*	0,38	*90,5%*	0,04	*99,90%*	0,000	*99,99%*
VOC	39,50	*99,0%*	0,20	*0,0%*	0,20	*0,00%*	0,202	*99,49%*
PM	0,38	*25,0%*	0,10	*0,0%*	0,10	*0,00%*	0,098	*25,0%*

Speed up with Diesel fuel **10% load =** **2100 kW** **(mechanical power at the engine shaft)** Operational 0,4 h/y

Flow rate 15,1 kg/s - before recirculation 15,1 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	40,61	*0,0%*	40,61	*0,0%*	40,61	*0,0%*	40,614	*0,00%*
CO	2,14	*0,0%*	2,14	*0,0%*	2,144	*0,0%*	2,144	*0,00%*
SOx	0,93	*0,0%*	0,93	*90,5%*	0,09	*99,90%*	0,000	*99,99%*
VOC	18,21	*0,0%*	18,21	*0,0%*	18,21	*0,0%*	18,208	*0,00%*
PM	0,27	*0,0%*	0,27	*0,0%*	0,27	*0,0%*	0,274	*0,00%*

Fuel Switch **10% load =** **2100 kW** **(mechanical power at the engine shaft)** Operational 0,15 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	removal efficiency	B	removal efficiency	C	removal efficiency	D	removal efficiency
	kg/h	on deCO/SCR deNOx unit	kg/h	De-SOx Unit	kg/h	Wet De-NOx Unit	kg/h	overall%
NOx	2,18	0,0%	1,13	0,0%	1,13	0,0%	1,134	48,08%
CO	7,56	0,0%	3,92	0,0%	3,923	0,0%	3,923	48,08%
SOx	0,12	0,0%	0,06	90,5%	0,01	99,90%	0,000	99,99%
VOC	22,66	0,0%	11,77	0,0%	11,77	0,0%	11,766	48,08%
PM	0,44	0,0%	0,23	0,0%	0,23	0,0%	0,228	0,0%

Generator switched on **20% load =** **4200 kW** **(mechanical power at the engine shaft)** Operational 0,15 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	removal efficiency	B	removal efficiency	C	removal efficiency	D	removal efficiency
	kg/h	on deCO/SCR deNOx unit	kg/h	De-SOx Unit	kg/h	Wet De-NOx Unit	kg/h	overall%
NOx	2,18	0,0%	1,13	0,0%	1,13	0,0%	1,134	48,08%
CO	7,56	0,0%	3,92	0,0%	3,923	0,0%	3,923	48,08%
SOx	0,12	0,0%	0,06	90,5%	0,01	99,90%	0,000	99,99%
VOC	22,66	50,0%	5,88	0,0%	5,88	0,0%	5,883	74,04%
PM	0,44	0,0%	0,23	0,0%	0,23	0,0%	0,228	0,0%

Load up cold control **25% load =** **5250 kW** **(mechanical power at the engine shaft)** Operational 0,85 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	*removal efficiency*	B	*removal efficiency*	C	*removal efficiency*	D	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	4,20	*80,0%*	0,44	*0,0%*	0,44	*80,0%*	0,087	*97,92%*
CO	8,34	*25,0%*	3,25	*0,0%*	3,247	*0,0%*	3,247	*61,06%*
SOx	0,27	*0,0%*	0,14	*90,5%*	0,01	*99,90%*	0,000	*99,99%*
VOC	21,10	*99,0%*	0,11	*0,0%*	0,11	*0,0%*	0,110	*99,48%*
PM	0,36	*0,0%*	0,18	*0,0%*	0,18	*0,0%*	0,185	*0,0%*

Compensation mode **100% load =** **21000 kW** **(mechanical power at the engine shaft)** Operational 567 h/y

Flow rate 42,1 kg/s - before recirculation 20,4 kg/s - after recirculation

	A	*removal efficiency*	B	*removal efficiency*	C	*removal efficiency*	D	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	4,20	*90,0%*	0,20	*0,0%*	0,20	*90,0%*	0,020	*99,52%*
CO	8,93	*90,0%*	0,43	*0,0%*	0,433	*0,0%*	0,433	*95,15%*
SOx	0,29	*0,0%*	0,14	*90,5%*	0,01	*99,90%*	0,000	*99,99%*
VOC	22,61	*99,0%*	0,11	*0,0%*	0,11	*0,0%*	0,110	*99,52%*
PM	0,38	*25,0%*	0,09	*0,0%*	0,09	*0,0%*	0,092	*25,0%*

Ramp down **40% load =** **8400 kW** **(mechanical power at the engine shaft)** Operational 1,65 h/y

Flow rate 20,8 kg/s - before recirculation 10,7 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	4,70	*90,0%*	0,24	*0,0%*	0,24	*90,0%*	0,024	*99,49%*
CO	12,16	*90,0%*	0,63	*0,0%*	0,625	*0,0%*	0,625	*94,86%*
SOx	0,42	*0,0%*	0,21	*90,5%*	0,02	*99,90%*	0,000	*99,99%*
VOC	26,06	*99,0%*	0,13	*0,0%*	0,13	*0,0%*	0,134	*99,49%*
PM	0,36	*25,0%*	0,09	*0,0%*	0,09	*0,0%*	0,094	*25,0%*

Min Load **20% load =** **4200 kW** **(mechanical power at the engine shaft)** Operational 0,4 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	*removal efficiency*	**B**	*removal efficiency*	**C**	*removal efficiency*	**D**	*removal efficiency*
	kg/h	*on deCO/SCR deNOx unit*	kg/h	*De-SOx Unit*	kg/h	*Wet De-NOx Unit*	kg/h	*overall%*
NOx	3,70	*80,0%*	0,38	*0,0%*	0,38	*90,0%*	0,038	*98,96%*
CO	8,08	*25,0%*	3,15	*0,0%*	3,145	*0,0%*	3,145	*61,06%*
SOx	0,22	*0,0%*	0,12	*90,5%*	0,01	*99,90%*	0,000	*99,99%*
VOC	21,62	*70,0%*	3,37	*0,0%*	3,37	*0,0%*	3,368	*84,42%*
PM	0,38	*0,0%*	0,20	*0,0%*	0,20	*0,0%*	0,199	*0,0%*

Spin out **10% load =** **2100 kW** **(mechanical power at the engine shaft)** Operational 0,1 h/y

Flow rate 15,6 kg/s - before recirculation 8,1 kg/s - after recirculation

	A	removal efficiency	B	removal efficiency	C	removal efficiency	D	removal efficiency
	kg/h	on deCO/SCR deNOx unit	kg/h	De-SOx Unit	kg/h	Wet De-NOx Unit	kg/h	overall%
NOx	2,18	0,0%	1,13	0,0%	1,13	90,0%	0,113	94,81%
CO	7,56	0,0%	3,92	0,0%	3,923	0,0%	3,923	48,08%
SOx	0,12	0,0%	0,06	90,5%	0,01	99,90%	0,000	99,99%
VOC	22,66	0,0%	11,77	0,0%	11,77	0,0%	11,766	48,08%
PM	0,44	0,0%	0,23	0,0%	0,23	0,0%	0,228	0,0%

Emergency Mode **75% load with Diesel and iCER =** **15750 kW** **(mechanical power at the engine shaft)** Operational 192 h/y

Flow rate 37,8 kg/s - before recirculation 32,4 kg/s - after recirculation

	A	removal efficiency	B	removal efficiency	C	removal efficiency	D	removal efficiency
	kg/h	on deCO/SCR deNOx unit	kg/h	De-SOx Unit	kg/h	Wet De-NOx Unit	kg/h	overall%
NOx	234,68	90,0%	20,12	0,0%	20,12	80,5%	3,932	98,32%
CO	4,73	90,0%	0,41	0,0%	0,406	0,0%	0,406	91,43%
SOx	6,03	0,0%	5,17	90,5%	0,49	99,90%	0,000	99,99%
VOC	23,18	99,0%	0,20	0,0%	0,20	0,0%	0,199	99,14%
PM	1,21	25,0%	0,52	0,0%	0,52	0,0%	0,519	25,0%

Inlet pollutant data design basis:

File "PermittingProcess[redacted]n January 23rd

Efficiency on VOCs is valid considering VOCs to be composed minimum for 99.5% by formaldehyde

Pollutants mass flow decrease from Step A to Step B considers both removal efficiency of air pollution control system and pollutants mass flow reduction due to the fact that part of flue gas is recirculated

Overall efficiency takes into account also pollutants mass flow reduction due to partial flue gas recirculation when running with iCER

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TransGas Development Systems, LLC
March 24, 2024

ATTACHMENT N

SUPPORTING EMISSIONS CALCULATIONS

Facility Total

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	277.33	215.17
PM10	254.42	192.26
PM2.5	250.19	188.03
SO2	495.46	9.93
NOx	13,493.81	194.30
CO	11,173.65	205.62
VOC	11,517.84	117.66
Total HAPS	85.78	0.87

Engines (Worst Case)

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	248.69	186.53
PM10	248.69	186.53
PM2.5	248.69	186.53
SO2	495	9.93
NOx	13,494	194.30
CO	11,174	205.62
VOC	11,517	116.59
Total HAPS	85.77	0.86

Tanks

Emission Type	Uncontrolled	Controlled
	tpy	tpy
VOC	0.75	0.75

Haulroads and Fugitive Leaks

Emission Type	Uncontrolled	Controlled
	tpy	tpy
PM	28.64	28.64
PM10	5.73	5.73
PM2.5	1.50	1.50
VOC	0.31	0.31
Total HAPS	0.0053	0.0053

US! All tons are short tons!
907.18 kg/t_s
Pounds!
2.20 lb/kg
Convert lb=> t_s
2000 lb/t_s
Gas density
0.0462 lb/ft³
Diesel Density
7.10 lb/gal
MJ => MMBTU
0.00095 MMBTU/MJ

Number of engines operated	114	[-]
Engine Power	21,000	[kW]
Total mechanical Power (theoretic)	2,394	[MW]
Effective mech. Power	1,796	[MW]
Total Power electr.	2,298	[MW]
Effective electr. Power	1,724	[MW]
Yearly Produced Electricity	15,101	[GWh]

Fuel Choices
Diesel
Gas

Calculations provided by Engine Supplier with edits by POTESTA

weight Nm3 air
1.293 [kg/Nm3]

Single Engine

	Time	Time	Time	Load	Load	Electricity	Fuel type	Fuel Consumption Gas	Fuel Consumption Diesel	Enthalpy before Turbine Temp	Enthalpy before Turbine mass flow	Engine Out Temp	Engine Out mass flow	Oil consumption mass flow	NOx NOx_gas	NOx NOx_diesel	NOx NOx_engine	NOx Abat. Eff.	NOx NOx_stack	PM PM_gas	PM PM_diesel	PM PM_engine	PM Abat. Eff.	PM PM_stack
	[d]	[h]	[min]	[%]	[kW]	[GWh/a]	[-]	[kg/h]	[kg/h]	[°C]	[kg/s]	[°C]	[kg/s]	[kg/h]	[g/kWh]	[g/kWh]	[kg/h]	[%]	[kg/h]	[mg/Nm³]	[mg/Nm³]	[kg/h]	[%]	[kg/h]
Position in emiss. Abat. Schem										MP800	MP800	MP820A	MP820A		MP800				MP850			MP820A		MP850
Speed up	0	0.08	5	10%	2100	0	Diesel	0	462.0	187		15.1	172	8	0.37	1.04	19.34	40.614	**0.0%**	40.614	10.626	6.85	0.152486311	**0.0%**	0.152486311
Fuel Switch	0	0.03	2	10%	2100	0	Gas	294	4.6	194		15.6	172	8.1	0.37	1.04	19.34	2.184	**0.0%**	2.184	10.626	6.85	0.239639722	**0.0%**	0.239639722
Generator switched on	0	0.08	5	20%	4200	0	Gas	576	7.6	248		15.6	208	8.1	0.6	0.88	18.78	3.696	**0.0%**	3.696	9.282	8.02	0.209329559	**0.0%**	0.209329559
Load up cold control	0	0.17	10	25%	5250	0	Gas	713	8.4	275		15.6	226	8.1	0.73	0.80	18.50	4.2	**25.0%**	3.15	8.61	8.61	0.194174478	**0.0%**	0.194174478
Normal Operation	333	8000	480000	75.0%	15750	121	Gas	2075	12.6	360		34.4	215	17.6	1.84	0.40	14.90	6.3	**99.0%**	0.063	4.2	12.08	0.205809745	**25.0%**	0.154357309
Compensation Mode	24	567	34032	100%	21000	11	Gas	2897	12.6	406		42.1	231	20.4	2.4	1.00	11.60	21	**99.0%**	0.21	5.67	8.40	0.322045476	**25.0%**	0.241534107
Ramp down	0	0.33	20	40%	8400	0	Gas	1109	10.1	319		20.8	236	10.7	1.08	0.56	17.66	4.704	**99.0%**	0.04704	6.594	10.37	0.196443063	**25.0%**	0.147332297
Min load	0	0.08	5	20%	4200	0	Gas	576	7.6	248		15.6	208	8.1	0.6	0.88	18.78	3.696	**70.0%**	1.1088	9.282	8.02	0.209329559	**0.0%**	0.209329559
Spin out	0	0.02	1	10%	2100	0	Gas	294	4.6	194		15.6	172	8.1	0.37	1.04	19.34	2.184	**40.0%**	1.3104	10.626	6.85	0.239639722	**0.0%**	0.239639722
Emergency Mode	8	192	11520	75%	15750	3	Diesel	0	2570.4	351		38.5	198	23.2	1.84	0.40	14.90	234.675	**98.0%**	4.6935	4.2	12.08	0.779972158	**25.0%**	0.584979118
Operational time	365	**8760**																							

Start-Up / Shut-Down

Sulphur content

gas	diesel	lub oil
0.000143	0.002	0.008

Single Engine

	CO_dry CO_gas [ppm]	CO_gas [mg/Nm3]	CO_diesel [ppm]	CO_diesel [mg/Nm3]	CO_engine [kg/h]	CO_dry **Abat. Eff.** [%]	CO_stack [kg/h]	VOC_wet THC_gas [ppm]	CH4_gas [ppm]	VOC_gas [mg/Nm3]	THC_diesel [ppm]	VOC_diesel [mg/Nm3]	VOC_engine [kg/h]	VOC_wet **Abat. Eff.** [%]	VOC_stack [kg/h]	SO2 gas [kg/h]	SO2 diesel [kg/h]	SO2 lub oil [kg/h]	SO2 Total [kg/h]	SO2 Abatement [%]	SO2 Total [kg/h]
Position in emiss. Abat. Schem					MP820A		MP850						MP820A		MP850			MP820A			MP850
Speed up	139	174.0	41	51.0	1.135658791	**0.0%**	1.135658791	921	788	262.8	202	397.0	8.842766514	**0.0%**	8.842766514	0	0.924	0.00296	0.92696	**95.0%**	0.046348
Fuel Switch	139	174.0	41	51.0	3.923033089	**0.0%**	3.923033089	921	788	262.8	202	397.0	5.92666448	**0.0%**	5.92666448	0.04197238	0.00924	0.00296	0.054172378	**99.0%**	0.000541724
Generator switched on	149	186.0	40	49.5	4.193587096	**0.0%**	4.193587096	878	750	251.1	181	356.2	5.662606142	**0.0%**	5.662606142	0.08235628	0.01512	0.0048	0.102276281	**99.0%**	0.001022763
Load up cold control	154	191.9	39	48.7	4.328864099	**25.0%**	3.246648074	856	732	245.2	171	335.8	5.530576973	**25.0%**	4.147932729	0.10195256	0.0168	0.00584	0.124592555	**99.0%**	0.001245926
Normal Operation	166	206.9	36	45.0	10.14076497	**98.5%**	0.152111475	722	616	209.5	103	201.9	10.26458552	**99.0%**	0.102645855	0.29669339	0.0252	0.01472	0.336613391	**99.0%**	0.003366134
Compensation Mode	180	224.9	83	103.1	12.7761614	**95.0%**	0.63880807	755	644	218.3	91	179.2	12.40156502	**99.0%**	0.12401565	0.41422521	0.0252	0.0192	0.458625213	**99.0%**	0.004586252
Ramp down	168	209.9	37	46.5	6.254473785	**94.0%**	0.375268427	791	675	227.7	140	274.7	6.782597194	**99.0%**	0.067825972	0.15860305	0.02016	0.00864	0.187403046	**99.0%**	0.00187403
Min load	149	186.0	40	49.5	4.193587096	**50.0%**	2.096793548	878	750	251.1	181	356.2	5.662606142	**70.0%**	1.698781843	0.08235628	0.01512	0.0048	0.102276281	**99.0%**	0.001022763
Spin out	139	174.0	41	51.0	3.923033089	**35.0%**	2.549971508	921	788	262.8	202	397.0	5.92666448	**40.0%**	3.555988688	0.04197238	0.00924	0.00296	0.054172378	**99.0%**	0.000541724
Emergency Mode	166	206.9	36	45.0	2.905950437	**91.0%**	0.261535539	722	616	209.5	103	201.9	13.04146662	**99.0%**	0.130414666	0	5.1408	0.01472	5.15552	**95.0%**	0.257776

Hazardous emissions

Fraction of NMHC (AP-42, Table 3.4-3)

NMHC	Benzene	Toluene	Xylenes	Formaldehyde	Acrolein	Acetaldehyde	Naphthalene
0.2	0.000776	0.000281	0.000193	0.0000789	0.00000788	0.0000225	0.00013
100%	**0.388%**	**0.141%**	**0.097%**	**0.039%**	**0.004%**	**0.011%**	**0.065%**

CO2-Content	GHG-factor
2.743	3.158	28	265

Single Engine

	CO2_equivalent CO2_gas [kg/h]	CO2_diesel [kg/h]	Methane [kg/h]	N2O [ppm]	N2O [kg/h]	CO2_eq [kg/h]	NMHC [lb/h]	Benzene Uncontrolled [lb/h]	Benzene Uncontrolled [t/a]	Benzene Abatement [%]	Benzene Controlled [lb/h]	Benzene Controlled [t/a]	Toluene Uncontrolled [lb/h]	Toluene Uncontrolled [t/a]	Toluene Abatement [%]	Toluene Controlled [lb/h]	Toluene Controlled [t/a]	Xylenes Uncontrolled [lb/h]	Xylenes Uncontrolled [t/a]	Xylenes Abatement [%]	Xylenes Controlled [lb/h]	Xylenes Controlled [t/a]	Formaldehyde Uncontrolled [lb/h]	Formaldehyde Uncontrolled [t/a]	Formaldehyde Abatement [%]	Formaldehyde Controlled [lb/h]	Formaldehyde Controlled [t/a]
Position in emiss. Abat. Schem	MP850	MP850	MP850	MP850	MP850	MP850		MP820A	MP820A		MP850	MP850	MP820A	MP820A		MP850	MP850	MP820A	MP820A		MP850	MP850	MP820A	MP820A		MP850	MP850
Speed up	0.00	1459.00	0.00	1.20	0.05	1473	19.49	0.07564	0.00036	0.0%	0.07564	0.00036	0.02739	0.00013	0.0%	0.02739	0.00013	0.01881	0.00009	0.0%	0.01881	0.00009	0.00769	0.00004	0.0%	0.00769	0.00004
Fuel Switch	805.11	14.59	12.72	1.20	0.05	1190	13.07	0.05070	0.00010	0.0%	0.05070	0.00010	0.01836	0.00003	0.0%	0.01836	0.00003	0.01261	0.00002	0.0%	0.01261	0.00002	0.00515	0.00001	0.0%	0.00515	0.00001
Generator switched on	1579.74	23.87	12.11	1.20	0.05	1957	12.48	0.04844	0.00023	0.0%	0.04844	0.00023	0.01754	0.00008	0.0%	0.01754	0.00008	0.01205	0.00006	0.0%	0.01205	0.00006	0.00492	0.00002	0.0%	0.00492	0.00002
Load up cold control	1955.64	26.53	11.81	1.20	0.05	2327	12.19	0.04731	0.00045	25.0%	0.03548	0.00034	0.01713	0.00016	25.0%	0.01285	0.00012	0.01177	0.00011	25.0%	0.00882	0.00008	0.00481	0.00005	25.0%	0.00361	0.00003
Normal Operation	5691.12	39.79	21.59	1.20	0.12	6366	22.63	0.08780	40.03794	99.0%	0.00088	0.40038	0.03179	14.49827	99.0%	0.00032	0.14498	0.02184	9.95789	99.0%	0.00022	0.09958	0.00893	4.07087	99.0%	0.00009	0.04071
Compensation Mode	7945.59	39.79	26.19	2.40	0.27	8790	27.34	0.10608	3.42968	99.0%	0.00106	0.03430	0.03841	1.24193	99.0%	0.00038	0.01242	0.02638	0.85300	99.0%	0.00026	0.00853	0.01079	0.34871	99.0%	0.00011	0.00349
Ramp down	3042.29	31.83	14.40	1.20	0.07	3496	14.95	0.05802	0.00110	99.0%	0.00058	0.00001	0.02101	0.00040	99.0%	0.00021	0.00000	0.01443	0.00027	99.0%	0.00014	0.00000	0.00590	0.00011	99.0%	0.00006	0.00000
Min load	1579.74	23.87	12.11	1.20	0.05	1957	12.48	0.04844	0.00023	70.0%	0.01453	0.00007	0.01754	0.00008	70.0%	0.00526	0.00002	0.01205	0.00006	70.0%	0.00361	0.00002	0.00492	0.00002	70.0%	0.00148	0.00001
Spin out	805.11	14.59	12.72	1.20	0.05	1190	13.07	0.05070	0.00005	40.0%	0.03042	0.00003	0.01836	0.00002	40.0%	0.01101	0.00001	0.01261	0.00001	40.0%	0.00757	0.00001	0.00515	0.00000	40.0%	0.00309	0.00000
Emergency Mode	0.00	8117.32	0.00	2.40	0.30	8198	28.75	0.11156	1.22087	99.0%	0.00112	0.01221	0.04040	0.44209	99.0%	0.00040	0.00442	0.02775	0.30364	99.0%	0.00028	0.00304	0.01134	0.12413	99.0%	0.00011	0.00124
									Yearly Emissions	[t/a]	0.448016526			Yearly Emissions	[t/a]	0.162232789			Yearly Emissions	[t/a]	0.111426791			Yearly Emissions	[t/a]	0.045552196
									Yearly Emissions	[lb/a]	896.0330527			Yearly Emissions	[lb/a]	324.4655771			Yearly Emissions	[lb/a]	222.8535814			Yearly Emissions	[lb/a]	91.10439157

Single Engine

	Acrolein Uncontrolled [lb/h]	Acrolein Uncontrolled [t/a]	Acrolein Abatement [%]	Acrolein Controlled [lb/h]	Acrolein Controlled [t/a]	Acetaldehyde Uncontrolled [lb/h]	Acetaldehyde Uncontrolled [t/a]	Acetaldehyde Abatement [%]	Acetaldehyde Controlled [lb/h]	Acetaldehyde Controlled [t/a]	Naphthalene Uncontrolled [lb/h]	Naphthalene Uncontrolled [t/a]	Naphthalene Abatement [%]	Naphthalene Controlled [lb/h]	Naphthalene Controlled [t/a]	Total HAPS Uncontrolled [lb/h] per engine	Total HAPS Uncontrolled [t/a] per engine	Total HAPS Uncontrolled [t/a] all engines	Total HAPS Controlled [lb/h] per engine	Total HAPS Controlled [t/a] per engine	Total HAPS Controlled [t/a] all engines
Position in emiss. Abat. Schem	MP820A	MP820A		MP850	MP850	MP820A	MP820A		MP850	MP850	MP820A	MP820A		MP850	MP850						
Speed up	0.00077	0.000004	0.0%	0.00077	0.000004	0.00219	0.000010	0.0%	0.00219	0.000010	0.01267	0.00006	0.0%	0.01267	0.00006	0.14517	0.00001	0.00069	0.14517	0.00001	0.00069
Fuel Switch	0.00051	0.000001	0.0%	0.00051	0.000001	0.00147	0.000003	0.0%	0.00147	0.000003	0.00849	0.00002	0.0%	0.00849	0.00002	0.09729	0.00000	0.00018	0.09729	0.00000	0.00018
Generator switched on	0.00049	0.000002	0.0%	0.00049	0.000002	0.00140	0.000007	0.0%	0.00140	0.000007	0.00811	0.00004	0.0%	0.00811	0.00004	0.09296	0.00000	0.00044	0.09296	0.00000	0.00044
Load up cold control	0.00048	0.000005	25.0%	0.00036	0.000003	0.00137	0.000013	25.0%	0.00103	0.000010	0.00793	0.00008	25.0%	0.00594	0.00006	0.09079	0.00001	0.00086	0.06809	0.00001	0.00065
Normal Operation	0.00089	0.406571	99.0%	0.00001	0.004066	0.00255	1.160894	99.0%	0.00003	0.011609	0.01471	6.70739	99.0%	0.00015	0.06707	0.16851	0.67403	76.83982	0.00169	0.00674	0.76840
Compensation Mode	0.00108	0.034827	99.0%	0.00001	0.000348	0.00308	0.099443	99.0%	0.00003	0.000994	0.01777	0.57456	99.0%	0.00018	0.00575	0.20359	0.05774	6.58215	0.00204	0.00058	0.06582
Ramp down	0.00059	0.000011	99.0%	0.00001	0.000000	0.00168	0.000032	99.0%	0.00002	0.000000	0.00972	0.00018	99.0%	0.00010	0.00000	0.11135	0.00002	0.00212	0.00111	0.00000	0.00002
Min load	0.00049	0.000002	70.0%	0.00015	0.000001	0.00140	0.000007	70.0%	0.00042	0.000002	0.00811	0.00004	70.0%	0.00243	0.00001	0.09296	0.00000	0.00044	0.02789	0.00000	0.00013
Spin out	0.00051	0.000000	40.0%	0.00031	0.000000	0.00147	0.000001	40.0%	0.00088	0.000001	0.00849	0.00001	40.0%	0.00510	0.00000	0.09729	0.00000	0.00009	0.05838	0.00000	0.00006
Emergency Mode	0.00113	0.012397	99.0%	0.00001	0.000124	0.00323	0.035399	99.0%	0.00003	0.000354	0.01869	0.20453	99.0%	0.00019	0.00205	0.21410	0.02055	2.34306	0.00214	0.00021	0.02343
		Yearly Emissions	[t/a]	0.004549446			Yearly Emissions	[t/a]	0.0129902			Yearly Emissions	[t/a]	0.075054315		**1.31**	**0.75**	**85.77**	**0.50**	**0.01**	**0.86**
		Yearly Emissions	[lb/a]	9.09889234			Yearly Emissions	[lb/a]	25.98034			Yearly Emissions	[lb/a]	150.10863							

Worst case

Entire Plant, worst case

Startups per year 5 [-]

			Gas [t/a]	Diesel [t/a]		NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SO2 [t/a]	CO2_e [t/a]
Speed up	0	0.42	25	0.00	24.19	2.13	0.01	0.06	0.46	0.00	77
Fuel Switch	0	0.17	10	6.15	0.10	0.05	0.01	0.08	0.12	0.00	25
Generator switched on	0	0.42	25	30.15	0.40	0.19	0.01	0.22	0.30	0.00	102
Load up cold control	0	0.83	50	74.66	0.88	0.33	0.02	0.34	0.43	0.00	244
Normal Operation	333	7996.80	479808	2084957.39	12661.81	63.31	155.11	152.86	103.15	3.38	6397261
Compensation Mode	24	567.20	34032	206464.71	898.08	14.97	17.22	45.53	8.84	0.33	626484
Ramp down	0	1.67	100	232.29	2.11	0.01	0.03	0.08	0.01	0.00	732
Min load	0	0.42	25	30.15	0.40	0.06	0.01	0.11	0.09	0.00	102
Spin out	0	0.08	5	3.07	0.05	0.01	0.00	0.03	0.04	0.00	12
Emergency Mode	8	192.00	11520	0.00	62017.04	113.24	14.11	6.31	3.15	6.22	197796
Total		**8760.00**		**2,291,799**	**75,605**	**194**	**187**	**206**	**117**	**10**	**7,222,837**

Entire Plant, worst case UNCONTROLLED

Startups per year 5 [-]

NOx [t/a]	PM [t/a]	CO [t/a]	VOC [t/a]	SO2 [t/a]	CO2_e [t/a]
2.13	0.01	0.06	0.46	0.05	77
0.05	0.01	0.08	0.12	0.00	25
0.19	0.01	0.22	0.30	0.01	102
0.44	0.02	0.45	0.58	0.01	244
6330.91	206.82	10190.51	10314.94	338.26	6397261
1496.80	22.95	910.64	883.94	32.69	626484
0.99	0.04	1.31	1.42	0.04	732
0.19	0.01	0.22	0.30	0.01	102
0.02	0.00	0.04	0.06	0.00	12
5662.10	18.82	70.11	314.66	124.39	197796
13,494	**249**	**11,174**	**11,517**	**495**	**7,222,837**

Raw Emissions [pounds/hour]

Hourly base

Single Engine raw emissions

	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]	Heat Input MMBtu/hr
Speed up	10%	0.0	0	1018.5	143.46	89.54	0.34	2.50	19.49	2.04	3,217	0.00	0.12	3,247	18.74
Fuel Changeover	10%	647.1	13994	10.2	1.43	4.81	0.53	8.65	13.07	0.12	1,807	28.03	0.12	2,623	13.86
Generator switched on	20%	1269.7	27459	16.7	2.35	8.15	0.46	9.25	12.48	0.23	3,535	26.70	0.12	4,314	27.13
Load up cold control	25%	1571.8	33993	18.5	2.61	9.26	0.43	9.54	12.19	0.27	4,370	26.03	0.12	5,130	33.55
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]	
Normal Operation	75%	4574.1	98924	27.8	3.91	13.89	0.45	22.36	22.63	0.74	12,634	47.60	0.25	14,035	97.15
Compensation Mode	100%	6386.1	138112	27.8	3.91	46.30	0.71	28.17	27.34	1.01	17,605	57.73	0.59	19,378	135.44
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]	
Ramp down	40%	2445.2	52882	22.2	3.13	10.37	0.43	13.79	14.95	0.41	6,777	31.74	0.15	7,707	52.07
Min load	20%	1269.7	27459	16.7	2.35	8.15	0.46	9.25	12.48	0.23	3,535	26.70	0.12	4,314	27.13
Spin out	10%	647.1	13994	10.2	1.43	4.81	0.53	8.65	13.07	0.12	1,807	28.03	0.12	2,623	13.86
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	CO2_eq [lb/h]	
Emergency Mode	75%	0.0	0	5666.8	798.13	517.37	1.72	6.41	28.75	11.37	17,896	0.00	0.67	18,073	104.25

Emission Control [%]

	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]	CO2 [%]	Methane [%]	N2O [%]	0 [%]
Speed up	0%	0%	0%	0%	95%	0%	0%	0%	0%
Fuel Changeover	0%	0%	0%	0%	99%	0%	0%	0%	0%
Generator switched on	0%	0%	0%	0%	99%	0%	0%	0%	0%
Load up cold control	25%	0%	25%	25%	99%	0%	0%	0%	0%
	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]	CO2 [%]	Methane [%]	N2O [%]	0 [%]
Normal Operation	99%	25%	99%	99%	99%	0%	0%	0%	0%
Compensation Mode	99%	25%	95%	99%	99%	0%	0%	0%	0%
	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]	CO2 [%]	Methane [%]	N2O [%]	0 [%]
Ramp down	99%	25%	94%	99%	99%	0%	0%	0%	0%
Min load	70%	0%	50%	70%	70%	0%	0%	0%	0%
Spin out	40%	0%	35%	40%	40%	0%	0%	0%	0%
	NOx [%]	PM [%]	CO [%]	VOC [%]	SO2 [%]	CO2 [%]	Methane [%]	N2O [%]	0 [%]
Emergency Mode	98%	25%	91%	99%	99%	0%	0%	0%	0%

Controlled Emissions [pounds/hour]

Hourly base

Single Engine controlled emissions

	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Speed up	10%	0.0		1018.5	143.46	89.54	0.34	2.50	19.49	0.10	3,217	0.00	0.12	3,247
Fuel Changeover	10%	647.1	13994	10.2	1.43	4.81	0.53	8.65	13.07	0.00	1,807	28.03	0.12	2,623
Generator switched on	20%	1269.7	27459	16.7	2.35	8.15	0.46	9.25	12.48	0.00	3,535	26.70	0.12	4,314
Load up cold control	25%	1571.8	33993	18.5	2.61	6.94	0.43	7.16	9.14	0.00	4,370	26.03	0.12	5,130
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Normal Operation	75%	4574.1	98924	27.8	3.91	0.14	0.34	0.34	0.23	0.01	12,634	47.60	0.25	14,035
Compensation Mode	100%	6386.1	138112	27.8	3.91	0.46	0.53	1.41	0.27	0.01	17,605	57.73	0.59	19,378
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Ramp down	40%	2445.2	52882	22.2	3.13	0.10	0.32	0.83	0.15	0.00	6,777	31.74	0.15	7,707
Min load	20%	1269.7	27459	16.7	2.35	2.44	0.46	4.62	3.75	0.07	3,535	26.70	0.12	4,314
Spin out	10%	647.1	13994	10.2	1.43	2.89	0.53	5.62	7.84	0.07	1,807	28.03	0.12	2,623
	Load [%]	Gas [lb/h]	[ft³/h]	Diesel [lb/h]	[gal/h]	NOx [lb/h]	PM [lb/h]	CO [lb/h]	VOC [lb/h]	SO2 [lb/h]	CO2 [lb/h]	Methane [lb/h]	N2O [lb/h]	0.00146993 [lb/h]
Emergency Mode	75%	0.0		5666.8	798.13	10.35	1.29	0.58	0.29	0.11	17,896	0.00	0.67	18,073

1

Raw Emissions [tons / year]

Yearly base															
Single Engine raw emissions	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Speed up	0.08	0	-	0.04	11.95	0.004	0.000	0.000	0.001	0.000	0.134	0.000	0.00000	0.135	
Fuel Changeover	0.03	0.01	466	0.00	0.05	0.000	0.000	0.000	0.000	0.000	0.030	0.000	0.00000	0.044	
Generator switched on	0.08	0.1	2,288	0.00	0.20	0.000	0.000	0.000	0.001	0.000	0.147	0.001	0.00000	0.180	
Load up cold control	0.17	0.1	5,666	0.00	0.43	0.001	0.000	0.001	0.001	0.000	0.364	0.002	0.00001	0.427	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Normal Operation	8760	20034.6	866,574,112	121.67	34273	60.83	1.99	97.92	99.12	3.25	55339	208	1.1	61472	
Compensation Mode	567	1811.1	78,336,919	7.88	2219	13.13	0.20	7.99	7.75	0.29	4993	16	0.2	5495	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Ramp down	0.33	0.4	17,627	0.00	1.04	0.002	0.000	0.002	0.002	0.000	1.130	0.005	0.00003	1.285	
Min load	0.08	0.1	2,288	0.00	0.20	0.000	0.000	0.000	0.001	0.000	0.147	0.001	0.00000	0.180	
Spin out	0.02	0.0	233	0.00	0.02	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.00000	0.022	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq	
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Emergency Mode	192.00	0.0	-	544.01	153242	49.67	0.17	0.62	2.76	1.09	1718	0	0.1	1735	

Start / Stop controlled

Yearly base															
Single Engine raw emissions	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2		0	0	CO2_eq
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Speed up	0.08	0	-	0.04	11.95	0.004	0.000	0.000	0.001	0.000	0.134	0.000	0.00000	0.135	
Fuel Changeover	0.03	0.01	466	0.00	0.05	0.000	0.000	0.000	0.000	0.000	0.030	0.000	0.00000	0.044	
Generator switched on	0.08	0.1	2,288	0.00	0.20	0.000	0.000	0.000	0.001	0.000	0.147	0.001	0.00000	0.180	
Load up cold control	0.17	0.1	5,666	0.00	0.43	0.001	0.000	0.001	0.001	0.000	0.364	0.002	0.00001	0.427	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2		0	0	CO2_eq
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Normal Operation	8000	20034.6	866,574,112	121.67	34273	0.608	1.491	1.469	0.991	0.033	55339.012	208.479	1.11498	61471.893	
Compensation Mode	567	1811.1	78,336,919	7.88	2219	0.131	0.151	0.399	0.078	0.003	4992.703	16.372	0.16736	5495.468	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2		0	0	CO2_eq
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Ramp down	0.33	0.4	17,627	0.00	1.04	0.000	0.000	0.000	0.000	0.000	1.130	0.005	0.00003	1.285	
Min load	0.08	0.1	2,288	0.00	0.20	0.000	0.000	0.000	0.000	0.000	0.147	0.001	0.00000	0.180	
Spin out	0.02	0.0	233	0.00	0.02	0.000	0.000	0.000	0.000	0.000	0.015	0.000	0.00000	0.022	
	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2		0	0	CO2_eq
	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Emergency Mode	192.00	0.0	-	544.01	153242	0.99	0.12	0.06	0.03	0.01	1718	0	0.1	1735	
TOTAL	8760.00	21846.31	944,939,599	673.60	189747.69	1.74	1.77	1.93	1.10	0.05	62052	225	1.3	68705	
						198.1163256									

Best case

Yearly base	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2		0	0	CO2_eq
Single Engine raw emissions	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	
Normal Operation	8760	20035	866574112	122	34273	60.83	1.99	97.92	99.12	3.25	55339	208	1.1	61472	
Normal Operation w. abatement						0.61	1.49	1.47	0.99	0.03	55339	208	1.1	61472	
Operation of 114 engines						69.35	169.92	167.45	112.99	3.71	6,308,647	23,767	127	7,007,796	

1 Start Up / Shut down	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq
all engines	[h]	[t]	[ft³]	[t]	[gal]	[t]	[t]	[t]	[t]	[t]	[t]	[t]	[t]	[t]
all engines	0.80	75.30	3256871	5.62	1584	0.5555	0.0177	0.1833	0.2917	0.0010	224.2974	1.1839	0.0060	259.0492
Single engine	[h]	[t]	[ft³]	[t]	[gal]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]	[lb]
Single engine	0.80	0.66	28569	0.05	14	9.74	0.31	3.22	5.12	0.02	3935.04	20.77	0.11	4544.72

Best case	Duration	Gas		Diesel		NOx	PM	CO	VOC	SOx	CO2	Methane	N2O	CO2_eq
8760h@75% plus 1 Start/Stop	[h/a]	[t/a]	[ft³/a]	[t/a]	[gal/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]	[t/a]
	8760.8	2,284,015	98,792,705,589	13,876	3,908,687	69.9	169.9	167.6	113.3	3.7	6308871.7	23767.8	127.1	7008054.9

By: PEW
Date: 3/20/2025

Checked By: KBK
Date: 03/21/2025

Tanks

Tank	I.D.	Volume	Turnovers	Yearly Throughput	Fixed Roof Losses		VOC Emissions				
					Working	Breathing	Uncontrolled			Controlled	
		(gal)	(No.)	(gal/yr)	(lbs/yr)	(lbs/yr)	(lbs/yr)	(lbs/hr)(1)	(tpy)	(lbs/hr)(1)	(tpy)
Diesel Tank	TK1-40	170,000	4	680,000	12.28	25.27	37.55	0.18	0.02	0.18	0.02
Total Emissions (40 tanks)					491.2	1,010.80	1,502.00	7.34	0.75	7.34	0.75
						Total VOC =		7.34	0.75	7.34	0.75

Notes:
1. Emissions based on breathing losses divided by 8,760 hours per year and working losses divided by total throughput multiplied by one truck delivery to the tanks of 10,000 gallons.
2. Number of USLD tanks at the site = 40

Natural Gas (Vapor Sources)

Source Type	Number of Sources	Emission Factor(1) (kg/hr/source)	TOC Emissions (lb/hr)	TOC Emissions (ton/yr)	Uncontrolled VOC Emissions (lb/hr)	Uncontrolled VOC Emissions (ton/yr)	Control Efficiency (%)	Controlled VOC Emissions (lb/hr)	Controlled VOC Emissions (ton/yr)
Valves	176	0.000131	0.050829	0.222632	0.0003	0.0013	0	0.0003	0.0013
Pressure Relief Valves	120	0.0447	11.825474	51.795578	0.0698	0.3056	0	0.0698	0.3056
Connectors (Flanges)	917	0.0000810	0.163751	0.717230	0.0010	0.0042	0	0.0010	0.0042
Compressor Seals	0	0.0894	0.000000	0.000000	0.0000	0.0000	0	0.0000	0.0000
Light Liquid Pumps	0	0.00187	0.000000	0.000000	0.0000	0.0000	0	0.0000	0.0000
Sample Connections (2)	1	0.0150	0.033069	0.144842	0.0002	0.0009	0	0.0002	0.0009
				Total VOC =	0.0712	0.3120		0.0712	0.3120

	Uncontrolled Hexane Emissions (lb/hr)	Uncontrolled Hexane Emissions (ton/yr)	Control Efficiency (%)	Controlled Hexane Emissions (lb/hr)	Controlled Hexane Emissions (ton/yr)
	0.000005	0.000022	0	0.000005	0.000022
	0.001183	0.005180	0	0.001183	0.005180
	0.000016	0.000072	0	0.000016	0.000072
	0.000000	0.000000	0	0.000000	0.000000
	0.000000	0.000000	0	0.000000	0.000000
	0.000003	0.000014	0	0.000003	0.000014
Total	0.001	0.0053		0.001	0.0053

Sample Natural Gas Composition							
Gas Composition Key		BTU	S.G.	Non-VOC	Non-VOC	Non-VOC	Non-VOC
				Carbon Dioxide	Nitrogen	Methane	Ethane
Gas Sample - TransCanada		1082.2	0.6100	0.2000	0.4400	90.3300	8.4400
						Total Non-VOC =	99.4100

Sample Natural Gas Composition							
Gas Composition Key	VOC	VOC	VOC	VOC	VOC	VOC	VOC/HAP
	Propane	N Butane	Iso Butane	Pentane	Iso Pentane	Neo Pentane	Hexane
Gas Sample - TransCanada	0.5200	0.0300	0.0200	0.0001	0.0100	0.0000	0.0100
Max value	0.5200	0.0300	0.0200	0.0001	0.0100	0.0000	0.0100
						Total VOC =	0.5901
						Total HAP =	0.0100

1. AP42, Chapter 5, Protocol for Equipment Leak Emission Estimates, Table 2-1 and 2-5.
2. Sight Glass lb/kg = 2.2046

By: PEW
Date: 3/20/2025

Checked By: KBK
Date: 03/21/2025

Vehicle Activity (VA)

Paved Roadway: Trucks delivering fluids, fuel, and miscellaneous deliveries and removal of materials (estimated).

Emission Factor Equation from AP-42 Section 13.2.1, Paved Roads (January 2011):
E = [k * (sL/2)^0.91 * (W)^1.02] * (1 - 1.2P/4N) = lb / Vehicle Mile Traveled (VMT)

	PM	PM10	PM2.5	
k =	0.011	0.0022	0.00054	dimensionless, particle size multiplier
sL =	9.7	9.7	9.7	surface material silt content (g/m^2)
W =	26.8	26.8	26.8	tons, mean vehicle weight
P =	157	157	157	no. days/year with 0.01 in of rain
e =	1.15	0.23	0.06	lb/VMT

Rounding to 2

Pollutant	No. of Vehicles		Miles Per Trip (1)	Control Device		Emissions			
						Uncontrolled		Controlled	
	Per Hour	Per Year	(mi)	Type	Effic(%)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
PM	2	9,963	5.00	N	0	11.50	28.64	11.50	28.64
PM10	2	9,963	5.00	N	0	2.30	5.73	2.30	5.73
PM2.5	2	9,963	5.00	N	0	0.60	1.50	0.60	1.50

Tankers/Trucks								
Product	Empty Weight lbs	Loaded Weight lbs	Gallons Per Load	Average Weight tons	Gallons Per Hour	Gallons Per Year	Trucks Per Hour	Trucks Per Year
Delivery of Fluids	27,000	80,000	10,000	26.750	673	55,824,392	1	5,583
Miscellaneous Trucking							1	4,380
						Total =	2	9,963

1. Trip Distance - Bens Creek Road to Back of Property (miles one direction) = 2.5
2. Miscellaneous trucking is for deliveries and shipping of materials other than the fluid identified below. Trucking volume is assumed at one truck per hour and 4,380 trucks per year. Truck weighs are assumed to be the same mean weight as liquid trucking.

Estimated Delivery of Fluids			
Material	gal/hr	gal/day	gal/yr
ULSD	446.00	10,704.00	21,297,198.81
Lubricant Oil	65.13	1,563.00	570,495.00
NH3(aq)	16.57	397.58	3,482,822.90
NaOH	142.07	3,409.78	29,869,648.56
NaHS	0.50	12.04	105,437.79
NaClO2	1.90	45.50	398,601.40
H2SO4	0.48	11.44	100,187.27
Total	672.64	16,143.34	55,824,391.73

kJ/BTU	m³/ft³
1.055056	0.028317

Information provided by Engine Supplier

Gas	49.15 MJ/kg	976.94	BTU/ft³
Diesel	42.7 MJ/kg	130613.5	BTU/gal

For Export

Gas mode		100	75	50	25	20	10
NOx	g/kWh	1.0	0.4	0.4	0.8	0.9	1.0
PM (Filterable)	mg/Nm3	5.7	4.2	5.3	8.6	9.3	10.6
PM10 (Filterable +	mg/Nm3	5.4	4.1	5.1	8.1	8.8	10.1
PM2.5 (Filterable +	mg/Nm3	5.4	4.1	5.1	8.1	8.8	10.1
CO	ppm	180	166	178	154	149	139
VOC	ppm	79	76	78	88	90	94
N2O	ppm	2	1	1	1	1	1
CH4	0	644	616	638	732	750	788
CO2	g/kWh	383	373	377	400	405	416
SO2	g/kWh	0.025	0.023	0.021	0.021	0.021	0.022

Diesel mode		100	75	50	25	20	10
NOx	g/kWh	11.6	14.9	17.1	18.5	18.8	19.3
PM (Filterable)	mg/Nm3	8.4	12.1	11.6	8.6	8.0	6.8
PM10 (Filterable +	mg/Nm3	8.4	12.1	11.6	8.6	8.0	6.8
PM2.5 (Filterable +	mg/Nm3	8.0	11.7	11.3	8.1	7.6	6.5
CO	ppm	83	36	36	39	40	41
VOC	ppm	91	103	119	171	181	202
N2O	ppm	4	2	1	1	1	1
CO2	g/kWh	439	426	430	454	460	471
SO2	g/kWh	0.353	0.330	0.330	0.336	0.401	0.440

SO2 [g/kWh]

		21000	15750	10500	5250	4200	2100
Sulphur content		**100**	**75**	**50**	**25**	**20**	**10**
gas	0.00014	0.02	0.02	0.02	0.02	0.02	0.02
diesel	0.002	0.35	0.33	0.33	0.34	0.40	0.44
lub oil	0.008	0.0050	0.0032	0.0018	0.0009	0.0006	0.0003
	Diesel	**0.353**	**0.330**	**0.330**	**0.336**	**0.401**	**0.440**
	Gas	**0.025**	**0.023**	**0.021**	**0.021**	**0.021**	**0.022**
CO2 gas	2.743	383.32	372.74	376.79	399.75	405.09	415.76
CO2 Diese	3.158	439.13	426.23	430.16	454.41	459.83	470.67

Gas, iCER, Tier III

| | | | | | General | | | | | | ISO | | | | | |

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, TESTING PLANS

ATTACHMENT O

MONITORING, RECORDKEEPING, REPORTING, AND TESTING PLANS

TransGas Development Systems, LLC will work with the Division of Air Quality to identify and address Monitoring, Recordkeeping, Reporting, and Testing Plans. Requirements that are identified in the permit will be implemented.

ATTACHMENT P

PUBLIC NOTICE

ATTACHMENT P

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that TransGas Development Systems, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for the Adams Fork Data Center Energy Campus located on Twisted Gun Road near Wharncliffe in Mingo County, West Virginia. The latitude and longitude coordinates are: 37.593717 and -81.954906.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: NO_x of 194.30 tons per year (tpy), SO2 of 9.93 tpy, CO of 205.62, tpy, VOC of 117.66 which includes fugitives of 0.31 tpy, PM of 215.17 tpy which includes fugitives of 28.64 tpy, PM10 of 192.26 which includes fugitives of 5.73 tpy, PM2.5 of 188.03 tpy which includes fugitives of 1.50 tpy, and total HAPS of 0.87 tpy.

Startup of operations is planned to begin on or about the 1st day of January 2027. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice. Written comments will also be received via email at DEPAirQualityPermitting@WV.gov.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, Extension 41281, during normal business hours.

Dated this the **(Insert Date)** day of March 2025.

By: TransGas Development Systems, LLC
Adam Victor
President
630 First Avenue, Suite 30C
New York, New York 10016-3799

ATTACHMENT Q

BUSINESS CONFIDENTIAL CLAIMS

Cover Document
Confidential Information

This sample form contains each of the required elements for the cover document required under 45CSR31. The person submitting this form may wish to attach an additional page(s) to provide adequate justification under the "Rationale" section of the form.

Company Name	TransGas Development Systems, LLC	Responsible Official		Adam Victor, President
Company Address	630 First Avenue, Suite 30C New York, NY 10016-3799	Confidential Information Designee in State of WV	Name	Patrick Ward
			Title	Senior Engineer
			Address	7012 MacCorkle Ave, SE Charleston, WV 25304
Person/Title *Submitting* Confidential Information	Adam Victor			
	President		Phone	(304) 342-1400
			Fax	(304) 343-9031

Reason for Submittal of Confidential Information: Initial permitting.

Identification of Confidential Information	Rationale for Confidential Claim	Confidential Treatment Time Period
All Marked Confidential Information.	Provide justification that the criteria set forth in § 45CSR31-4.1.a - e have been met. The information contained within the application is fully protected under non-disclosure and confidentiality agreements by all parties involved in the application process and design of the facility. See Page Q2 of Q2.	This information is to be maintained confidential. There is no timeframe for expiration of confidential treatment.

Responsible Official Signature:	
Responsible Official Title:	President
Date Signed:	3/24/25

NOTE: Must be signed and dated in **BLUE INK**.

Provide justification that the criteria set forth in § 45CSR31-4.1.a - e have been met.

4.1.a. The claim of confidentiality has not expired by its terms, nor been waived or withdrawn;

The confidentiality agreements do not have an expiration date due to the nature of the information contained in the application.

4.1.b. The person asserting the claim of confidentiality has satisfactorily shown that it has taken reasonable measures to protect the confidentiality of the information, and that it intends to continue to take such measures;

The information contained within the application is fully protected under non-disclosure and confidentiality agreements by all parities involved in the original development of the processes, the design of the facility, and the permit application process.

4.1.c. The information claimed confidential is not, and has not been, reasonably obtainable without the person's consent by other persons (other than governmental bodies) by use of legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding);

The information available herein is not available and is not to be made available to outside parties.

4.1.d. No statute specifically requires disclosure of the information; and

Applicant believes there are no statutes that require disclosure of the information.

4.1.e. Either--

4.1.e.1. The person has satisfactorily shown that disclosure of the information is likely to cause substantial harm to the business's competitive position; or

This is a unique facility with many parties involved in preparing and providing information on the systems. Release of this information could cause substantial harm to Applicant's competitive position in the market.

4.1.e.2. The information is voluntarily submitted information, and its disclosure would likely to impair the State's ability to obtain necessary information in the future.

The State should not disclose this information to anyone.

5. Draft Permit R13-3714

West Virginia Department of Environmental Protection

Harold D. Ward
Cabinet Secretary

Construction Permit

R13-3714

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 C.S.R. 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

TransGas Development Systems, LLC
Adams Fork Harless Data Center Energy Campus
059-00133

Laura M. Crowder
Director, Division of Air Quality

Issued: Draft

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Facility Location:	Off of 22 Mine Road, Holden, Mingo County, West Virginia
Mailing Address:	630 First Avenue, Suite 30C, New York, NY 10016-3799
Facility Description:	Off-grid Power Generation Facility
NAICS Codes:	221112 – Fossil Fuel Electric Power Generation
UTM Coordinates:	401.420 km Easting • 4,179.002 km Northing • Zone 17
Latitude/Longitude:	37.75302 / -82.11905
Permit Type:	Construction
Description of Change:	Construction and operation of an off-grid power generation facility.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

As a result of the granting of this permit, the source is subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the date of the commencement of the operation or activity (activities) authorized by this permit, unless granted a deferral or exemption by the Director from such filing deadline pursuant to a request from the permittee.

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1.0. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
1S – 117S	1E – 117E	Engine 1 – Engine 117	2026	28,194 HP (each)	1C – 117C
118S – 157S	118E – 157E	ULSD Tanks (TK1 – TK40)	2026	170,000 gal (each)	None
DM	DM	Hydrous Ammonia Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Caustic Soda Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Sulfuric Acid Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Sodium Chlorite Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Sodium Hydrosulfide Tanks 1-39	2026	4,600 gal (each)	None
UNLOAD	UNLOAD-E	Diesel Truck Unloading	2026	3,907,000 gal (normal operation)	None

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2.0. General Conditions

2.1. Definitions

2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.

2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.

2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments
CBI	Confidential Business Information
CEM	Continuous Emission Monitor
CES	Certified Emission Statement
C.F.R. *or* CFR	Code of Federal Regulations
CO	Carbon Monoxide
C.S.R. *or* CSR	Codes of State Rules
DAQ	Division of Air Quality
DEP	Department of Environmental Protection
dscm	Dry Standard Cubic Meter
FOIA	Freedom of Information Act
HAP	Hazardous Air Pollutant
HON	Hazardous Organic NESHAP
HP	Horsepower
lbs/hr	Pounds per Hour
LDAR	Leak Detection and Repair
M	Thousand
MACT	Maximum Achievable Control Technology
MDHI	Maximum Design Heat Input
MM	Million
MMBtu/hr *or* mmbtu/hr	Million British Thermal Units per Hour
MMCF/hr *or* mmcf/hr	Million Cubic Feet per Hour
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NO_X	Nitrogen Oxides
NSPS	New Source Performance Standards
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter less than 2.5 μm in diameter
PM_{10}	Particulate Matter less than 10μm in diameter
Ppb	Pounds per Batch
Pph	Pounds per Hour
Ppm	Parts per Million
Ppm_V or ppmv	Parts per Million by Volume
PSD	Prevention of Significant Deterioration
Psi	Pounds per Square Inch
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
TPY	Tons per Year
TRS	Total Reduced Sulfur
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
VEE	Visual Emissions Evaluation
VOC	Volatile Organic Compounds
VOL	Volatile Organic Liquids

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2.3. Authority

This permit is issued in accordance with West Virginia air pollution control law W.Va. Code §§ 22-5-1. et seq. and the following Legislative Rules promulgated thereunder:

2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation*;

2.4. Term and Renewal

2.4.1. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Application R13-3714 and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.10 and -10.3.]

2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;

2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;

2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

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2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-4.]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-5.4.]

2.10 Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.
[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;

d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. *[Reserved]*

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety,

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or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. **[45CSR§13-10.1.]**

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

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3.0. Facility-Wide Requirements

3.1. Limitations and Standards

3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]

3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]

3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management, and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]

3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1] ***[State Enforceable Only]***

3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]

3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

3.2.1. **Emission Limit Averaging Time.** Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months. Compliance with all hourly emission limits shall be based on the applicable NAAQS averaging times or, where applicable, as given in any approved performance test method.

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3.3. Testing Requirements

3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.

b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.

c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:

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1. The permit or rule evaluated, with the citation number and language;
2. The result of the test for each permit or rule condition; and,
3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports, and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. *State Enforceable Only.*]

3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.

3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class or by private carrier with postage prepaid to the address(es), or submitted in electronic format by email as set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

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DAQ:
Director
WVDEP
Division of Air Quality
601 57th Street
Charleston, WV 25304-2345

US EPA:
Section Chief, USEPA, Region III
Enforcement and Compliance Assurance Division
Air Section (3ED21)
Four Penn Center
1600 John F Kennedy Blvd
Philadelphia, PA 19103-2852

DAQ Compliance and Enforcement[1]:
DEPAirQualityReports@wv.gov

[1]For all self-monitoring reports (MACT, GACT, NSPS, etc.), stack tests and protocols, Notice of Compliance Status Reports, Initial Notifications, etc.

3.5.4. **Operating Fee**

3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.

3.5.4.2. In accordance with 45CSR30 – Operating Permit Program, enclosed with this permit is a Certified Emissions Statement (CES) Invoice, from the date of initial startup through the following June 30. Said invoice and the appropriate fee shall be submitted to this office no later than 30 days prior to the date of initial startup. For any startup date other than July 1, the permittee shall pay a fee or prorated fee in accordance with Section 4.5 of 45CSR22. A copy of this schedule may be found attached to the Certified Emissions Statement (CES) Invoice.

3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

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4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. The facility shall consist of only the pollutant-emitting equipment and processes identified under Section 1.0 of this permit. In accordance with the information filed under Permit Application R13-3714, the equipment shall be installed, maintained and operated so as to minimize any fugitive escape of pollutants and the equipment/processes shall use the specified air pollution control devices.

4.1.2. **Maximum Horsepower.** The maximum horsepower of each engine (1S – 117S) shall be 28,194 hp.

4.1.3. **Operation Modes.** The engines (1S – 117S) have the ability to operate in the following operational modes. Each operation mode shall abide by the descriptions included in Permit Application R13-3714.

Operation Mode
Normal
Compensation
Emergency
Startup (Speed Up, Fuel Switch, Generator Switched On, Load Up Cold Control)
Shutdown (Ramp Down, Min Load, Spin Out)

4.1.4. The maximum hourly emissions during each operating mode shall not exceed the following for each engine (1S – 117S):

a. Normal

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	0.14
Carbon Monoxide	0.34
Volatile Organic Compounds	0.23
Particulate Matter-10/2.5[1]	0.34
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.004

[1] Includes both filterable and condensable particulate matter.

b. Compensation

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	0.46
Carbon Monoxide	1.41
Volatile Organic Compounds	0.27
Particulate Matter-10/2.5[1]	0.53
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.005

[1] Includes both filterable and condensable particulate matter.

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c. Emergency

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	10.35
Carbon Monoxide	0.58
Volatile Organic Compounds	0.29
Particulate Matter-10/2.5[1]	1.29
Sulfur Dioxide	0.11
Total Hazardous Air Pollutants	0.005

[1] Includes both filterable and condensable particulate matter.

d. Startup – Speed Up

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	89.54
Carbon Monoxide	2.50
Volatile Organic Compounds	19.49
Particulate Matter-10/2.5[1]	0.34
Sulfur Dioxide	0.10
Total Hazardous Air Pollutants	0.32

[1] Includes both filterable and condensable particulate matter.

e. Startup – Fuel Switch

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	4.81
Carbon Monoxide	8.65
Volatile Organic Compounds	13.07
Particulate Matter-10/2.5[1]	0.53
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.22

[1] Includes both filterable and condensable particulate matter.

g. Startup – Generator Switched On

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	8.15
Carbon Monoxide	9.25
Volatile Organic Compounds	12.48
Particulate Matter-10/2.5[1]	0.46
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.21

[1] Includes both filterable and condensable particulate matter.

h. Startup – Load Up Cold Control

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	6.94
Carbon Monoxide	7.16
Volatile Organic Compounds	9.14
Particulate Matter-10/2.5[1]	0.43
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.15

[1] Includes both filterable and condensable particulate matter.

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i. Shutdown – Ramp Down

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	0.10
Carbon Monoxide	0.83
Volatile Organic Compounds	0.15
Particulate Matter-10/2.5[1]	0.32
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.003

[1] Includes both filterable and condensable particulate matter.

j. Shutdown – Min Load

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	2.44
Carbon Monoxide	4.62
Volatile Organic Compounds	3.75
Particulate Matter-10/2.5[1]	0.46
Sulfur Dioxide	0.07
Total Hazardous Air Pollutants	0.06

[1] Includes both filterable and condensable particulate matter.

k. Shutdown – Spin Out

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	2.89
Carbon Monoxide	5.62
Volatile Organic Compounds	7.84
Particulate Matter-10/2.5[1]	0.53
Sulfur Dioxide	0.07
Total Hazardous Air Pollutants	0.13

[1] Includes both filterable and condensable particulate matter.

4.1.5. The maximum aggregate total annual emissions[1] from the engines (1S – 117S) shall not exceed the following:

Pollutant	Maximum Annual Emissions (tons/year)[1]
Nitrogen Oxides	194.30
Carbon Monoxide	205.62
Volatile Organic Compounds	116.59
Particulate Matter-10/2.5[2]	186.53
Sulfur Dioxide	9.93
Total Hazardous Air Pollutants	0.86

[1] Includes all operation modes in permit condition 4.1.4.
[2] Includes both filterable and condensable particulate matter.

Compliance with the annual emission limits shall be determined by multiplying each operational mode hourly emissions in permit condition 4.1.4 by the hours operated in each operation mode.

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4.1.6. The permittee shall meet the air pollution control technology requirements for each engine (1S – 117S). The emission control systems for the engines consist of two main systems. The dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, which is downstream of the turbocharger. The dry systems consist of an oxidation catalyst and an SCR catalyst. The catalytic reduction of CO has a reduction efficiency of over 99%. The same system oxidizes VOC emissions with a reduction efficiency of 99%. The de-NOx unit is a urea based SCR technology, and the reduction efficiency exceeds 90%. The wet system consists of four (4) stages, which reduce NOx further with 90.9% reduction efficiency and SO2 with 70% reduction efficiency. The emission abatement system (dry and wet) that will be employed on each engine shall meet the following emissions reductions when operating in the following modes:

Mode	NOx (%)	CO (%)	VOC (%)	PM (%)	SO_2 (%)
Speed Up	0	0	0	0	95.0
Fuel Changeover	0	0	0	0	99.0
Generator Switched On	0	0	0	0	99.0
Load Up Cold Control	25.0	25.0	25.0	0	99.0
Normal Operation	99.0	99.0	99.0	25.0	99.0
Compensation Mode	99.0	95.0	99.0	25.0	99.0
Ramp Down	99.0	94.0	99.0	25.0	99.0
Min Load	70.0	50.0	70.0	0	70.0
Spin Out	40.0	35.0	40.0	0	40.0
Emergency	98.0	91.0	99.0	25.0	99.0

4.1.7. During startup and shutdown operations, the permittee shall minimize emissions by:

a. Operating and maintaining the engines (1S – 117S) and associated air pollution control devices (1C – 117C) in accordance with good combustion and air pollution control practices, safe operating practices, and protection of the facility. Good combustion and air pollution control practices shall mean proper operation and maintenance of the engine control systems and air pollution control equipment in accordance with manufacturer specifications. Additionally, it shall mean such practices that promote sufficient residence time of fuel in the combustion zone, thorough mixing of air and fuel, and proper combustion temperatures.

b. Implementing operations and maintenance practices comprised of maintaining a high level of steady state operation time and minimizing (as much as practicable) the frequency of startup and shutdown events.

4.1.8. **Fuel Throughput Parameters.** The engines (1S – 117S) are capable of firing natural gas with co-firing diesel or diesel fuel only. The following maximum hourly fuel consumptions apply to the engines:

Mode	Maximum NG Hourly Throughput (scf/hr per engine)	Maximum Diesel Hourly Throughput (gal/hr per engine)[1]
Speed Up	0	143.46
Fuel Changeover	13,994	1.43
Generator Switched On	27,459	2.35
Load Up Cold Control	33,993	2.61
Normal Operation	98,924	3.91
Compensation Mode	138,112	3.91
Ramp Down	52,882	3.13
Min Load	27,459	2.35
Spin Out	13,994	1.43
Emergency	0	798.13

[1] Sulfur content of ultra-low sulfur diesel (ULSD) fuel shall be less than 15 ppm.

4.1.9. **Annual Operational Limitation.**

a. The operating hours of each engine (1S – 117S), the throughput of each type of fuel (natural gas/diesel), and operation mode (permit condition 4.1.3) will be continuously monitored and recorded. The permittee will keep records of the fuel consumption (natural gas/diesel), and operating hours (natural gas/diesel) for each engine. The 12-month rolling sum of emissions will be calculated monthly.

b. Natural gas and diesel fuel meters shall be installed on each engine (1S – 117S).

c. Operational hour meters shall be installed on each engine (1S – 117S).

4.1.10. In order to minimize NOx emissions, within 180 days of startup, the permittee shall determine the optimal injection rate of aqueous ammonia into the SCR. The permittee shall then operate the SCR at the determined optimal injection rate.

4.1.11. The permittee shall meet the following emission standards:

a. For engines (1S – 117S) installed on or after January 1, 2016, limit the emissions of NOX in the stationary CI internal combustion engine exhaust to the following:

i. 3.4 g/KW-hr (2.5 g/HP-hr) when maximum engine speed is less than 130 rpm;
ii. Reduce particulate matter (PM) emissions by 60 percent or more, or limit the emissions of PM in the stationary CI internal combustion engine exhaust to 0.15 g/KW-hr (0.11 g/HP-hr).

[40CFR§60.4204(c)]

4.1.12. The permittee must operate and maintain stationary CI ICE that achieve the emission standards as required in §§ 60.4204 and 60.4205 over the entire life of the engines (1S – 117S).
[40CFR§60.4206]

4.1.13. The permittee shall meet the following fuel requirements:

a. Beginning June 1, 2012, owners and operators of stationary CI ICE subject to this subpart with a displacement of greater than or equal to 30 liters per cylinder must use diesel fuel that meets a maximum per-gallon sulfur content of 1,000 parts per million (ppm).
[40CFR§60.4207(d)]

4.1.14. The engines (1S – 117S) shall use the air pollution control devices (1C – 117C) specified in Section 1.0 and permit condition 4.1.6 and identified in Permit Application R13-3714 at all times when in operation except during periods of startup and shutdown when operating temperatures do not allow for proper use of the air pollution control devices.

4.1.15. The maximum annual throughput of diesel fuel to the storage tanks shall not exceed the following:

Storage Tank ID	Nominal Capacity (gal)	Product Stored	Maximum Annual Throughput (gal/yr)
TK1 – TK40	170,000 (each)	Diesel Fuel	3,907,000 (all tanks) Normal Operation

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4.1.16. The storage tanks (TK1 – TK40) shall be designed and operated as specified in the paragraphs (a) through (c).

a. The cover and all openings on the cover (e.g., access hatches, sampling ports, pressure relief valves and gauge wells) shall form a continuous impermeable barrier over the entire surface area of the liquid in the storage vessel.

b. Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) whenever material is in the unit on which the cover is installed except during those times when it is necessary to use an opening as follows:

(i) To add material to, or remove material from the unit (this includes openings necessary to equalize or balance the internal pressure of the unit following changes in the level of the material in the unit);

(ii) To inspect or sample the material in the unit; or

(iii) To inspect, maintain, repair, or replace equipment located inside the unit.

c. The storage tanks (TK1 – TK40) thief hatch shall be weighted and properly seated. **[45CSR§13-5.10]**

4.1.17. The permittee shall comply with all applicable provisions of 45 CSR 17 to minimize fugitive particulate matter emissions on the haul roads.

4.1.18. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.10]

4.1.19. The permittee shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to minimize any fugitive escape of regulated air pollutants (leak). Any above-ground piping, valves, pumps, etc. that shows signs of excess wear that have a reasonable potential for fugitive emissions of regulated air pollutants shall be repaired or replaced.
[45CSR§13-5.10]

4.2. Monitoring Requirements

4.2.1. To determine compliance with permit conditions 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, and 4.1.9, the permittee shall monitor the operation type (listed in permit condition 4.1.4), number of startup/shutdown events, and hours of operation in each operating mode (natural gas/diesel) on a daily basis.

4.2.2. To demonstrate compliance with permit condition 4.1.8, the permittee shall monitor fuel consumption (natural gas/diesel) on a daily basis.

4.2.3. To demonstrate compliance with permit conditions 4.1.10 and 4.1.14, the permittee shall monitor the operating times for the air pollution control devices on at least an hourly basis.

4.2.4. The permittee will install air pollution control devices on the engines (1S – 117S) to show compliance with permit condition 4.1.6.b. The air pollution control devices shall be continuously

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monitored to verify proper operation. The permittee shall operate the air pollution control devices in accordance with manufacturer specifications. **[45CSR§13-5.10]**

4.2.5. To demonstrate compliance with permit condition 4.1.15, the permittee shall monitor diesel fuel unloading on a daily basis.

4.2.6. To demonstrate compliance with permit condition 4.1.17, the permittee shall conduct a visible inspection of the paved roads once each operating day to ensure no fugitive particulate matter emissions from diesel truck and employee traffic are generated. If necessary, roads will be swept and/or watered to minimize fugitive particulate matter.

4.2.7. The permittee shall, at the time of initial startup, maintain on-site and have readily available to be made available to the Director or his/her representative upon request, a copy of the all current vendor guarantees relevant to the air emissions associated with the facility. This includes information relating to the performance of both emission units and control devices.

4.2.8. The permittee shall meet all applicable requirements, including those not specified above, as given under 45 CSR 4, 45 CSR 13, 45 CSR 16, 45 CSR 17, 45 CSR 30, 45 CSR 34, 40 CFR 60, Subpart IIII, and 40 CFR 63 Subpart ZZZZ. Any final revisions made to the above rules will, where applicable, supercede those specifically cited in this permit.

4.2.9. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit, and time of sampling or measurements;
b. The date(s) analyses were performed;
c. The company or entity that performed the analyses;
d. The analytical techniques or methods used;
e. The results of the analyses; and
f. The operating conditions existing at the time of sampling or measurement.

4.3. Testing Requirements

4.3.1. See Facility-Wide Testing Requirements Section 3.3.

4.3.2. The permittee shall meet the following testing requirements for the engines (1S – 117S):

a. Conduct an initial performance test to demonstrate initial compliance with the emission standards as specified in § 60.4213.

b. Establish operating parameters to be monitored continuously to ensure the stationary internal combustion engine continues to meet the emission standards. The owner or operator must petition the Administrator for approval of operating parameters to be monitored continuously. The petition must include the information described in paragraphs (d)(2)(i) through (v) of this section.

i. Identification of the specific parameters you propose to monitor continuously;

ii. A discussion of the relationship between these parameters and NOX and PM emissions, identifying how the emissions of these pollutants change with changes in these parameters, and how limitations on these parameters will serve to limit NOX and PM emissions;

iii. A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

iv. A discussion identifying the methods and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

v. A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

c. For non-emergency engines with a displacement of greater than or equal to 30 liters per cylinder, conduct annual performance tests to demonstrate continuous compliance with the emission standards as specified in § 60.4213.

[40CFR§4211(d)]

4.4. Recordkeeping Requirements

4.4.1. To determine compliance with permit conditions 4.1.5, 4.1.8, and 4.1.9, the permittee shall keep records of the operating hours of each engine, the throughput of each type of fuel (natural gas/diesel), and operation type (as outlined in permit condition 4.1.4) on a daily basis. The permittee shall multiply the hourly operation type emissions in permit condition 4.1.4 by the number of hours operated in that operational mode. The permittee shall calculate the emissions monthly and on a twelve-month rolling total. A twelve-month rolling total shall mean the sum of operating hours at any given time during the previous twelve consecutive calendar months.

4.4.2. To determine compliance with permit condition 4.2.7, the permittee shall keep records of the daily road particulate matter fugitive inspections and any corrective actions taken.

4.4.3. To determine compliance with permit conditions 4.1.15 and 4.2.6, the permittee shall keep records of the diesel unloading on a daily basis. Compliance with the throughput limit shall be determined on a 12 month rolling total basis.

4.4.4. To demonstrate compliance with permit condition 4.1.19, the permittee shall keep records of the fugitive emissions components repairs and replacements.

4.4.5. The permittee shall keep the following engine (1S – 117S) records:

a. All notifications submitted to comply with this subpart and all documentation supporting any notification.

b. Maintenance conducted on the engine.

c. If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.

d. If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards.

[40CFR§4214(a)(2)]

4.5. Reporting Requirements

4.5.1. See Facility-Wide Reporting Requirements Section 3.5.

4.5.2. The permittee shall submit notifications of the date construction commences, the actual date of initial startup as required under §60.7. The notification must include the information below. Beginning on February 26, 2025, submit the notification electronically according to paragraph (g) of this section.

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a. Name and address of the owner or operator;

b. The address of the affected source;

c. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

d. Emission control equipment; and

e. Fuel used.
[40CFR§4214(a)(1)]

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CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature[1] (please use blue ink) _____ Responsible Official or Authorized Representative _____ Date

Name & Title (please print or type) _____ Name _____ Title

Telephone No. _____ Fax No. _____

[1] This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:

a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), or

(ii) the delegation of authority to such representative is approved in advance by the Director;

b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of U.S. EPA); or

d. The designated representative delegated with such authority and approved in advance by the Director.

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6. Engineering Evaluation R13-3714

west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Harold D. Ward, Cabinet Secretary
dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3714
Plant ID No.:	059-00133
Applicant:	TransGas Development Systems, LLC
Facility Name:	Adams Fork Harless Data Center Energy Campus
Location	Holden, Mingo County
NAICS Code:	221112 – Fossil Fuel Electric Power Generation
Application Type:	Construction
Received Date:	March 26, 2025 (Revised application submitted May 14, 2025)
Engineer Assigned:	Jerry Williams
Fee Amount:	$2,000 ($1,000 45 CSR 13 Application Fee, $1,000 NSPS Fee)
Date Received:	April 2, 2025
Complete Date:	June 4, 2025
Due Date:	September 2, 2025
Applicant Ad Date:	April 9, 2025
Newspaper	*Williamson Daily News*
UTM's:	Easting: 401.420 km Northing: 4,179.002 km Zone: 17
Latitude/Longitude:	37.75302 / -82.11905
Description:	Construction and operation of an off-grid power generation facility.

CONFIDENTIAL BUSINESS INFORMATION OVERVIEW

TransGas Development Systems, LLC (TransGas) submitted an air permit application for an off-grid power generation facility to be located near Holden in Mingo County. This permit application included confidential business information (CBI) submitted under 45 CSR 31, entitled "Confidential Information". Therefore, both a CBI and redacted version of the application were submitted. TransGas provided all CBI under the requirements of 45 CSR 31, which is the Division of Air Quality (DAQ)

regulation that establishes the requirements for claiming information submitted to the DAQ as confidential and the procedures for determinations of confidentiality in accordance with the provisions of W. Va. Code §22-5-10.

The reason for the CBI submittal according to TransGas is that the application contains information that is fully protected under non-disclosure and confidentiality agreements between the applicant and equipment provider concerning development of the process and facility design. Release of this information could cause substantial harm to TransGas' competitive position in the market. For each submission of information any portion of which is claimed to be confidential, a complete set of the information, including the document justifying the claim of confidentiality shall be submitted simultaneously on uncolored paper with the information claimed to be confidential blacked out, and with the words "redacted copy – claim of confidentiality" marked clearly on each such page, so that such a set of information is suitable for public disclosure and provides notice to the public that a claim of confidentiality has been made. DAQ allows for electronic submittals (via email) of redacted permit applications. However, all CBI applications must be submitted via mail or hand delivered. During the Notice of Application period, the DAQ received a public comment concerning the proposed project, which specifically requested the release of information that has been redacted.

As stated in 45 CSR 31, Section 4, during the course of the DAQ's review of whether the information claimed to be confidential is a trade secret in accordance with this rule, the DAQ shall consider the following:

- The claim of confidentiality has not expired by its terms, nor been waived or withdrawn;
- The person asserting the claim of confidentiality has satisfactorily shown that it has taken reasonable measures to protect the confidentiality of the information, and that it intends to continue to take such measures;
- The information claimed confidential is not, and has not been, reasonably obtainable without the person's consent by other persons (other than governmental bodies) by use of legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding);
- No statute specifically requires disclosure of the information; and
- Either the person has satisfactorily shown that disclosure of the information is likely to cause substantial harm to the business's competitive position or the information is voluntarily submitted information, and its disclosure would likely to impair the State's ability to obtain necessary information in the future.

Additionally, 45 CSR 31, Section 6, states that no person shall claim as confidential, information concerning the types and amounts of pollutants discharged. "Types and amounts of air pollutants discharged" is defined in 45 CSR 31 Section 2.4. Furthermore, 45 CSR 31B entitled "Confidential Business Information and Emission Data" is an interpretive rule that provides guidance and clarification concerning the term "types and amounts of air pollutants discharged" defined under 45CSR§31-2.4, the DAQ's legislative rule entitled "Confidential Information," and thus what information may not be claimed confidential in accordance with 45CSR§31-6.

The aforementioned public comment received during the Notice of Application comment period triggered a review of the CBI claims by the DEP's Office of the General Counsel (OGC). A letter dated

April 28, 2025, from the OGC was issued to TransGas that stated that the information claimed as CBI may not qualify for such designation as it falls under the definition of "Types and Amounts of Pollutants Discharged" as excluded under §45-31-6 as defined under §45-31-2.4 (and further defined under 45 CSR 31B). This letter was made available to the public on the WVDEP Application Xtender (AX) website at that time. There was also concern that the claimed CBI may not meet the eligibility requirements under §45-31-4.1(b) and 4.1(c). The letter requested further justification that the information claimed as CBI is not defined as "Types and Amounts of Pollutants Discharged" and also does not conflict with the eligibility requirements of §45-31-4.1(b) and 4.1(c). The letter requested a written response within 15 days.

TransGas provided a response to this request on May 2, 2025. This response was made available to the public on the AX website at that time. TransGas proposed to revise the CBI claim to cover the company names for the engine and control systems designers and manufacturers. This includes the engine model number which would identify the engine company. All other previously claimed CBI would be removed from the request. Upon reviewing this information, the WVDEP issued a letter to TransGas on May 9, 2025, stating that a permit application so submitted would be in compliance with the requirements governing the submission of CBI under 45 CSR 31 and 45 CSR 31B. TransGas provided the revised application to DAQ on May 14, 2025, and the application was made available to the public on the AX website at that time.

This engineering evaluation/fact sheet contains only the information that was provided in the redacted copy of the permit application. Furthermore, the information contained herein is more than adequate to make the appropriate permitting determinations and can be used to determine compliance with all applicable rules and regulations. This includes all necessary monitoring, recordkeeping, reporting, and testing that will be required as part of the proposed draft permit.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3714:

The Adams Fork Harless Data Center Energy Campus is a unique off-grid, electric generating facility designed to provide power to adjacent data center operations. The facility encompasses 117 engines (Source ID# 1S – 117S) with 114 engines operating full-time and 3 engines in reserve. Each engine has a proposed control strategy (Emission Point ID# 1E – 117E). The facility will contain 39 powerhouses with each containing 3 generator setups with each generator having a nameplate capacity of 25 MWe. Actual power generation will depend on the operating mode of the engines. Each engine will have a maximum power output of 21 MW, therefore, the theoretically installed power output would be 2,457 MW. The effective and continuously delivered power output will be 1,796 MW.

The engines are configured to be dual-fuel units and have the ability to operate on natural gas or diesel fuel, or can be operated on diesel fuel only, in backup mode. Under normal operation, the engines consume natural gas as their primary fuel with a pilot injection of ultra-low sulfur diesel (ULSD). Under natural gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% in emergency operation.

The engines can operate under the following operational profiles:

Normal Operation
To ensure peak operation conditions, the engines will be regularly serviced. With 1-2 weeks of downtime per engine per year, 3 engines are going to be off-line at any time of the year. Under normal operations, the engines will be run at 75% power only. Therefore, the continuously delivered power will be 1,796 MW.

Compensation Mode
In the case of one or more, or in the unrealistic, but foreseen case of up to 29 engines out of service, the rest of the field will compensate, increasing their power output to 100%. For the calculation of the yearly emissions the worst case is assumed, when 29 engines go offline and the remaining 85 are operated at 100%.

Emergency Mode
In case the pipeline is down, or the gas cannot be delivered for any other reason, the engines can switch to diesel fuel mode immediately and are then operated on diesel fuel only. Apart from the different fuel type, the engines are controlled in the same way as in Normal Operation.

Startup Mode
To start an engine and bring power production online, several steps are necessary. In the first phase the emission control system is not operational temperature, therefore the control rate is not optimal. The following is a simplification and a representation of the worst case for emissions emission-wise. The different steps can be reduced to four main sub-modes:

- Speed up
  Bring the engine from standstill to nominal speed (89 rpm). This is done in diesel mode. The emission control system is still offline at this point, as it is not at optimal temperature. Once nominal speed is set and the minimum load for a fuel switch is reached (less than 5 minutes), the system initiates the next sub mode.

- Fuel Switch
  For about two minutes the load is kept constant, and the fuel is changed from 100% diesel to 98% gas & 2% diesel.

- Generator switched on
  On gas operation, the load is further increased until the generator can by energized and synchronized with the rest of the engine fleet. This takes no more than 5 minutes. For the emissions calculation of all these steps the emission control system is looked at as non-operational, even though the exhaust gases will have heated it already and some abatement is taking place, even at a reduced level.

- Load up cold control
  Once the generator is online and synchronized, then the engine is powered up to its set point (75% in normal operation mode). For reasons of simplicity and to ensure a conservative view on the problem, during engine load up the control system is looked at as cold and operational at

25% only. This is even though in reality the system was heated up constantly by the exhaust gases and reaching operational condition during the load up.

Shut Down
The shut down procedure consists of three phases:

- Ramp down
  The load is constantly reduced to a minimum load.

- Min Load
  At minimum load the generator is decoupled from the grid and the engine's load and speed setting are zero.

- Spin out
  Due to the zero-load setting the injection systems are turned off and the engine is spun out until full stop. In this entire sequence the emission control system is still operational due to its thermal inertia. Therefore, until the injection is stopped the emissions are treated.

The engines will operate on ULSD and natural gas depending on the operating status. ULSD will be stored in 40 storage tanks (Source ID# 118S – 157S, Emission Point ID# 118E – 157E) on the property. Natural gas will be delivered via pipeline. Tanks for control device liquids will be located at each powerhouse. There will be 39 tanks each of hydrous ammonia, caustic soda, sulfuric acid, sodium chlorite, and sodium hydrosulfide. These tanks are considered de minimis due to minimal emissions. Liquids and supplies for these tanks will be trucked to the site.

There is no steam-power production at the site. Cooling will be provided by mine pool water as needed. Therefore, there are no requirements for cooling towers.

SITE INSPECTION

A site inspection of the proposed location was conducted on May 20, 2025, by the writer and Joe Kessler (NSR Program Manager) of the DAQ. This is a greenfield site, and no construction or equipment installation was visible at the time of the site inspection. The proposed site is located in an industrial park with no residences nearby. There is a business (Coal Mac) located adjacent to the proposed location.

Directions to the site:

The facility will be located on the property at the Harless Industrial Park near Holden. This site can be accessed from U.S. Route 119 going south from Holden. Turn left onto 22 Mine Road. The proposed location is adjacent to Mohawk Industries.

Aerial view of the proposed site:

The site will be located in an industrial park and situated approximately close to the arrow in the photo found below.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this facility consist of the equipment listed in the following table and fugitive emissions.

Emission Unit ID#	Process Equipment	Calculation Methodology
1S – 117S	Engine 1 – Engine 117 28,194 HP (each)	Manufacturer Data (NOx, CO, PM, VOC, SO_2) EPA AP-42 Emission Factors Chapter 3.2 (HAPs)
118S – 157S	40 – Diesel Storage Tanks 170,000 gal (each)	EPA TANKS Emissions Estimation Software, Version 4.0.9d
De Minimis	39 – Hydrous Ammonia Storage Tanks	De Minimis
De Minimis	39 – Caustic Soda Storage Tanks	De Minimis
De Minimis	39 – Sulfuric Acid Storage Tanks	De Minimis
De Minimis	39 – Sodium Chlorite Storage Tanks	De Minimis
De Minimis	39 – Sodium Hydrosulfide Storage Tanks	De Minimis
HR	Paved Haul Roads	EPA AP-42 Emission Factors, Chapter 13.2.1

The potential emissions from the engines were estimated using the ability to fire the units with natural gas or diesel. The engines at the facility are capable of firing either fuel. The operating hours, operational mode and throughput of each type of fuel will be continuously monitored and recorded. TransGas will keep records of the total amount of hours each engine uses natural gas as a fuel and the total amount of hours each engine uses diesel as a fuel. The 12-month rolling sum of emissions will be calculated monthly.

The emission control systems for the engines consist of two main systems. The dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, which is downstream of the turbocharger. The dry systems consist of an oxidation catalyst and an SCR catalyst. The catalytic reduction of CO has a reduction efficiency of over 99%. The same system oxidizes VOC emissions with a reduction efficiency of 99%. The de-NOx unit is a urea based SCR technology, and the reduction efficiency exceeds 90%. The wet system consists of four (4) stages, which reduce NOx further with 90.9% reduction efficiency and SO_2 with 70% reduction efficiency.

The emission abatement system that will be employed on each engine results in the following emissions reductions when operating in the following modes:

Mode	NOx (%)	CO (%)	VOC/HAP (%)	PM (%)	SO_2 (%)
Speed Up	0	0	0	0	95.0
Fuel Changeover	0	0	0	0	99.0
Generator Switched On	0	0	0	0	99.0
Load Up Cold Control	25.0	25.0	25.0	0	99.0
Normal Operation	99.0	99.0	99.0	25.0	99.0
Compensation Mode	99.0	95.0	99.0	25.0	99.0
Ramp Down	99.0	94.0	99.0	25.0	99.0
Min Load	70.0	50.0	70.0	0	70.0
Spin Out	40.0	35.0	40.0	0	40.0
Emergency	98.0	91.0	99.0	25.0	99.0

As discussed in the DESCRIPTION OF PROCESS and also as shown in the above table, the engines will operate in multiple modes. Under normal operations, the engine will remain comfortably below the PSD threshold. However, to ensure that the facility can be operated under worst-case conditions, the following worst-case scenario was examined.

The pipeline is out for eight (8) days, which equates to 192 hours. During this outage, the facility would be operated only on diesel fuel. During the same year, an unplanned event resulted in 31 engines are down and the remaining 86 engines are operated in compensation mode and will continue to deliver full power. This would increase the engines output to 99.4% load. It was estimated that the compensation mode would last for 24 days or 567 hours. Finally, the engines would have to go through 5 startups and shutdowns in place of the scheduled one (1) event. Using this worst case scenario results in the following hourly breakdown by operational mode:

Mode	Hours
Speed Up	0.42
Fuel Changeover	0.17
Generator Switched On	0.42
Load Up Cold Control	0.83
Normal Operation	7996.80
Compensation Mode	567.20
Ramp Down	1.67
Min Load	0.42
Spin Out	0.08
Emergency	192
Total Time	**8,760**

The operating hours used for the worst-case scenario results in the following potential to emit (PTE) for all of the engines:

Pollutant	**Annual Emissions (tons/year)**
Nitrogen Oxides	194.30
Carbon Monoxide	205.62
Volatile Organic Compounds	116.59
Particulate Matter-10/2.5	186.53
Sulfur Dioxide	9.93
Benzene	0.45
Toluene	0.16
Xylenes	0.11
Formaldehyde	0.046
Acrolein	0.0045
Acetaldehyde	0.013
Naphthalene	0.075
Total Hazardous Air Pollutants	0.86

The following table represents the maximum hourly and annual emissions during *normal operations* for one engine:

Pollutant	**Hourly Emissions (lb/hr)**	**Annual Emissions (tons/year)**
Nitrogen Oxides	0.14	0.61
Carbon Monoxide	0.34	1.47
Volatile Organic Compounds	0.23	0.99
Particulate Matter-10/2.5	0.34	1.49
Sulfur Dioxide	0.01	0.03
Benzene	0.00088	0.00352
Toluene	0.00032	0.00128
Xylenes	0.00022	0.00088
Formaldehyde	0.00009	0.00036
Acrolein	0.00001	0.00004
Acetaldehyde	0.00003	0.00012
Naphthalene	0.00015	0.0006
Total Hazardous Air Pollutants	0.0017	0.0068

Storage Tanks
The potential aggregate emissions for the 40 – 170,000 gallon diesel storage tanks include the losses from working and breathing. Due to the very low vapor pressure of diesel fuel (0.007 psia), the emissions associated with the diesel fuel tanks are low. EPA TANKS 4.09d allows users to enter specific information about a storage tank (dimensions, construction, paint condition, etc.), the liquid contents (chemical components and liquid temperature), and the meteorological conditions and location of the tank (nearest city, ambient temperature, etc.) to generate an air emissions report. Report features include estimates of monthly, annual, or partial year emissions for each chemical or mixture of chemicals stored in the tank. The closest meteorological location available in EPA TANKS 4.09d that was used was Charleston. As stated above, due to the very low vapor pressure of diesel fuel, the emissions associated with the diesel fuel tanks are low. The results of the EPA TANKS 4.09d analysis resulted in the following diesel storage tank emissions:

Pollutant	**Hourly Emissions (lb/hr)**	**Annual Emissions (tons/year)**
Volatile Organic Compounds	7.34	0.75

Truck Loading
There will also be potential emissions associated with the truck loading of the 40 – 170,000 gallon diesel storage tanks. These emissions were accounted for and included as working losses in the aforementioned storage tank emissions.

Paved Haul Roads
There are paved haul road activities associated with this facility. The following table indicates the assumptions made in estimating the emissions:

Operating Condition	**Parameter**
Potential Operating Days	365
Estimated Roundtrip Distance per Vehicle	1.25 miles/vehicle
Fluid Delivery Trucks per Year	5,583
Miscellaneous Vehicles per Year	4,380

Using these operating conditions, the potential emissions associated with these haul road operations result in the following:

Pollutant	**Hourly Emissions (lb/hr)**	**Annual Emissions (tons/year)**
Particulate Matter	2.88	7.16
Particulate Matter-10	0.58	1.43
Particulate Matter-2.5	0.15	0.38

Fugitive Emission Leaks
The fugitive equipment leaks (VOC/HAP) associated with fugitive components (valves, pressure relief valves, connections, flanges, etc.) were estimated using EPA's Protocol for Equipment Leak Emission Estimates Table 2-1 (SOCMI average emission factors) and Table 2-5 (SOCMI screening ranges emission factors) and the component counts associated with the proposed facility. Based on this

analysis, the fugitive equipment leaks associated with this facility would be 0.31 tons per year of VOC and less than 0.01 tons per year of HAPs. The permit does require minimization of fugitive emissions and further requires any above-ground piping, valves, pumps, etc. that shows signs of excess wear that have a reasonable potential for fugitive emissions of regulated air pollutants to be repaired or replaced.

The following table represents the emissions associated with this 45CSR13 construction permit:

Emission Source	Annual Emissions (tons/year)					
	NO_x	**CO**	**VOC**	**SO_2**	**PM_{10}**	**Total HAPs**
Engines	194.30	205.62	116.59	9.93	186.53	0.86
Storage Tanks	-	-	0.75	-	-	-
Paved Haul Roads	-	-	-	-	1.43	-
Fugitive Leaks	-	-	0.31	-	-	0.01
Facility PTE	**194.30**	**205.62**	**117.66**	**9.93**	**187.96**	**0.87**

REGULATORY APPLICABILITY

State

45 CSR 2 - Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers ***(not applicable)***

This rule establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units. 45 CSR 2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. A fuel burning unit is defined in 45 CSR 2 section 2.10 as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. The engines are not fuel burning units because this operation is not their primary purpose. Therefore, these units would not be subject to this rule.

45 CSR 4 - To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors

The purpose of this rule is to prevent and control the discharge of pollutants into the open air which causes or contributes to an objectionable odor or odors. This facility would generally be subject to this rule, however, this type of facility normally does not have issues with odors. However, the DAQ will, using the authority under this rule to respond to complaints involving objectionable odors if confirmed while the facility is operating, and may require mitigation at that time to reduce the odor potential of the source. An objectionable odor must be determined by the DAQ in the course of an inspection or investigation of an actual odor, and is possible to prove quantitatively, pursuant to this rule, that an objectionable odor will be present before a facility is in operation.

45 CSR 10 - To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides ***(not applicable)***

This rule establishes emission limitations for sulfur dioxide which are discharged from fuel burning units. 45 CSR 10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. A fuel burning unit is defined in 45 CSR 10 section 2.8 as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. The engines are not fuel burning units because this operation is not their primary purpose. Therefore, these units would not be subject to this rule.

45 CSR 13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct."

Based upon the potential emissions for the facility, TransGas is required to obtain a permit under 45CSR13 for this facility.

As required under §45-13-8.3 ("Notice Le vel A"), TransGas placed a Class I legal advertisement in the *Williamson Daily News* on April 9, 2025. Additionally, TransGas paid the appropriate application fee of $2,000 ($1,000 45 CSR 13 permit application fee, $1,000 NSPS fee) on April 2, 2025.

45 CSR 14 - Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants ***(not applicable)***
45 CSR 19 - Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment ***(not applicable)***

45CSR14 establishes and adopts a preconstruction permit program for the construction and major modification of major stationary sources in areas of attainment with the National Ambient Air Quality Standards (NAAQS). Mingo County is currently classified as in attainment/unclassifiable with the NAAQS and, therefore, a proposed new "major stationary source" in Mingo County would be subject to the provisions of 45CSR14. The proposed facility is not defined as a source listed under §45-14-2.43(a), therefore, pursuant to 2.4(b), would be defined as a "major stationary source" if any regulated pollutant has a PTE in excess of 250 TPY. The proposed facility, however, does not have a PTE of any regulated pollutant in excess of 250 TPY as shown in the table on the following page, therefore, not defined as a major stationary source and is not subject to the provisions of 45 CSR 14. 45 CSR 19 applies to sources that are located in areas that are classified as non-attainment with the NAAQS. Mingo County is an attainment/unclassified area, therefore, 45 CSR 19 would not apply.

Pollutant	PSD (45CSR14) Threshold (TPY)	NANSR (45CSR19) Threshold (TPY)	Facility PTE (TPY)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	205.62	No
Nitrogen Oxides	250	NA	194.30	No
Sulfur Dioxide	250	NA	9.93	No
Particulate Matter 2.5	250	NA	186.53	No
Ozone (VOC)	250	NA	117.35	No

45 CSR 16 - Standards of Performance for New Stationary Sources

This rule incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources (NSPS) set forth in 40 CFR Part 60 by reference. 45 CSR 16 applies to this source by reference of 40 CFR 60 Subpart IIII. These requirements are discussed under that rule below.

45 CSR 17 - To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

The purpose of this rule is to prevent and control particulate matter air pollution from materials handling, preparation, storage and other sources of fugitive particulate matter. TransGas will ensure appropriate precautions are taken to prevent the escape of fugitive particulate matter beyond the boundary lines of the property.

45 CSR 21 - Control of Air Pollution from the Emission of Volatile Organic Compounds ***(not applicable)***

This rule establishes reasonably available control technology to control emissions of volatile organic compounds from sources that manufacture, mix, store, use, or apply materials containing volatile organic compounds that are located in Cabell, Kanawha, Putnam, Wayne and Wood Counties. This facility is located in Mingo County, and therefore, not applicable to this rule.

45 CSR 27 - To Prevent and Control the Emissions of Toxic Air Pollutants ***(not applicable)***

The purpose of this rule is to prevent and control the discharge of toxic air pollutants requiring the application of best available technology (BAT) for chemical processing units. Section 2.4 defines a chemical processing unit as an assembly of reactors, tanks, distillation columns, heat exchangers, vaporizers, compressors, dryers, decanters, and/or other equipment used to treat, store, manufacture, or use toxic air pollutants. For the purpose of this rule, the term chemical processing unit includes surface coating equipment or similar equipment utilizing a toxic air pollutant as a solvent or for other purposes but does not include equipment used in the production and distribution of petroleum products providing that such equipment does not produce or contact materials containing more than 5% benzene by weight. Potential emissions of toxic air pollutants from this facility result from the combustion of natural gas or diesel in the engines. Regulation of emissions of toxic air pollutants from these unit types are not included in this rule, and therefore, not applicable.

45 CSR 30 - Requirements for Operating Permits

The facility is a major source and is subject to 45CSR30 based upon CO, NOx, PM, and VOC emissions each exceeding 100 tons per year. Due to this facility's PTE over 100 tons per year of a criteria pollutant, TransGas is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30. TransGas is required to pay the appropriate annual operating fees and submit an annual Certified Emissions Statement.

45 CSR 31 - Confidential Information

The purpose of this rule is to establish the requirements for claiming information submitted to the Director as confidential and the procedures for determinations of confidentiality in accordance with the provisions of W. Va. Code §22-5-10. The reason for the CBI submittal is that the application contains information that is fully protected under non-disclosure and confidentiality agreements between the applicant and equipment provider concerning development of the process and facility design. This was previously discussed in detail in the CONFIDENTIAL BUSINESS INFORMATION section.

45 CSR31B – Confidential Business Information and Emission Data

The purpose of this rule is to provide guidance and clarification concerning the term “types and amounts of pollutants discharged” defined under 45 CSR §31-2.4, the DAQ’s legislative rule (45 CSR 31) and thus what information may not be claimed confidential in accordance with 45 CSR §31-6. An in-depth discussion regarding this was previously discussed in detail in the CONFIDENTIAL BUSINESS INFORMATION section.

45 CSR 33 - Acid Rain Provisions and Permits ***(not applicable)***

This rule establishes and adopts general provisions and the operating permit program requirements for affected sources and affected units under the Acid Rain Program promulgated by the United States Environmental Protection Agency under Title IV of the Clean Air Act, as amended (CAA). The rule and associated reference methods, performance specifications and other test methods which are appended to these standards are adopted by reference. These units are exempt under the New Unit Exemption in §40-72.7. See explanation below in Federal for 40 CFR 72 (Permits Regulation).

45 CSR 34 - Emission Standards for Hazardous Air Pollutants

This rule incorporates the federal Clean Air Act (CAA) national emission standards for hazardous air pollutants (NESHAPs) set forth in 40 CFR Parts 61 and 63 by reference. 45 CSR 34 applies to this source by reference of 40 CFR 63 Subpart ZZZZ. These requirements are discussed under that rule below.

45 CSR 40 - Control of Ozone Season Nitrogen Oxide Emissions ***(not applicable)***

The purpose of this rule is to establish ozone season NOx emission limitation, monitoring, recordkeeping, reporting, excess emissions, and NOx budget demonstration requirements for large industrial boilers and combustion turbines that have a maximum design heat input greater than 250

MMBTU/hr, in accordance with 40 CFR §51.121. Ozone season is defined as May 1 through September 30 in the same calendar year. This facility does not have industrial boilers or combustion turbines, therefore, this rule does not apply.

Federal

40 CFR 51.166 - Prevention of Significant Deterioration of Air Quality ***(not applicable)***

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration (PSD) and new and modified sources of non-attainment pollutants under Non-Attainment New Source Review (NANSR). The provisions of this section are captured in the West Virginia state rules discussed above known as 45 CSR 14 (PSD) and 45 CSR 19 (NANSR). Both of these rules are part of West Virginia's State Implementation Plan (SIP).

Mingo County is designated as attainment/unclassifiable for all criteria pollutants. PSD regulations apply when a new source is constructed in which emissions exceed major source thresholds, an existing minor source undergoes modification in which emission increases exceed PSD major source thresholds, or an existing major source undergoes a modification in which emission increases exceed PSD significant emission rates. PSD major source thresholds are 250 tons per year of a regulated pollutant, except for the 28 regulated facility categories. This facility is not one of listed 28 regulated facility categories. Therefore, the PSD major source threshold is 250 tons per year of a regulated pollutant. The emissions associated with this facility is less than the PSD major source threshold, therefore, this rule does not apply.

40 CFR 60 Subpart Kc - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After October 4, 2023 ***(not applicable)***

Subpart Kc applies to storage vessels of volatile organic liquids with capacities greater than or equal to 20,000 gallons for which construction commenced after October 4, 2023. § 60.110c(b)(8) exempts storage vessels that only store volatile organic liquids with a maximum true vapor pressure less than 0.25 psia (1.7 kPa absolute). Each storage vessel at the facility has a capacity of 170,000 gallons. However, the maximum vapor pressure of the storage vessels is 0.007 psia, which is less than 0.25 psia. Therefore, this rule does not apply.

40 CFR 60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

Subpart IIII applies to owners and operators of compression ignition internal combustion engines that commenced construction after July 11, 2005, and were manufactured after April 1, 2006, and not a fire pump engine.

The 28,194 HP engines (1S – 117S) are configured to be dual-fuel units and have the ability to operate on natural gas or diesel fuel, or can be operated on diesel fuel only, in backup mode. Under normal operation, the engines consume natural gas as their primary fuel with a pilot injection of ULSD. Under

natural gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% in emergency operation.

The engines commenced construction after July 11, 2005, are non-emergency engines, were manufactured after April 1, 2006, utilizes diesel fuel, have displacements greater than 30 liters per cylinder, less than 130 rpm, not reducing PM by 60%, do not have diesel particulate filters, and were installed after January 1, 2016. Due to these parameters, the following are the regulatory requirements for each pollutant:

NOx

Emission Limit	3.4 g/KW-hr (2.5 g/HP-hr)
Standards	§60.4204(c)(3)
Monitoring/Testing	§60.4213(e)

PM

Emission Limit	0.15 g/kW-hr (0.11 g/HP-hr)
Standards	§60.4204(c)(4)
Monitoring/Testing	§60.4213(f)

Based upon the proposed hourly emission limits for the engines, the regulatory emission limits will be met.

The following requirements also apply to these pollutants:

Standards	§60.4206, §60.4207(d), §60.4211(d)
Monitoring/Testing	§60.4213(a), (b), (c); §60.4211(d)(1), (d)(3)
Recordkeeping	§60.4214(a)(2), §60.4211(d)(2)
Reporting	§60.4214(a)(1), §60.4211(d)(2)

40 CFR 60 Subpart TTTTa - Standards of Performance for Greenhouse Gas Emissions for Modified Coal-Fired Steam Electric Generating Units and New Construction and Reconstruction Stationary Combustion Turbine Electric Generating Units ***(not applicable)***

Subpart TTTTa applies to stationary combustion turbines that commence construction after May 23, 2023, that also serve a generator or generators capable of selling greater than 25 MW of electricity to a utility power distribution system. There are no combustion turbines at the proposed facility, therefore, Subpart TTTTa is not applicable.

40 CFR 63 Subpart EEEE - National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline) ***(not applicable)***

Subpart EEEE applies to organic liquids storage and distribution at major sources of HAPs. The facility is not a major source of HAPs because its PTE of total HAPs is less than 25 tons per year and its PTE of any single HAP is less than 10 tons per year. Therefore, Subpart EEEE does not apply.

40 CFR 63 Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)

Subpart ZZZZ applies to stationary combustion RICE at area and major sources of HAPs. As stated in §63.6590(c), stationary RICE that are subject to regulations under 40 CFR 60 (IIII) must meet those requirements, and no further requirements apply for these units under this subpart.

40 CFR 64 - Compliance Assurance Monitoring ***(not applicable)***

Compliance Assurance Monitoring (CAM) applies to pollutant-specific emissions units at a major source under 40 CFR 70. The facility is not a major source under 40 CFR 70; therefore, CAM does not apply.

40 CFR 72 - Permits Regulation ***(not applicable)***

The purpose of this part is to establish certain general provisions and the operating permit program requirements for affected sources and affected units under the Acid Rain Program, pursuant to title IV of the Clean Air Act, 42 U.S.C. 7401, et seq., as amended by Public Law 101-549 (November 15, 1990).

The nameplate capacity of the generators attached to each unit is 25 MWe or less. The units do not burn coal or a coal-derived fuel, and burns fuel with sulfur of 0.05% or less by weight. Therefore, these units are exempt under the New Unit Exemption in Section 72.7 and are exempt from permit requirements, monitoring, and allowance holdings, except for the provisions of §72.7 itself, and §72.2 through 72.6 (definitions, measurements, abbreviations, and acronyms, federal authority, state authority, and applicability) and 72.10 through 72.13 (availability of information, computation of time, administrative appeals, and incorporation by reference).

40 CFR 97 Subpart DDDDD - Federal NOx Budget Trading Program, CAIR NOx and SO_2 Trading Programs, CSAPR NOx and SO_2 Trading Programs, and Texas SO_2 Trading Program ***(not applicable)***

This rule sets forth the general, designated representative, allowance, and monitoring provisions for the Cross-State Air Pollution Rule (CSAPR) SO_2 Group 2 Trading Program, under section 110 of the Clean Air Act and §52.39 of this chapter, as a means of mitigating interstate transport of fine particulates and sulfur dioxide.

This rule applies to fossil-fuel-fired combustion turbines serving at any time, on of after January 1, 2005, a generator with a nameplate capacity of more than 25 MWe producing electricity for sale. These units are RICEs and not combustion turbines. Additionally, the nameplate capacity of the generators attached to each unit is 25 Mwe. Therefore, this regulation does not apply.

ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides information on those regulated pollutants that are not classified as "criteria pollutants". Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NOx), Ozone, Particulate Matter (PM_{10} and $PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect public health and welfare. Other pollutants of concern, although designated as non-criteria *and without national air quality standards*, are regulated through various state and federal programs designed to limit their emissions and public exposure. These programs include federal source-specific HAP regulations promulgated under 40 CFR 61 and 40 CFR 63 (NESHAPS/MACT), and WV Legislative Rule 45 CSR 27 that regulates certain HAPs as Toxic Air Pollutants (TAPs). Any potential applicability to these programs were addressed in the REGULATORY APPLICABILITY section of this document.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows, or suspects *may* cause cancer or other serious human health effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. It is also important to note that the USEPA does not divide the various HAPs into further classifications based on toxicity or if the compound is a suspected carcinogen. The HAP emissions associated with this application are found in the ESTIMATE OF EMISSIONS section of this document. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

The HAPs emitted from the proposed facility are created during the combustion of natural gas and diesel fuel. The HAP emission values were estimated using EPA AP-42: Compilation of Air Emissions Factors from Stationary Sources. AP-42 contains emission factors and process information for more than 200 air pollution source categories. AP-42 Chapter 3.2 contains HAP emission factors for reciprocating engines.

The table on the following page lists each HAP currently identified by TransGas as potentially being emitted based upon the information available in AP-42 Chapter 3.2, Tables 3.2-1, 3.2-3, and 3.2-4. Additionally, the Chemical Abstracts Service (CAS) registry number, the type of HAP, the PTE of the individual HAP, and any potentially applicable Most Available Control Technology (MACT) is provided.

Pollutant	CAS #	Type	PTE (TPY)	MACT[1]
Acetaldehyde	75-07-0	VOC	0.013	None
Acrolein	107-02-8	VOC	0.0045	None
Benzene	71-43-2	VOC	0.448	None
Formaldehyde	50-00-0	VOC	0.046	None
Naphthalene	91-20-3	VOC	0.075	None
Toluene	108-88-3	VOC	0.163	None
Xylenes	1330-20-7	VOC	0.111	None

[1] Does a MACT apply to this specific HAP for any emission unit at the facility? See REGULATORY APPLICABILITY section for discussion.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source because the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as discussed in the Regulatory Discussion Section.

SOURCE AGGREGATION

“Building, structure, facility, or installation” is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

TransGas has an option on the site with the current owner, therefore, they do have control of the proposed site. There are no other emission units belonging to the same industrial grouping, under common control, and located on contiguous or adjacent properties with the facility. Therefore, the emissions from the Adams Fork Harless Data Center facility should not be aggregated in determining Title V or PSD status.

MONITORING, RECORDKEEPING, REPORTING, AND TESTING (MRRT) OF OPERATIONS

TransGas will be required to perform the following MRRT:

- **Operational Limitations**
  - Operating limits will be established on the engines. TransGas will be required to monitor the operating hours, operational mode, and the throughput of each type of fuel will be continuously monitored and recorded for each engine. Required to keep records of the total amount of hours each engine uses natural gas as a fuel and the total amount of hours each engine uses diesel as a fuel. The 12-month rolling sum of emissions will be calculated monthly.
- **40 CFR 60 Subpart IIII MRRT**
  - Monitor and utilize diesel fuel that meets a maximum per-gallon sulfur content of 1,000 ppm. [§60.4207(d)]
  - Conduct an initial performance test to demonstrate initial compliance with the emission standards as specified in §60.4213. [§60.4211(d)(1)]
  - Conduct an annual performance test to demonstrate initial compliance with the emission standards as specified in §60.4213. [§60.4211(d)(3)]
  - Keep records of the information in paragraphs (a)(2)(i) through (iv) of this section.
    - (i) All notifications submitted to comply with this subpart and all documentation supporting any notification.
    - (ii) Maintenance conducted on the engine.
    - (iii) If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.
    - (iv) If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards. [§60.4214(a)(2)]
  - Establish operating parameters to be monitored continuously to ensure the stationary internal combustion engine continues to meet the emission standards. The owner or operator must petition the Administrator for approval of operating parameters to be monitored continuously. The petition must include the information described in paragraphs (d)(2)(i) through (v) of this section.
    - (i) Identification of the specific parameters you propose to monitor continuously;
    - (ii) A discussion of the relationship between these parameters and NOX and PM emissions, identifying how the emissions of these pollutants change with changes in these parameters, and how limitations on these parameters will serve to limit NOX and PM emissions;
    - (iii) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;
    - (iv) A discussion identifying the methods and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and
    - (v) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters. [§60.4211(d)(2)]

    - Submit an initial notification as required in § 60.7(a)(1). The notification must include the information in paragraphs (a)(1)(i) through (v) of this section. Beginning on February 26, 2025, submit the notification electronically according to paragraph (g) of this section.
        - (i) Name and address of the owner or operator;
        - (ii) The address of the affected source;
        - (iii) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
        - (iv) Emission control equipment; and
        - (v) Fuel used. [§60.4214(a)(1)]
- **Tank Throughput and Loading**
    - TransGas will be required to monitor the tank throughput and loading operations for each storage tank. The 12-month rolling sum of throughputs/emissions will be calculated monthly.
- **45 CSR 17 Fugitive Sources of Particulate Matter**
    - Sources of fugitive particulate matter at the facility include diesel truck and employee traffic on paved plant roads. Conduct a visual inspection of the paved roads once each operating day to ensure no fugitive emissions are generated. When needed, roads will be swept and/or watered to minimize fugitive dust. Records will be kept of the inspections and any corrective actions.
- Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location.
- Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
- Maintain a record of all PTE HAP calculations for the entire facility.

The records shall be maintained on site or in a readily available off-site location maintained by TransGas for a period of five (5) years.

STATUTORY AUTHORITY OF THE DAQ

The statutory authority of the DAQ is given under the Air Pollution Control Act (APCA) – West Virginia Code §22-5-1, *et. seq.* – which states, under §22-5-1 ("Declaration of policy and purpose"), that:

> It is hereby declared that public policy of this state and the purpose of this article is to achieve and maintain such levels of air quality ***as will*** (underlining and emphasis added) protect human health and safety, and to the greatest degree practicable, prevent injury to plant and animal life and property, foster the comfort and convenience of the people, promote the economic and social development of this state and facilitate the enjoyment of the natural attractions of this state.

Therefore, while the code states that the intent of the rule includes the criteria outlined in the latter part of the above sentence, it is clear by the underlined and bolded section of the above sentence that the scope of the delegated authority does not extend beyond the *impact of air quality* on these criteria. Based on the language under §22-5-1, *et. seq.*, the DAQ, in making determinations on issuance or denial of permits under WV Legislative Rule 45 CSR 13 (45 CSR 13), does not take into consideration

substantive non-air quality issues such as job creation, economic viability of proposed project, strategic energy issues, non-air quality environmental impacts, nuisance issues, etc.

The basis for issuance or denial of an air quality permit is given under 45 CSR 13. Pursuant to §45-13-5.7, the DAQ shall issue a permit unless:

> a determination is made that the proposed construction, modification, registration or relocation will violate applicable emission standards, will interfere with attainment or maintenance of an applicable ambient air quality standard, cause or contribute to a violation of an applicable air quality increment, or be inconsistent with the intent and purpose of this rule or W. Va. Code § 22-5-1, et seq., in which case the Secretary shall issue an order denying such construction, modification, relocation and operation. The Secretary shall, to the extent possible, give priority to the issuance of any such permit so as to avoid undue delay and hardship.

It is clear under 45 CSR 13 that denial of a permit must be based on one of the above explicitly stated criteria or, as noted, is inconsistent with 45 CSR 13 or §22-5-1, *et. seq*. As is stated above, it is the DAQ's position that the intent of both the APCA and 45 CSR 13 is to circumscribe the authority of the DAQ to air quality issues as outlined in the APCA and in West Virginia's State Implementation Plan (SIP).

The air quality issues evaluated relating to TransGas' proposed construction are outlined in this document. All applicable and potentially applicable rules were evaluated in the REGULATORY DISCUSSION section. The items covered under that section represent the extent of the substantive air quality issues over which the DAQ has authority to evaluate under 45 CSR 13 and the APCA as relating to this permit application.

RECOMMENDATION TO DIRECTOR

The information provided in permit application R13-3714 indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director that the DAQ go to public notice with a preliminary determination to issue Permit Number R13-3714 to TransGas for the proposed construction of the Adams Fork Harless Data Center Energy Campus located in Holden, Mingo County, WV.

Jerry Williams, P.E.
Engineer

7. Public Notice R13-3714

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off-grid power generation facility (Adams Fork Harless Data Center Energy Campus) located at 22 Mine Road, near Holden, Mingo County WV at latitude 37.75302 and longitude -82.11905. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3714.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.66 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 193.69 TPY; Particulate Matter less than 10 microns in diameter, 187.96 TPY; Particulate Matter less than 2.5 microns in diameter, 186.91 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304-926-0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

8. Draft Permit R13-3715

West Virginia Department of Environmental Protection

Harold D. Ward
Cabinet Secretary

Construction Permit

R13-3715

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 C.S.R. 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

TransGas Development Systems, LLC
Adams Fork Data Center Energy Campus
059-00134

Laura M. Crowder
Director, Division of Air Quality

Issued: Draft

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Facility Location:	2002 Twisted Gun Road, Wharncliffe, Mingo County, West Virginia
Mailing Address:	630 First Avenue, Suite 30C, New York, NY 10016-3799
Facility Description:	Off-grid Power Generation Facility
NAICS Codes:	221112 – Fossil Fuel Electric Power Generation
UTM Coordinates:	415.706 km Easting • 4,161.7222 km Northing • Zone 17
Latitude/Longitude:	37.59372 / -81.95491
Permit Type:	Construction
Description of Change:	Construction and operation of an off-grid power generation facility.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

As a result of the granting of this permit, the source is subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the date of the commencement of the operation or activity (activities) authorized by this permit, unless granted a deferral or exemption by the Director from such filing deadline pursuant to a request from the permittee.

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1.0. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
1S – 117S	1E – 117E	Engine 1 – Engine 117	2026	28,194 HP (each)	1C – 117C
118S – 157S	118E – 157E	ULSD Tanks (TK1 – TK40)	2026	170,000 gal (each)	None
DM	DM	Hydrous Ammonia Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Caustic Soda Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Sulfuric Acid Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Sodium Chlorite Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Sodium Hydrosulfide Tanks 1-39	2026	4,600 gal (each)	None
UNLOAD	UNLOAD-E	Diesel Truck Unloading	2026	3,907,000 gal (normal operation)	None

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2.0. General Conditions

2.1. Definitions

2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.

2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.

2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments
CBI	Confidential Business Information
CEM	Continuous Emission Monitor
CES	Certified Emission Statement
C.F.R. *or* CFR	Code of Federal Regulations
CO	Carbon Monoxide
C.S.R. *or* CSR	Codes of State Rules
DAQ	Division of Air Quality
DEP	Department of Environmental Protection
dscm	Dry Standard Cubic Meter
FOIA	Freedom of Information Act
HAP	Hazardous Air Pollutant
HON	Hazardous Organic NESHAP
HP	Horsepower
lbs/hr	Pounds per Hour
LDAR	Leak Detection and Repair
M	Thousand
MACT	Maximum Achievable Control Technology
MDHI	Maximum Design Heat Input
MM	Million
MMBtu/hr *or* mmbtu/hr	Million British Thermal Units per Hour
MMCF/hr *or* mmcf/hr	Million Cubic Feet per Hour
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NO_X	Nitrogen Oxides
NSPS	New Source Performance Standards
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter less than 2.5 μm in diameter
PM_{10}	Particulate Matter less than 10μm in diameter
Ppb	Pounds per Batch
Pph	Pounds per Hour
Ppm	Parts per Million
Ppm_V or ppmv	Parts per Million by Volume
PSD	Prevention of Significant Deterioration
Psi	Pounds per Square Inch
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
TPY	Tons per Year
TRS	Total Reduced Sulfur
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
VEE	Visual Emissions Evaluation
VOC	Volatile Organic Compounds
VOL	Volatile Organic Liquids

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2.3. Authority

This permit is issued in accordance with West Virginia air pollution control law W.Va. Code §§ 22-5-1. et seq. and the following Legislative Rules promulgated thereunder:

2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation*;

2.4. Term and Renewal

2.4.1. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Application R13-3715 and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.10 and -10.3.]

2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;

2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;

2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

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2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-4.]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-5.4.]

2.10 Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.
[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;

d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. *[Reserved]*

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety,

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or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. **[45CSR§13-10.1.]**

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

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3.0. Facility-Wide Requirements

3.1. Limitations and Standards

3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]

3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]

3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management, and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]

3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1] ***[State Enforceable Only]***

3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]

3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

3.2.1. **Emission Limit Averaging Time.** Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months. Compliance with all hourly emission limits shall be based on the applicable NAAQS averaging times or, where applicable, as given in any approved performance test method.

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3.3. Testing Requirements

3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.

b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.

c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:

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1. The permit or rule evaluated, with the citation number and language;
2. The result of the test for each permit or rule condition; and,
3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports, and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. *State Enforceable Only.*]

3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.

3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class or by private carrier with postage prepaid to the address(es), or submitted in electronic format by email as set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

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DAQ:
Director
WVDEP
Division of Air Quality
601 57th Street
Charleston, WV 25304-2345

US EPA:
Section Chief, USEPA, Region III
Enforcement and Compliance Assurance Division
Air Section (3ED21)
Four Penn Center
1600 John F Kennedy Blvd
Philadelphia, PA 19103-2852

DAQ Compliance and Enforcement[1]:
DEPAirQualityReports@wv.gov

[1]For all self-monitoring reports (MACT, GACT, NSPS, etc.), stack tests and protocols, Notice of Compliance Status Reports, Initial Notifications, etc.

3.5.4. **Operating Fee**

3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.

3.5.4.2. In accordance with 45CSR30 – Operating Permit Program, enclosed with this permit is a Certified Emissions Statement (CES) Invoice, from the date of initial startup through the following June 30. Said invoice and the appropriate fee shall be submitted to this office no later than 30 days prior to the date of initial startup. For any startup date other than July 1, the permittee shall pay a fee or prorated fee in accordance with Section 4.5 of 45CSR22. A copy of this schedule may be found attached to the Certified Emissions Statement (CES) Invoice.

3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

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4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. The facility shall consist of only the pollutant-emitting equipment and processes identified under Section 1.0 of this permit. In accordance with the information filed under Permit Application R13-3715, the equipment shall be installed, maintained and operated so as to minimize any fugitive escape of pollutants and the equipment/processes shall use the specified air pollution control devices.

4.1.2. **Maximum Horsepower.** The maximum horsepower of each engine (1S – 117S) shall be 28,194 hp.

4.1.3. **Operation Modes.** The engines (1S – 117S) have the ability to operate in the following operational modes. Each operation mode shall abide by the descriptions included in Permit Application R13-3715.

Operation Mode
Normal
Compensation
Emergency
Startup (Speed Up, Fuel Switch, Generator Switched On, Load Up Cold Control)
Shutdown (Ramp Down, Min Load, Spin Out)

4.1.4. The maximum hourly emissions during each operating mode shall not exceed the following for each engine (1S – 117S):

a. Normal

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	0.14
Carbon Monoxide	0.34
Volatile Organic Compounds	0.23
Particulate Matter-10/2.5[1]	0.34
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.004

[1] Includes both filterable and condensable particulate matter.

b. Compensation

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	0.46
Carbon Monoxide	1.41
Volatile Organic Compounds	0.27
Particulate Matter-10/2.5[1]	0.53
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.005

[1] Includes both filterable and condensable particulate matter.

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c. Emergency

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	10.35
Carbon Monoxide	0.58
Volatile Organic Compounds	0.29
Particulate Matter-10/2.5[1]	1.29
Sulfur Dioxide	0.11
Total Hazardous Air Pollutants	0.005

[1] Includes both filterable and condensable particulate matter.

d. Startup – Speed Up

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	89.54
Carbon Monoxide	2.50
Volatile Organic Compounds	19.49
Particulate Matter-10/2.5[1]	0.34
Sulfur Dioxide	0.10
Total Hazardous Air Pollutants	0.32

[1] Includes both filterable and condensable particulate matter.

e. Startup – Fuel Switch

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	4.81
Carbon Monoxide	8.65
Volatile Organic Compounds	13.07
Particulate Matter-10/2.5[1]	0.53
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.22

[1] Includes both filterable and condensable particulate matter.

g. Startup – Generator Switched On

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	8.15
Carbon Monoxide	9.25
Volatile Organic Compounds	12.48
Particulate Matter-10/2.5[1]	0.46
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.21

[1] Includes both filterable and condensable particulate matter.

h. Startup – Load Up Cold Control

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	6.94
Carbon Monoxide	7.16
Volatile Organic Compounds	9.14
Particulate Matter-10/2.5[1]	0.43
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.15

[1] Includes both filterable and condensable particulate matter.

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i. Shutdown – Ramp Down

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	0.10
Carbon Monoxide	0.83
Volatile Organic Compounds	0.15
Particulate Matter-10/2.5[1]	0.32
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.003

[1] Includes both filterable and condensable particulate matter.

j. Shutdown – Min Load

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	2.44
Carbon Monoxide	4.62
Volatile Organic Compounds	3.75
Particulate Matter-10/2.5[1]	0.46
Sulfur Dioxide	0.07
Total Hazardous Air Pollutants	0.06

[1] Includes both filterable and condensable particulate matter.

k. Shutdown – Spin Out

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	2.89
Carbon Monoxide	5.62
Volatile Organic Compounds	7.84
Particulate Matter-10/2.5[1]	0.53
Sulfur Dioxide	0.07
Total Hazardous Air Pollutants	0.13

[1] Includes both filterable and condensable particulate matter.

4.1.5. The maximum aggregate total annual emissions[1] from the engines (1S – 117S) shall not exceed the following:

Pollutant	Maximum Annual Emissions (tons/year)[1]
Nitrogen Oxides	194.30
Carbon Monoxide	205.62
Volatile Organic Compounds	116.59
Particulate Matter-10/2.5[2]	186.53
Sulfur Dioxide	9.93
Total Hazardous Air Pollutants	0.86

[1] Includes all operation modes in permit condition 4.1.4.
[2] Includes both filterable and condensable particulate matter.

Compliance with the annual emission limits shall be determined by multiplying each operational mode hourly emissions in permit condition 4.1.4 by the hours operated in each operation mode.

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4.1.6. The permittee shall meet the air pollution control technology requirements for each engine (1S – 117S). The emission control systems for the engines consist of two main systems. The dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, which is downstream of the turbocharger. The dry systems consist of an oxidation catalyst and an SCR catalyst. The catalytic reduction of CO has a reduction efficiency of over 99%. The same system oxidizes VOC emissions with a reduction efficiency of 99%. The de-NOx unit is a urea based SCR technology, and the reduction efficiency exceeds 90%. The wet system consists of four (4) stages, which reduce NOx further with 90.9% reduction efficiency and SO2 with 70% reduction efficiency. The emission abatement system (dry and wet) that will be employed on each engine shall meet the following emissions reductions when operating in the following modes:

Mode	NOx (%)	CO (%)	VOC (%)	PM (%)	SO_2 (%)
Speed Up	0	0	0	0	95.0
Fuel Changeover	0	0	0	0	99.0
Generator Switched On	0	0	0	0	99.0
Load Up Cold Control	25.0	25.0	25.0	0	99.0
Normal Operation	99.0	99.0	99.0	25.0	99.0
Compensation Mode	99.0	95.0	99.0	25.0	99.0
Ramp Down	99.0	94.0	99.0	25.0	99.0
Min Load	70.0	50.0	70.0	0	70.0
Spin Out	40.0	35.0	40.0	0	40.0
Emergency	98.0	91.0	99.0	25.0	99.0

4.1.7. During startup and shutdown operations, the permittee shall minimize emissions by:

a. Operating and maintaining the engines (1S – 117S) and associated air pollution control devices (1C – 117C) in accordance with good combustion and air pollution control practices, safe operating practices, and protection of the facility. Good combustion and air pollution control practices shall mean proper operation and maintenance of the engine control systems and air pollution control equipment in accordance with manufacturer specifications. Additionally, it shall mean such practices that promote sufficient residence time of fuel in the combustion zone, thorough mixing of air and fuel, and proper combustion temperatures.

b. Implementing operations and maintenance practices comprised of maintaining a high level of steady state operation time and minimizing (as much as practicable) the frequency of startup and shutdown events.

4.1.8. **Fuel Throughput Parameters.** The engines (1S – 117S) are capable of firing natural gas with co-firing diesel or diesel fuel only. The following maximum hourly fuel consumptions apply to the engines:

Mode	Maximum NG Hourly Throughput (scf/hr per engine)	Maximum Diesel Hourly Throughput (gal/hr per engine)[1]
Speed Up	0	143.46
Fuel Changeover	13,994	1.43
Generator Switched On	27,459	2.35
Load Up Cold Control	33,993	2.61
Normal Operation	98,924	3.91
Compensation Mode	138,112	3.91
Ramp Down	52,882	3.13
Min Load	27,459	2.35
Spin Out	13,994	1.43
Emergency	0	798.13

[1] Sulfur content of ultra-low sulfur diesel (ULSD) fuel shall be less than 15 ppm.

4.1.9. **Annual Operational Limitation.**

a. The operating hours of each engine (1S – 117S), the throughput of each type of fuel (natural gas/diesel), and operation mode (permit condition 4.1.3) will be continuously monitored and recorded. The permittee will keep records of the fuel consumption (natural gas/diesel), and operating hours (natural gas/diesel) for each engine. The 12-month rolling sum of emissions will be calculated monthly.

b. Natural gas and diesel fuel meters shall be installed on each engine (1S – 117S).

c. Operational hour meters shall be installed on each engine (1S – 117S).

4.1.10. In order to minimize NOx emissions, within 180 days of startup, the permittee shall determine the optimal injection rate of aqueous ammonia into the SCR. The permittee shall then operate the SCR at the determined optimal injection rate.

4.1.11. The permittee shall meet the following emission standards:

a. For engines (1S – 117S) installed on or after January 1, 2016, limit the emissions of NOX in the stationary CI internal combustion engine exhaust to the following:

i. 3.4 g/KW-hr (2.5 g/HP-hr) when maximum engine speed is less than 130 rpm;
ii. Reduce particulate matter (PM) emissions by 60 percent or more, or limit the emissions of PM in the stationary CI internal combustion engine exhaust to 0.15 g/KW-hr (0.11 g/HP-hr).

[40CFR§60.4204(c)]

4.1.12. The permittee must operate and maintain stationary CI ICE that achieve the emission standards as required in §§ 60.4204 and 60.4205 over the entire life of the engines (1S – 117S).
[40CFR§60.4206]

4.1.13. The permittee shall meet the following fuel requirements:

a. Beginning June 1, 2012, owners and operators of stationary CI ICE subject to this subpart with a displacement of greater than or equal to 30 liters per cylinder must use diesel fuel that meets a maximum per-gallon sulfur content of 1,000 parts per million (ppm).
[40CFR§60.4207(d)]

4.1.14. The engines (1S – 117S) shall use the air pollution control devices (1C – 117C) specified in Section 1.0 and permit condition 4.1.6 and identified in Permit Application R13-3715 at all times when in operation except during periods of startup and shutdown when operating temperatures do not allow for proper use of the air pollution control devices.

4.1.15. The maximum annual throughput of diesel fuel to the storage tanks shall not exceed the following:

Storage Tank ID	Nominal Capacity (gal)	Product Stored	Maximum Annual Throughput (gal/yr)
TK1 – TK40	170,000 (each)	Diesel Fuel	3,907,000 (all tanks) Normal Operation

4.1.16. The storage tanks (TK1 – TK40) shall be designed and operated as specified in the paragraphs (a) through (c).

a. The cover and all openings on the cover (e.g., access hatches, sampling ports, pressure relief valves and gauge wells) shall form a continuous impermeable barrier over the entire surface area of the liquid in the storage vessel.

b. Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) whenever material is in the unit on which the cover is installed except during those times when it is necessary to use an opening as follows:

(i) To add material to, or remove material from the unit (this includes openings necessary to equalize or balance the internal pressure of the unit following changes in the level of the material in the unit);

(ii) To inspect or sample the material in the unit; or

(iii) To inspect, maintain, repair, or replace equipment located inside the unit.

c. The storage tanks (TK1 – TK40) thief hatch shall be weighted and properly seated. **[45CSR§13-5.10]**

4.1.17. The permittee shall comply with all applicable provisions of 45 CSR 17 to minimize fugitive particulate matter emissions on the haul roads.

4.1.18. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.10]

4.1.19. The permittee shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to minimize any fugitive escape of regulated air pollutants (leak). Any above-ground piping, valves, pumps, etc. that shows signs of excess wear that have a reasonable potential for fugitive emissions of regulated air pollutants shall be repaired or replaced.
[45CSR§13-5.10]

4.2. Monitoring Requirements

4.2.1. To determine compliance with permit conditions 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, and 4.1.9, the permittee shall monitor the operation type (listed in permit condition 4.1.4), number of startup/shutdown events, and hours of operation in each operating mode (natural gas/diesel) on a daily basis.

4.2.2. To demonstrate compliance with permit condition 4.1.8, the permittee shall monitor fuel consumption (natural gas/diesel) on a daily basis.

4.2.3. To demonstrate compliance with permit conditions 4.1.10 and 4.1.14, the permittee shall monitor the operating times for the air pollution control devices on at least an hourly basis.

4.2.4. The permittee will install air pollution control devices on the engines (1S – 117S) to show compliance with permit condition 4.1.6.b. The air pollution control devices shall be continuously

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monitored to verify proper operation. The permittee shall operate the air pollution control devices in accordance with manufacturer specifications. **[45CSR§13-5.10]**

4.2.5. To demonstrate compliance with permit condition 4.1.15, the permittee shall monitor diesel fuel unloading on a daily basis.

4.2.6. To demonstrate compliance with permit condition 4.1.17, the permittee shall conduct a visible inspection of the paved roads once each operating day to ensure no fugitive particulate matter emissions from diesel truck and employee traffic are generated. If necessary, roads will be swept and/or watered to minimize fugitive particulate matter.

4.2.7. The permittee shall, at the time of initial startup, maintain on-site and have readily available to be made available to the Director or his/her representative upon request, a copy of the all current vendor guarantees relevant to the air emissions associated with the facility. This includes information relating to the performance of both emission units and control devices.

4.2.8. The permittee shall meet all applicable requirements, including those not specified above, as given under 45 CSR 4, 45 CSR 13, 45 CSR 16, 45 CSR 17, 45 CSR 30, 45 CSR 34, 40 CFR 60, Subpart IIII, and 40 CFR 63 Subpart ZZZZ. Any final revisions made to the above rules will, where applicable, supercede those specifically cited in this permit.

4.2.9. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit, and time of sampling or measurements;
b. The date(s) analyses were performed;
c. The company or entity that performed the analyses;
d. The analytical techniques or methods used;
e. The results of the analyses; and
f. The operating conditions existing at the time of sampling or measurement.

4.3. Testing Requirements

4.3.1. See Facility-Wide Testing Requirements Section 3.3.

4.3.2. The permittee shall meet the following testing requirements for the engines (1S – 117S):

a. Conduct an initial performance test to demonstrate initial compliance with the emission standards as specified in § 60.4213.

b. Establish operating parameters to be monitored continuously to ensure the stationary internal combustion engine continues to meet the emission standards. The owner or operator must petition the Administrator for approval of operating parameters to be monitored continuously. The petition must include the information described in paragraphs (d)(2)(i) through (v) of this section.

i. Identification of the specific parameters you propose to monitor continuously;

ii. A discussion of the relationship between these parameters and NOX and PM emissions, identifying how the emissions of these pollutants change with changes in these parameters, and how limitations on these parameters will serve to limit NOX and PM emissions;

iii. A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

iv. A discussion identifying the methods and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

v. A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

c. For non-emergency engines with a displacement of greater than or equal to 30 liters per cylinder, conduct annual performance tests to demonstrate continuous compliance with the emission standards as specified in § 60.4213.

[40CFR§4211(d)]

4.4. Recordkeeping Requirements

4.4.1. To determine compliance with permit conditions 4.1.5, 4.1.8, and 4.1.9, the permittee shall keep records of the operating hours of each engine, the throughput of each type of fuel (natural gas/diesel), and operation type (as outlined in permit condition 4.1.4) on a daily basis. The permittee shall multiply the hourly operation type emissions in permit condition 4.1.4 by the number of hours operated in that operational mode. The permittee shall calculate the emissions monthly and on a twelve-month rolling total. A twelve-month rolling total shall mean the sum of operating hours at any given time during the previous twelve consecutive calendar months.

4.4.2. To determine compliance with permit condition 4.2.7, the permittee shall keep records of the daily road particulate matter fugitive inspections and any corrective actions taken.

4.4.3. To determine compliance with permit conditions 4.1.15 and 4.2.6, the permittee shall keep records of the diesel unloading on a daily basis. Compliance with the throughput limit shall be determined on a 12 month rolling total basis.

4.4.4. To demonstrate compliance with permit condition 4.1.19, the permittee shall keep records of the fugitive emissions components repairs and replacements.

4.4.5. The permittee shall keep the following engine (1S – 117S) records:

a. All notifications submitted to comply with this subpart and all documentation supporting any notification.

b. Maintenance conducted on the engine.

c. If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.

d. If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards.

[40CFR§4214(a)(2)]

4.5. Reporting Requirements

4.5.1. See Facility-Wide Reporting Requirements Section 3.5.

4.5.2. The permittee shall submit notifications of the date construction commences, the actual date of initial startup as required under §60.7. The notification must include the information below. Beginning on February 26, 2025, submit the notification electronically according to paragraph (g) of this section.

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a. Name and address of the owner or operator;

b. The address of the affected source;

c. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

d. Emission control equipment; and

e. Fuel used.
[40CFR§4214(a)(1)]

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CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature[1] (please use blue ink) _____ Responsible Official or Authorized Representative _____ Date

Name & Title (please print or type) _____ Name _____ Title

Telephone No. _____ Fax No. _____

[1] This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:

a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), or

(ii) the delegation of authority to such representative is approved in advance by the Director;

b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of U.S. EPA); or

d. The designated representative delegated with such authority and approved in advance by the Director.

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9. Engineering Evaluation R13-3715

west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Harold D. Ward, Cabinet Secretary
dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3715
Plant ID No.:	059-00134
Applicant:	TransGas Development Systems, LLC
Facility Name:	Adams Fork Data Center Energy Campus
Location	Wharncliffe, Mingo County
NAICS Code:	221112 – Fossil Fuel Electric Power Generation
Application Type:	Construction
Received Date:	March 26, 2025 (Revised application submitted May 14, 2025)
Engineer Assigned:	Jerry Williams
Fee Amount:	$2,000 ($1,000 45 CSR 13 Application Fee, $1,000 NSPS Fee)
Date Received:	April 2, 2025
Complete Date:	June 4, 2025
Due Date:	September 2, 2025
Applicant Ad Date:	April 9, 2025
Newspaper	*Williamson Daily News*
UTM's:	Easting: 415.706 km Northing: 4,161.722 km Zone: 17
Latitude/Longitude:	37.59372 / -81.95491
Description:	Construction and operation of an off-grid power generation facility.

CONFIDENTIAL BUSINESS INFORMATION OVERVIEW

TransGas Development Systems, LLC (TransGas) submitted an air permit application for an off-grid power generation facility to be located near Wharncliffe in Mingo County. This permit application included confidential business information (CBI) submitted under 45 CSR 31, entitled "Confidential Information". Therefore, both a CBI and redacted version of the application were submitted. TransGas provided all CBI under the requirements of 45 CSR 31, which is the Division of Air Quality (DAQ)

regulation that establishes the requirements for claiming information submitted to the DAQ as confidential and the procedures for determinations of confidentiality in accordance with the provisions of W. Va. Code §22-5-10.

The reason for the CBI submittal according to TransGas is that the application contains information that is fully protected under non-disclosure and confidentiality agreements between the applicant and equipment provider concerning development of the process and facility design. Release of this information could cause substantial harm to TransGas' competitive position in the market. For each submission of information any portion of which is claimed to be confidential, a complete set of the information, including the document justifying the claim of confidentiality shall be submitted simultaneously on uncolored paper with the information claimed to be confidential blacked out, and with the words "redacted copy – claim of confidentiality" marked clearly on each such page, so that such a set of information is suitable for public disclosure and provides notice to the public that a claim of confidentiality has been made. DAQ allows for electronic submittals (via email) of redacted permit applications. However, all CBI applications must be submitted via mail or hand delivered. During the Notice of Application period, the DAQ received a public comment concerning the proposed project, which specifically requested the release of information that has been redacted.

As stated in 45 CSR 31, Section 4, during the course of the DAQ's review of whether the information claimed to be confidential is a trade secret in accordance with this rule, the DAQ shall consider the following:

- The claim of confidentiality has not expired by its terms, nor been waived or withdrawn;
- The person asserting the claim of confidentiality has satisfactorily shown that it has taken reasonable measures to protect the confidentiality of the information, and that it intends to continue to take such measures;
- The information claimed confidential is not, and has not been, reasonably obtainable without the person's consent by other persons (other than governmental bodies) by use of legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding);
- No statute specifically requires disclosure of the information; and
- Either the person has satisfactorily shown that disclosure of the information is likely to cause substantial harm to the business's competitive position or the information is voluntarily submitted information, and its disclosure would likely to impair the State's ability to obtain necessary information in the future.

Additionally, 45 CSR 31, Section 6, states that no person shall claim as confidential, information concerning the types and amounts of pollutants discharged. "Types and amounts of air pollutants discharged" is defined in 45 CSR 31 Section 2.4. Furthermore, 45 CSR 31B entitled "Confidential Business Information and Emission Data" is an interpretive rule that provides guidance and clarification concerning the term "types and amounts of air pollutants discharged" defined under 45CSR§31-2.4, the DAQ's legislative rule entitled "Confidential Information," and thus what information may not be claimed confidential in accordance with 45CSR§31-6.

The aforementioned public comment received during the Notice of Application comment period triggered a review of the CBI claims by the DEP's Office of the General Counsel (OGC). A letter dated

April 28, 2025, from the OGC was issued to TransGas that stated that the information claimed as CBI may not qualify for such designation as it falls under the definition of "Types and Amounts of Pollutants Discharged" as excluded under §45-31-6 as defined under §45-31-2.4 (and further defined under 45 CSR 31B). This letter was made available to the public on the WVDEP Application Xtender (AX) website at that time. There was also concern that the claimed CBI may not meet the eligibility requirements under §45-31-4.1(b) and 4.1(c). The letter requested further justification that the information claimed as CBI is not defined as "Types and Amounts of Pollutants Discharged" and also does not conflict with the eligibility requirements of §45-31-4.1(b) and 4.1(c). The letter requested a written response within 15 days.

TransGas provided a response to this request on May 2, 2025. This response was made available to the public on the AX website at that time. TransGas proposed to revise the CBI claim to cover the company names for the engine and control systems designers and manufacturers. This includes the engine model number which would identify the engine company. All other previously claimed CBI would be removed from the request. Upon reviewing this information, the WVDEP issued a letter to TransGas on May 9, 2025, stating that a permit application so submitted would be in compliance with the requirements governing the submission of CBI under 45 CSR 31 and 45 CSR 31B. TransGas provided the revised application to DAQ on May 14, 2025, and the application was made available to the public on the AX website at that time.

This engineering evaluation/fact sheet contains only the information that was provided in the redacted copy of the permit application. Furthermore, the information contained herein is more than adequate to make the appropriate permitting determinations and can be used to determine compliance with all applicable rules and regulations. This includes all necessary monitoring, recordkeeping, reporting, and testing that will be required as part of the proposed draft permit.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3715:

The Adams Fork Data Center Energy Campus is a unique off-grid, electric generating facility designed to provide power to adjacent data center operations. The facility encompasses 117 engines (Source ID# 1S – 117S) with 114 engines operating full-time and 3 engines in reserve. Each engine has a proposed control strategy (Emission Point ID# 1E – 117E). The facility will contain 39 powerhouses with each containing 3 generator setups with each generator having a nameplate capacity of 25 MWe. Actual power generation will depend on the operating mode of the engines. Each engine will have a maximum power output of 21 MW, therefore, the theoretically installed power output would be 2,457 MW. The effective and continuously delivered power output will be 1,796 MW.

The engines are configured to be dual-fuel units and have the ability to operate on natural gas or diesel fuel, or can be operated on diesel fuel only, in backup mode. Under normal operation, the engines consume natural gas as their primary fuel with a pilot injection of ultra-low sulfur diesel (ULSD). Under natural gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% in emergency operation.

The engines can operate under the following operational profiles:

Normal Operation
To ensure peak operation conditions, the engines will be regularly serviced. With 1-2 weeks of downtime per engine per year, 3 engines are going to be off-line at any time of the year. Under normal operations, the engines will be run at 75% power only. Therefore, the continuously delivered power will be 1,796 MW.

Compensation Mode
In the case of one or more, or in the unrealistic, but foreseen case of up to 29 engines out of service, the rest of the field will compensate, increasing their power output to 100%. For the calculation of the yearly emissions the worst case is assumed, when 29 engines go offline and the remaining 85 are operated at 100%.

Emergency Mode
In case the pipeline is down, or the gas cannot be delivered for any other reason, the engines can switch to diesel fuel mode immediately and are then operated on diesel fuel only. Apart from the different fuel type, the engines are controlled in the same way as in Normal Operation.

Startup Mode
To start an engine and bring power production online, several steps are necessary. In the first phase the emission control system is not operational temperature, therefore the control rate is not optimal. The following is a simplification and a representation of the worst case for emissions emission-wise. The different steps can be reduced to four main sub-modes:

- Speed up
  Bring the engine from standstill to nominal speed (89 rpm). This is done in diesel mode. The emission control system is still offline at this point, as it is not at optimal temperature. Once nominal speed is set and the minimum load for a fuel switch is reached (less than 5 minutes), the system initiates the next sub mode.

- Fuel Switch
  For about two minutes the load is kept constant, and the fuel is changed from 100% diesel to 98% gas & 2% diesel.

- Generator switched on
  On gas operation, the load is further increased until the generator can by energized and synchronized with the rest of the engine fleet. This takes no more than 5 minutes. For the emissions calculation of all these steps the emission control system is looked at as non-operational, even though the exhaust gases will have heated it already and some abatement is taking place, even at a reduced level.

- Load up cold control
  Once the generator is online and synchronized, then the engine is powered up to its set point (75% in normal operation mode). For reasons of simplicity and to ensure a conservative view on the problem, during engine load up the control system is looked at as cold and operational at

25% only. This is even though in reality the system was heated up constantly by the exhaust gases and reaching operational condition during the load up.

Shut Down
The shut down procedure consists of three phases:

- Ramp down
  The load is constantly reduced to a minimum load.

- Min Load
  At minimum load the generator is decoupled from the grid and the engine's load and speed setting are zero.

- Spin out
  Due to the zero-load setting the injection systems are turned off and the engine is spun out until full stop. In this entire sequence the emission control system is still operational due to its thermal inertia. Therefore, until the injection is stopped the emissions are treated.

The engines will operate on ULSD and natural gas depending on the operating status. ULSD will be stored in 40 storage tanks (Source ID# 118S – 157S, Emission Point ID# 118E – 157E) on the property. Natural gas will be delivered via pipeline. Tanks for control device liquids will be located at each powerhouse. There will be 39 tanks each of hydrous ammonia, caustic soda, sulfuric acid, sodium chlorite, and sodium hydrosulfide. These tanks are considered de minimis due to minimal emissions. Liquids and supplies for these tanks will be trucked to the site.

There is no steam-power production at the site. Cooling will be provided by mine pool water as needed. Therefore, there are no requirements for cooling towers.

SITE INSPECTION

A site inspection of the proposed location was conducted on May 20, 2025, by the writer and Joe Kessler (NSR Program Manager) of the DAQ. The proposed site is located at the existing Twisted Gun Golf Course, and no construction or equipment installation was visible at the time of the site inspection. There were no visible residences nearby.

Directions to the site:

The facility will be located on the property currently occupied by the Twisted Gun Golf Course in Wharncliffe. The site can be accessed from WV Route 52 headed toward Gilbert. Turn right onto Gilbert Creek Road, then right onto Right Fork Bens Creek Road to Twisted Gun. Proceed to the end of the Twisted Gun Road to the site.

Aerial view of the proposed site

The site will be located at the existing Twisted Gun Golf Course approximately close to the arrow in the photo found below.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this facility consist of the equipment listed in the following table and fugitive emissions.

Emission Unit ID#	Process Equipment	Calculation Methodology
1S – 117S	Engine 1 – Engine 117 28,194 HP (each)	Manufacturer Data (NOx, CO, PM, VOC, SO_2) EPA AP-42 Emission Factors Chapter 3.2 (HAPs)
118S – 157S	40 – Diesel Storage Tanks 170,000 gal (each)	EPA TANKS Emissions Estimation Software, Version 4.0.9d
De Minimis	39 – Hydrous Ammonia Storage Tanks	De Minimis
De Minimis	39 – Caustic Soda Storage Tanks	De Minimis
De Minimis	39 – Sulfuric Acid Storage Tanks	De Minimis
De Minimis	39 – Sodium Chlorite Storage Tanks	De Minimis
De Minimis	39 – Sodium Hydrosulfide Storage Tanks	De Minimis
HR	Paved Haul Roads	EPA AP-42 Emission Factors, Chapter 13.2.1

The potential emissions from the engines were estimated using the ability to fire the units with natural gas or diesel. The engines at the facility are capable of firing either fuel. The operating hours, operational mode and throughput of each type of fuel will be continuously monitored and recorded. TransGas will keep records of the total amount of hours each engine uses natural gas as a fuel and the total amount of hours each engine uses diesel as a fuel. The 12-month rolling sum of emissions will be calculated monthly.

The emission control systems for the engines consist of two main systems. The dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, which is downstream of the turbocharger. The dry systems consist of an oxidation catalyst and an SCR catalyst. The catalytic reduction of CO has a reduction efficiency of over 99%. The same system oxidizes VOC emissions with a reduction efficiency of 99%. The de-NOx unit is a urea based SCR technology, and the reduction efficiency exceeds 90%. The wet system consists of four (4) stages, which reduce NOx further with 90.9% reduction efficiency and SO_2 with 70% reduction efficiency.

The emission abatement system that will be employed on each engine results in the following emissions reductions when operating in the following modes:

Mode	NOx (%)	CO (%)	VOC/HAP (%)	PM (%)	SO_2 (%)
Speed Up	0	0	0	0	95.0
Fuel Changeover	0	0	0	0	99.0
Generator Switched On	0	0	0	0	99.0
Load Up Cold Control	25.0	25.0	25.0	0	99.0
Normal Operation	99.0	99.0	99.0	25.0	99.0
Compensation Mode	99.0	95.0	99.0	25.0	99.0
Ramp Down	99.0	94.0	99.0	25.0	99.0
Min Load	70.0	50.0	70.0	0	70.0
Spin Out	40.0	35.0	40.0	0	40.0
Emergency	98.0	91.0	99.0	25.0	99.0

As discussed in the DESCRIPTION OF PROCESS and also as shown in the above table, the engines will operate in multiple modes. Under normal operations, the engine will remain comfortably below the PSD threshold. However, to ensure that the facility can be operated under worst-case conditions, the following worst-case scenario was examined.

The pipeline is out for eight (8) days, which equates to 192 hours. During this outage, the facility would be operated only on diesel fuel. During the same year, an unplanned event resulted in 31 engines are down and the remaining 86 engines are operated in compensation mode and will continue to deliver full power. This would increase the engines output to 99.4% load. It was estimated that the compensation mode would last for 24 days or 567 hours. Finally, the engines would have to go through 5 startups and shutdowns in place of the scheduled one (1) event. Using this worst case scenario results in the following hourly breakdown by operational mode:

Mode	Hours
Speed Up	0.42
Fuel Changeover	0.17
Generator Switched On	0.42
Load Up Cold Control	0.83
Normal Operation	7996.80
Compensation Mode	567.20
Ramp Down	1.67
Min Load	0.42
Spin Out	0.08
Emergency	192
Total Time	**8,760**

The operating hours used for the worst-case scenario results in the following potential to emit (PTE) for all of the engines:

Pollutant	**Annual Emissions (tons/year)**
Nitrogen Oxides	194.30
Carbon Monoxide	205.62
Volatile Organic Compounds	116.59
Particulate Matter-10/2.5	186.53
Sulfur Dioxide	9.93
Benzene	0.45
Toluene	0.16
Xylenes	0.11
Formaldehyde	0.046
Acrolein	0.0045
Acetaldehyde	0.013
Naphthalene	0.075
Total Hazardous Air Pollutants	0.86

The following table represents the maximum hourly and annual emissions during *normal operations* for one engine:

Pollutant	**Hourly Emissions (lb/hr)**	**Annual Emissions (tons/year)**
Nitrogen Oxides	0.14	0.61
Carbon Monoxide	0.34	1.47
Volatile Organic Compounds	0.23	0.99
Particulate Matter-10/2.5	0.34	1.49
Sulfur Dioxide	0.01	0.03
Benzene	0.00088	0.00352
Toluene	0.00032	0.00128
Xylenes	0.00022	0.00088
Formaldehyde	0.00009	0.00036
Acrolein	0.00001	0.00004
Acetaldehyde	0.00003	0.00012
Naphthalene	0.00015	0.0006
Total Hazardous Air Pollutants	0.0017	0.0068

Storage Tanks
The potential aggregate emissions for the 40 – 170,000 gallon diesel storage tanks include the losses from working and breathing. Due to the very low vapor pressure of diesel fuel (0.007 psia), the emissions associated with the diesel fuel tanks are low. EPA TANKS 4.09d allows users to enter specific information about a storage tank (dimensions, construction, paint condition, etc.), the liquid contents (chemical components and liquid temperature), and the meteorological conditions and location of the tank (nearest city, ambient temperature, etc.) to generate an air emissions report. Report features include estimates of monthly, annual, or partial year emissions for each chemical or mixture of chemicals stored in the tank. The closest meteorological location available in EPA TANKS 4.09d that was used was Charleston. As stated above, due to the very low vapor pressure of diesel fuel, the emissions associated with the diesel fuel tanks are low. The results of the EPA TANKS 4.09d analysis resulted in the following diesel storage tank emissions:

Pollutant	**Hourly Emissions (lb/hr)**	**Annual Emissions (tons/year)**
Volatile Organic Compounds	7.34	0.75

Truck Loading
There will also be potential emissions associated with the truck loading of the 40 – 170,000 gallon diesel storage tanks. These emissions were accounted for and included as working losses in the aforementioned storage tank emissions.

Paved Haul Roads
There are paved haul road activities associated with this facility. The following table indicates the assumptions made in estimating the emissions:

Operating Condition	**Parameter**
Potential Operating Days	365
Estimated Roundtrip Distance per Vehicle	5.00 miles/vehicle
Fluid Delivery Trucks per Year	5,583
Miscellaneous Vehicles per Year	4,380

Using these operating conditions, the potential emissions associated with these haul road operations result in the following:

Pollutant	**Hourly Emissions (lb/hr)**	**Annual Emissions (tons/year)**
Particulate Matter	11.50	28.64
Particulate Matter-10	2.30	5.73
Particulate Matter-2.5	0.60	1.50

Fugitive Emission Leaks
The fugitive equipment leaks (VOC/HAP) associated with fugitive components (valves, pressure relief valves, connections, flanges, etc.) were estimated using EPA's Protocol for Equipment Leak Emission Estimates Table 2-1 (SOCMI average emission factors) and Table 2-5 (SOCMI screening ranges emission factors) and the component counts associated with the proposed facility. Based on this

analysis, the fugitive equipment leaks associated with this facility would be 0.59 tons per year of VOC and less than 0.01 tons per year of HAPs. The permit does require minimization of fugitive emissions and further requires any above-ground piping, valves, pumps, etc. that shows signs of excess wear that have a reasonable potential for fugitive emissions of regulated air pollutants to be repaired or replaced.

The following table represents the emissions associated with this 45CSR13 construction permit:

Emission Source	Annual Emissions (tons/year)					
	NO_x	**CO**	**VOC**	**SO_2**	**PM_{10}**	**Total HAPs**
Engines	194.30	205.62	116.59	9.93	186.53	0.86
Storage Tanks	-	-	0.75	-	-	-
Paved Haul Roads	-	-	-	-	5.73	-
Fugitive Leaks	-	-	0.59	-	-	0.01
Facility PTE	**194.30**	**205.62**	**117.93**	**9.93**	**192.26**	**0.87**

REGULATORY APPLICABILITY

State

45 CSR 2 - Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers ***(not applicable)***

This rule establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units. 45 CSR 2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. A fuel burning unit is defined in 45 CSR 2 section 2.10 as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. The engines are not fuel burning units because this operation is not their primary purpose. Therefore, these units would not be subject to this rule.

45 CSR 4 - To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors

The purpose of this rule is to prevent and control the discharge of pollutants into the open air which causes or contributes to an objectionable odor or odors. This facility would generally be subject to this rule, however, this type of facility normally does not have issues with odors. However, the DAQ will, using the authority under this rule to respond to complaints involving objectionable odors if confirmed while the facility is operating, and may require mitigation at that time to reduce the odor potential of the source. An objectionable odor must be determined by the DAQ in the course of an inspection or investigation of an actual odor, and is possible to prove quantitatively, pursuant to this rule, that an objectionable odor will be present before a facility is in operation.

45 CSR 10 - To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides ***(not applicable)***

This rule establishes emission limitations for sulfur dioxide which are discharged from fuel burning units. 45 CSR 10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. A fuel burning unit is defined in 45 CSR 10 section 2.8 as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. The engines are not fuel burning units because this operation is not their primary purpose. Therefore, these units would not be subject to this rule.

45 CSR 13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct."

Based upon the potential emissions for the facility, TransGas is required to obtain a permit under 45CSR13 for this facility.

As required under §45-13-8.3 ("Notice Le vel A"), TransGas placed a Class I legal advertisement in the *Williamson Daily News* on April 9, 2025. Additionally, TransGas paid the appropriate application fee of $2,000 ($1,000 45 CSR 13 permit application fee, $1,000 NSPS fee) on April 2, 2025.

45 CSR 14 - Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants ***(not applicable)***
45 CSR 19 - Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment ***(not applicable)***

45CSR14 establishes and adopts a preconstruction permit program for the construction and major modification of major stationary sources in areas of attainment with the National Ambient Air Quality Standards (NAAQS). Mingo County is currently classified as in attainment/unclassifiable with the NAAQS and, therefore, a proposed new "major stationary source" in Mingo County would be subject to the provisions of 45CSR14. The proposed facility is not defined as a source listed under §45-14-2.43(a), therefore, pursuant to 2.4(b), would be defined as a "major stationary source" if any regulated pollutant has a PTE in excess of 250 TPY. The proposed facility, however, does not have a PTE of any regulated pollutant in excess of 250 TPY as shown in the table on the following page, therefore, not defined as a major stationary source and is not subject to the provisions of 45 CSR 14. 45 CSR 19 applies to sources that are located in areas that are classified as non-attainment with the NAAQS. Mingo County is an attainment/unclassified area, therefore, 45 CSR 19 would not apply.

Pollutant	PSD (45CSR14) Threshold (TPY)	NANSR (45CSR19) Threshold (TPY)	Facility PTE (TPY)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	205.62	No
Nitrogen Oxides	250	NA	194.30	No
Sulfur Dioxide	250	NA	9.93	No
Particulate Matter 2.5	250	NA	186.53	No
Ozone (VOC)	250	NA	117.34	No

45 CSR 16 - Standards of Performance for New Stationary Sources

This rule incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources (NSPS) set forth in 40 CFR Part 60 by reference. 45 CSR 16 applies to this source by reference of 40 CFR 60 Subpart IIII. These requirements are discussed under that rule below.

45 CSR 17 - To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

The purpose of this rule is to prevent and control particulate matter air pollution from materials handling, preparation, storage and other sources of fugitive particulate matter. TransGas will ensure appropriate precautions are taken to prevent the escape of fugitive particulate matter beyond the boundary lines of the property.

45 CSR 21 - Control of Air Pollution from the Emission of Volatile Organic Compounds ***(not applicable)***

This rule establishes reasonably available control technology to control emissions of volatile organic compounds from sources that manufacture, mix, store, use, or apply materials containing volatile organic compounds that are located in Cabell, Kanawha, Putnam, Wayne and Wood Counties. This facility is located in Mingo County, and therefore, not applicable to this rule.

45 CSR 27 - To Prevent and Control the Emissions of Toxic Air Pollutants ***(not applicable)***

The purpose of this rule is to prevent and control the discharge of toxic air pollutants requiring the application of best available technology (BAT) for chemical processing units. Section 2.4 defines a chemical processing unit as an assembly of reactors, tanks, distillation columns, heat exchangers, vaporizers, compressors, dryers, decanters, and/or other equipment used to treat, store, manufacture, or use toxic air pollutants. For the purpose of this rule, the term chemical processing unit includes surface coating equipment or similar equipment utilizing a toxic air pollutant as a solvent or for other purposes but does not include equipment used in the production and distribution of petroleum products providing that such equipment does not produce or contact materials containing more than 5% benzene by weight. Potential emissions of toxic air pollutants from this facility result from the combustion of natural gas or diesel in the engines. Regulation of emissions of toxic air pollutants from these unit types are not included in this rule, and therefore, not applicable.

45 CSR 30 - Requirements for Operating Permits

The facility is a major source and is subject to 45CSR30 based upon CO, NOx, PM, and VOC emissions each exceeding 100 tons per year. Due to this facility's PTE over 100 tons per year of a criteria pollutant, TransGas is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30. TransGas is required to pay the appropriate annual operating fees and submit an annual Certified Emissions Statement.

45 CSR 31 - Confidential Information

The purpose of this rule is to establish the requirements for claiming information submitted to the Director as confidential and the procedures for determinations of confidentiality in accordance with the provisions of W. Va. Code §22-5-10. The reason for the CBI submittal is that the application contains information that is fully protected under non-disclosure and confidentiality agreements between the applicant and equipment provider concerning development of the process and facility design. This was previously discussed in detail in the CONFIDENTIAL BUSINESS INFORMATION section.

45 CSR31B – Confidential Business Information and Emission Data

The purpose of this rule is to provide guidance and clarification concerning the term “types and amounts of pollutants discharged” defined under 45 CSR §31-2.4, the DAQ’s legislative rule (45 CSR 31) and thus what information may not be claimed confidential in accordance with 45 CSR §31-6. An in-depth discussion regarding this was previously discussed in detail in the CONFIDENTIAL BUSINESS INFORMATION section.

45 CSR 33 - Acid Rain Provisions and Permits ***(not applicable)***

This rule establishes and adopts general provisions and the operating permit program requirements for affected sources and affected units under the Acid Rain Program promulgated by the United States Environmental Protection Agency under Title IV of the Clean Air Act, as amended (CAA). The rule and associated reference methods, performance specifications and other test methods which are appended to these standards are adopted by reference. These units are exempt under the New Unit Exemption in §40-72.7. See explanation below in Federal for 40 CFR 72 (Permits Regulation).

45 CSR 34 - Emission Standards for Hazardous Air Pollutants

This rule incorporates the federal Clean Air Act (CAA) national emission standards for hazardous air pollutants (NESHAPs) set forth in 40 CFR Parts 61 and 63 by reference. 45 CSR 34 applies to this source by reference of 40 CFR 63 Subpart ZZZZ. These requirements are discussed under that rule below.

45 CSR 40 - Control of Ozone Season Nitrogen Oxide Emissions ***(not applicable)***

The purpose of this rule is to establish ozone season NOx emission limitation, monitoring, recordkeeping, reporting, excess emissions, and NOx budget demonstration requirements for large industrial boilers and combustion turbines that have a maximum design heat input greater than 250

MMBTU/hr, in accordance with 40 CFR §51.121. Ozone season is defined as May 1 through September 30 in the same calendar year. This facility does not have industrial boilers or combustion turbines, therefore, this rule does not apply.

Federal

40 CFR 51.166 - Prevention of Significant Deterioration of Air Quality ***(not applicable)***

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration (PSD) and new and modified sources of non-attainment pollutants under Non-Attainment New Source Review (NANSR). The provisions of this section are captured in the West Virginia state rules discussed above known as 45 CSR 14 (PSD) and 45 CSR 19 (NANSR). Both of these rules are part of West Virginia's State Implementation Plan (SIP).

Mingo County is designated as attainment/unclassifiable for all criteria pollutants. PSD regulations apply when a new source is constructed in which emissions exceed major source thresholds, an existing minor source undergoes modification in which emission increases exceed PSD major source thresholds, or an existing major source undergoes a modification in which emission increases exceed PSD significant emission rates. PSD major source thresholds are 250 tons per year of a regulated pollutant, except for the 28 regulated facility categories. This facility is not one of listed 28 regulated facility categories. Therefore, the PSD major source threshold is 250 tons per year of a regulated pollutant. The emissions associated with this facility is less than the PSD major source threshold, therefore, this rule does not apply.

40 CFR 60 Subpart Kc - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After October 4, 2023 ***(not applicable)***

Subpart Kc applies to storage vessels of volatile organic liquids with capacities greater than or equal to 20,000 gallons for which construction commenced after October 4, 2023. § 60.110c(b)(8) exempts storage vessels that only store volatile organic liquids with a maximum true vapor pressure less than 0.25 psia (1.7 kPa absolute). Each storage vessel at the facility has a capacity of 170,000 gallons. However, the maximum vapor pressure of the storage vessels is 0.007 psia, which is less than 0.25 psia. Therefore, this rule does not apply.

40 CFR 60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

Subpart IIII applies to owners and operators of compression ignition internal combustion engines that commenced construction after July 11, 2005, and were manufactured after April 1, 2006, and not a fire pump engine.

The 28,194 HP engines (1S – 117S) are configured to be dual-fuel units and have the ability to operate on natural gas or diesel fuel, or can be operated on diesel fuel only, in backup mode. Under normal operation, the engines consume natural gas as their primary fuel with a pilot injection of ULSD. Under

natural gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% in emergency operation.

The engines commenced construction after July 11, 2005, are non-emergency engines, were manufactured after April 1, 2006, utilizes diesel fuel, have displacements greater than 30 liters per cylinder, less than 130 rpm, not reducing PM by 60%, do not have diesel particulate filters, and were installed after January 1, 2016. Due to these parameters, the following are the regulatory requirements for each pollutant:

NOx

Emission Limit	3.4 g/KW-hr (2.5 g/HP-hr)
Standards	§60.4204(c)(3)
Monitoring/Testing	§60.4213(e)

PM

Emission Limit	0.15 g/kW-hr (0.11 g/HP-hr)
Standards	§60.4204(c)(4)
Monitoring/Testing	§60.4213(f)

Based upon the proposed hourly emission limits for the engines, the regulatory emission limits will be met.

The following requirements also apply to these pollutants:

Standards	§60.4206, §60.4207(d), §60.4211(d)
Monitoring/Testing	§60.4213(a), (b), (c); §60.4211(d)(1), (d)(3)
Recordkeeping	§60.4214(a)(2), §60.4211(d)(2)
Reporting	§60.4214(a)(1), §60.4211(d)(2)

40 CFR 60 Subpart TTTTa - Standards of Performance for Greenhouse Gas Emissions for Modified Coal-Fired Steam Electric Generating Units and New Construction and Reconstruction Stationary Combustion Turbine Electric Generating Units ***(not applicable)***

Subpart TTTTa applies to stationary combustion turbines that commence construction after May 23, 2023, that also serve a generator or generators capable of selling greater than 25 MW of electricity to a utility power distribution system. There are no combustion turbines at the proposed facility, therefore, Subpart TTTTa is not applicable.

40 CFR 63 Subpart EEEE - National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline) ***(not applicable)***

Subpart EEEE applies to organic liquids storage and distribution at major sources of HAPs. The facility is not a major source of HAPs because its PTE of total HAPs is less than 25 tons per year and its PTE of any single HAP is less than 10 tons per year. Therefore, Subpart EEEE does not apply.

40 CFR 63 Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)

Subpart ZZZZ applies to stationary combustion RICE at area and major sources of HAPs. As stated in §63.6590(c), stationary RICE that are subject to regulations under 40 CFR 60 (IIII) must meet those requirements, and no further requirements apply for these units under this subpart.

40 CFR 64 - Compliance Assurance Monitoring ***(not applicable)***

Compliance Assurance Monitoring (CAM) applies to pollutant-specific emissions units at a major source under 40 CFR 70. The facility is not a major source under 40 CFR 70; therefore, CAM does not apply.

40 CFR 72 - Permits Regulation ***(not applicable)***

The purpose of this part is to establish certain general provisions and the operating permit program requirements for affected sources and affected units under the Acid Rain Program, pursuant to title IV of the Clean Air Act, 42 U.S.C. 7401, et seq., as amended by Public Law 101-549 (November 15, 1990).

The nameplate capacity of the generators attached to each unit is 25 MWe or less. The units do not burn coal or a coal-derived fuel, and burns fuel with sulfur of 0.05% or less by weight. Therefore, these units are exempt under the New Unit Exemption in Section 72.7 and are exempt from permit requirements, monitoring, and allowance holdings, except for the provisions of §72.7 itself, and §72.2 through 72.6 (definitions, measurements, abbreviations, and acronyms, federal authority, state authority, and applicability) and 72.10 through 72.13 (availability of information, computation of time, administrative appeals, and incorporation by reference).

40 CFR 97 Subpart DDDDD - Federal NOx Budget Trading Program, CAIR NOx and SO_2 Trading Programs, CSAPR NOx and SO_2 Trading Programs, and Texas SO_2 Trading Program ***(not applicable)***

This rule sets forth the general, designated representative, allowance, and monitoring provisions for the Cross-State Air Pollution Rule (CSAPR) SO_2 Group 2 Trading Program, under section 110 of the Clean Air Act and §52.39 of this chapter, as a means of mitigating interstate transport of fine particulates and sulfur dioxide.

This rule applies to fossil-fuel-fired combustion turbines serving at any time, on of after January 1, 2005, a generator with a nameplate capacity of more than 25 MWe producing electricity for sale. These units are RICEs and not combustion turbines. Additionally, the nameplate capacity of the generators attached to each unit is 25 Mwe. Therefore, this regulation does not apply.

ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides information on those regulated pollutants that are not classified as "criteria pollutants". Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NOx), Ozone, Particulate Matter (PM_{10} and $PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect public health and welfare. Other pollutants of concern, although designated as non-criteria *and without national air quality standards*, are regulated through various state and federal programs designed to limit their emissions and public exposure. These programs include federal source-specific HAP regulations promulgated under 40 CFR 61 and 40 CFR 63 (NESHAPS/MACT), and WV Legislative Rule 45 CSR 27 that regulates certain HAPs as Toxic Air Pollutants (TAPs). Any potential applicability to these programs were addressed in the REGULATORY APPLICABILITY section of this document.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows, or suspects *may* cause cancer or other serious human health effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. It is also important to note that the USEPA does not divide the various HAPs into further classifications based on toxicity or if the compound is a suspected carcinogen. The HAP emissions associated with this application are found in the ESTIMATE OF EMISSIONS section of this document. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

The HAPs emitted from the proposed facility are created during the combustion of natural gas and diesel fuel. The HAP emission values were estimated using EPA AP-42: Compilation of Air Emissions Factors from Stationary Sources. AP-42 contains emission factors and process information for more than 200 air pollution source categories. AP-42 Chapter 3.2 contains HAP emission factors for reciprocating engines.

The table on the following page lists each HAP currently identified by TransGas as potentially being emitted based upon the information available in AP-42 Chapter 3.2, Tables 3.2-1, 3.2-3, and 3.2-4. Additionally, the Chemical Abstracts Service (CAS) registry number, the type of HAP, the PTE of the individual HAP, and any potentially applicable Most Available Control Technology (MACT) is provided.

Pollutant	CAS #	Type	PTE (TPY)	MACT[1]
Acetaldehyde	75-07-0	VOC	0.013	None
Acrolein	107-02-8	VOC	0.0045	None
Benzene	71-43-2	VOC	0.448	None
Formaldehyde	50-00-0	VOC	0.046	None
Naphthalene	91-20-3	VOC	0.075	None
Toluene	108-88-3	VOC	0.163	None
Xylenes	1330-20-7	VOC	0.111	None

[1] Does a MACT apply to this specific HAP for any emission unit at the facility? See REGULATORY APPLICABILITY section for discussion.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source because the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as discussed in the Regulatory Discussion Section.

SOURCE AGGREGATION

"Building, structure, facility, or installation" is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

TransGas has an option on the site with the current owner, therefore, they do have control of the proposed site. There are no other emission units belonging to the same industrial grouping, under common control, and located on contiguous or adjacent properties with the facility. Therefore, the emissions from the Adams Fork Data Center facility should not be aggregated in determining Title V or PSD status.

MONITORING, RECORDKEEPING, REPORTING, AND TESTING (MRRT) OF OPERATIONS

TransGas will be required to perform the following MRRT:

- **Operational Limitations**
  - Operating limits will be established on the engines. TransGas will be required to monitor the operating hours, operational mode, and the throughput of each type of fuel will be continuously monitored and recorded for each engine. Required to keep records of the total amount of hours each engine uses natural gas as a fuel and the total amount of hours each engine uses diesel as a fuel. The 12-month rolling sum of emissions will be calculated monthly.
- **40 CFR 60 Subpart IIII MRRT**
  - Monitor and utilize diesel fuel that meets a maximum per-gallon sulfur content of 1,000 ppm. [§60.4207(d)]
  - Conduct an initial performance test to demonstrate initial compliance with the emission standards as specified in §60.4213. [§60.4211(d)(1)]
  - Conduct an annual performance test to demonstrate initial compliance with the emission standards as specified in §60.4213. [§60.4211(d)(3)]
  - Keep records of the information in paragraphs (a)(2)(i) through (iv) of this section.
    - (i) All notifications submitted to comply with this subpart and all documentation supporting any notification.
    - (ii) Maintenance conducted on the engine.
    - (iii) If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.
    - (iv) If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards. [§60.4214(a)(2)]
  - Establish operating parameters to be monitored continuously to ensure the stationary internal combustion engine continues to meet the emission standards. The owner or operator must petition the Administrator for approval of operating parameters to be monitored continuously. The petition must include the information described in paragraphs (d)(2)(i) through (v) of this section.
    - (i) Identification of the specific parameters you propose to monitor continuously;
    - (ii) A discussion of the relationship between these parameters and NOX and PM emissions, identifying how the emissions of these pollutants change with changes in these parameters, and how limitations on these parameters will serve to limit NOX and PM emissions;
    - (iii) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;
    - (iv) A discussion identifying the methods and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and
    - (v) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters. [§60.4211(d)(2)]

    - Submit an initial notification as required in § 60.7(a)(1). The notification must include the information in paragraphs (a)(1)(i) through (v) of this section. Beginning on February 26, 2025, submit the notification electronically according to paragraph (g) of this section.
        - (i) Name and address of the owner or operator;
        - (ii) The address of the affected source;
        - (iii) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
        - (iv) Emission control equipment; and
        - (v) Fuel used. [§60.4214(a)(1)]
- **Tank Throughput and Loading**
    - TransGas will be required to monitor the tank throughput and loading operations for each storage tank. The 12-month rolling sum of throughputs/emissions will be calculated monthly.
- **45 CSR 17 Fugitive Sources of Particulate Matter**
    - Sources of fugitive particulate matter at the facility include diesel truck and employee traffic on paved plant roads. Conduct a visual inspection of the paved roads once each operating day to ensure no fugitive emissions are generated. When needed, roads will be swept and/or watered to minimize fugitive dust. Records will be kept of the inspections and any corrective actions.
- Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location.
- Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
- Maintain a record of all PTE HAP calculations for the entire facility.

The records shall be maintained on site or in a readily available off-site location maintained by TransGas for a period of five (5) years.

STATUTORY AUTHORITY OF THE DAQ

The statutory authority of the DAQ is given under the Air Pollution Control Act (APCA) – West Virginia Code §22-5-1, *et. seq.* – which states, under §22-5-1 ("Declaration of policy and purpose"), that:

> It is hereby declared that public policy of this state and the purpose of this article is to achieve and maintain such levels of air quality ***as will*** (underlining and emphasis added) protect human health and safety, and to the greatest degree practicable, prevent injury to plant and animal life and property, foster the comfort and convenience of the people, promote the economic and social development of this state and facilitate the enjoyment of the natural attractions of this state.

Therefore, while the code states that the intent of the rule includes the criteria outlined in the latter part of the above sentence, it is clear by the underlined and bolded section of the above sentence that the scope of the delegated authority does not extend beyond the *impact of air quality* on these criteria. Based on the language under §22-5-1, *et. seq.*, the DAQ, in making determinations on issuance or denial of permits under WV Legislative Rule 45 CSR 13 (45 CSR 13), does not take into consideration

substantive non-air quality issues such as job creation, economic viability of proposed project, strategic energy issues, non-air quality environmental impacts, nuisance issues, etc.

The basis for issuance or denial of an air quality permit is given under 45 CSR 13. Pursuant to §45-13-5.7, the DAQ shall issue a permit unless:

> a determination is made that the proposed construction, modification, registration or relocation will violate applicable emission standards, will interfere with attainment or maintenance of an applicable ambient air quality standard, cause or contribute to a violation of an applicable air quality increment, or be inconsistent with the intent and purpose of this rule or W. Va. Code § 22-5-1, et seq., in which case the Secretary shall issue an order denying such construction, modification, relocation and operation. The Secretary shall, to the extent possible, give priority to the issuance of any such permit so as to avoid undue delay and hardship.

It is clear under 45 CSR 13 that denial of a permit must be based on one of the above explicitly stated criteria or, as noted, is inconsistent with 45 CSR 13 or §22-5-1, *et. seq*. As is stated above, it is the DAQ's position that the intent of both the APCA and 45 CSR 13 is to circumscribe the authority of the DAQ to air quality issues as outlined in the APCA and in West Virginia's State Implementation Plan (SIP).

The air quality issues evaluated relating to TransGas' proposed construction are outlined in this document. All applicable and potentially applicable rules were evaluated in the REGULATORY DISCUSSION section. The items covered under that section represent the extent of the substantive air quality issues over which the DAQ has authority to evaluate under 45 CSR 13 and the APCA as relating to this permit application.

RECOMMENDATION TO DIRECTOR

The information provided in permit application R13-3715 indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director that the DAQ go to public notice with a preliminary determination to issue Permit Number R13-3715 to TransGas for the proposed construction of the Adams Fork Data Center Energy Campus located in Wharncliffe, Mingo County, WV.

Jerry Williams, P.E.
Engineer

10. Public Notice R13-3715

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off grid power generation facility (Adams Fork Data Center Energy Campus) located at 2002 Twisted Gun Road, Wharncliffe, Mingo County WV at latitude 37.59372 and longitude -81.95491. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3715.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.93 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 215.17 TPY; Particulate Matter less than 10 microns in diameter, 192.26 TPY; Particulate Matter less than 2.5 microns in diameter, 188.03 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m.on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304-926-0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

11. Affidavits of Publication R13-3714

Ad Number 298262

Received
July 21, 2025
WV DEP/Div of Air Quality

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

I Elisha Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper published in the county of Mingo, West Virginia, hereby certify that the annexed publication was inserted in said newspaper _____

The cost of publishing said annexed advertisement as aforesaid was $ 64.50

Commencing On: 07/09/2025

Ending On: 07/09/2025

Given under my hand this day 07/09/2025

Sworn to and subscribed before me 07/09/2025
at Williamson, Mingo County, West Virginia

Cheylan Lewis

Notary Public of, in and for Mingo County, West Virginia

OFFICIAL SEAL - NOTARY PUBLIC
STATE OF WEST VIRGINIA
CHEYLAN LEWIS
6266 Aracoma Road
Huntington WV, 25705
My Commission Expires April 8, 2030

MY COMMISSION EXPIRES: 4-8-30

Elisha Queen

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an offgrid power generation facility (Adams Fork Harless Data Center Energy Campus) located at 22 Mine Road, near Holden, Mingo County WV at latitude 37.75302 and longitude 82.11905. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3714.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.66 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 193.69 TPY; Particulate Matter less than 10 microns in diameter, 187.96 TPY; Particulate Matter less than 2.5 microns in diameter, 186.91 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted

Acc.Id:	69164	
Name:	AIR QUALITY–WV DEP	
Phone:	304-926-0499	
Address:	601 57TH ST SE	
City:	CHARLESTON	
State:	WV	
Postcode:	25304	
Class:	9010	Legal Notices
Edition:	WDN	
Start:	07/09/2025	
Stop:	07/09/2025	
Issues:	1	
Units	130.0	
Order ID:	HC 298262	
TFN:	C	
TFN cycle:		
Rep:	EQUEEN	
Status:	CF	
Source:	EM	
Paytype:	BI	
Rate:	LG	
Cost EXC GST:	64.50	
Tax:	0.00	
Total Charge:	64.50	

Printed on: 06/30/2025 10:40:46
Printed by: EQUEEN

at the address listed below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304 926 0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

LH-298262
07-09;2025

CLASSIFIEDS

ANNOUNCEMENTS

Special Notices

Sunset Sing at Liberty Shrine Church of God Sat 7/12 @ 7 PM

Featuring: The Lin Lee Family, The Kings Seven and John Meade's Bluegrass Gospel Group

Refreshments after, the cost for gospel sing or refreshments. Everyone welcome!

STUFF

Cemetery Lots

FOR SALE
4 Cemetery Plots
Mountain View Memory Gardens, Maher, WV
Garden of Sermon on the Mount Sect.
$1,750.00 ea. + deed transfer
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Legal Notices

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, Translogic Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off-grid power generation facility (Adams Fork Data Center Energy Campus) located at 2902 Twisted Gun Road, Wharncliffe, Mingo County WV at latitude 37.59372 and longitude -81.86491. It is estimated that all State and Federal air quality requirements will be met.

Legal Notices

by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3715.

The following potential emissions will be authorized by the permit action: Volatile Organic Compounds, 117.88 tons per year (TPY); Nitrogen Oxides, 194.50 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 0.93 TPY; Total Particulate Matter, 215.47 TPY; Particulate Matter less than 10 microns in diameter, 193.26 TPY; Particulate Matter less than 2.5 microns in diameter, 187.96 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
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Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

LH-298264
07-09-2025

In the Circuit Court of Kanawha County, West Virginia

Case No.
CC-20-2025-C-212

Judge
Tod J. Kaufman

Lewis Glasser PLLC,
Plaintiff,

v.

Sidney Gilman, Jr.,
Defendant.

ORDER OF PUBLICATION

The object of the above-entitled action is a breach of contract brought by Plaintiff Lewis Glasser PLLC against Defendant, Sidney Gilman, Jr.

It appearing by an affidavit filed in this action by Hannah K.W. Pelmas, attorney for Plaintiff, that due diligence has been used to ascertain the whereabouts of Sidney Gilman, Jr., without effect, it is ordered that Defendant Sidney Gilman Jr. do serve upon Hannah K.W. Pelmas and the law firm of Lewis Glasser PLLC at 300 Summers Street, Suite 700, Charleston, West Virginia 25301 an answer to the Complaint or other defense to the Complaint filed in this action on or before July 1, 2025, otherwise, judgment by default will be taken against Defendant. Sidney Gilman, Jr. at any time thereafter. A copy of said Petition can be obtained from the undersigned Clerk at her office.

(s/ Richard D. Lindsay
Circuit Court Judge
20th Judicial Circuit

LH-298253
07-02, 09, 16-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:

Betty Lee Newsome

LH-298284
07-09,16,2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:

Bettie James

LH-297152
07-02,09,2025

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, Translogic Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off-grid power generation facility (Adams Fork Data Center Energy Campus) located at 22 Mine Road, near Nolan, Mingo County WV at latitude 37.75302 and longitude -82.11905. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3714.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.88 tons per year (TPY); Nitrogen Oxides, 194.50 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 0.93 TPY; Total Particulate Matter, 193.89 TPY; Particulate Matter less than 10 microns in diameter, 187.96 TPY; Particulate Matter less than 2.5 microns in diameter, 186.91 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone:
304/926-0499 ext. 41216
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

LH-298262
07-09,2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:

Carlos Dana Ellis

LH-298258
07-02,09,2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:

Norman Paul Perry

LH-301451
07-09,16,2025

We shall not be liable for any loss or expense that results from the publication or omission of an advertisement.

Legal Notices

Advertisement

Notice is hereby given that Coal-Mac, LLC, 1345 22 Mine Road, Holden, WV 25625 has submitted an application to the Division of Environmental Protection (DEP) at 1101 Terrace Kanawha Drive, Logan, WV 25601 for an Article 3 permit for the surface disturbance of approximately 536.4 acres, in order to Area/Contour Mine with Auger and/or Highwall Mine and Construct a Haul Road, and disturb within 100 feet of (if None: 53 Right of Way) and change the post mining land use from Forestland to Fish and Wildlife Habitat, in the Middle Mitchening, Middle Mitchening Lower, Five Block, Stockton, Cuttlery, Rolen Cranberry, Buffalo Creek and all rights and ridge seams, thereof, seam of coal. The proposed operation is discharging into Unnamed Tributaries of/and Hell Creek, Unnamed Tributaries of/and Pigeonroost Creek, Unnamed Tributaries of/and Hell Creek, Unnamed Tributaries of/and Pigeonroost Creek, Unnamed Tributary of Stonepost Branch, all of Pigeon Creek, Unnamed Tributaries of Pigeon Creek, Miller Creek, and Buffalo Creek, all of Tug Fork River of the Big Sandy River and is located 1.4 miles southwest of Delbarton in Lee, Hardee and Tug River Districts of Mingo County at Longitude 81-13-48 and Latitude 37-42-30. (Coordinates from USGS Topographic Map)

Surface of the area associated herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface	Elberta Marston Goodwin, et al. (L.C.), P.O. Box 418, Lenore, WV 25676-418
Mineral	Wanda Lee (Marston) Bowen et al (L.C.), P.O. Box 23, P.O. Box 23, Chattaroy, WV 25667
Surface	Hoolahoola Surface Interests, LLC, 800 Princeton Ave, Bluefield, WV 24701
Surface and Mineral	Mathew J. Dean, et ux, Rt. 1 Box 207, Williamson, WV 25661
Surface and Mineral	Colliga Development Company, 8258 Germantown Ave, Philadelphia, WV 19118-1401
Surface	Mingo County Redevelopment Authority, P.O. Box 286, 1607 East Fourth Avenue, Williamson, WV 25661
Surface and Mineral	Savannah SCS, LLC, 114 Morningside Street, Charleston, WV 25302
Surface	Mary Maynard, 320 6th Street, Huntington, WV 25701
Surface	Everett Hannah et ux, Box 377, Varney, WV 25696
Surface	Coal-Mac, LLC, 1345 22 Mine Road, Holden, WV 25625
Surface	WV Division of Highways (Right of Way), 801 Madison Avenue, Huntington, WV 25701-1888
Surface	Elberta Marston Goodwin, et al. (L.C.), P.O. Box 418, Lenore, WV 25676-418
Mineral	Wanda Lee (Marston) Bowen et al (L.C.), P.O. Box 23, P.O. Box 23, Chattaroy, WV 25667
Surface and Mineral	Mathew J. Dean, et ux, Rt. 1 Box 207, Williamson, WV 25661
Surface	Hoolahoola Surface Interests, LLC, 800 Princeton Ave, Bluefield, WV 24701
Surface	Bessie Lane, 536 Meltzear Drive, Delbarton, WV 25670
Surface	Raymond Mark Stevenson, et ux., P.O. Box 710, Delbarton, WV 25670

Written comments and/or requests for an informal conference of the surface mining operation shall identify the applicant and application number and will be received by the Permit Supervisor at the mail address above until 8/08/2025, or thirty (30) days from date of final publication. A copy of the application will be available for review until 8/08/2025, or thirty (30) days from date of final publication in the DEP Regional Office located at the address above and is available at:

http://apps.dep.wv.gov/WebApps/_dep/Search/Information/eSermitting/ApplicationSearch/Page.cfm

The above link can be accessed from a computer at all West Virginia public libraries.

Comments on or requests for Public Hearing regarding conducting mining activities within 100' of US Route 52 (right of Way) shall be submitted, and must state the nature of the issues proposed to be raised in the hearing.

DEP Telephone No. (304) 792-7250 Permit No. S5005-23

Page 717 of 1592

Legal Notices

Location Map
General Highway Map
Article 3 No: S-5005-23 / WVNPDES No: WV1031295
Majestic Quad
Stafford District, Mingo County
Scale: 1" = 1 Mile
Receiving Streams: Unnamed Tributaries of/and Talley Hollow of Alum Creek, Unnamed Tributary of Alum Creek, a tributary of the Tug Fork River, a tributary of the Big Sandy River, a tributary of the Ohio River

Advertisement

Notice is hereby given that Mags Highwall Mining, LLC, (Ben's Creek Operation WV LLC) 12081 Virginia Boulevard, Ashland, Kentucky 41102 has submitted an application to the Department of Environmental Protection (DEP), Division of Mining and Reclamation (DMR) located at 1101 Georgie Kostas Drive, Logan, WV 25601 for an Article 3 permit for the surface disturbance of approximately 108.33 acres in order to Surface, Ridge, and Highwall Mine in the 2 Gas ---- Kanawha Treeless ---- Kanawha Powellton ---- Kanawha Powellton ---- Upper ---- Kanawha Powellton A ---- Kanawha Williamson ---- Kanawha seams of coal. The proposed operation is discharging into Talley Hollow, a tributary to Alum Creek, a tributary to the Tug Fork River, a tributary to the Big Sandy River and is located 3.9 miles, Northwest of Wharncliffe in Stafford District of Mingo County, Longitude 82° 08' 11" and Latitude 37° 35' 26".

Surface of the area associated herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface and Mineral	Carbon Fork Properties, LLC, PO Box 5220, Ashland, KY 41105
Surface and Mineral	Mags Highwall Mining, LLC, 12081 Virginia Boulevard, Ashland, KY 41102

Surface of the area associated within 100 feet of the permit area herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface and Mineral	Carbon Fork Properties, LLC, PO Box 5220, Ashland, KY 41105
Surface and Mineral	Mags Highwall Mining, LLC, 12081 Virginia Boulevard, Ashland, KY 41102

This application was advertised in the past with Ben's Creek Operations WV, LLC listed as the applicant. Written comments and/or requests for an informal conference of the surface mining applications shall identify the applicant and application number and will be received by the Permit Supervisor at the DEP address above until 7/19/2025, or ten (10) days from date of final publication. A copy of the application will be available for review until 7/19/2025, or ten (10) days from date of final publication in the DEP Regional Office located at the address above and is available at:

http://apps.dep.wv.gov/WebApps/_dep/Search/Information/eSermitting/ApplicationSearch/Page.cfm

The above link can be accessed from a computer at all West Virginia public libraries.

DEP Telephone Number 304-792-7250 Permit Number A500823

Received
August 6, 2025
WV DEP/Div of Air Quality

Ad Number 324554

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

I Elisha Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper published in the county of Mingo, West Virginia, hereby certify that the annexed publication was inserted in said newspaper _____

The cost of publishing said annexed advertisement as aforesaid was $ 94.50

Commencing On: 08/06/2025

Ending On: 08/06/2025

Given under my hand this day 08/06/2025

Sworn to and subscribed before me 08/06/2025
at Williamson, Mingo County, West Virginia

Notary Public of, in and for Mingo County, West Virginia

MY COMMISSION EXPIRES: 4-8-30

OFFICIAL SEAL - NOTARY PUBLIC
STATE OF WEST VIRGINIA
CHEYLAN LEWIS
6266 Aracoma Road
Huntington WV, 25705
My Commission Expires April 8, 2030

Elisha Queen

DEP to Hold Virtual Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits to construct an off grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus is to be located off of 22 Mine Road, near Holden at latitude 37.75302 and longitude 82.11905. TransGas Development Systems LLC's Adams Fork Data Energy Center is to be located at 2002 Twisted Gun Road, in Wharncliffe at latitude 37.59372 and longitude 81.95491. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities.

The following potential emissions will be authorized by each permitting action: Volatile Organic Compounds, 117.93 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 215.17 TPY; Particulate Matter less than 10 microns in diameter, 192.26 TPY; Particulate Matter less than 2.5 microns in diameter, 188.03 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

The West Virginia Department of Environmental Protection's Division of Air Quality (DAQ) will hold a virtual public meeting at 6:00 p.m. on Monday, August 18, 2025 to provide information on both facilities. DAQ staff members will be available to provide a presentation and answer questions before taking comments from the public about TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus (Draft Permit R13-3714), and TransGas Development Systems LLC's Adams Fork Data Center Energy Campus (Draft Permit R13-3715). Instructions

Acc.Id:	69164	
Name:	AIR QUALITY--WV DEP	
Phone:	304-926-0499	
Address:	601 57TH ST SE	
City:	CHARLESTON	
State:	WV	
Postcode:	25304	
Class:	9010	Legal Notices
Edition:	WDN	
Start:	08/06/2025	
Stop:	08/06/2025	
Issues:	1	
Units	190.0	
Order ID:	HC 324554	
TFN:	C	
TFN cycle:		
Rep:	EQUEEN	
Status:	CF	
Source:	EM	
Paytype:	BI	
Rate:	LG	
Cost EXC GST:	94.50	
Tax:	0.00	
Total Charge:	94.50	

Printed on: 07/31/2025 10:39:19
Printed by: EQUEEN

to register for the public meeting and to provide a comment are below.

Registration for the public meeting is required by 4:00 p.m. on Monday, August 18, 2025. To register, please complete the registration form at: **https://forms.gle/H4VUfdWDrpxKv9qx7**. To register to ask questions and/or provide oral comments, please indicate "yes" you want to ask a question and/or provide oral comments on the record when you register. A confirmation email will be sent with your responses when you register. A separate email with information on how to join the public meeting will be sent after registration closes at 4:00 p.m. on Monday, August 18, 2025. If you do not have internet access and want to register to participate via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes. Video demonstrations and screen sharing by commenters is not permitted.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed permits will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to this determination. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

The public comment period has been extended to 5:00 p.m. on Friday, August 22, 2025. Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with "Trans Gas Development Comments" as the subject line, or
- Mail: WVDEP Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permit, application, and all other supporting materials relevant to the permit decision is available at: **https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx.**

LH-324554
08-06;2025

CLASSIFIEDS

JOBS

Looking to Hire PREP PLANT CREW LEADER POSITIONS for Maintenance and New Construction

Top hourly wage, com pany truck, gas card, paid lodging. Call Bill at 304-412-4681.

Legal Notices

DEP to Hold Virtual Public Meeting and Extend Public Comment Period

On March 25, 2025, Transitus Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits to construct an integral power generation facility at two distinct locations in Wetzel County: Transitus Development Systems, LLC's Adams Fork Natural Gas Data Center Energy Campus and Triana Gas Development Systems LLC's Adams Fork Data Center Energy Campus. Draft Permits R13-3715I, instructions to register for the public meeting, and to provide a comment are below.

Registration for the public meeting is required by 4:00 p.m. on Monday, August 18, 2025. To register, please complete the registration form at: https://forms.gle/M4VMMPCzpqh1Wkgv7. To register by phone, questions, and/or provide oral comments, please indicate "yes" you want to ask a question and/or provide oral comments on the record when you register. A confirmation email will be sent with your response when you register. A separate email with information on how to join the public meeting will be sent after registration closes at 4:00 p.m. on Monday, August 18, 2025. If you do not have internet access and want to register by phone/voice, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes. Video demonstrations and screen sharing by commenters is not permitted.

The purpose of the DAQ's permitting projects is to make a preliminary determination if the proposed permits will meet all State and federal requirements. The permits will meet all State and federal requirements and will be enforced by this two facilities.

The following potential emissions will be authorized by each permitting action: Volatile Organic Compounds, 117.93 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 305.62 TPY; Sulfur Dioxide, 2.69 TPY; Total Particulate Matter, 215.17 TPY; Particulate Matter less than 10 microns in diameter, 192.26 TPY; particulate Matter less than 2.5 microns in diameter, 188.05 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

The West Virginia Department of Environmental Protection's Division of Air Quality (DAQ) will hold a virtual public meeting at 6:00 p.m. on Monday, August 18, 2025 to provide information on both facilities. DAQ staff members will be available to provide a presentation and answer questions before taking comments from the public about Transitus Development Systems LLC's Adams Fork Natural Gas Data Center Energy Campus Draft Permit R13-3715I and Triana Gas Development Systems LLC's Adams Fork Data Center Energy Campus Draft Permit R13-3715I. Instructions to register for the public meeting

RECEIVED
SEP 08 2025
WV DEP / DIV OF AIR QUALITY

MINGO MESSENGER

PO BOX 802
PIKEVILLE, KY 41502
606-437-4054

ADVERTISING INVOICE

West Virginia Dept. of Environmental Protection
DIVISION OF AIR QUALITY
601 – 57th Street
Charleston, WV 25304
ATTN: Stephanie Mink

BILLING DATED: 8/27/2025
ACCOUNT NO. #13064

DATE	Description	RATE	UNITS	TOTAL
9/5	Public Meeting Air Quality	6.00	29	$174.00

AMOUNT DUE: $174.00

REMIT TO:
Mingo Messenger
PO Box 802
Pikeville KY 41502

Acct. Name: WVDEP – Division of Air Quality
Billed Acct No: #13064
Amount Due: $174.00
Application No: Public Meeting

Mingo
MESSENGER
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NEWSPAPER AFFIDAVIT

APPLICATION NO: TransGas Development Systems LLC

I, Beth McPeek, Administrative Assistant of the **Mingo Messenger** newspaper, a newspaper in Mingo County, West Virginia, do hereby certify that from my own knowledge and a check of the files of this newspaper that the advertisement of In-person public meeting, Extend comment period for WVDEP Division of Air Quality was inserted in the **Mingo Messenger** on the following dates:

DATE 9/5	PAGE NO. 4B & 7B
DATE _____	PAGE NO. _____
DATE _____	PAGE NO. _____
DATE _____	PAGE NO. _____

SIGNATURE Beth McPeek DATE 9-8-25

Subscribed and Sworn to before me by Beth McPeek

This 8th day of September, 2025.

NOTARY PUBLIC Deborah Chambers

ID No KYNP11291 State Ky

My commission expires: July 28, 2028

Mingo MESSENGER CLASSIFI

PHONE: (800) 539-4054
MAIL: classads@mingomessenger.com
MAIL: P.O. Box 802 • Pikeville, KY 41502
AX: (606) 437-4246

Deadline is Wednesday @ 5 PM

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MasterCard VISA

To Our Readers

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POLICIES

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ational origin
physical dis-
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PUBLISHER'S NOTICE

l real estate adver-
ing in this news-
per is subject to
: Fair Housing
t which makes it

To Our Readers

illegal to advertise "any preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status or national origin, or an intention to make any such preference, limitation or discrimination.". Familial includes children under the age of 18 living with parents or legal custodians, pregnant women and people securing custody of children under 18. This newspaper will not knowingly accept any advertising for real estate which is in violation of the law. Our readers are hereby informed that all dwellings advertised in this newspaper are available on an equal opportunity basis. To complain of discrimination, call HUD toll-free at 1-800-669-9777. The toll-free number for the hearing impaired is 1-800-927-9275.

EQUAL HOUSING OPPORTUNITY

Legals

DEP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13-3714 and R13-3715) to construct an off-grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLCs Adams Fork Harless Data Center Energy Campus is proposed to be located off of 22 Mine Road, near Holden, at latitude 37.75302 and longitude -82.11905. TransGas Development Systems LLCs Adams Fork Data Energy Center is proposed to be located at 2002 Twisted Gun Road, in Wharncliffe, at latitude 37.59372 and longitude -81.95491. On July 9, 2025,

RECEIVED
SEP 08 2025
WV DEP / DIV OF AIR QUALITY

E-FI
Min

ORDER OF PUBLICATION
IN THE CIRCUIT COURT OF MINGO COUNTY, WEST V

State of West Virginia,
Petitioner,
AND
Ariel Nicole Carver,
Co-Petitioner,
Vs. Juvenile Case Nos.
Derrick Brewer,
Respondents,
IN THE INTEREST OF THESE MINOR CHILDRE

C.B. DOB: 08-14-2017
O.B. DOB: 03-01-2019
D.B. DOB: 08-28-2020

The object of the above entitled action is to terminate the parental and or other custodians of the above named children and to place permanent cu West Virginia Department of Human Services.

To: Derrick Brewer

It appearing that the above named Respondent, Derrick Brewer, ma Mingo County, West Virginia, and it is hereby Ordered that the said Derrick advised by this Publication to appear in the Circuit Court of Mingo County, in October 8, 2025, at 9:30 a.m., for a preliminary/adjudicatory/dispositional he result in the termination of his parental/custodial rights in and to the above men

Jim Pajarillo, Attorney at Law, whose address is P.O. Box 1082, Willia Number (304) 928-3037, has been appointed to represent the Respon be contacted at the address and telephone number listed.

Should said Respondent, Derrick Brewer, fail to appear on October and trial he is hereby notified and advised that his parental/custodial rights may

A copy of the Petition giving rise to the aforesaid court proceedir undersigned Clerk at his office.

Entered by the Clerk of said Court on this the 22nd day of August, 202

e DAQ notified e public that a eliminary eval- tion has deter- ined that all ate and Federal quality re- irements will met by the two ilities and ade available a aft permit and gineering eval- tion for each ility. A virtual blic meeting to scuss these per- itting actions as held by the AQ on August , 2025. ow, upon re- uest, the DAQ ll hold an addi- onal in-person blic meeting to ovide informa- n, answer estions, and ac- pt oral com- ents for the cord for both rmitting ac- ns. The meet- g will be held at e Larry Joe arless Commu- ty Center, 202 rry Joe Harless ive, Gilbert, V 25621, on ursday, ptember 18, 25, at 4:30 p.m. ors will open 4:00 p.m. to gister atten- es. you plan to at- nd the in-per- n public meet- g, to save time d ensure all rticipants in tendance are gistered, please l out the pre- gistration form <https://forms. e/16EakUxukcv kMY9> by 5:00 p.m. on Wednes- day, September 17, 2025. While pre-registration is not required, it is encouraged to save time and en- sure all partici- pants in atten- dance are regis- tered. To register to ask questions and/or provide oral comments, please indicate yes that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your re- sponses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five The purpose of the DAQs permit- ting process is to determine if the proposed facili- ties will meet all state and federal requirements. The purpose of the public review process is to pro- vide information and accept public comments on air quality issues rel- evant to these de- terminations. Only written comments re- ceived at the ad- dresses noted be- low within the specified time frame, or com- ments presented orally at the pub- lic meeting, will be considered pri- or to final action on the permits. All such com- ments will be- come part of the public record. The public com- ment period has been extended to 5:00 p.m. on Fri- day, September 19, 2025. Written comments may be submitted by:

- Email: Jer- ry Williams at Jerry.Williams@ WV.gov with "TransGas Devel- opment Com- ments" as the subject line, or
- Mail: WVDEP - Air Quality, Atten- tion: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading ad- ditional informa- tion, including copies of the draft permits, applica- tions, and all oth- er supporting ma- terials relevant to the permit deci- sions, are avail- able at: https:// dep.wv.gov/daq/ permitting /Pages /NSK-Pemit- Applications. aspx.

REAL ESTATE FOR RENT

FOR RENT: Commercial and Residential Prop- erty in Williamson, WV. Call 304-235- 5395 or 304-687- 0410.

PUBLIC NOTICE • LEGAL NOTICE

West Virginia State Auditor's Office
County Collections Division 1900 Kanawha Boulevard East
Building 1, Room W-114
Charleston, West Virginia 25305

(2024-C-0000141-MINGO COUNTY-WVTB LLC)
The Mingo Messenger
PO Box 802
Pikeville KY 41502

To: TODD JENKINS, KARRIE JENKINS, TODD JENKINS, KARRIE JENKINS, TODD JENKINS, KARRIE JENKINS, OCCUPANT, IRS, ATTN: ADVISORY CONSOLIDATED RECEIPTS, WV STATE TAX DEPARTMENT, or heirs at law, devisees, creditors, representatives, successors, assigns, all known heirs, guardians, conservators, fiduciaries, administrators, lienholders, co-owners, other parties having an undivided interest in the delinquent property, and other parties that may have any interest in the subject property.

DISTRICT LEE MAP 366 PARCEL 0023 0000 0000

You will take notice that WVTB LLC, the purchaser of the following real estate, Cert. No. 2024-C-000141, located in LEE District, .77 FEE PIGEON CR which was returned delinquent or nonentered in the name of JENKINS TODD ET UX, and was sold by the deputy commissioner of delinquent and nonentered lands of MINGO County at the sale for the delinquent taxes on June 17, 2025, WVTB LLC requests that you be notified that a deed for such real estate will be made on or after February 1, 2026, as provided by law, unless before that day you redeem such real estate. The amount needed to redeem on or before January 31, 2026, will be as follows:

- Amount equal to the taxes and charges due on the date of the certification, with interest, for tax year ticket number 2023 - 8623 ... $930.82
- Back tax tickets, with interest, and charges due on the date of certification for ticket number ... $0.00
- Subsequent of taxes paid on the property, with interest to for tax year 2024 - 8611 ... $824.69
- Additional taxes with interest ... $0.00
- Auditor's Certification, Publication, and Redemption fee plus interest ... $210.20
- Amount paid for Title Examination, notice to redeem, publication, personal service, Secretary of State with interest ... $904.74
- Additional Statutory Fees with Interest ... $0.00
- Total Amount Due and Payable to WV State Auditor - cashier check, money order, certified or personal check ... $2,870.45

You may redeem at any time before January 31, 2026, by paying the above total less any unearned interest.

If the above real estate is your primary residence, you may petition the Auditor to redeem the real estate in not more than three incremental payments that equal the total amount required to redeem the real estate prior to the issuance of the deed described above.

Given under my hand August 13, 2025.

Christal G. Perry
Christal G. Perry
Deputy Commissioner of Delinquent and Nonentered Lands of MINGO County, State of West Virginia

Please Return this letter and payment to the West Virginia State Auditor's Office, County Collections Division, 1900 Kanawha Boulevard East, Building 1, Room W-114 Charleston, West Virginia, 25305. Questions please call 1-888-509-6568

PUBLIC NO

West Virginia State Auditor
County Collections Divisior
Building 1, Room W-114
Charleston, West Virginia 2

(2024-C-0000204-MINGO
The Mingo Messenger
PO Box 802
Pikeville KY 41502

To: IRS, ATTN: ADVISOR' DEPARTMENT, EMMA MOU or heirs at law, devisees, cr known heirs, guardians, co ers, co-owners, other parti quent property, and other property.

DISTRICT MAGNOLIA MAP

You will take notice that estate, Cert. No. 2024-C-0 (2 TRS) TUG RIVER which name of MOUNTS EMMA, linquent and nonentered quent taxes on June 17, 2 a deed for such real estate provided by law, unless be amount needed to redeem lows:

- Amount equal to the tax certification, with interest $183.48
- Back tax tickets, with inte certification for ticket nun
- Subsequent of taxes pai 2024 - 12131 ... $135.7
- Additional taxes with int
- Auditor's Certification, Pu $210.20
- Amount paid for Title Exa personal service, Secretar
- Additional Statutory Fee
- Total Amount Due and Pa money order, certified or

You may redeem at any tim above total less any unearn

If the above real estate is y Auditor to redeem the real payments that equal the to prior to the issuance of the

Given under my hand Aug

Christal G. Perry
Christal G. Perry
Deputy Commissioner of D County, State of West Virgi

Please Return West Virg Coun 1900 Kanawha Bou Charlest Questions

Ad Number 340359

RECEIVED
SEP 10 2025
WV DEP / DIV OF AIR QUALITY

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Logan, TO-WIT

I Elisha Queen, Classified Advertising

Representative of The Logan Banner, a newspaper published in the county of Logan, West Virginia, hereby

certify that the annexed publication was inserted in said newspaper _____

_____

The cost of publishing said annexed advertisement

as aforesaid was $ 86.50

Commencing On: 09/03/2025

Ending On: 09/03/2025

Given under my hand this day 09/03/2025

Sworn to and subscribed before me 09/03/2025
at Logan, Logan County, West Virginia

Lee Ann Welch

Notary Public of, in and for Logan County, West Virginia

MY COMMISSION EXPIRES: Jan. 3, 2028

Elisha Queen

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
LEE ANN WELCH
190 Rotary Road, Huntington, WV 25702
My Commission Expires January 03, 2028

DEP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13-3714 and R13-3715) to construct an off-grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus is proposed to be located off of 22 Mine Road, near Holden, at latitude 37.75302 and longitude 82.11905. TransGas Development Systems LLC's Adams Fork Data Energy Center is proposed to be located at 2002 Twisted Gun Road, in Whamcliffe, at latitude 37.59372 and longitude 81.95491. On July 9, 2025, the DAQ notified the public that a preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and engineering evaluation for each facility. A virtual public meeting to discuss these permitting actions was held by the DAQ on August 18, 2025.

Now, upon request, the DAQ will hold an additional in-person public meeting to provide information, answer questions, and accept oral comments for the record for both permitting actions. The meeting will be held at the Larry Joe Harless Community Center, 202 Larry Joe Harless Drive, Gilbert, WV 25621, on Thursday, September 18, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at **https://forms.gle/16Eak0xukcv12MMY9** by 5:00 p.m. on Wednesday, September 17, 2025. While pre-

Acc.Id:	69164	
Name:	AIR QUALITY--WV DEP	
Phone:	304-926-0499	
Address:	601 57TH ST SE	
City:	CHARLESTON	
State:	WV	
Postcode:	25304	
Class:	9010	Legal Notices
Edition:	LOG	
Start:	09/03/2025	
Stop:	09/03/2025	
Issues:	1	
Units	174.0	
Order ID:	HC 340359	
TFN:	C	
TFN cycle:		
Rep:	EQUEEN	
Status:	CF	
Source:	EM	
Paytype:	BI	
Rate:	LG	
Cost EXC GST:	86.50	
Tax:	0.00	
Total Charge:	86.50	

Printed on: 08/27/2025 13:53:27
Printed by: EQUEEN

2025. While pre-registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register to ask questions and/or provide oral comments, please indicate 'yes' that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes.

The purpose of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to these determinations. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permits. All such comments will become part of the public record.

The public comment period has been extended to **5:00 p.m. on Friday, September 19, 2025**. Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with 'Trans Gas Development Comments' as the subject line, or
- Mail: WVDEP Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permits, applications, and all other supporting materials relevant to the permit decisions, are available at: **https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx.**

LH-340359
09-03;2025

Colleges struggle amid Trump policies

By LUENA RODRIGUEZ-FEO VILLEBA, MAKIYA SEMINERA and COLLIN BINKLEY
The Associated Press

The Case Student Union at Case University in Cleveland, Tenn., is shown Friday, May 30, 2025.

One international student after another told the University of Central Missouri this summer that they couldn't get a visa and many struggled to even land an interview for one.

Even though demand was just as high as ever, half as many new international graduate students showed up for fall classes compared to last year.

The decline represents a hit to the bottom line for Central Missouri, a small public university that operates close to its margins with an endowment of only $65 million. International students typically account for nearly a quarter of its tuition revenue.

"We aren't able to subsidize domestic students as much when we have fewer international students who are bringing revenue to us," said Roger Best, the university's president.

Signs of a decline in international students have universities around the U.S. College's with large numbers of foreign students and small endowments have little financial cushion to protect them from steep losses in tuition money.

International students represent at least 20% of enrollment at more than 100 colleges with endowments of less than $250,000 per student, according to an Associated Press analysis. Many are small Christian colleges, but the group also includes large universities such as Northeastern and Carnegie Mellon.

Enrollment at students' top universities

The extent of the changes in enrollment will not be clear until the fall. Some groups have forecast a decline of as much as 40%, with a huge impact on college budgets and the wider U.S. economy.

International student numbers face uncertainty

Anyone of a dozen efforts to reshape higher education, President Donald Trump has pressured colleges to limit their numbers of international students and heightened scrutiny of student visas. His administration has moved to deport foreign students involved in pro-Palestinian activism, and new student visa appointments were put on hold for weeks as it ramped up vetting of applicants' social media.

On Wednesday, the Department of Homeland Security said it will propose a rule that would put new limits on the time foreign students can stay in the U.S.

The policies have increased severe financial instability for colleges, said Justin Gest, a professor at George Mason University who studies the politics of immigration.

At Rochester, where he received a scholarship to study electrical engineering, Ahmed, 19, said he feels supported by the staff. But he also finds himself on edge and understands why other students might not want to subject themselves to the scrutiny in the U.S., particularly those who are entirely paying their own way.

"I feel like I made it through, but I'm one of the last people to make it through," he said.

Colleges are looking at ways to lower the impact

In recent years, international students have made up about 30% of enrollment at Central Missouri, which has a total of around 12,800 students. In anticipation of the hit to international enrollment, Central Missouri cut a cost of living raise for employees. It has pushed off infrastructure improvements planned for its campus and has been looking for other ways to cut costs.

Small schools — typically classified as those with no more than 5,000 students — tend to have less financial flexibility and will be especially vulnerable, said Dick Startz, an economics professor at the University of California, Santa Barbara.

Lee University, a Christian institution with 3,500 students in Tennessee, is expecting 50 to 60 international students enrolled this fall, down from 82 the previous school year, representing a significant drop in revenue for the school, said Roy V. Chan, the university's director of graduate studies.

The school already has increased tuition by 20% over the past five years to account for a decrease in overall enrollment, he said.

"Since we're a smaller liberal arts campus, tuition can't be our main, primary revenue," Chan said, as opposed to government funding or donations.

The strains on international enrollment only add to distress for schools already on the financial brink.

Colleges around the country have been closing as they cope with declines in domestic enrollment, a consequence of changing demographics and the effects of the pandemic. Nationwide, private colleges have been closing at a rate of about two per month, according to the State Higher Education Executive Officers Association.

The number of high school graduates in the U.S. is expected to decline through 2041, when there will be 13% fewer compared to 2024, according to projections from the Western Interstate Commission for Higher Education.

"That means that if your [international] participation from [international students] is even worse," Startz said.

CLASSIFIEDS

HOMES

STUFF

FOCUS GROUP PARTICIPANTS
Attorney Art Lees associated with Hill & Lees, LC is conducting focus groups and looking for participants to give opinions on court cases involving Logan County, WV. The groups will be held on September 12-13, 2025 and are important. You will receive $150.00 in cash for participating. You must be 21 years old or older to apply. Please Apply on our website at http://leesbrowngroups.com or call 412-818-5583.
If selected, you will receive an email and then some needs to be confirmed in order to participate.

Advertisement for Bids

The TOWN OF CHAPMANVILLE WATER/SEWER DEPARTMENT is considering the sale of the following equipment:

1999 JCB BACKHOE Model 3125 4x4x4. Purchased new October 1999.

Equipment will be sold as is starting bid of $10,000.00

Interested parties need to call the Town Hall at 304-855-7321, Monday thru Friday from 8:30 am to 3:00 pm to schedule an appointment to inspect back hoe.

The Chapmanville Water/Sewer Department has the right to accept or refuse any and all bids.

Bids are to be mailed to: Chapmanville Water/Sewer Dept. PO Box 425 Chapmanville, WV 25508 ATTENTION: MACHINE BIDS

We accept sealed bids until Monday, September 8, 2025 by 3:00 pm

Ltr.
08-20,27,09-03,2025

IN THE CIRCUIT COURT OF LOGAN COUNTY, WEST VIRGINIA

U.S. BANK TRUST NATIONAL ASSOCIATION, NOT IN ITS INDIVIDUAL CAPACITY BUT SOLELY AS CERTIFICATE TRUSTEE
Plaintiff,
v.
REBECCA J. TOMBLIN AND JOSHUA MEADOWS and/or ANY/ALL UNKNOWN OCCUPANTS,
Defendant(s).

Service By Order of Publication

ORDER OF PUBLICATION

The object of the above-styled action is to grant immediate possession of the property to Plaintiff U.S. Bank Trust National Association, not in its individual capacity but solely as Certificate Trustee.

And it appearing by affidavit that the identity and whereabouts of Defendant(s) Unknown Occupants are unknown and cannot be located after due diligence, it is ORDERED that the above named Respondent(s) appear before Attorney Lauren D. Casto of the law firm of Samuel L. White, P.C., whose mailing address is 5000 Coonskin Park Drive, Ste 104, Morgantown, WV 26508 an Answer or any pleading to the Complaint for Unlawful Detainer filed in this action, within Thirty (30) days of entry of this Order; otherwise judgment by default may be taken against said Defendant as to the allegations.

A copy of the Complaint in the action may be obtained from the undersigned Clerk's office.

Entered by the Clerk of the Circuit Court of Logan County, West Virginia, this 22nd day of July, 2025.

Matt McCrone
Clerk of the Court

/s/ Latoya D. Cecil
Lauren D. Casto, Esquire
(WVSB #14231)
Charles J. Mazzone, Esquire (WVSB #14702)
Samuel L. White, P.C.
5000 Coonskin Park Drive, Suite 104
Morgantown, WV 26508
Telephone: (304) 413-8010
Facsimile: (304) 413-8014

LH-340799
08-03,10,2025

DEP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, Transition Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13-3714 and R13-3715A) to construct an offgrid power generation facility at two distinct locations in Logan County. Transition Development Systems LLC's Adams Fork Battery Energy Center is proposed to be located off of 20 West Road, near Holden, at latitude 37.75300 and longitude -82.11605. Transition Development Systems LLC's Adams Fork Battery Energy Center is proposed to be located at 2002 Tomblin Gap Road, in Whitesville, at latitude 37.59073 and longitude -81.95491. On July 9, 2025, the DAQ notified the public that a preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and supporting evaluation for each facility. A virtual public meeting to discuss these permitting actions was held by the DAQ on August 18, 2025.

Now, upon request, the DAQ will hold an additional in-person public meeting to provide information, answer questions, and accept oral comments for the record. Written comments will also be accepted. Any comments received during this meeting will be considered by the DAQ in making a final determination regarding these permits. The meeting will be held at the Larry Joe Harless Community Center, 200 Larry Joe Harless Drive, Gilbert, WV 25621, on Tuesday, September 16, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at https://forms.gle/16EaBGbdaeT2bM9T9 by 5:30 p.m. on the meeting, September 15, 2025. While pre-registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register to ask questions and/or provide oral comments, please indicate "yes" that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926-0499 ext.1256. Oral comments are limited to two (2) minutes.

The proposal of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to these determinations. Only written comments received by the established deadline will be considered. Comments received after the public meeting will be considered part of the public record.

The public comment period has been extended to 5:00 p.m. on October 15, 2025. Written comments may be submitted by:

• Email: Jerry.Williams@wv.gov with "Logan Development Complex" in the subject line, or

• Mail: WVDEP – Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304

Instructions for downloading additional information, including copies of the draft permits, applications, and all other supporting materials related to the permit decision, are available at: https://dep.wv.gov/daq/permitting/Pages/R13R-Permit-Applications.aspx.

LH-340519
08-03,2025

ERRORS MUST BE REPORTED ON THE FIRST DAY OF PUBLICATION

Auction Sale
Two Residential Two Digital Two Locations!
Guns, Tools, Jewelry, Ammo, Knives, Scopes, and More!
Day 1: Live & Online
Live auction on 9/6 @ 10am, pre-bidding open NOW
Location: 71 Jackson St, Logan, WV
Day 2: Online Only
Lots begin closing 9/9 @6pm, pre-bidding open NOW
Location: 5508 Bentzoni Drive, Shinnston, WV
Pick Up: Either Day, Wed, Sept 10, 3-6 pm, two locations
Day 1: Over 550 Lots! Firearms and Hardening! Sterling Firearms & Ammo Reloading from around the world!
Day 2: Over 900 Lots! Ammo, Knives, Scopes, and More!
Terms: 15% BP, Full terms for each day online
Joe R Price Auctions Registered Auction House
304-592-8000
www.JoePrice-Auctions.com
Other Means WV 2384

Harless Community Center, 200 Larry Joe Harless Drive, Gilbert, WV 25621, on Tuesday, September 16, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

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LH-340519
08-03,2025

ERRORS MUST BE REPORTED ON THE FIRST DAY OF PUBLICATION

Ad Number 340361

Affidavit of Legal Publication and Posting

RECEIVED
SEP 10 2025
WV DEP / DIV OF AIR QUALITY

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

I Linda Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper

published in the county of Mingo, West Virginia, hereby

certify that the annexed publication was inserted in said

newspaper _____

The cost of publishing said annexed advertisement

as aforesaid was $ 86.50

Commencing On: 09/03/2025

Ending On: 09/03/2025

Given under my hand this day 09/03/2025

Sworn to and subscribed before me 09/03/2025
at Williamson, Mingo County, West Virginia

Lee Ann Welch

Notary Public of, in and for Mingo County, West Virginia

MY COMMISSION EXPIRES: Jan. 3, 2028

Linda Queen

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
LEE ANN WELCH
190 Rotary Road, Huntington, WV 25705
My Commission Expires January 03, 2028

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Acc.Id:	69164
Name:	AIR QUALITY–WV DEP
Phone:	304-926-0499
Address:	601 57TH ST SE
City:	CHARLESTON
State:	WV
Postcode:	25304
Class:	9010 Legal Notices
Edition:	WDN
Start:	09/03/2025
Stop:	09/03/2025
Issues:	1
Units	174.0
Order ID:	HC 340361
TFN:	C
TFN cycle:	
Rep:	EQUEEN
Status:	CF
Source:	EM
Paytype:	BI
Rate:	LG
Cost EXC GST:	86.50
Tax:	0.00
Total Charge:	86.50

Printed on: 08/27/2025 13:56:20
Printed by: EQUEEN

RECEIVED
SEP 10 2025
WV DEP / DIV OF AIR QUALITY

2023. While pre registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register to ask questions and/or provide oral comments, please indicate "yes" that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes.

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- Mail: WVDEP Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

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LH-340361
09-03;2025

SUBSCRIBE NOW

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Terry Joan Hohensee

LH-3327692
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Hilland Dale

LH-3327565
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Myrtle Thursa Lester

LH-3325548
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Nellanita Kirk

LH-3327276
08-27,09-03-2025

NOTICE

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Name:
Myrtle Thursa Lester

LH-3325548
08-27,09-03-2025

NOTICE

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Name:
Ruby Howard Spaulding

LH-3326801
08-27,09-03-2025

NOTICE

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Name:
Ruth Jessone Hinkle

LH-3313729
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Hackey Doyle
aka Mayo F

LH-3058310
08-27,09-03-2025

ORDER OF PUBLICATION

IN THE FAMILY COURT OF MINGO COUNTY, WEST VIRGINIA

CIVIL ACTION No. 25D-93

IN RE THE MARRIAGE OF:

Jose Luis Gonzalez
PETITIONER

AND

Mark A. Gonzalez
RESPONDENT

THE OBJECT OF THIS SUIT IS TO OBTAIN A DIVORCE

TO THE ABOVE NAMED PETITIONER/RESPONDENT:

It appearing by affidavit filed in this action that Mark A. Gonzalez is a nonresident of the State of West Virginia or has a nonresident address, it is hereby ordered that Mark A. Gonzalez serve upon Jose Luis Gonzalez, CIRCUIT CLERK'S OFFICE, whose address is 75 Last 2nd Avenue, Room 237, Williamson, West Virginia 25661, an Answer, including any related counterclaim or defense you may have to the above named action on or before October 1, 2025, 9:30 AM or you fail to do so, thereafter judgment, upon proper hearing, may be taken against you for the relief demanded in the Petition.

A copy of said Petition can be obtained from the undersigned Clerk's office

RUN PUBLICATION ONCE A WEEK FOR TWO CONSECUTIVE WEEKS.

Entered by the Clerk of said Mingo County

Lonnie Hunsuck
Clerk of
Mingo County

LH-3326214
08-27,09-03,2025

In the Circuit Court of Mingo County, West Virginia

Case No.
CC-28-2025-C-55

Judge Joshua Butcher

Kentucky Financial Leasing Partnership,
Plaintiff,

v.

Rocky Kennedy,
Defendant

Order for Publication

1. In the civil action and pursuant to Plaintiff's Motion filed on Mar. 13, 2025 Complaint, Plaintiff seeks an entry of judgment of Court for Plaintiff for the money owed to it for Defendant's default of his 10% Master Lease seven contracts made between Defendant's property company Emerald Coal LLC, Pawgasett, and Plaintiff and the payments made between Defendant and Plaintiff, in an amount of not less than $1,021,737.75, plus all costs and fees incurred by Plaintiff in connection with the enforcement of this matter, including attorneys fees, an award of pre-judgment and post-judgment interest, an award of all other amounts due to Plaintiff under the Contracts, Guaranty, and applicable law, and all other relief the Court deems possible and just.

2. Between July 30, 2021 and October 28, 2024, Eleanor made irregular and deficient payments (the "Contracts") to Lex Equipment Machinery Finders, which required Eleanor to pay under certain amounts as Each Payment.

3. Eleanor defaulted under the Contracts by failing and refusing to make the required payments to Plaintiff.

5. Defendant made, executed, and delivered to Plaintiff a guaranty (the "Guaranty"), pursuant to which Defendant is personally liable for Eleanor's obligations under the Contracts.

6. As of the time of the Complaint, Defendant was in default of his obligations under the Contracts and the Guaranty in an amount of not less than $1,021,737.75

7. Plaintiff, despite its delivery of them, pursuant to Rule 4(e)(1)(C) of the West Virginia Rules of Civil Procedure, is unable to secure the present location or whereabouts of Defendant.

8. Accordingly, Plaintiff has been unable to serve Defendant through certified mail at his last known address or by hand. Rule. Process through the Mingo County Sheriff's Office or through a private process server

9. A copy of the Complaint in this matter can be obtained from the undersigned Clerk in the Office of the Mingo County Circuit Clerk, located at the Mingo County Courthouse, 78 East Second Avenue, Williamson, West Virginia 25661.

10. It appearing by affidavit filed in this action that the location of the residence of the Defendant is unknown, and Plaintiff has made diligent but futile efforts to serve the Complaint upon Defendant at Defendant's last known address and through the Mingo County Sheriff's Office, it is accordingly ORDERED that he be published before or serve upon Plaintiff's attorney James Matthew Dunn, whose address is 501 Lee Street East, Suite 1500, Charleston, West Virginia 25301, an answer, or other defense to the Complaint filed in this action on or before October 6, 2025 otherwise judgment will be taken by default against him as any time thereafter.

The Clerk is directed to provide a copy of this Order to counsel listed below

/s/ Joshua Butcher
Circuit Court Judge
11th Judicial Circuit

Prepared By:
/s/ James M Dunn
James Matthew Dunn
WV State Bar No. 10820
JACKSON KELLY PLLC
P.O. Box 553
Charleston
West Virginia 25322
(304) 340-1000
Counsel for Plaintiff

LH-3328210
08-03,10-2025

Will be held
In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, Tran Gas Development Systems LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for two separate permits (R13-3716 and 913-3717-I) to construct an oil and gas power generation facility at the Logan County, Hamilton Development Systems, LLC's Adkins Fork Natural Gas Data Center Energy Campus is proposed to be located at 23 Mile Road, near Holden at latitude 37.75303 and longitude -81.95491. On July 9, 2025, the DAQ notified the public that a preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and engineering evaluation for each facility. A virtual public meeting in electronic format pertaining to these facilities will be held by the DAQ on August 18, 2025.

Now, upon request, the DAQ will hold an additional in-person public meeting to provide information, answer questions, and accept public comments for the record for both permitting actions. The meeting will be held in the Larry Joe Harless Community Center, 202 Larry Joe Harless Drive, Gilbert, WV 25621, on Thursday, September 18, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at http://tinyurl.com/3e3uuuyt1234567 by 5:00 p.m. on Wednesday, September 17, 2025. While pre-registration is not required, it is encouraged to save time and ensure all participants in attendance are registered to register to ask questions and/or provide oral comments. Please ensure you have what you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ennis at (304) 926-0499 ext. 1056. Oral comments are invited to be recorded.

The purpose of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to the determinations. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to any action on the permits. All such comments and received part of the public record.

The public comment period has been extended to 5:00 p.m. on Friday, September 19, 2025. Timely comments may be submitted by:

• Email (any individual): Jerry.D.Williams@wv.gov with "Transcap Development; Comments" in the subject line; or

• Mail WVDEP - Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304

Instructions for downloading additional information, including copies of the draft permits, applications, and all data supporting materials relevant to the permit decisions, are available at: https://dep.wv.gov/daq/permitting/Pages/R13-Permit-Applications.aspx.

LH-3403461
08-03,2025

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF MINING AND RECLAMATION

PUBLIC NOTICE OF BLASTING OPERATORS

LEGAL ADVERTISEMENT

Notice is hereby given that:

Independence Energy, LLC
109 Depot Street
Suite 4
Beckley, WV 25801

Phone Number:
(681) 307-7343
Surface Mine
Permit Number
S-5009-22

located on the Stafford District of Mingo County, approximately 3.5 miles northeast of Gilbert, WV will be conducting blasting activities in accordance with all State and Federal laws and as approved by the Department of Environmental Protection.

Blasting activities will occur Monday through Saturday from sunrise to sunset. No blasting shall be conducted on Sunday. Blasting is to commence on August 31, 2025 and continue through August 31, 2026

Ten minutes prior to and immediately after each blast, all access to the special area will be safeguarded from unauthorized entry. The warning signal prior to each blast shall be from an air horn, siren or other device audible to at least one (1) mile from the blast. The warning will be given three (3) minutes prior to detonation and will consist of three (3) short blasts of two (2) seconds duration with one (1) second between each blast. The all clear signal shall be one long blast from an air horn, siren or other device of twenty (20) seconds duration.

Blasting shall be conducted in such a way as to prevent adverse impacts to the public or the environment.

Blasting activities will not be conducted at times other than those announced in the blasting schedule except in the event of an emergency situation where law, weather or other atmospheric conditions, or request of public safety requires scheduled blast detonation.

LH-3403557
09-03,2025

ERRORS MUST BE REPORTED ON THE FIRST DAY OF PUBLICATION

We shall not be liable for any error or omission that occurs from the publication or omission of an advertisement

ALL THINGS BASEMENTY
WE FIX THIS ...AND THIS
...AND THIS ...AND THIS
Alford FOUNDATION & CRAWL SPACE Repair
$250 OFF Any Crawl Space Repair
304-600-7373

12. Affidavits of Publication R13-3715

Ad Number 298264

Received
July 21, 2025
WV DEP/Div of Air Quality

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

I Elisha Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper published in the county of Mingo, West Virginia, hereby certify that the annexed publication was inserted in said newspaper _____

The cost of publishing said annexed advertisement as aforesaid was $ 64.50

Commencing On: 07/09/2025

Ending On: 07/09/2025

Given under my hand this day 07/09/2025

Sworn to and subscribed before me 07/09/2025
at Williamson, Mingo County, West Virginia

Notary Public of, in and for Mingo County, West Virginia

MY COMMISSION EXPIRES: 4·8·30

OFFICIAL SEAL - NOTARY PUBLIC
STATE OF WEST VIRGINIA
CHEYLAN LEWIS
6266 Aracoma Road
Huntington WV, 25705
My Commission Expires April 8, 2030

Elisha Queen

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off grid power generation facility (Adams Fork Data Center Energy Campus) located at 2002 Twisted Gun Road, Wharncliffe, Mingo County WV at latitude 37.59372 and longitude 81.95491. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3715.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.93 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 215.17 TPY; Particulate Matter less than 10 microns in diameter, 192.26 TPY; Particulate Matter less than 2.5 microns in diameter, 188.03 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted

Acc.Id:	69164	
Name:	AIR QUALITY--WV DEP	
Phone:	304-926-0499	
Address:	601 57TH ST SE	
City:	CHARLESTON	
State:	WV	
Postcode:	25304	
Class:	9010	Legal Notices
Edition:	WDN	
Start:	07/09/2025	
Stop:	07/09/2025	
Issues:	1	
Units	130.0	
Order ID:	HC 298264	
TFN:	C	
TFN cycle:		
Rep:	EQUEEN	
Status:	CF	
Source:	EM	
Paytype:	BI	
Rate:	LG	
Cost EXC GST:	64.50	
Tax:	0.00	
Total Charge:	64.50	

Printed on: 06/30/2025 10:46:06
Printed by: EQUEEN

at the address listed below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304 926 0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

LH-298264
07-09;2025

CLASSIFIEDS

Announcements

Special Notices

Gospel Sing at Living Stone Church of God Sat 7/12 @ 5 PM

Featuring: The Lee Wells Family, The Kings Sisters and John Kent's Bluegrass Gospel Sirens

Refreshments after. No cost for gospel sing or refreshments. Everyone welcome!

STUFF

Cemetery Lots

FOR SALE
4 Cemetery Plots
Mountain View Memory Gardens, Mabee, WV
Garden of Sermon on the Mount Sect.
$1750.00 ea. - or best offer
(704) 226-2803

Legal Notices

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 28, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an oil and gas power generation facility (Adkins Fork Data Center Energy Complex) located at 2003 Twelve Gun Road, Wharncliffe, Mingo County WV at latitude 37.59672 and longitude -81.95431. A preliminary evaluation has determined that all State and Federal air quality requirements will be met and the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304-926-0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

LH-298264
07-09/2025

In the Circuit Court of Kanawha County, West Virginia

Case No. CC-20-2025-C-312

Judge
Richard D. Lindsay

Lewis Glasser PLLC,
Plaintiff,

v.

Sidney Gilman, Jr.,
Defendant

ORDER OF PUBLICATION

The object of the above entitled action is a breach of contract brought by Plaintiff, Lewis Glasser PLLC, against Defendant, Sidney Gilman Jr.

It appearing by an affidavit filed in this action by Hannah K.W. Perrine, attorney for Plaintiff, that due diligence has been used to ascertain the whereabouts of Sidney Gilman Jr., without effect, it is ordered that Defendant Sidney Gilman Jr. do serve upon Hannah K.W. Perrine and the law firm of Lewis Glasser PLLC at 300 Summers Street, Suite 700, Charleston, West Virginia 25301, an Answer to the Complaint or other defense to the Complaint filed in this action on or before July 7, 2025, otherwise judgment by default will be taken against Defendant Sidney Gilman Jr. at any time thereafter. A copy of said Petition can be obtained from the undersigned Clerk at our office.

/s/ Richard D. Lindsay
Circuit Court Judge
20th Judicial Circuit

LH-298263
07-02,09,16/2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:
Betty Lee Newsome

LH-298284
07-09,16,2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:
Bertha James

LH-298253
07-02,09/2025

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 28, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an oil and gas power generation facility (Adkins Fork Data Center Energy Complex) located at 22 Mine Road, near Holden, Mingo County WV at latitude 37.73302 and longitude -82.11905. A preliminary evaluation has determined that all State and Federal air quality requirements will be met and the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304-926-0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

LH-298252
07-09/2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:
Norman Paul Terry

LH-301851
07-09,16,2025

We shall not be liable for any loss or expense that results from the publication or omission of an advertisement.

Legal Notices

Advertisement

Notice is hereby given that Mega Highwall Mining, LLC, Ben's Creek Operation WV LLC) 12081 Virginia Boulevard, Ashland, Kentucky 41102 has submitted an application to the Department of Environmental Protection (DEP), Division of Mining and Reclamation (DMR) located at 1101 George Kostas Drive, Logan, WV 25601 for an Article 3 permit for the surface disturbance of approximately 108.23 acres in order to Surface, Auger, and Highwall Mine in the 1 Gas — Kanawha, Fayette — Kanawha, Powellton — Upper Kanawha, Powellton A — Kanawha, Williamson — Kanawha seams of coal. The proposed operation is discharging into Talley Hollow, a tributary to Alum Creek, a tributary to the Tug Fork River, a tributary to the Big Sandy River and Big Sandy River and is located 8.0 miles Northwest of Wharncliffe in Stafford District of Mingo County, Longitude (DD°MM'SS") and Latitude (YY°SS'ZZ").

Surface of the area associated herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface and Mineral	Carbon Fuels Properties, LLC, PO Box 5201, Ashland, KY 41105
Surface and Mineral	Mega Highwall Mining, LLC, 12081 Virginia Boulevard Ashland, KY 41102

Surface of the area associated within 100 feet of the permit area herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface and Mineral	Carbon Fuels Properties, LLC, PO Box 5201, Ashland, KY 41105
Surface and Mineral	Mega Highwall Mining, LLC, 12081 Virginia Boulevard, Ashland, KY 41102

This application was advertised in the paid with Ben's Creek Operations WV LLC Below as the applicant. Written comments and/or requests for an informal conference of the surface mining application shall identify the applicant and application number and will be received by the Permit Supervisor at the DEP address above until 7/16/2025, or ten (10) days from date of final publication. A copy of the application will be available for review until 7/16/2025, or ten (10) days from date of final publication in the DEP Regional Office located at the address above and is available at:

http://apps.dep.wv.gov/WebApp/_dep/Search/eNermitting/eNermitting/ApplicationSearchPage.cfm

The above link can be accessed from a computer at all West Virginia public libraries.

DEP Telephone Number 304-752-7250 (Permit Number 1000123)

ADVERTISEMENT

Notice is hereby given that Coal-Mac, LLC, 1245 22 Mine Road, Holden, WV 25625 has submitted an application to the Division of Environmental Protection (DEP) at 1101 George Kostas Drive, Logan, WV 25601 for an Article 3 permit for the surface disturbance of approximately 5364 acres, in order to Area/Contour Mine with Auger and/or Highwall Mine and Construct a Haul Road and disturb within 100 feet of US Route 52 Right of Way and change the post mining land use from Forestland to Fish and Wildlife Habitat, in the Middle Straitening, Middle Straitening Lower, Five Block, Stockton, Coalburg Rider, Coalburg, Buffalo Creek and all splits and rider seams, thereof, seam of coal. The proposed operation is discharging into Unnamed Tributaries of/and Hell Creek, Unnamed Tributaries of/and Pigeonroost Creek, Unnamed Tributaries of/and Hell Creek, Unnamed Tributaries of/and Pigeonroost Creek, Unnamed Tributary of Stonecoal Branch, all of Pigeon Creek, Unnamed Tributaries of Pigeon Creek, Mills Creek, and Buffalo Creek, all of Tug Fork River of the Big Sandy River and is located 7.4 miles southeast of Delbarton in Lee, Hardee and Tug River Districts of Mingo County at Longitude 82-11-44 and Latitude 37-42-31. (Coordinates from USGS Topographic Map).

Surface of the area associated herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface:	Elberta Marcum Goodwin et al, (L.C.), P.O. Box 418, Lenore, WV 25678-418
Mineral	Wanda Lee (Marcum) Bowen et al (L.C.), P.O. Box 74, P.O. Box 34, Chattaroy, WV 25667
Surface:	Pocahontas Surface Interests, LLC, 800 Princeton Ave, Bluefield, WV 24701
Surface and Mineral	Matthew J. Dixon, et ux, Rt. 1 Box 207, Williamson, WV 25661
Surface and Mineral	Colgat Development Company, 8258 Germantown Ave, Philadelphia, WV 19118-3407
Surface:	Mingo County Redevelopment Authority, P.O. Box 248, 1807 East Fourth Avenue, Williamson, WV 25661
Surface and Mineral	Savannah 605, LLC, 114 Morningside Street, Charleston, WV 25301
Surface:	Mary Maynard, 320 4th Street, Huntington, WV 25703
Surface:	Everett Harman et ux, Box 277, Verney, WV 25696
Surface:	Coal-Mac, LLC, 1245 22 Mine Road, Holden, WV 25625

Surface of the area associated within 100 feet of the permit area herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface and Mineral	Colgat Development Company, 8258 Germantown Ave, Philadelphia, WV 19118-3407
Surface:	Mingo County Redevelopment Authority, P.O. Box 248, 1807 East Fourth Avenue, Williamson, WV 25661
Surface and Mineral	Savannah 605, LLC, 114 Morningside Street, Charleston, WV 25301
Surface:	Mary Maynard, 320 4th Street, Huntington, WV 25703
Surface:	Everett Harman et ux, Box 277, Verney, WV 25696
Surface:	Coal-Mac, LLC, 1245 22 Mine Road, Holden, WV 25625
Surface:	WV Division of Highways (Right of Way), 601 Aberdeen Avenue, Huntington, WV 25712-0880
Surface:	Elberta Marcum Goodwin et al, (L.C.), P.O. Box 418, Lenore, WV 25678-418
Mineral:	Wanda Lee (Marcum) Bowen et al (L.C.), P.O. Box 25, P.O. Box 20, Chattaroy, WV 25667
Surface and Mineral:	Matthew J. Dixon, et ux, Rt. 1 Box 207, Williamson, WV 25661
Surface:	Pocahontas Surface Interests, LLC, 800 Princeton Ave, Bluefield, WV 24701
Surface:	Route Lane, Etal Mitigating Drive, Delbarton, WV 25670
Surface:	Raymond Mack Stevenson, et ux, P.O. Box 171, Delbarton, WV 25670

Written comments and/or requests for an informal conference of the surface mining application shall identify the applicant and application number and will be received by the Permit Supervisor at the DEP address above until 8/29/2025, or thirty (30) days from date of final publication. A copy of the application will be available for review until 8/29/2025, or thirty (30) days from date of final publication in the DEP Regional Office located at the address above and is available at:

http://apps.dep.wv.gov/WebApp/_dep/Search/eNermitting/eNermitting/ApplicationSearchPage.cfm

The above link can be accessed from a computer at all West Virginia public libraries.

Comments on or requests for Public Hearing regarding combatting mining activities within 100' of US Route 52 Right of Way shall be in writing and shall state the nature of the issues proposed to be raised in the hearing.

DEP Telephone No. (304) 752-7250 Permit No. 1000123

Received
August 6, 2025
WV DEP/Div of Air Quality

Ad Number 324554

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

I Elisha Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper published in the county of Mingo, West Virginia, hereby certify that the annexed publication was inserted in said newspaper _____

The cost of publishing said annexed advertisement as aforesaid was $ 94.50

Commencing On: 08/06/2025

Ending On: 08/06/2025

Given under my hand this day 08/06/2025

Sworn to and subscribed before me 08/06/2025
at Williamson, Mingo County, West Virginia

Notary Public of, in and for Mingo County, West Virginia

MY COMMISSION EXPIRES: 4-8-30

OFFICIAL SEAL - NOTARY PUBLIC
STATE OF WEST VIRGINIA
CHEYLAN LEWIS
6266 Aracoma Road
Huntington WV, 25705
My Commission Expires April 8, 2030

Elisha Queen

DEP to Hold Virtual Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits to construct an off grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus is to be located off of 22 Mine Road, near Holden at latitude 37.75302 and longitude 82.11905. TransGas Development Systems LLC's Adams Fork Data Energy Center is to be located at 2002 Twisted Gun Road, in Wharncliffe at latitude 37.59372 and longitude 81.95491. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities.

The following potential emissions will be authorized by each permitting action: Volatile Organic Compounds, 117.93 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 215.17 TPY; Particulate Matter less than 10 microns in diameter, 192.26 TPY; Particulate Matter less than 2.5 microns in diameter, 188.03 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

The West Virginia Department of Environmental Protection's Division of Air Quality (DAQ) will hold a virtual public meeting at 6:00 p.m. on Monday, August 18, 2025 to provide information on both facilities. DAQ staff members will be available to provide a presentation and answer questions before taking comments from the public about TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus (Draft Permit R13-3714), and TransGas Development Systems LLC's Adams Fork Data Center Energy Campus (Draft Permit R13-3715). Instructions

Acc.Id:	69164	
Name:	AIR QUALITY--WV DEP	
Phone:	304-926-0499	
Address:	601 57TH ST SE	
City:	CHARLESTON	
State:	WV	
Postcode:	25304	
Class:	9010	Legal Notices
Edition:	WDN	
Start:	08/06/2025	
Stop:	08/06/2025	
Issues:	1	
Units	190.0	
Order ID:	HC 324554	
TFN:	C	
TFN cycle:		
Rep:	EQUEEN	
Status:	CF	
Source:	EM	
Paytype:	BI	
Rate:	LG	
Cost EXC GST:	94.50	
Tax:	0.00	
Total Charge:	94.50	

Printed on: 07/31/2025 10:39:19
Printed by: EQUEEN

to register for the public meeting and to provide a comment are below.

Registration for the public meeting is required by 4:00 p.m. on Monday, August 18, 2025. To register, please complete the registration form at: **https://forms.gle/H4VUfdWDrpxKv9qx7**. To register to ask questions and/or provide oral comments, please indicate "yes you want to ask a question and/or provide oral comments on the record when you register. A confirmation email will be sent with your responses when you register. A separate email with information on how to join the public meeting will be sent after registration closes at 4:00 p.m. on Monday, August 18, 2025. If you do not have internet access and want to register to participate via telephone, please contact Nicole Ernest at (304) 926 0499 x41256. Oral comments are limited to five (5) minutes. Video demonstrations and screen sharing by commenters is not permitted.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed permits will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to this determination. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

The public comment period has been extended to 5:00 p.m. on Friday, August 22, 2025. Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with "Trans Gas Development Comments" as the subject line, or
- Mail: WVDEP Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permit, application, and all other supporting materials relevant to the permit decision is available at: **https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx.**

LH-324554
08-06;2025

CLASSIFIEDS

JOBS

Looking to Hire PREP PLANT CREW LEADER POSITIONS for Maintenance and New Construction

Too many years, don't have truck, gas card, fuel, lodging. Call Bill at 304-412-4661.

Legal Notices

GEP to Hold Virtual Public Meeting and Extend Public Comment Period

On March 25, 2025, Transitus Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits to construct an integral power generation facility at two distinct locations in Mingo County. Transitus Development Systems, LLC's Adams Fork Hollow Data Center Energy Campus to be located off of 122 Nine Road, Naugatuck at latitude 37.75302 and longitude 82.11805. TransGas Development Systems, LLC's Adams Fork Data Energy Center to be located at 2002 Theodor Dew Road, in Wharncliffe at latitude 37.59372 and longitude 82.05451. A preliminary determination has determined that all State and Federal air quality requirements will be met by the two facilities.

The following potential emissions will be authorized for each permitting action: Volatile Organic Compounds, 117.93 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 305.62 TPY; Sulfur Dioxide, 2.69 TPY; Total Particulate Matter, 215.17 TPY; Particulate Matter less than 10 microns in diameter, 192.26 TPY; Particulate Matter less than 2.5 microns in diameter, 188.05 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

The West Virginia Department of Environmental Protection's Division of Air Quality (DAQ) will hold a virtual public meeting at 6:00 p.m. on Monday, August 18, 2025 to provide information on both facilities. DAQ staff members will be available to provide a presentation and answer questions before taking comments from the public about Transitus Development Systems LLC's Adams Fork Hollow Data Center Energy Campus Draft Permit R13-3715J and Transitus Development Systems LLC's Adams Fork Data Center Energy Campus Draft Permit R13-3715I. Instructions to register for the public meeting and to provide a comment are below.

Registration for the public meeting is required by 4:00 p.m. on Monday, August 18, 2025. To register, please confirm the registration form at: https://dep.wv.gov/daq/newsandevents/Pages/default.aspx. To register to ask questions and/or provide oral comments, please indicate "yes" you want to ask a question and/or provide oral comments on the record when you register. A confirmation email will be sent with your response when you register. A separate email with information on how to join the public meeting will be sent after registration closes at 4:00 p.m. on Monday, August 18, 2025. If you do not have internet access and want to register to participate by telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes. Video demonstrations and screen sharing by commenters is not permitted.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed permits will meet all State and federal requirements. The permits will meet all applicable emission standards. Trucking emissions will be controlled by requiring the use of paved roads and by limiting the speed of trucks to 15 miles per hour. Fugitive dust emissions will be controlled by the application of water or suitable chemicals on unpaved roads, materials stockpiles, and other surfaces as necessary.

A 30-day public comment period will be held from August 4, 2025 through September 3, 2025. All comments received by the deadline will be considered prior to final action on the permit. All such comments will become part of the public record.

The public comment period has been extended to 5:00 p.m. on Friday, August 22, 2025. Written comments may be submitted by:

- Email: Jerry.Williams@WV.gov with "Transitus Gas Development Comments" as the subject line; or
- Mail: WVDEP - Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information including copies of the draft permit, application, and all other supporting materials relevant to the permit decision is available at: https://dep.wv.gov/daq/newsandevents/Pages/Public-Notices.aspx.

UA-3216554
08-06-2025

TRUSTEE'S SALE OF VALUABLE REAL ESTATE

The undersigned Substitute Trustee, by virtue of the authority vested in him by that certain Deed of Trust, dated January 7, 2019, and duly recorded in the Office of the Clerk of the County Commission of Mingo County, West Virginia, in Book No. 675, at Page 41, Jordan Gibson and Delonna Gibson did convey unto Douglas McElwee, Trustee(s), certain real property described in said Deed of Trust, and the beneficiary has elected to appoint Seneca Trust, Inc., as Substitute Trustee, and default having been made under the aforementioned Deed of Trust, and the undersigned Substitute Trustee having been requested by the holder of the Note secured by said Deed of Trust, Mortgage, LLC (f/k/a Quicken Loans, LLC (f/k/a Quicken Loans Inc. as successor by merger), will offer for sale at public auction at the front door of the Mingo County Courthouse in Williamson, West Virginia, on

September 2, 2025 at 2:00 PM

the following described real estate, together with its improvements, easements and appurtenances thereunto belonging, situate in 06 - Lee District, Mingo County, West Virginia, and more particularly described as follows:

Land situated in the County of Mingo in the State of WV.

All that certain tract or parcel of real estate situate in Lee District, Mingo County, West Virginia, known and designated on that certain map of Inchland Subdivision and being more particularly described as follows, to-wit:

Lot No. Five (5), which said lot is of record in the Office of the Clerk of the County Court of said County in Map Book No. 1, at Page 29. Being the land and within the exterior boundary lines of said lot is hereby conveyed, even though part of said lot may lend on a public highway. Commonly known as: 1449 Stockhouse Fork, Delbarton, WV 25670-8194.

At the time of the execution of the Deed of Trust, this property was reported to have an address of: 1449 Packhouse Fork, Delbarton, WV 25670-8194.

The referenced real estate will be conveyed with no covenants of warranty, and subject to all covenants, restrictions, easements, rights of way and reservations which may be a matter of record in the aforesaid Clerk's Office or visible upon the ground, all prior liens and encumbrances, including, without limitation, liens for real estate taxes, homeowner, sanitary and sewer charges. The purchaser at the sale shall be responsible for paying the recording costs and also the tax on the privilege of transferring real property. The cost of the tax stamp to be affixed to the deed. The purchasers shall be responsible for payment of all real estate taxes.

The subject property will be sold in "AS IS" condition. The Substitute Trustee shall be under no duty to cause any existing tenant or person occupying the subject property to vacate said property.

TERMS: $7000.00 in cash and/or certified funds as deposit at the time of sale with the balance due and payable within 30 days of the day of sale.

FEDERAL TAX LIEN: In the event that there are Federal Tax Liens against the property the United States would have the right to redeem the property within a period of 120 days from the date of such sale of the period allowable for redemption under local law, whichever is longer.

Pursuant to the Deed of Trust, the Trustee may postpone the sale by public announcement at the time and place designated or by posting a notice of the same and act by agent in the execution of the sale. The parties secured by the Deed of Trust reserve the right to institute the proper in a suit in equity.

SENECA TRUSTEES, INC.
3000 Coolidge Farm Drive, Suite 106
Morgantown, WV 26505
(304) 413-0044
(304) 282-2812
Toll free: (888) 534-3182
Reference File No. 91304

UA-3214108
08-06,13,2025

Legal Notices

PUBLIC SERVICE COMMISSION
OF WEST VIRGINIA
CHARLESTON

Case No. 25-0855-G-30P

HOPE GAS, INC.
Annual Pipeline Replacement and Expansion Program (PREP) Application, pursuant to W. Va. Code § 24-2-1k

NOTICE OF FILING AND HEARING

On May 30, 2025, Hope Gas, Inc. (Hope) filed its Annual Pipeline Replacement and Expansion Program (PREP) Filing with revised PREP Rates, pursuant to W. Va. Code § 24-2-1k, which authorizes the Public Service Commission of West Virginia (Commission) to approve cost recovery of projects to replace, upgrade, and expand natural gas utility infrastructure that are deemed to be just and reasonable and in the public interest.

In its PREP Filing, Hope projects PREP capital investment for calendar year 2026 of $115.6 million, as part of its General Program (core distribution system) and Gathering Program (gathering facilities), under its multi-year plans. The PREP Filing also contains a true-up for actual versus projected 2024 calendar year PREP capital investment activity for both the General Program and the Gathering Program. The PREP covers several categories of plant asset replacements and improvements, including mains, service lines, regulator stations, and other plant equipment. These plant investments are proposed to be made in Hope service territories throughout the State. These projects are identified in the PREP Filing, which is on file and available for public inspection at the Commission's offices at 201 Brooks Street, Charleston, West Virginia.

Hope proposes to recover costs associated with these investments through an increase/s within the fixed or volumetric, base rate components of its rates depending on the applicable rate schedule under which service is rendered, to be effective on November 1, 2025. Hope projects that the average monthly bill for the various classes of customers will be changed on November 1, 2025, as follows:

HOPE GAS, INC. - PROPOSED		
TYPE OF CUSTOMER	$ INCREASE	% INCREASE
Residential Sales (Rate Class RS)	$2.06	2.40%
Small Commercial Sales (Rate Class SGS)	$1.98	0.70%
Small Commercial Transport (Rate Class SGS)	$13.00	1.19%
Large Commercial Sales (Rate Class LGS)	$342.18	5.71%
Large Commercial Transport (Rate Class LGS)	$371.40	0.66%
Large Commercial-Industrial - Distribution Sales (Rate Class LGI-D)	$240.77	1.59%
Large Commercial-Industrial - Distribution Transport (Rate Class LGI-D)	$230.09	1.05%
Large Commercial-Industrial - Direct Service Transport (Rate Class LGI-DS)	$268.32	8.31%
Resale Sales (Rate Class WS)	$1,340.75	5.17%
Gathering (Rate Class PGAS)	$13,356.27	42.62%

FORMER PEOPLES GAS WV - PROPOSED		
TYPE OF CUSTOMER	$ INCREASE	% INCREASE
General Service – Residential Sales	$2.09	2.56%
General Service – Commercial Sales	$2.34	0.88%
Commercial Transport – WV Produced	$16.32	1.50%
Industrial Sales	$43.46	1.15%
Industrial Transport – WV Produced	$59.71	4.00%

FORMER SOUTHERN PUBLIC SERVICE COMPANY - PROPOSED		
TYPE OF CUSTOMER	$ INCREASE	% INCREASE
General Service - Residential Sales	$1.82	2.02%
General Service - Commercial Sales	$2.57	0.84%

FORMER STANDARD/BLAZETTE GAS COMPANY - PROPOSED		
TYPE OF CUSTOMER	$ INCREASE	% INCREASE
General Domestic - Residential Sales	$1.80	2.60%
Commercial Service - Sales	$1.38	0.77%

FORMER CONSUMERS GAS COMPANY - PROPOSED		
TYPE OF CUSTOMER	$ INCREASE	% INCREASE
General Domestic - Residential Sales	$1.70	2.45%
Commercial Service - Sales	$1.83	0.68%

The increases shown are based on averages of all customers in the indicated classes. Each class may receive an increase greater or less than stated here. Individual customers may receive increases that are greater or less than average. Furthermore, the requested rates and charges are only a proposal and are subject to change (increase or decrease) by the Commission in its review of this filing. Any increase in rates and charges will not become effective until authorized and approved by the Commission.

The Commission adopted the following procedural schedule:

EVENT	DEADLINE
Staff/Intervenor Direct Testimony	4:00 p.m., August 18, 2025
All Rebuttal Testimony	4:00 p.m., September 2, 2025
Agreed Order of Witnesses	4:00 p.m., September 5, 2025
Evidentiary Hearing	September 9, 2025, at 9:30 a.m. Howard M. Cunningham Hearing Room, 201 Brooks Street, Charleston, West Virginia

If the Commission receives no opposition to the PREP Filing within one week of the hearing date, the hearing may be waived, and the Commission may issue a final Order within 150 days of the filing date.

Anyone desiring to intervene should file a written petition to intervene within twenty (20) days following the date of this publication unless otherwise modified by Commission Order. All requests to intervene should briefly state the reason for the request to intervene and comply with the rules on intervention set forth in the Commission's Rules of Practice and Procedure. The Commission will receive public comments until the beginning of the hearing. All written comments and requests to intervene should state the case name and number and be addressed to Karen Buckley, Executive Secretary, P.O. Box 812, Charleston, West Virginia 25323. Public Comments may also be filed online at http://www.puc.state.wv.us/esports/online_comments/default.cfm by clicking the "Formal Case" link.

HOPE GAS, INC.

LOCATION MAP
Scale: 1" = 1 mile

ADVERTISEMENT

Notice is hereby given that Fallen Rock Energy, LLC, 300 Spruce St., Suite 9, Beckley, WV has a permit on file with the Department of Environmental Protection (DEP), Division of Mining and Reclamation (DMR) located at 1101 George Kostas Drive, Logan, West Virginia 25601 for the surface mining of 126.2 acres and has submitted an application to the WVDEP for Bureau of Air for a Permit Number G50-1006 to operate and maintain a coal surface mine in the Upper Cedar Grove, Lower Cedar Grove, Nine, and Pond Creek, and all splits thereof seams of coal. The proposed operation is discharging into Roberts Branch, Buckeye Fork, Left Hand Fork, and Sand Hollow of Gilbert Creek and White Oak Branch, Trace Fork of Little Oak Creek of Little Huff Creek of the Guyandotte River and Long Pole Creek and Stinnett Fork of Long Pole Creek of the Twig Fork River and is located 3.8 miles Southwest of Baileys in Stafford District of Mingo County, Longitude 81° 51' 51", Latitude 37° 33' 30", Kilometerates from USGS Topographic Map).

Surface of the area described hereinafter and within 100 feet of the permit is owned by:
Mingo Wyoming Land Company, 300 West Washington Street Charleston, WV 25303
Jonas Trent, PO Box 117, Gilbert, WV 25621
Meta Ann Justice, HC 65 Box 198A, Baileys, WV 25608
MS Land Holding, LLC, PO Box 1968, Princeton, WV 24740
Big Meadows Company, PO Box 748, Lewisburg, WV 24901
Chesney Trent, P.O. Box 845, Logan, WV 24844
M/M-SHO Lands, Inc., 2 Wells Ct., Summersville, WV 26651
and the mineral associated herewith and within 100 feet of the permit is owned by:
MS Land Holding, LLC, PO Box 1968, Princeton, WV 24740
Big Meadows Company, PO Box 748, Lewisburg, WV 24901
Chesney Trent, P.O. Box 845, Logan, WV 24844
M/M-SHO Lands, Inc., 2 Wells Ct., Summersville, WV 26651
Mingo Wyoming Land Company, 300 West Washington Street, Charleston, WV 25303

Written comments and/or requests for a formal conference of the surface mining application shall identify the applicant and application number and will be received by the Permit Supervisor at the WVDEP address listed until September 12, 2025, or thirty (30) days from the date of first publication. A copy of the application will be available until September 12, 2025, or thirty (30) days from the date of first publication in the WVDEP Regional Office located at the address above and is available at:

http://apps.dep.wv.gov/WebApps/_app/Search/eFormsHistory/eFormsHistoryApplicationSearchPage.cfm

The above link can be accessed from a computer at all West Virginia public libraries.

DMR Telephone No.: 304-792-7250 Permit No. S501806

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MINGO MESSENGER

PO BOX 802
PIKEVILLE, KY 41502
606-437-4054

ADVERTISING INVOICE

West Virginia Dept. of Environmental Protection
DIVISION OF AIR QUALITY
601 – 57th Street
Charleston, WV 25304
ATTN: Stephanie Mink

BILLING DATED: 8/27/2025
ACCOUNT NO. #13064

DATE	Description	RATE	UNITS	TOTAL
9/5	Public Meeting Air Quality	6.00	29	$174.00

AMOUNT DUE: $174.00

REMIT TO:
Mingo Messenger
PO Box 802
Pikeville KY 41502

Acct. Name: WVDEP – Division of Air Quality
Billed Acct No: #13064
Amount Due: $174.00
Application No: Public Meeting

Mingo
MESSENGER
YOUR SOURCE FOR ALL THINGS MINGO

NEWSPAPER AFFIDAVIT

APPLICATION NO: TransGas Development Systems LLC

I, Beth McPeek, Administrative Assistant of the **Mingo Messenger** newspaper, a newspaper in Mingo County, West Virginia, do hereby certify that from my own knowledge and a check of the files of this newspaper that the advertisement of In-person public meeting, Extend comment period for WVDEP Division of Air Quality was inserted in the **Mingo Messenger** on the following dates:

DATE 9/5	PAGE NO. 4B & 7B
DATE _____	PAGE NO. _____
DATE _____	PAGE NO. _____
DATE _____	PAGE NO. _____

SIGNATURE Beth McPeek DATE 9-8-25

Subscribed and Sworn to before me by Beth McPeek

This 8th day of September, 2025.

NOTARY PUBLIC Deborah Chambers

ID No KyNP11291 State Ky

My commission expires: July 28, 2028

Mingo MESSENGER CLASSIFI

PHONE: (800) 539-4054
MAIL: classads@mingomessenger.com
MAIL: P.O. Box 802 • Pikeville, KY 41502
AX: (606) 437-4246

Deadline is Wednesday @ 5 PM

Pre-Pay
All major credit

To Our Readers

PLEASE CHECK YOUR AD

lease read your l the first day appears in the ıper. Report ıy errors imme-ately and we ill gladly cor-ct any errors ıblished. Cred- will be issued r one (1) day ily. After the :st day the ad n be corrected r the remain-g number of ns, but credit ill not be is-ıed for days ad n incorrectly.

POLICIES

ıe Mingo Mes-nger reserves ıe right to edit, ·operly classify, ncel or decline ıy ad. We will ot knowingly :cept advertis-g that discrim-ates on the ba-s of sex, age, ligion, race, ational origin physical dis-ility.

PUBLISHER'S NOTICE

l real estate adver-ing in this news-per is subject to Fair Housing t which makes it

To Our Readers

illegal to advertise "any preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status or national origin, or an intention to make any such preference, limitation or discrimination.". Familial includes children under the age of 18 living with parents or legal custodians, pregnant women and people securing custody of children under 18. This newspaper will not knowingly accept any advertising for real estate which is in violation of the law. Our readers are hereby informed that all dwellings advertised in this newspaper are available on an equal opportunity basis. To complain of discrimination, call HUD toll-free at 1-800-669-9777. The toll-free number for the hearing impaired is 1-800-927-9275.

EQUAL HOUSING OPPORTUNITY

Legals

DEP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13-3714 and R13-3715) to construct an off-grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLCs Adams Fork Harless Data Center Energy Campus is proposed to be located off of 22 Mine Road, near Holden, at latitude 37.75302 and longitude -82.11905. TransGas Development Systems LLCs Adams Fork Data Energy Center is proposed to be located at 2002 Twisted Gun Road, in Wharncliffe, at latitude 37.59372 and longitude -81.95491. On July 9, 2025,

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SEP 08 2025
WV DEP / DIV OF AIR QUALITY

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Mir

ORDER OF PUBLICATION
IN THE CIRCUIT COURT OF MINGO COUNTY, WEST V

State of West Virginia,
Petitioner,
AND
Ariel Nicole Carver,
Co-Petitioner,
Vs. Juvenile Case Nos.
Derrick Brewer,
Respondents,
IN THE INTEREST OF THESE MINOR CHILDRE

C.B. DOB: 08-14-2017
O.B. DOB: 03-01-2019
D.B. DOB: 08-28-2020

The object of the above entitled action is to terminate the parental and or other custodians of the above named children and to place permanent cu West Virginia Department of Human Services.

To: Derrick Brewer

It appearing that the above named Respondent, Derrick Brewer, ma Mingo County, West Virginia, and it is hereby Ordered that the said Derrick advised by this Publication to appear in the Circuit Court of Mingo County, in October 8, 2025, at 9:30 a.m., for a preliminary/adjudicatory/dispositional he result in the termination of his parental/custodial rights in and to the above men

Jim Pajarillo, Attorney at Law, whose address is P.O. Box 1082, Willia Number (304) 928-3037, has been appointed to represent the Respon be contacted at the address and telephone number listed.

Should said Respondent, Derrick Brewer, fail to appear on October and trial he is hereby notified and advised that his parental/custodial rights may

A copy of the Petition giving rise to the aforesaid court proceedir undersigned Clerk at his office.

Entered by the Clerk of said Court on this the 22nd day of August, 202

LEGALS

e DAQ notified e public that a eliminary eval- tion has deter- ined that all ate and Federal quality re- irements will met by the two ilities and ade available a aft permit and gineering eval- tion for each ility. A virtual blic meeting to scuss these per- itting actions as held by the AQ on August , 2025. ow, upon re- uest, the DAQ ll hold an addi- onal in-person blic meeting to ovide informa- on, answer estions, and ac- pt oral com- ents for the cord for both rmitting ac- ons. The meet- g will be held at e Larry Joe arless Commu- ty Center, 202 rry Joe Harless ive, Gilbert, V 25621, on ursday, ptember 18, 25, at 4:30 p.m. ors will open 4:00 p.m. to gister atten- es. you plan to at- nd the in-per- n public meet- g, to save time d ensure all rticipants in tendance are gistered, please l out the pre- gistration form <https://forms. e/16EakUxukcv kMY9> by 5:00

LEGALS

p.m. on Wednesday, September 17, 2025. While pre-registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register to ask questions and/or provide oral comments, please indicate yes that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five The purpose of the DAQs permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to these determinations. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the pub-

LEGALS

lic meeting, will be considered prior to final action on the permits. All such comments will become part of the public record. The public comment period has been extended to 5:00 p.m. on Friday, September 19, 2025. Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with "TransGas Development Comments" as the subject line, or
- Mail: WVDEP - Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permits, applications, and all other supporting materials relevant to the permit decisions, are available at: https://dep.wv.gov/daq/permitting /Pages /NSK-Pemit-Applications.aspx.

REAL ESTATE FOR RENT

FOR RENT: Commercial and Residential Property in Williamson, WV. Call 304-235-5395 or 304-687-0410.

PUBLIC NOTICE • LEGAL NOTICE

West Virginia State Auditor's Office
County Collections Division 1900 Kanawha Boulevard East
Building 1, Room W-114
Charleston, West Virginia 25305

(2024-C-0000141-MINGO COUNTY-WVTB LLC)
The Mingo Messenger
PO Box 802
Pikeville KY 41502

To: TODD JENKINS, KARRIE JENKINS, TODD JENKINS, KARRIE JENKINS, TODD JENKINS, KARRIE JENKINS, OCCUPANT, IRS, ATTN: ADVISORY CONSOLIDATED RECEIPTS, WV STATE TAX DEPARTMENT, or heirs at law, devisees, creditors, representatives, successors, assigns, all known heirs, guardians, conservators, fiduciaries, administrators, lienholders, co-owners, other parties having an undivided interest in the delinquent property, and other parties that may have any interest in the subject property.

DISTRICT LEE MAP 366 PARCEL 0023 0000 0000

You will take notice that WVTB LLC, the purchaser of the following real estate, Cert. No. 2024-C-000141, located in LEE District, .77 FEE PIGEON CR which was returned delinquent or nonentered in the name of JENKINS TODD ET UX, and was sold by the deputy commissioner of delinquent and nonentered lands of MINGO County at the sale for the delinquent taxes on June 17, 2025, WVTB LLC requests that you be notified that a deed for such real estate will be made on or after February 1, 2026, as provided by law, unless before that day you redeem such real estate. The amount needed to redeem on or before January 31, 2026, will be as follows:

- Amount equal to the taxes and charges due on the date of the certification, with interest, for tax year ticket number 2023 - 8623 ... $930.82
- Back tax tickets, with interest, and charges due on the date of certification for ticket number ... $0.00
- Subsequent of taxes paid on the property, with interest to for tax year 2024 - 8611 ... $824.69
- Additional taxes with interest ... $0.00
- Auditor's Certification, Publication, and Redemption fee plus interest ... $210.20
- Amount paid for Title Examination, notice to redeem, publication, personal service, Secretary of State with interest ... $904.74
- Additional Statutory Fees with Interest ... $0.00
- Total Amount Due and Payable to WV State Auditor - cashier check, money order, certified or personal check ... $2,870.45

You may redeem at any time before January 31, 2026, by paying the above total less any unearned interest.

If the above real estate is your primary residence, you may petition the Auditor to redeem the real estate in not more than three incremental payments that equal the total amount required to redeem the real estate prior to the issuance of the deed described above.

Given under my hand August 13, 2025.

Christal G. Perry
Christal G. Perry
Deputy Commissioner of Delinquent and Nonentered Lands of MINGO County, State of West Virginia

Please Return this letter and payment to the West Virginia State Auditor's Office, County Collections Division, 1900 Kanawha Boulevard East, Building 1, Room W-114 Charleston, West Virginia, 25305. Questions please call 1-888-509-6568

PUBLIC NO

West Virginia State Auditor
County Collections Division
Building 1, Room W-114
Charleston, West Virginia 2

(2024-C-0000204-MINGO
The Mingo Messenger
PO Box 802
Pikeville KY 41502

To: IRS, ATTN: ADVISOR DEPARTMENT, EMMA MOU or heirs at law, devisees, cr known heirs, guardians, co ers, co-owners, other parti quent property, and other property.

DISTRICT MAGNOLIA MAP

You will take notice that estate, Cert. No. 2024-C-0 (2 TRS) TUG RIVER which name of MOUNTS EMMA, linquent and nonentered quent taxes on June 17, 2 a deed for such real estate provided by law, unless be amount needed to redeem lows:

- Amount equal to the tax certification, with interest $183.48
- Back tax tickets, with inte certification for ticket nun
- Subsequent of taxes pai 2024 - 12131 ... $135.7
- Additional taxes with int
- Auditor's Certification, P $210.20
- Amount paid for Title Exa personal service, Secretar
- Additional Statutory Fee
- Total Amount Due and P money order, certified or

You may redeem at any tim above total less any unearn

If the above real estate is y Auditor to redeem the real payments that equal the to prior to the issuance of the

Given under my hand Aug

Christal G. Perry
Christal G. Perry
Deputy Commissioner of D County, State of West Virgi

Please Return West Virg Coun 1900 Kanawha Bou Charlest Questions

Ad Number 340359

RECEIVED
SEP 10 2025
WV DEP / DIV OF AIR QUALITY

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Logan, TO-WIT

I Elisha Queen, Classified Advertising

Representative of The Logan Banner, a newspaper published in the county of Logan, West Virginia, hereby

certify that the annexed publication was inserted in said newspaper _____

_____

The cost of publishing said annexed advertisement

as aforesaid was $ 86.50

Commencing On: 09/03/2025

Ending On: 09/03/2025

Given under my hand this day 09/03/2025

Sworn to and subscribed before me 09/03/2025
at Logan, Logan County, West Virginia

Lee Ann Welch

Notary Public of, in and for Logan County, West Virginia

MY COMMISSION EXPIRES: Jan. 3, 2028

Elisha Queen

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
LEE ANN WELCH
190 Rotary Road, Huntington, WV 25702
My Commission Expires January 03, 2028

DEP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13 3714 and R13 3715) to construct an off grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus is proposed to be located off of 22 Mine Road, near Holden, at latitude 37.75302 and longitude 82.11905. TransGas Development Systems LLC's Adams Fork Data Energy Center is proposed to be located at 2002 Twisted Gun Road, in Whamcliffe, at latitude 37.59372 and longitude 81.95491. On July 9, 2025, the DAQ notified the public that a preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and engineering evaluation for each facility. A virtual public meeting to discuss these permitting actions was held by the DAQ on August 18, 2025.

Now, upon request, the DAQ will hold an additional in-person public meeting to provide information, answer questions, and accept oral comments for the record for both permitting actions. The meeting will be held at the Larry Joe Harless Community Center, 202 Larry Joe Harless Drive, Gilbert, WV 25621, on Thursday, September 18, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at **https://forms.gle/16Eak0xukcv12MMY9** by 5:00 p.m. on Wednesday, September 17, 2025. While pre-

Acc.Id:	69164	
Name:	AIR QUALITY--WV DEP	
Phone:	304-926-0499	
Address:	601 57TH ST SE	
City:	CHARLESTON	
State:	WV	
Postcode:	25304	
Class:	9010	Legal Notices
Edition:	LOG	
Start:	09/03/2025	
Stop:	09/03/2025	
Issues:	1	
Units	174.0	
Order ID:	HC 340359	
TFN:	C	
TFN cycle:		
Rep:	EQUEEN	
Status:	CF	
Source:	EM	
Paytype:	BI	
Rate:	LG	
Cost EXC GST:	86.50	
Tax:	0.00	
Total Charge:	86.50	

Printed on: 08/27/2025 13:53:27
Printed by: EQUEEN

RECEIVED
SEP 10 2025
WV DEP / DIV OF AIR QUALITY

registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register to ask questions and/or provide oral comments, please indicate 'yes' that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes.

The purpose of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to these determinations. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permits. All such comments will become part of the public record.

The public comment period has been extended to **5:00 p.m. on Friday, September 19, 2025**. Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with 'Trans Gas Development Comments' as the subject line, or
- Mail: WVDEP Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permits, applications, and all other supporting materials relevant to the permit decisions, are available at: **https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx.**

LH-340359
09-03;2025

Colleges struggle amid Trump policies

By LUENA RODRIGUEZ-FEO VILLEBA, MAKIYA SEMINERA and COLLIN BINKLEY
The Associated Press

The Case Student Union at Case University in Cleveland, Tenn., is shown Friday, May 30, 2025.

One international student after another told the University of Central Missouri this summer that they couldn't get a visa and many struggled to even land an interview for one.

Even though demand was four as high as ever, half as many new international graduate students showed up for fall classes compared to last year.

The decline represents a hit to the bottom line for Central Missouri, a small public university that operates close to its margins with an endowment of only $65 million. International students typically account for nearly a quarter of its tuition revenue.

"We aren't able to subsidize domestic students as much when we have fewer international students who are bringing revenue to us," said Roger Best, the university's president.

Signs of a decline in international students have unsettled colleges around the U.S. Colleges with large numbers of foreign students and small endowments have little financial cushion to protect them from steep losses in tuition money.

International students represent at least 20% of enrollment at more than 100 colleges with endowments of less than $250,000 per student, according to an Associated Press analysis. Many are small Christian colleges, but the group also includes large universities such as Northeastern and Carnegie Mellon.

The extent of the changes in enrollment will not be clear until the fall. Some groups have forecast a decline of as much as 40%, with a huge impact on college budgets and the wider U.S. economy.

International students face new scrutiny

As part of a broader effort to reshape higher education, President Donald Trump has pressured colleges to limit their numbers of international students and heightened scrutiny of student visas. His administration has moved to deport foreign students involved in pro-Palestinian activism, and new student visa appointments were put on hold for weeks as it ramped up vetting of applicants' social media.

On Wednesday, the Department of Homeland Security said it will propose a rule that would put new limits on the time foreign students can stay in the U.S.

The policies have increased severe financial instability for colleges, said Justin Gest, a professor at George Mason University who studies the politics of immigration.

Foreign students are not eligible for federal financial aid and often pay full price for tuition — double or even triple the in-state rate paid by domestic students at public universities.

"To put it more dollars and cents-wise, if an international student comes in and pays $80,000 a year in tuition, that gives universities the flexibility to offer lower fees and more scholarship money to American students," Gest said.

Sudanese student barely made it to the US for class

Ahmed Ahmed, a Sudanese student, nearly didn't make it to the U.S. for his freshman year at the University of Rochester.

The Trump administration in June announced a travel ban on 12 countries, including Sudan. Diplomatic officials assured Ahmed he could still enter the U.S. because his visa was issued before the ban. But when he tried to board a flight to leave for the U.S. from Uganda, where he stayed with family during the summer, he was turned away and advised to contact an embassy about his visa.

With the help of the University of Rochester's international office, Ahmed was able to book another flight.

At Rochester, where he received a scholarship to study electrical engineering, Ahmed, 19, said he feels supported by the staff. But he also finds himself on edge and understands why other students might not want to subject themselves to the scrutiny in the U.S., particularly those who are entirely paying their own way.

"I feel like I made it through, but I'm one of the last people to make it through," he said.

Colleges are looking at ways to blunt the impact

In recent years, international students have made up about 30% of enrollment at Central Missouri, which has a total of around 12,800 students. In anticipation of the hit to international enrollment, Central Missouri cut a row of living value for employees. It has pushed off infrastructure improvements planned for its campus and has been looking for other ways to cut costs.

Small schools — typically classified as those with no more than 5,000 students — tend to have less financial flexibility and will be especially vulnerable, said Dick Startz, an economics professor at the University of California, Santa Barbara.

Lee University, a Christian institution with 3,500 students in Tennessee, is expecting 50 to 60 international students enrolled this fall, down from 82 the previous school year, representing a significant drop in revenue for the school, said Roy V. Chan, the university's director of graduate studies.

The school already has increased tuition by 20% over the past five years to account for a decrease in overall enrollment, he said.

"Since we're a smaller liberal arts campus, tuition cost is our main, primary revenue," Chan said, as opposed to government funding or donations.

The strains on international enrollment only add to distress for schools already on the financial brink.

Colleges around the country have been closing as they cope with declines in domestic enrollment, a consequence of changing demographics and the effects of the pandemic. Nationwide, private colleges have been closing at a rate of about two per month, according to the State Higher Education Executive Officers Association.

The number of high school graduates in the U.S. is expected to decline through 2041, when there will be 13% fewer compared to 2024, according to projections from the Western Interstate Commission for Higher Education.

"That means that if your [international] participation from international students is even worse," Startz said.

CLASSIFIEDS

FOCUS GROUP PARTICIPANTS
Attorney Art Lees associated with Hunt & Lees, LLC is conducting focus groups and looking for participants to give opinions on court cases in Logan County, WV. The groups will be held on September 12-13, 2025 and are important. You will receive $150.00 in cash for participating. You must be 21 years old and voter to apply. Please Apply on our website at http://leesforcompanies.com or call 412-818-5583.
If selected, you will receive an email and text about needs to be confirmed in order to participate.

HOMES

STUFF

Advertisement for Bids

The TOWN OF CHAPMANVILLE WATER/SEWER DEPARTMENT is considering the sale of the following equipment:

1999 JCB BACKHOE Model 3125 4x4x4. Purchased new October 1999.

Equipment will be sold as is/where is/ for at $10,000.00

Interested parties need to call the Town Hall at 304-855-7321, Monday thru Friday from 8:30 am to 3:00 pm to schedule an appointment to inspect back hoe.

The Chapmanville Water/Sewer Department has the right to accept or refuse any and all bids.

Bids are to be mailed to: Chapmanville Water/Sewer Dept. PO Box 425 Chapmanville, WV 25508 ATTENTION: BACKHOE BIDS

We accept sealed bids until Monday, September 8, 2025 by 3:00 pm

Lic. 06-20,27,09-03-2025

IN THE CIRCUIT COURT OF LOGAN COUNTY, WEST VIRGINIA

U.S. BANK TRUST NATIONAL ASSOCIATION, NOT IN ITS INDIVIDUAL CAPACITY BUT SOLELY AS CERTIFICATE TRUSTEE Plaintiff,

v.

REBECCA J. TOMBLIN AND JOSHUA MEADOWS and/or ANY/ALL UNKNOWN OCCUPANTS, Defendant(s).

Service By Order of Publication

ORDER OF PUBLICATION

The object of the above-styled action is to grant immediate possession of the property to Plaintiff U.S. Bank Trust National Association, not in its individual capacity but solely as Certificate Trustee.

And it appearing by affidavit that the identity and whereabouts of Defendant(s) Unknown Occupants are unknown and cannot be learned after due diligence, it is ORDERED that the above named Defendant(s) Unknown Occupants, be served upon Petitioner's attorney Lauryn D. Cassell at the law firm of Samuel L. White, P.C., whose mailing address is 5000 Coonskin Park Drive, Ste 104, Morgantown, WV 26508 an Answer or any pleading to the Complaint for Unlawful Detainer filed in this action, within thirty (30) days of entry of this Order; otherwise judgment by default may be taken against said Defendant or any like thereafter.

A copy of the Complaint in the action may be obtained from the undersigned Clerk's office.

Entered by the Clerk of the Circuit Court of Logan County, West Virginia, this 22nd day of July, 2025.

Matt McCrone
Clerk of the Court

/s/ Lauryn D. Cassell
Lauryn D. Cassell, Esquire
(WVSB #14321)
Charles J. Mucklow
Esquire (WVSB #14702)
Samuel L. White, P.C.
5000 Coonskin Park Drive, Suite 104
Morgantown, WV 26508
Telephone: (304) 413-8010
Facsimile: (304) 413-8014

LH-340799
08-03,10,2025

OCP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, Transition Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13-3714 and R13-3715A) to construct an offgrid power generation facility at two distinct locations in Logan County, Transition Development Systems LLC's Adams Fork Battery Energy Center is proposed to be located off of 20 West Road, near Holden, at latitude 37.75300 and longitude -82.11605. Transition Development Systems LLC's Adams Fork Battery Energy Center is proposed to be located at 2002 Tanglad Gap Road, in Whitesville, at latitude 37.59073 and longitude -81.95491. On July 9, 2025, the DAQ notified the public that a preliminary determination has been made that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and supporting evaluation for each facility. A virtual public meeting to discuss these permitting actions was held by the DAQ on August 18, 2025.

Now, upon request, the DAQ will hold an additional in-person public meeting to provide information, answer questions, and accept oral comments for the record when you register. A combustion engine will be used with your responses when you register. If you do not have internet access and want to register via telephone, please contact Paula Ernest at (304) 926-0499 ext.1256. Oral comments are limited to two (2) minutes.

The proposal of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues with all to those determinations. Only written comments received or postmarked before the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permits. All such comments will become part of the public record.

The public comment period has been extended to 5:00 p.m. on October 3, 2025. Written comments may be submitted by:

• Email: Jerry.Williams@wv.gov with "Transition Development Corp" in the subject line, or

• Mail: WVDEP - Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304

Instructions for downloading additional information, including copies of the draft permits, applications, and all other supporting materials related to the permit decision, are available at: https://dep.wv.gov/daq/permitting/Pages/R13R-Permit-Applications.aspx.

LH-340519
08-03-2025

ERRORS MUST BE REPORTED ON THE FIRST DAY OF PUBLICATION

Harless Community Center, 200 Larry Joe Harvey Drive, Gilbert, WV 25621, on Tuesday, September 16, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at https://forms.gle/16EaBGbdcbTzBM7F9 by 5:00 p.m. on the meeting, September 15, 2025. While pre-registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register for this meeting, and/or provide oral comments, please indicate "yes" that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Paula Ernest at (304) 926-0499 ext.1256. Oral comments are limited to two (2) minutes.

The proposal of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues with all to those determinations. Only written comments received or postmarked before the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permits. All such comments will become part of the public record.

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• Email: Jerry.Williams@wv.gov with "Transition Development Corp" in the subject line, or

• Mail: WVDEP - Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304

Instructions for downloading additional information, including copies of the draft permits, applications, and all other supporting materials related to the permit decision, are available at: https://dep.wv.gov/daq/permitting/Pages/R13R-Permit-Applications.aspx.

LH-340519
08-03-2025

ERRORS MUST BE REPORTED ON THE FIRST DAY OF PUBLICATION

Ad Number 340361

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

RECEIVED
SEP 10 2025
WV DEP / DIV OF AIR QUALITY

I Linda Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper

published in the county of Mingo, West Virginia, hereby

certify that the annexed publication was inserted in said

newspaper _____

The cost of publishing said annexed advertisement

as aforesaid was $ 86.50

Commencing On: 09/03/2025

Ending On: 09/03/2025

Given under my hand this day 09/03/2025

Sworn to and subscribed before me 09/03/2025
at Williamson, Mingo County, West Virginia

Lee Ann Welch

Notary Public of, in and for Mingo County, West Virginia

MY COMMISSION EXPIRES: Jan. 3, 2028

Linda Queen

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
LEE ANN WELCH
190 Rotary Road, Huntington, WV 25705
My Commission Expires January 03, 2028

DEP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13-3714 and R13-3715) to construct an off-grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus is proposed to be located off of 22 Mine Road, near Holden, at latitude 37.75302 and longitude 82.11905. TransGas Development Systems LLC's Adams Fork Data Energy Center is proposed to be located at 2002 Twisted Gun Road, in Whamcliffe, at latitude 37.59372 and longitude 81.95491. On July 9, 2025, the DAQ notified the public that a preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and engineering evaluation for each facility. A virtual public meeting to discuss these permitting actions was held by the DAQ on August 18, 2025.

Now, upon request, the DAQ will hold an additional in-person public meeting to provide information, answer questions, and accept oral comments for the record for both permitting actions. The meeting will be held at the Larry Joe Harless Community Center, 202 Larry Joe Harless Drive, Gilbert, WV 25621, on Thursday, September 18, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at **https://forms.gle/16EakUxukcv12kMY9** by 5:00 p.m. on Wednesday, September 17, 2025. While pre-

Acc.Id:	69164
Name:	AIR QUALITY–WV DEP
Phone:	304-926-0499
Address:	601 57TH ST SE
City:	CHARLESTON
State:	WV
Postcode:	25304
Class:	9010 Legal Notices
Edition:	WDN
Start:	09/03/2025
Stop:	09/03/2025
Issues:	1
Units	174.0
Order ID:	HC 340361
TFN:	C
TFN cycle:	
Rep:	EQUEEN
Status:	CF
Source:	EM
Paytype:	BI
Rate:	LG
Cost EXC GST:	86.50
Tax:	0.00
Total Charge:	86.50

Printed on: 08/27/2025 13:56:20
Printed by: EQUEEN

RECEIVED
SEP 10 2025
WV DEP / DIV OF AIR QUALITY

2025. While pre registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register to ask questions and/or provide oral comments, please indicate "yes" that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926 0499 x41256. Oral comments are limited to five (5) minutes.

The purpose of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to these determinations. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permits. All such comments will become part of the public record.

The public comment period has been extended to **5:00 p.m. on Friday, September 19, 2025.** Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with "Trans Gas Development Comments" as the subject line, or

- Mail: WVDEP Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permits, applications, and all other supporting materials relevant to the permit decisions, are available at: **https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx.**

LH-340361
09-03;2025

SUBSCRIBE NOW

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of this notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Terry Joan Hohenshe

LH-3376B2
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of this notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Hilland Dale

LH-3317B5
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of this notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Myrtle Thursa Lester

LH-3325A8
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of this notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Nathania Ann

LH-3322B
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of this notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Myrtle Dunne Lester

LH-3A0553
08-03,10-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of this notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Gary Howard Spaulding

LH-3388D1
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of this notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Ruth Jessone Hinkle

LH-3333F9
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of this notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Rickey Doyle
aka Mickey E

LH-3358J0
08-27,09-03,2025

ORDER OF PUBLICATION

IN THE FAMILY COURT OF MINGO COUNTY, WEST VIRGINIA

CIVIL ACTION No. 25D-93

IN RE THE MARRIAGE OF:

Jose Luis Gonzalez
PETITIONER,

AND

Mark A. Gonzalez
RESPONDENT

THE OBJECT OF THIS SUIT IS TO OBTAIN A DIVORCE

TO THE ABOVE NAMED PETITIONER/RESPONDENT:

It appearing by affidavit filed in this action that Mark A. Gonzalez is a nonresident of the State of West Virginia or has a nonresident address, it is hereby ordered that Mark A. Gonzalez serve upon Jose Luis Gonzalez, CIRCUIT CLERK'S OFFICE, whose address is 75 Last 2nd Avenue, Room 237, Williamson, West Virginia 25661, an Answer, including any related counterclaim or defense you may have to the above named action on or before October 1, 2025, 9:30 AM or you fail to do so, thereafter judgment, upon proper hearing, may be taken against you for the relief demanded in the Petition.

A copy of said Petition can be obtained from the undersigned Clerk's office

RUN PUBLICATION ONCE A WEEK FOR TWO CONSECUTIVE WEEKS.

Entered by the Clerk of said Mingo County

Lonnie Hamish
Clerk of
Mingo County

LH-3326J4
08-27,09-03,2025

In the Circuit Court of Mingo County, West Virginia

Case No.
CC-30-2025-C-55

Judge Joshua Butcher

Kentucky Financial Leasing Partnership,
Plaintiff,

v.

Rocky Kennedy,
Defendant

Order for Publication

1. In the civil action and pursuant to Plaintiff's Mar 13, 2025 Complaint, Plaintiff seeks an entry of judgment of Court in Plaintiff for the money owed to it for Defendant's default of his obligations under seven contracts made between Defendant's employer company Emerus Coal LLC, Pawnee, and Plaintiff and the payments made between Defendant and Plaintiff, in an amount of not less than $1,021,737.75, plus all costs and fees incurred by Plaintiff in connection with the enforcement of this matter, including attorneys fees, an award of pre-judgment and post-judgment interest, an award of all other amounts due to Plaintiff under the Contracts, Guaranty, and applicable law, and all other relief the Court deems possible and just.

2. Between July 30, 2021 and October 28, 2024, Emerus made periodic and deliveries seven Conditional Sale Agreements (the "Contracts") to Emerus for Industrial Machinery Plunders, which required Emerus to pay under certain amounts as stated therein.

3. Emerus defaulted under the Contracts by failing and refusing to make the required payments to Plaintiff.

5. Defendant made, executed, and delivered to Plaintiff a guaranty (the "Guaranty"), pursuant to which Defendant is personally liable for Emerus's obligations under the Contracts.

6. As of the time of the Complaint, Defendant was in default of his obligations under the Contracts and the Guaranty in an amount of not less than $1,021,737.75

7. Plaintiff, despite its delights efforts, pursuant to Rule 4(e)(1)(C) of the West Virginia Rules of Civil Procedure, is unable to ascertain the present location or whereabouts of Defendant.

8. Accordingly, Plaintiff

Defendant.

Order for Publication

has been unable to serve Defendant through certified mail at his last known address or by hand. Plaintiff, through the Mingo County Sheriff's Office, or through a private process server

9. A copy of the Complaint in this matter can be obtained from the undersigned Clerk's at the Office of the Mingo County Circuit Clerk, located at the Mingo County Courthouse, 78 East Second Avenue, Williamson, West Virginia 25661

10. It appearing by affidavit filed in this action that the location or whereabouts of the Defendant is unknown, and Plaintiff has made diligent but futile efforts to serve the Complaint upon Defendant at Defendant's last known address and through the Mingo County Sheriff's Office, it is accordingly ORDERED that he be published once a week for two consecutive weeks in this newspaper, and that Defendant is required to file his Answer to the Complaint filed in this action on or before October 6, 2025 otherwise judgment will be taken by default against him as any time thereafter.

The Clerk is directed to provide a copy of this Order to counsel listed below

/s/ Joshua Butcher
Circuit Court Judge
11th Judicial Circuit

Prepared By:
/s/ James M. Davis
James Matthew Davis
WV State Bar No. 10820
JACKSON KELLY PLLC
P.O. Box 553
Charleston
West Virginia 25322
(304) 340-1000
Counsel for Plaintiff

LH-3382B0
08-03,10-2025

Will be held in-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection's Division of Air Quality (DAQ) for two separate permits (R13-3716 and 91537151) to construct an oil and gas power generation facility at two distinct locations in Logan County, TransGas Development Systems, LLC's Adkins Fork Natural Gas Data Center Energy Campus is proposed to be located at 23 Mine Road, near Holden at latitude 37.75303 and longitude -81.99491. (37.751905, -81.991667). TransGas Development Systems, LLC's Adkins Fork Data Energy Center is proposed to be located at 2002 Twisted Gun Road, in Branchville, at latitude 37.59372 and longitude -81.85691. On July 9, 2025, the DAQ noticed the public that a preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and engineering evaluation for each facility. A virtual public meeting on the two draft permitting actions will be held by the DAQ on August 18, 2025.

Now, upon request, the DAQ will hold an additional in-person public meeting to provide information about the proposed facilities, and allow the public to submit comments for the record for both permitting actions. The meeting will be held at the Larry Joe Harless Community Center, 202 Larry Joe Harless Drive, Cabell, WV 25621, on Thursday, September 18, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at https://forms.gle/1EaSdUuuqY1ZMdT89 by 5:00 p.m. on Wednesday, September 17, 2025. While pre-registration is not required, it is encouraged to save time and ensure all participants in attendance are registered to register to ask questions and/or provide oral comments, please ensure you have indicated you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ennett at (304) 926-0499 ext.1256. Oral comments are invited to the public.

The purpose of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to the determinations. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered in the decision. All such comments are located part of the public record.

The public comment period has been extended to 5:00 p.m. on Friday, September 19, 2025. Written comments may be submitted by:

• Email: Jerry.Williams@wv.gov with "TransGas Development Comments" in the subject line, or

• Mail: WVDEP - Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304

Instructions for downloading additional information, including copies of the draft permits, applications, and all data supporting materials relevant to the permit decisions, are available at: https://apps.dep.wv.gov/oaqpermitting/faces/R13-Permit-App-Locations.xhtml;

LH-3403A1
08-03,2025

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF MINING AND RECLAMATION

PUBLIC NOTICE OF BLASTING OPERATORS

LEGAL ADVERTISEMENT

Notice is hereby given that:

Defendant's Energy, LLC
109 Dayton Street, Suite 4
Beckley, WV 25801
Phone Number:
(681) 307-7343
Serious Mike
Permit Number:
S-5009-22

Located at the Stafford District of Mingo County, approximately 3.5 miles northeast of Gilbert. WV will be conducting blasting activities in accordance with all State and Federal laws and as approved by the Department of Environmental Protection.

Blasting activities will occur Monday through Saturday from sunrise to sunset. No blasting shall be conducted on Sunday. Blasting is to commence on August 31, 2025 and continue through August 31, 2026

Ten minutes prior to and immediately after each blast, all access to the special area will be safeguarded from unauthorized entry. The warning signal prior to each blast shall be from an air horn, siren or other device audible to at least one (1) mile from the blast. The warning will be given three (3) minutes prior to detonation and will consist of three (3) short blasts of two (2) seconds duration with one (1) second between each blast. The all clear signal shall be one long blast from an air horn, siren or other device of twenty (20) seconds duration.

Blasting shall be conducted in such a way as to prevent adverse impacts to the public or the environment.

Blasting activities will not be conducted at times other than those announced in the blasting schedule except in the event of an emergency situation where the law requires to other atmospheric conditions, or upon request of public safety agencies involved and determined.

LH-3403S7
09-03,2025

ERRORS MUST BE REPORTED ON THE FIRST DAY OF PUBLICATION

We shall not be liable for any typo or omission that occurs from the publication or omission of an advertisement

13. Public Meeting Presentation 08/18/2025

Public Meeting

concerning

TransGas Development Systems, LLC

Adams Fork Harless Data Center Energy Campus (R13-3714)

Adams Fork Data Center Energy Campus (R13-3715)

August 18, 2025

WVDEP - Division of Air Quality
Public Meeting

Presentation Outline

- Review Summary
- Project Overview
- DAQ Documents
- What Happens Next?
- Summary and Contact Information

DAQ Review Summary

- TransGas submitted both permit applications on March 26, 2025
- Revised permit applications were submitted on May 14, 2025
- Applications submitted as a minor source (45CSR13)
- TransGas Legal Advertisements: April 9, 2025
  - No air quality related comments or public meeting requests received
- DAQ Public Advertisements: July 9, 2025
  - Preliminary Review Complete: Draft Permit/Fact Sheet Available
  - Preliminary Determination
  - 30-Day Comment Period
  - Public meeting requests received

Non-AQ Issues

- DAQ does not have control over
  - Zoning Issues
  - Job Creation
  - Economic viability of project
  - Strategic energy issues
  - Non-AQ environmental impacts
  - Noise pollution
  - Light pollution
  - Tourism
  - Road Traffic
  - Nuisance Issues
  - Water Issues
- Contact local officials

Statutory Authority

- **The DAQ's permitting authorization is afforded under 45 CSR 13**

- **Pursuant to §45-13-5.7, the DAQ shall issue a permit unless:**
  - **a determination is made that the proposed construction, modification, registration or relocation will violate applicable emission standards, will interfere with attainment or maintenance of an applicable ambient air quality standard, cause or contribute to a violation of an applicable air quality increment, or be inconsistent with the intent and purpose of this rule or W. Va. Code §22-5-1 et seq., in which case an order denying such construction, modification, relocation and operation shall be issued. The Secretary shall, to the extent possible, give priority to the issuance of any such permit so as to avoid undue delay and hardship.**

- **It is clear under 45 CSR 13 that denial of a permit must be based on one of the above explicitly stated criteria or, as noted, is inconsistent with the intent of 45 CSR 13 or §22-5-1, et. seq. As is stated above, it is the DAQ's position that the intent of both the APCA and 45 CSR 13 is to limit the authority of the DAQ to air quality issues as outlined in the APCA and in West Virginia's State Implementation Plan (SIP).**

TransGas Project Overview

- 2 Locations
- Facilities are identical (different locations)
- R13-3714 – near Holden located in Mingo County on Mine Road adjacent to Mohawk Industries
- R13-3715 – Wharncliffe in Mingo County on the site of the Twisted Gun Golf Course
- Off-grid Power Generation Facilities
  - Purpose of facilities are to provide power to adjacent data center operations
  - 117 engines with the ability to operate on natural gas or diesel fuel
  - Each engine is 28,194 hp and will have a maximum power output of 21 MW
  - Aggregate power output – 2,457 MW

TransGas Project Overview *(cont.)*

- Engines utilize control device systems to control emissions from NOx, CO, VOC, PM, and SO_2
- All individual pollutant emissions below major source PSD thresholds
- TransGas will be required to obtain Title V Operating Permits for each location
- Detailed information in the permit application and Engineering Evaluation/Fact Sheet

R13-3714 Facility Location

R13-3714 Facility Location

R13-3715 Facility Location

R13-3715 Facility Location

What is Being Proposed?

- Facility powered by engines equipped with control device systems to control air emissions
- 114 engines operate full time and 3 engines in reserve
- Engines are dual-fuel units that can operate on natural gas or diesel
- Under normal operations, engines consume natural gas as primary fuel with a pilot injection of ULSD (approx. 2% from pilot fuel)
- Emissions are regulated due to operating modes
- Diesel storage tanks
- Diesel Unloading
- Miscellaneous control device liquids tanks (ammonia, caustic soda, sulfuric acid, sodium chlorite, sodium hydrosulfide)

What is Being Proposed? *(cont.)*

- **Monitor and maintain records of the operation type, startups/shutdowns, hours of operation, fuel consumption/type, air pollution control devices, fuel unloading, road inspections**
- **Rolling 12-month monthly emission calculations to ensure their emissions remain below any major source thresholds**
- **Required fuel meters**
- **Required hour meters**
- **Monitor control device operations**
- **Engine Testing (NOx, PM)**

Estimate of Emissions

- Engines
  - Manufacturer Data (criteria pollutants)
  - AP-42 (HAPs)
- Diesel Storage Tanks/Unloading
  - EPA TANKS 4.09d
- Paved Roadways
  - AP-42
- Fugitive Emissions
  - EPA Protocol for Equipment Leak Emission Estimates

Facility PTE

Emission Source	Annual Emissions (tons/year)					
	NO_x	**CO**	**VOC**	**SO_2**	**PM_{10}**	**Total HAPs**
Engines	194.30	205.62	116.59	9.93	186.53	0.86
Storage Tanks	-	-	0.75	-	-	-
Paved Haul Roads	-	-	-	-	1.43	-
Fugitive Leaks	-	-	0.31	-	-	0.01
Facility PTE	**194.30**	**205.62**	**117.66**	**9.93**	**187.96**	**0.87**

Applicable Air Quality Rules

- **WV Legislative Rules**
  - **45CSR4: To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors**
  - **45CSR13: Minor Source Permitting Rule**
  - **45CSR16: Standards of Performance for New Stationary Sources (Incorporates applicable Federal Air Quality Regulations)**
  - **45CSR17: To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter**
  - **45CSR30: Requirements for Operating Permits**
  - **45CSR34: Emission Standards for Hazardous Air Pollutants**

- **Federal Air Quality Regulations**
  - **40CFR60, Subpart IIII: Engines**
  - **40CFR63, Subpart ZZZZ: Engines**

WVDAQ Documents

- **Engineering Evaluation/Fact Sheet**
  - **Rationale document for Preliminary Determination**
- **Draft Permit**
  - **Includes operating restrictions, emission limitations and monitoring, recordkeeping and reporting requirements**
  - **Enforces the potential-to-emit (PTE) upon which Preliminary Determination was made**

Engineering Evaluation/Fact Sheet

- Administrative information
- Discussion of Confidential Business Information
- Description of proposed facility/emission units
- Discussion of emission calculations
- Quantifies proposed emissions per pollutant
- Applicability and compliance with federal regulations and state air quality rules
- Monitoring, record keeping, reporting, and testing requirements
- DAQ statutory authority

Draft Permit

- Facility-wide requirements
- Specific unit requirements
  - Limitations and standards
    - Operating Requirements
    - Fuel specifications
    - Control technology requirements
  - Monitoring requirements
  - Performance testing and compliance requirements
  - Recordkeeping requirements
  - Reporting requirements

What Happens Next?

- **Comment period was scheduled to conclude on August 8, 2025, at 5:00 PM**
- **Comment period extended until August 22, 2025, at 5:00 PM**
- **Prior to a final determination, the DAQ will evaluate and respond to timely comments that are relevant to air quality issues**
- **DAQ will make a Final Determination pursuant to the requirements §45-13-5.7**
- **Final Determination will be available in same locations as Engineering Evaluation/Fact Sheet and Draft Permit**

Summary

- **TransGas is proposing to build 2 off-grid power generating facilities to provide power to adjacent data centers in Mingo County**
- **DAQ has made a preliminary determination that the proposed construction will meet all applicable state rules and federal air quality regulations**
- **Engineering Evaluation/Fact Sheet and Draft Permit have been available for review since publication of the legal advertisement (July 9, 2025)**
- **DAQ will continue to accept public comments until 5:00 PM on August 22, 2025**
- **DAQ will evaluate and respond to all timely public air quality-related comments**
- **DAQ will make a final determination on this permitting action and make this determination and any related documents available at that time**

Contact Information

West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Attention: Jerry Williams
jerry.williams@wv.gov

**** TransGas Development Comments as subject line ****

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

14. Public Meeting Presentation 09/18/2025

Public Meeting

concerning

TransGas Development Systems, LLC

Adams Fork Harless Data Center Energy Campus (R13-3714)

Adams Fork Data Center Energy Campus (R13-3715)

September 18, 2025

WVDEP - Division of Air Quality
Public Meeting

Presentation Outline

- General Permitting Process
- TransGas Ammonia Plant/Data Centers
- TransGas Review Summary
- Project Overview
- Summary
- Contact Information

National Air Quality Strategy:
Permitting in Context

Clean Air Act: EPA Mandate to Protect Public Health and Welfare

Science

National Ambient Air Quality Standards (NAAQS)

State & Federal Rulemaking

State (SIP) and Federal Air Quality Rules

New Source Permitting Process

Specific Facility Requirements (NSR Air Permit)

Inspections

Compliance with Permit and Air Quality Rules

NAAQS

NAAQS: National Ambient Air Quality Standards

- *Primary Standards*
  - Protect Public Health
- *Secondary Standards*
  - Protect Public Welfare
- Criteria Pollutants: Carbon Monoxide (CO), Lead, Nitrogen Oxides (NO_x), Ozone (O_3), Particulate Matter (PM_{10} and $PM_{2.5}$) and Sulfur Dioxide (SO_2)
- Hazardous Air Pollutants (HAPs) do not have any national standards
  - Regulated under 40 CFR 61 and 63 (NESHAP and MACT programs)
- Counties designated as meeting (attainment) or not meeting (non-attainment) these standards
- Mingo County (& all of WV) classified as in attainment with each of the above standards

Permitting Programs

- New Source Review Permits
  - Minor Source Program (45CSR13)
  - Major Source in Attainment Areas (45CSR14)
    - "Prevention of Significant Deterioration" (PSD)
  - Major Source in Non-Attainment Areas (45CSR19)
- Post-Construction Operating Permit Program
  - Title V Process
    - Major Source (Permit) vs. Minor Source (No Permit)
    - 45CSR30

Minor Source Permitting Program

- Applicable to new "minor sources" of air pollution
  - Definition of major/minor is dependent on source type and location
  - Facility is not a "listed source": 250 tons/year threshold (per pollutant – not GHGs)
  - Administered under West Virginia Legislative Rule 45CSR13
- 45CSR13 Permitting Process: What it does do:
  - Determine/enforce compliance with state/federal air quality rules and regulations
  - Review and verify potential to emit of the facility is reasonable
  - Develop requirements to enforce compliance with facility's proposed air emissions
  - Provide framework of public notification/participation
- 45CSR13 Permitting Process: What it does <u>not</u> do:
  - Not designed to prevent industrial development
  - Require a full Environmental Impact Statement (EIS) or require a cumulative impact analysis that includes nearby sources
  - Address Greenhouse Gases (GHGs)
  - Take into consideration any other important but non-air quality benefits/impacts such as jobs, property values, traffic, zoning, national energy issues, economics of project, infrastructure, archaeology, etc.

WVDAQ Documents

- Engineering Evaluation/Fact Sheet
  - Rationale document for Preliminary Determination
- Draft Permit
  - Includes operating restrictions, emission limitations and monitoring, recordkeeping and reporting requirements
  - Enforces the PTE upon which Preliminary Determination was made

TransGas Ammonia Plant

- Proposed to take feedstock Natural Gas → Hydrogen → Ammonia
- Received 31 comments (including from Sierra Club) a response to comment document, other documents available on our ApplicationEnhancer Database
- Held a virtual public meeting on February 21, 2024
- Permit (R13-3622) was issued on March 26, 2024
- Superceded first TransGas permit (R13-2791) issued for proposed coal-to-liquids in 2009 and never built
- Has not started construction
- No information that this facility will have any connection to data centers
- DAQ will not be responding to any comments concerning that facility

Data Centers

- What is a Data Center?
  - A building that houses computers/servers used for cloud storage, AI applications, company applications, etc.
  - If you have a smart phone or do anything online you interact with a data center daily
  - Must not lose power or critical data will be lost (e.g., banking, medical data, etc.)
- Data Center & Air Emissions
  - Computers do not produce air emissions
  - Traditional on-grid Data Centers have huge amount back-up generation; emissions are relatively low only from maintenance/testing (emergency use not part of a permit)
  - In a microgrid, power produced locally directly tied to the Data Centers (may still have other backup options)
  - Emissions come from power generation facility
  - With backup capabilities way oversized.
  - HB2014 has no effect on review of an air quality permit for a data center

DAQ Review Summary

- TransGas submitted both permit applications on March 26, 2025
- Revised permit applications were submitted on May 14, 2025
- Applications submitted as a minor source (45CSR13)
- TransGas Legal Advertisements: April 9, 2025
  - No air quality related comments or public meeting requests received
- DAQ Public Advertisements: July 9, 2025
  - Preliminary Review Complete: Draft Permit/Fact Sheet Available
  - Preliminary Determination
  - 30-Day Comment Period
  - Public meeting requests received
- DAQ held virtual public meeting on August 18, 2025
- Additional request for in-person meeting

TransGas Project Overview

- 2 Locations
- Facilities are identical (different locations)
- R13-3714 – near Holden located in Mingo County on Mine Road adjacent to Mohawk Industries
- R13-3715 – Wharncliffe in Mingo County on the site of the Twisted Gun Golf Course
- Off-grid Power Generation Facilities
  - Purpose of facilities is to provide power to future adjacent data center operations
  - 117 engines with the ability to operate on natural gas or diesel fuel
  - Each engine is 28,194 hp and will have a maximum power output of 21 MW
  - Aggregate power output – 2,457 MW

TransGas Project Overview *(cont.)*

- Engines utilize control device systems to control emissions from NOx, CO, VOC, PM, and SO_2
- All individual pollutant emissions below PSD thresholds
- TransGas will be required to obtain Title V Operating Permits for each location
- Detailed information in the permit application and Engineering Evaluation/Fact Sheet

Air Pollution Control Technology

- Engines utilize control device systems to control emissions from NOx, CO, VOC, PM, and SO_2
- The technology consists of 2 main systems
  - The dry system is on the high-pressure side of the engine (before the turbocharger)
  - The wet system is on the low-pressure side of the engine, which is downstream of the turbocharger

Air Pollution Control Technology *(cont.)*

- The dry system utilizes an oxidation catalyst and selective catalytic reduction (SCR)
- The catalytic reduction of CO has a reduction efficiency of over 99%
- The same system also oxidizes VOC emissions with a reduction efficiency of 99%
- The de-NOx unit is a urea-based SCR technology with a reduction efficiency of 90%
- Dry system also utilizes the oxidation system of the de-NOx and de-CO system to reduce particulate matter emissions

Air Pollution Control Technology *(cont.)*

- The wet system consists of 4 stages which further reduces NOx by 90.9% and SO2 by 70%
- Stage 1 is designed for the removal of sulfur dioxide carried over by the exhaust gases
- Stages 2 and 3 are designed for the removal of nitrogen oxides. These stages are based on an oxidation-reduction mechanism that converts nitrogen oxides into gaseous nitrogen (N2), which achieves the reduced concentration at the stack
- Stage 4 serves as the finishing step and control unit which completes the process

Air Pollution Control Technology *(cont.)*

Mode	NOx Reduction (%)	CO Reduction (%)	VOC Reduction (%)	PM Reduction (%)	SO_2 Reduction (%)
Speed Up	0	0	0	0	95.0
Fuel Changeover	0	0	0	0	99.0
Generator Switched On	0	0	0	0	99.0
Load Up Cold Control	25.0	25.0	25.0	0	99.0
Normal Operation	99.0	99.0	99.0	25.0	99.0
Compensation Mode	99.0	95.0	99.0	25.0	99.0
Ramp Down	99.0	94.0	99.0	25.0	99.0
Min Load	70.0	50.0	70.0	0	70.0
Spin Out	40.0	35.0	40.0	0	40.0
Emergency	98.0	91.0	99.0	25.0	99.0

Summary

- TransGas is proposing to build 2 off-grid power generating facilities to provide power to future adjacent data centers in Mingo County
- DAQ has made a preliminary determination that the proposed construction will meet all applicable state rules and federal air quality regulations
- Engineering Evaluation/Fact Sheet and Draft Permit have been available for review since publication of the legal advertisement (July 9, 2025)
- DAQ will continue to accept public comments until 5:00 PM on September 19, 2025
- DAQ will evaluate and respond to all timely public air quality-related comments
- DAQ will make a final determination on this permitting action and make this determination and any related documents available at that time

Contact Information

West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Attention: Jerry Williams
jerry.williams@wv.gov

**** TransGas Development Comments as subject line ****

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

15. IPR Documents R13-3714

Williams, Jerry <jerry.williams@wv.gov>

WV DAQ Permit Application Status for TransGas Development Systems LLC; Adams Fork Harless Data Center Energy Campus

1 message

Mink, Stephanie R <stephanie.r.mink@wv.gov> Thu, Mar 27, 2025 at 12:26 PM
To: Adam Victor <adam@tgds.com>, avj@adamsforkenergy.com, "Patrick E. Ward" <PEWard@potesta.com>
Cc: Joseph R Kessler <joseph.r.kessler@wv.gov>, Jerry Williams <jerry.williams@wv.gov>, Casey M Samples <casey.m.samples@wv.gov>, Gregory L Null <gregory.l.null@wv.gov>, Barbara A Miles <barbara.a.miles@wv.gov>, Kathy M Sullivan <kathy.m.sullivan@wv.gov>

Application Status

TransGas Development Systems LLC; Adams Fork Harless Data Center Energy Campus

Facility ID: 059-00133

Application No. R13-3714

Mr. Victor:

Your application for a Construction Permit for the Adams Fork Harless Data Center Energy Campus was received by this division on March 16, 2025, and was assigned to Jerry Williams.

It is noted in the Payment Report that payment will be received via phone. The permit engineer will contact you regarding the amount due. Once you have the amount that you owe from the engineer, you may contact the Accounts Receivable section at 304 926-0499 ext. 41195. The DEP accepts Visa and MasterCard only. Please have the Facility ID and Application Number available when calling.

Within 30 days, you should receive notification from Jerry Williams stating the status of the permit application and, if complete, given an estimated time frame for the agency's final action on the permit.

Any determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit decision.

Should you have any questions, please contact the assigned engineer, Jerry Williams, at 304-926-0499, extension 41214.

--

Stephanie Mink

Environmental Resources Associate

West Virginia Department of Environmental Protection

Division of Air Quality, Title V & NSR Permitting

601 57th Street SE

Charleston, WV 25304

Phone: 304-926-0499 x41281

Williams, Jerry <jerry.williams@wv.gov>

Applications R13-3714 and R13-3715

Patrick E. Ward <PEWard@potesta.com> Thu, Apr 3, 2025 at 2:10 PM
To: "Jerry.Williams@wv.gov" <Jerry.Williams@wv.gov>
Cc: Adam Victor <adam@tgds.com>, "Adam Victor, Jr." <avj@adamsforkenergy.com>, "Ronald R. Potesta" <RRPotesta@potesta.com>, "Rhonda L. Henson" <rlhenson@potesta.com>

This email is to let you know the status of the fee payments and legal advertisements for the above applications. The application fees ($2,000 each) were paid yesterday. The legal advertisements have been sent to the Williamson Daily Mail and will be published on April 9th . We will submit the affidavits of publications when we receive them from the newspaper.

Regards,

Patrick Ward

Potesta & Associates, Inc.

7012 MacCorkle Avenue, S.E.

Charleston, West Virginia 25304

Ph: (304) 342-1400

Direct: (304) 414-4751

Fax: (304) 343-9031

This electronic communication and its attachments contain confidential information. The recommendations and/or design data included herein are provided as a matter of convenience and should not be used for final design or ultimate decision making. Rely only on the final hardcopy materials bearing the consultant's original signature and seal. If you have received this information in error, please notify the sender immediately.

Williams, Jerry <jerry.williams@wv.gov>

WV DAQ Permit Application Incomplete for TransGas Development Systems, LLC - Harless

1 message

Williams, Jerry <jerry.williams@wv.gov> Mon, Apr 21, 2025 at 10:59 AM
To: Adam Victor <adam@tgds.com>, "Adam Victor, Jr." <avj@adamsforkenergy.com>, "Patrick E. Ward" <PEWard@potesta.com>
Cc: Joseph R Kessler <joseph.r.kessler@wv.gov>

RE: Application Status: Incomplete
TransGas Development Systems, LLC - Harless
Permit Application R13-3714
Plant ID No. 059-00133

Dear Adam,

Your application for a 45 CSR 13 construction permit for a data center energy campus was received by this Division on March 26, 2025, and assigned to the writer for review. Upon initial review of said application, it has been determined that the application as submitted is incomplete based on the following items:

1. Page 5 of the pdf has the incorrect facility name and physical address.
2. Submit affidavit of publication for Class I legal advertisement.

Please address the above deficiencies in writing within fifteen (15) days of the receipt of this email. Application review will not commence until the application has been deemed to be technically complete. Failure to respond to this request in a timely manner may result in the denial of the application.

Should you have any questions, please reply to this email.

Thank you,
Jerry

--

Jerry Williams, P.E.
Engineer, Division of Air Quality

WV Department of Environmental Protection
601 57th Street SE, Charleston, WV 25304
Phone 304-926-0499, ext. 41214
Web dep.wv.gov **Email** jerry.williams@wv.gov

Williams, Jerry <jerry.williams@wv.gov>

WV DAQ Permit Application Incomplete for TransGas Development Systems, LLC - Harless

Patrick E. Ward <PEWard@potesta.com> Tue, Apr 22, 2025 at 9:47 AM
To: "Williams, Jerry" <jerry.williams@wv.gov>
Cc: Joseph R Kessler <joseph.r.kessler@wv.gov>, Adam Victor <adam@tgds.com>, "Adam Victor, Jr." <avj@adamsforkenergy.com>, "Ronald R. Potesta" <RRPotesta@potesta.com>, "Rhonda L. Henson" <rlhenson@potesta.com>

Attached are the two items requested in the below email: the affidavit of publication and the corrected PDF Page 5.

Regards,

Patrick Ward

Potesta & Associates, Inc.

7012 MacCorkle Avenue, S.E.

Charleston, West Virginia 25304

Ph: (304) 342-1400

Direct: (304) 414-4751

Fax: (304) 343-9031

This electronic communication and its attachments contain confidential information. The recommendations and/or design data included herein are provided as a matter of convenience and should not be used for final design or ultimate decision making. Rely only on the final hardcopy materials bearing the consultant's original signature and seal. If you have received this information in error, please notify the sender immediately.

[Quoted text hidden]

2 attachments

235088.pdf
244K

Revised Application for NSR Permit (Page 1) (22-0132-003B).pdf
213K

Ad Number 235088

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

I Tisha Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper

published in the county of Mingo, West Virginia, hereby

certify that the annexed publication was inserted in said

newspaper _____

The cost of publishing said annexed advertisement

as aforesaid was $ 42.50

Commencing On: 04/09/2025

Ending On: 04/09/2025

Given under my hand this day 04/09/2025

Sworn to and subscribed before me 04/09/2025
at Williamson, Mingo County, West Virginia

_____

Notary Public, In and for Mingo County, West Virginia

MY COMMISSION EXPIRES: May 12, 2027

_____

Official Seal
Notary Public, State of West Virginia
Jaime Lynn Copley
HD Media Co.
5192 Bradley Rd
Huntington, WV 25705
My Commission Expires May 12, 2027

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that TransGas Development Systems, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for the Adams Fork Harless Data Center Energy Campus located on 22 Mine Road near Holden in Mingo County, West Virginia. The latitude and longitude coordinates are: 37.753020 and 82.119050.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: NOx of 194.30 tons per year (tpy), SO2 of 9.93 tpy, CO of 205.62, tpy, VOC of 117.66 which includes fugitives of 0.31 tpy, PM of 193.69 tpy which includes fugitives of 7.16 tpy, PM10 of 187.96 which includes fugitives of 1.43 tpy, PM2.5 of 186.91 tpy which includes fugitives of 0.38 tpy, and total HAPS of 0.87 tpy.

Startup of operations is planned to begin on or about the 1st day of January 2027. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice. Written comments will also be received via email at DEPAirQualityPermitting@WV.gov.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, Extension 41281, during normal business hours.

Dated this the 9th day of April 2025.

By:
TransGas Development Systems, LLC
Adam Victor
President
630 First Avenue,
Suite 30C
New York, New York
10016-3799

LH-235088
04-09-2025

Acc.Id:	66275
Name:	POTESTA & ASSOCIATES
Phone:	304-342-1400
Address:	7012 MACCORKLE AVE SE
City:	CHARLESTON
State:	WV
Postcode:	25304
Class:	9010 Legal Notices
Edition:	WDN
Start:	04/09/2025
Stop:	04/09/2025
Issues:	1
Units	86.0
Order ID:	HC 235088
TFN:	C
TFN cycle:	
Rep:	EQUEEN
Status:	CF
Source:	EM
Paytype:	BI
Rate:	LG
Cost EXC GST:	42.50
Tax:	0.00
Total Charge:	42.50

Printed on: 04/02/2025 16:31:44
Printed by: EQUEEN

Legal Notices

ADVERTISEMENT FOR BID
Town of Matewan

Sealed bids for Matewan Old Fair Grounds will be received by the Town of Matewan at City Hall, located at 306 McCoy Alley, Matewan, WV 25678. The bid includes cutting all vegetation inside the fence and 15 feet outside the fence surrounding the property. This includes cutting all grass and trees and clean-up and removal of any debris including tree stumps. The deadline to turn in your bid is April 10th, 2025.

Bids must be submitted in a sealed envelope, bearing on the outside the name and address of the bidder and the words "Bid for Town of Matewan." The owner reserves the right to waive any information or to reject any or all bids. All bids must be mailed to:

Town of Matewan
PO Box 308
Matewan WV 25678

LH-229175
04-02,09/2025

IN THE CIRCUIT COURT OF MINGO COUNTY, WEST VIRGINIA

CASE NO.: 2025-P-38

IN RE THE MINOR CHILD OF:
Rebecca Layne

TO: Interested Parties of baby Caudill born 3-9-20 in Pike County, Kentucky at ARH.

Notice is hereby given to the above named parties pursuant to West Virginia code §49-6-1 and §49-3-1 that a petition in the above captioned matter has been previously filed in the Circuit Court of Mingo County, West Virginia. Notice is further given that a name change hearing in this case is scheduled for May 28, at 9:00 A.M. before the Honorable Judge S. Deskins, Located at 78 East 2nd Avenue, Room 2nd Floor, Williamson, West Virginia, 25661. From this hearing, the Interested Parties RIGHTS SHALL BE AFFECTED. You may appear and protect any rights and interests you may have if you are claiming any rights or relationship to said child belonging to Courtney Harris. Please contact the Mingo County Circuit Clerk's Office for more information.

A copy of the Petition in this matter may be obtained from the MINGO COUNTY CIRCUIT CLERK'S OFFICE, MINGO, WEST VIRGINIA.

Lonnie Hannah
MINGO COUNTY CIRCUIT CLERK

LH-225497
04-09/2025

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that TransGas Development Systems, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for the Adams Fork Data Center Energy Campus located on Twisted Gun Road near Wharncliffe in Mingo County, West Virginia. The latitude and longitude coordinates are: 37.593717 and 81.954906.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: NOx of 194.30 tons per year (tpy), SO2 of 9.93 tpy, CO of 205.62 tpy, VOC of 117.66 which includes fugitives of 0.31 tpy, PM of 215.17 tpy which includes fugitives of 28.64 tpy, PM10 of 192.26 which includes fugitives of 5.73 tpy, PM2.5 of 188.03 tpy which includes fugitives of 1.50 tpy, and total HAPS of 0.87 tpy.

Startup of operations is planned to begin on or about the 1st day of January 2027. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice. Written comments will also be received via email at DEPAirQualityPermitting@WV.gov.

Any questions regarding this permit application should be directed to the DAQ at (304) 926 0499 Extension 41281, during normal business hours.

Dated this the 9th day of April 2025.

By:
TransGas Development Systems, LLC
Adam Victor
President
630 First Avenue, Suite 30C
New York, New York 10016-3799

LH-235082
04-09;2025

The South Western West Virginia Region 2 Workforce Investment Board is seeking proposals from qualified applicants for a sub-recipient to provide Work-Based Learning Services (WBLS) in the Region 2 area, which includes: Boone, Cabell, Lincoln, Logan, Mingo, Putnam and Wayne counties. The funding for this proposal is provided under the Workforce Investment Opportunity Act 2014 (WIOA) by the United States Department of Labor and the State of West Virginia to South Western West Virginia Region 2 Workforce Investment Board, Inc. To learn more and review the RFP, please visit https://www.wvregion2.org/resources/rfp/. Proposal responses are due no later than 4/28/2025.*

LH-236177
04-09;2025

AIR QUALITY PERMIT NOTICE

Notice of Application

Notice is given that TransGas Development Systems, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for the Adams Fork Harless Data Center Energy Campus located on 22 Mine Road near Holden in Mingo County, West Virginia. The latitude and longitude coordinates are: 37.753020 and 82.119050.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be: NOx of 194.30 tons per year (tpy), SO2 of 9.93 tpy, CO of 205.62 tpy, VOC of 117.66 which includes fugitives of 0.31 tpy, PM of 193.69 tpy which includes fugitives of 7.16 tpy, PM10 of 187.96 which includes fugitives of 1.43 tpy, PM2.5 of 186.91 tpy which includes fugitives of 0.38 tpy, and total HAPS of 0.87 tpy.

Startup of operations is planned to begin on or about the 1st day of January 2027. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57th Street, SE, Charleston, WV 25304, for at least 30 calendar days from the date of publication of this notice. Written comments will also be received via email at DEPAirQualityPermitting@WV.gov.

Any questions regarding this permit application should be directed to the DAQ at (304) 926 0499 Extension 41281, during normal business hours.

Dated this the 9th day of April 2025.

By:
TransGas Development Systems, LLC
Adam Victor
President
630 First Avenue, Suite 30C
New York, New York 10016-3799

LH-235088
04-09/2025

Williamson Utility Board Repairs at 317 East 3rd Avenue

Scope of Work

Room 1
(Approximately 260 sq.ft.)
- Replace tile flooring
- Install new door
- Install new drop ceiling
- Install drywall on walls
- Install new door
- Painting of drywall on walls

Room 2
(Approximately 144 sq.ft)
- Replace tiles flooring
- Install new drop ceiling
- Install drywall on walls
- Painting of drywall installed

Bottom Floor
- Install new insulation
- Install lighting in drop ceiling

Top Floor office area
(Approximately 720 sq.ft.)
- Install new drywall
- Install new insulation
- Replace subfloor
- Install new lights
- Install new ductwork for HVAC
- Install two windows (2' x 3')
- Repair electrical connections in damaged areas
- Install new carpet
- Install (4) interior doors
- Painting of all new drywall hung

Tool Room
(Approximately 27' x 10')
- Replace 8' section of lower wall around entire room
- Replace any wet/damaged insulation

All areas where wood will not be replaced it will need to be cleaned and capped before installing products over top of. If you would like to schedule a site visit please contact City Hall between hours of 8:30am - 4:00pm Monday - Friday at (304)

All bidders must seal their bids and include the following with their proposal; West Virginia Business License, Proof of Business Insurance and delivered to City Hall no later than 4:00pm Friday April 18, 2025.

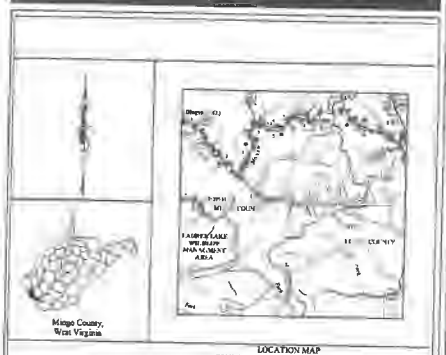
All bids will opened on April 24, 2025 at the regular scheduled council meeting.

LH-234907
04-09,16,23;2025

ERRORS MUST BE REPORTED ON THE FIRST DAY OF PUBLICATION

We shall not be liable for any loss or expense that results from the publication or omission of an advertisement.

Legal Notices



COAL MAC LLC, 1245 22 MINE ROAD, , HOLDEN, WV 25625

Notice is hereby given that has a permit on file with the Department of Environmental Protection (DEP) for the surface mining of approximately 277.32 acres and has submitted an application to the DEP 1101 George Kostas Drive, Logan, WV, 25601, for renewal of Article 3 Permit number O501090 to Other - Preparation Plant. The operation is discharging into Ohio River in the southeast of Dingess Harvey District of Mingo County, Longitude 82 ◆ 7 ' 46 " and Latitude 37 ◆ 53 ' 37 " (Coordinates from USGS Topographic Map)

N/A

West Fork of Twelvepole Creek

NAME	ADDRESS
Lexington Coal Company, LLC	PO Box 299 Sidney, KY 41564
Lyme Mountaineer Timberlands, LLC	PO Box 1142 Crab Orchard, WV 25827

NAME	ADDRESS
Pocahontas Land Corp.	PO Box 1517 Bluefield, WV 24701

NAME	ADDRESS
Pocahontas Land Corp.	PO Box 1517 Bluefield, WV 24701

NAME	ADDRESS
Lexington Coal Company, LLC	PO Box 299 Sidney, KY 41564
Lyme Mountaineer Timberlands, LLC	PO Box 1142 Crab Orchard, WV 25827

Written comments and/or requests for an informal conference of the permit renewal application shall identify the and application number and will be received by the Permit Supervisor at the DEP address above until 5/23/2025, or thirty (30) days from the date of final publication. A copy of the application will be available review until 5/23/2025, or thirty (30) days from the date of final publication in the DEP Regional Office at the address above and is available at:

http://apps.dep.wv.gov/WebApp/_dep/Search/ePermitting/ePermittingApplicationSearchPage.cfm

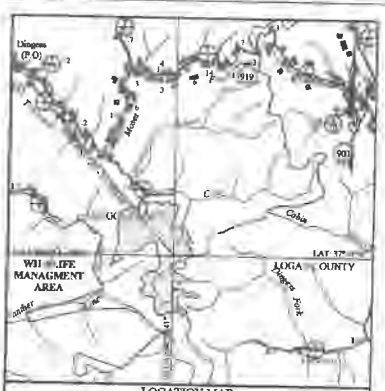
The above link can be accessed from a computer at all West Virginia public libraries.

Telephone Number: 304-792-7250
Number: O501090

Items are to be completed only for operations involving mineral removal.

location map in accordance with 38-2-3.2(b)(2)

HD-234948



LOCATION MAP
PERMIT NO. S-5013-06 - NPDES NO. WV1008251

WV GENERAL HIGHWAY MAP
SCALE: 1" = 1 MILE
NEAREST P.O.: DINGESS
COUNTIES: MINGO & LOGAN
DISTRICTS: HARVEY & ISLAND CREEK
QUAD: MYRTLE
RECEIVING STREAMS: UNNAMED TRIBUTARIES ON AND LAUREL FORK OF PIGEON CREEK OF THE TUG FORK RIVER AND DINGESS FORK OF COPPERAS MINE FORK OF THE GUYANDOTTE RIVER.

ADVERTISEMENT

Notice is hereby given that Coal Mac, LLC 1245 22 Mine Road, Holden, WV 25625 has submitted an application with the Department of Environmental Protection (DEP), 1101 George Kostas Drive, Logan, WV 25601 for Permit Number S5013-06 for a Phase 1 release on Increment Number 3 issued for 34.06 acres, a Phase 1 release on Increment Number 6 issued for 39.83 acres, a Phase 1 release on Increment 8 issued for 67.87 acres and a Phase 1 release on Increment 9 issued for 45.83 acres.

The permit is located in the Harvey and Island Creek Districts of Logan and Mingo Counties, 3.3 miles Southeast of Dingess on unnamed tributaries of/and Laurel Fork of Pigeon Creek of the Tug Fork River; Dingess Fork of Copperas Mine Fork of the Guyandotte River and West Fork Twelvepole Creek of Twelvepole Creek.

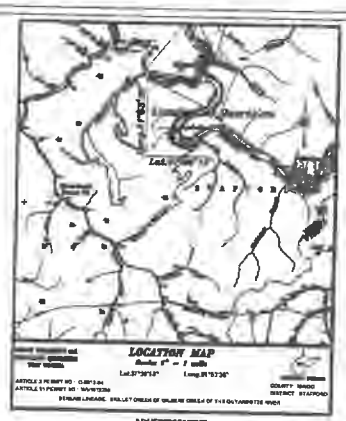
Coal-Mac LLC completed backfilling and regrading on 12/31/2021 and is requesting release of 60 percent of the reclamation performance bond currently in the amount of $35,000 for Phase 1 on Increment 3, 60% of $40,000 for Phase 1 on Increment 6, 60% of $68,000 for Phase 1 on Increment 8 and 60% of $46,000 for Phase 1 on Increment 9.

Written comments will be received at the DEP address above until 5/23/2025, or thirty (30) days from the date of final publication.

DEP Telephone Number: 304-792-7250

Permit Number: S-5017-98

HD-234959



ADVERTISEMENT

Notice is hereby given that Reflectance Energy, LLC, 200 George St., Suite 4, Beckley, WV has a permit on file with the Department of Environmental Protection (DEP), Division of Mining and Reclamation (DMR) located at 1101 George Kostas Drive, Logan, West Virginia 25601 for the surface mining of 47.23 acres and has submitted an application to the WVDEP for Renewal of Article 3 Permit Number O-5013-94 to operate and maintain a haulroad. The proposed operation is discharging into Skillet Creek and unnamed tributaries of Skillet Creek all tributaries Gilbert Creek of the Guyandotte River of the Ohio River and is located 1.8 miles Southwest of Gilbert in Stafford District of Mingo County, Longitude 81° 53' 37", Latitude 37° 36' 19". (Coordinates from USGS Topographic Map).

Surface of the area associated herewith, and the mineral associated herewith is owned by: Western Pocahontas Land Company, 5260 Irwin Rd, Huntington, WV 25705

Mineral within 100 feet of the permit herewith owned by: Western Pocahontas Land Company, 5260 Irwin Rd, Huntington, WV 25705

and the surface within 100 feet of the permit herewith is owned by: Western Pocahontas Land Company, 5260 Irwin Rd, Huntington, WV 25705
Ernestine Trent, 87 Chimney Pt., Balcden, WV 25608, and
Wayne Ellis et ux, P.O. Box 247, Gilbert, WV 25621

Written comments and/or requests for a formal conference of the surface mining application shall identify the applicant and application number and will be received by the Permit Supervisor at the WVDEP address above until May 9, 2025, or thirty (30) days from the date of final publication. A copy of the application will be available until May 9, 2025, or thirty (30) days from the date of final publication in the WVDEP Regional Office located at the address above and is available at:

http://apps.dep.wv.gov/WebApp/_dep/Search/ePermitting/ePermittingApplicationSearchPage.cfm

The above link can be accessed from a computer at all West Virginia public libraries.

DEP Telephone No.: 304-792-7250 Permit No. O-5013-94

HD-235013

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF AIR QUALITY

601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/daq

APPLICATION FOR NSR PERMIT AND TITLE V PERMIT REVISION (OPTIONAL)

PLEASE CHECK ALL THAT APPLY TO **NSR (45CSR13)** (IF KNOWN):

☒ **CONSTRUCTION** ☐ **MODIFICATION** ☐ **RELOCATION**
☐ **CLASS I ADMINISTRATIVE UPDATE** ☐ **TEMPORARY**
☐ **CLASS II ADMINISTRATIVE UPDATE** ☐ **AFTER-THE-FACT**

PLEASE CHECK TYPE OF **45CSR30 (TITLE V)** REVISION (IF ANY):

☐ **ADMINISTRATIVE AMENDMENT** ☐ **MINOR MODIFICATION**
☐ **SIGNIFICANT MODIFICATION**

IF ANY BOX ABOVE IS CHECKED, INCLUDE TITLE V REVISION INFORMATION AS **ATTACHMENT S** TO THIS APPLICATION

FOR TITLE V FACILITIES ONLY: Please refer to "Title V Revision Guidance" in order to determine your Title V Revision options (Appendix A, "Title V Permit Revision Flowchart") and ability to operate with the changes requested in this Permit Application.

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
TransGas Development Systems, LLC

2. Federal Employer ID No. ***(FEIN):***
20343110

3. Name of facility *(if different from above):*
Adams Fork Harless Data Center Energy Campus

4. The applicant is the:
☐ **OWNER** ☐ **OPERATOR** ☒ **BOTH**

5A. Applicant's mailing address:
630 First Avenue, Suite 30C
New York, New York 10016-3799

5B. Facility's present physical address:
22 Mine Road
Holden, WV 25670

6. **West Virginia Business Registration.** Is the applicant a resident of the State of West Virginia? ☒ **YES** ☐ **NO**

➪ If **YES,** provide a copy of the **Certificate of Incorporation/Organization/Limited Partnership** (one page) including any name change amendments or other Business Registration Certificate as **Attachment A.**

➪ If **NO,** provide a copy of the **Certificate of Authority/Authority of L.L.C./Registration** (one page) including any name change amendments or other Business Certificate as **Attachment A.**

7. If applicant is a subsidiary corporation, please provide the name of parent corporation: No

8. Does the applicant own, lease, have an option to buy or otherwise have control of the *proposed site?* ☐ **YES** ☐ **NO**

➪ If **YES,** please explain: Applicant has an option on the site with the current owner.

➪ If **NO,** you are not eligible for a permit for this source.

9. Type of plant or facility (stationary source) to be **constructed, modified, relocated, administratively updated** or **temporarily permitted** (e.g., coal preparation plant, primary crusher, etc.): Off-grid Power Generation

10. North American Industry Classification System **(NAICS)** code for the facility:
221112

11A. DAQ Plant ID No. (for existing facilities only):
New Facility

11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):
New Facility

All of the required forms and additional information can be found under the Permitting Section of DAQ's website, or requested by phone.

west virginia department of environmental protection

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
(304) 926-0475

Harold D. Ward, Cabinet Secretary
dep.wv.gov

April 28, 2025

Mr. Adam Victor
President
TransGas Development Systems, LLC
adam@tgds.com

Re: Confidential Business Information
TransGas Development Systems, LLC
Permit Numbers: R13-3714, 3715
Facility ID Numbers: 059-00133, 059-00134

Mr. Victor:

On March 26, 2025, TransGas Development Systems, LLC (TransGas) submitted air permit applications (R13-3714 and 3715) that contained information claimed as confidential business information (CBI). Redacted copies of the permit application were provided that have been made available for public review. As you are aware, the Division of Air Quality (DAQ) has received a public comment concerning the proposed project, which has specifically requested release of the information that has been redacted in the public version of the applications. This written request for release of information currently redacted has triggered a review of the CBI claims by the DEP's Office of the General Counsel (OGC). This review is governed by the applicable WV Legislative Rules 45CSR31, 31a, and 31b. At this time, the review has determined that some of the information claimed as CBI, specifically data concerning the RICE units and associated control devices, may not qualify for such designation as it falls under the definition of "Types and Amounts of Air Pollutants Discharged" as excluded under §45-31-6 and defined under §45-31-2.4 (and further defined under 45CSR31b). There is also some concern that the claimed CBI may not meet the eligibility requirements under §45-31-4.1(b) and 4.1(c).

At this time the OGC is requesting further justification (beyond that which is given on the CBI cover document) that the information noted above and claimed as CBI is not defined as "Types and Amounts of Air Pollutants Discharged" and also does not conflict with the eligibility requirements under §45-31-4.1(b) and 4.1(c). Please note that no information will be released without both TransGas having a full opportunity to justify the claims of CBI and the opportunity to have a full consultation with the WVDEP over this matter.

Please provide a written response within fifteen (15) days of receipt of this request to facilitate the continued review of Permit Applications R13-3714 and 3715.

Sincerely,

Jason Wandling

Jason Wandling
WVDEP General Counsel

cc: Adam Victor, Jr., avictor@adamsforkewvenergy.com
Patrick Ward, pward@potesta.com

TRANSGAS
Development Systems

May 2, 2025

Mr. Jason Wandling, General Counsel
WV Department of Environmental Protection Office of General Counsel
601 57th Street, SE
Charleston, West Virginia 25304

RE: Confidential Business Information
TransGas Development Systems, LLC
Facility I.D. Numbers 059-00133 and 059-00134

Dear Mr. Wandling:

TransGas Development Systems, LLC (TransGas) offers the following response to your agency's request dated April 28, 2025. The agency's letter requests that we further address the confidential business information (CBI) claim contained in the permit applications for the above sites.

To facilitate the review of the permit applications, TransGas is proposing to revise the CBI claim to cover the company names for the engine and control systems designers and manufacturers. This will include the engine model number which would identify the engine company. The remaining, currently claimed CBI, will be removed from our CBI request.

We hope that this revised CBI request is acceptable. If it is acceptable, we will submit another set of permit applications (confidential and redacted) reflecting this change.

Sincerely,

TRANSGAS DEVELOPMENT SYSTEMS, LLC

Adam Victor
President

cc: Patrick Ward, Potesta & Associates, Inc.

Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
(304) 926-0475

Harold D. Ward, Cabinet Secretary
dep.wv.gov

May 9, 2025

Mr. Adam Victor
President
TransGas Development Systems, LLC
adam@tgds.com

Re: Confidential Business Information
TransGas Development Systems, LLC
Permit Numbers: R13-3714, 3715
Facility ID Numbers: 059-00133, 059-00134

Mr. Victor:

On May 2, 2025, the Office of the General Counsel (OGC) received from TransGas Development Systems, LLC (TransGas) a letter proposing that TransGas revise its CBI claim in Permit Applications R13-3714/3715 to cover only the company names for the engine and control systems designers and manufacturers, including the engine model number which would identify the engine company. The remaining, currently claimed CBI, would be removed from the CBI request.

The Office of Legal Services has determined that a permit application so submitted would be in compliance with the requirements governing the submission of CBI under 45CSR31 and 45CSR31b.

Sincerely,

Laura M. Crowder

Digitally signed by: Laura M. Crowder
DN: CN = Laura M. Crowder email = Laura.M.Crowder@wv.gov C = US O = WV DEP OU = DAQ
Date: 2025.05.09 12:31:00 -04'00'

Laura M. Crowder
Director, Division of Air Quality

cc: Adam Victor, Jr., avj@adamsforkewvergy.com
Patrick Ward, peward@potesta.com

Williams, Jerry <jerry.williams@wv.gov>

Application Complete - TransGas; Adams Fork Harless Data Center Energy Campus

1 message

Williams, Jerry <jerry.williams@wv.gov> Wed, Jun 4, 2025 at 12:33 PM
To: Adam Victor <adam@tgds.com>
Cc: "Adam Victor, Jr." <avj@adamsforkenergy.com>, "Patrick E. Ward" <PEWard@potesta.com>, Joseph R Kessler <joseph.r.kessler@wv.gov>

Your application (R13-3714) for an off-grid power generation facility was received by the Division of Air Quality on March 26, 2025 and assigned to the writer for review. A revised application was received on May 14, 2025. Upon review of said application, it has been determined that the application is complete and, therefore, the statutory review period ***(90 days)*** commenced on June 4, 2025.

This determination of completeness shall not relieve the permit applicant of the requirement to subsequently submit, in a timely manner, any additional or corrected information deemed necessary for a final permit determination. **Please note that any additional information requests may pause the statutory review clock.**

Should you have any questions, please contact me at jerry.williams@wv.gov.

--

Jerry Williams, P.E.
Engineer, Division of Air Quality

WV Department of Environmental Protection
601 57th Street SE, Charleston, WV 25304
Phone 304-414-1214
Web dep.wv.gov **Email** jerry.williams@wv.gov

Williams, Jerry <jerry.williams@wv.gov>

Publication of Class I Legal Ad for the WV Division of Air Quality (1 of 2)

1 message

Mink, Stephanie R <stephanie.r.mink@wv.gov> Fri, Jun 27, 2025 at 3:23 PM
To: Southern WV Legals <swvlegals@hdmediallc.com>
Cc: Jerry Williams <jerry.williams@wv.gov>

Please publish the information below as a Class I legal advertisement (one time only) in the Wednesday, July 9, 2025 issue of the *The Williamson Daily News*. Please let me know that this has been received and will be published as requested. If this notice cannot be published on July 9 please advise prior to publication so that we can change the comment date within the notice. This is the first of two notices to be published in the July 9 edition. Thank you.

Send the invoice for payment and affidavit of publication to:

Stephanie Mink

Stephanie.R.Mink@wv.gov **

WV Department of Environmental Protection

DIVISION OF AIR QUALITY

601- 57th Street

Charleston, WV 25304

****To expedite payments for legal notices we are asking that all invoices and affidavits be emailed to the requestor. Any invoices which are mailed to the office are subject to delays. Thank you for your assistance.**

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off-grid power generation facility (Adams Fork Harless Data Center Energy Campus) located at 22 Mine Road, near Holden, Mingo County WV at latitude 37.75302 and longitude -82.11905. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3714.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.66 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 193.69 TPY; Particulate Matter less than 10 microns in diameter, 187.96 TPY; Particulate Matter less than 2.5 microns in diameter, 186.91 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been

expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304-926-0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

Williams, Jerry <jerry.williams@wv.gov>

WV Draft Permit R13-3714 for TransGas Development Systems, LLC; Adams Fork Harless Data Center Energy Campus

1 message

Mink, Stephanie R <stephanie.r.mink@wv.gov> Wed, Jul 9, 2025 at 7:58 AM
To: "Supplee, Gwendolyn" <supplee.gwendolyn@epa.gov>, "Whapham, Joseph" <Whapham.Joseph@epa.gov>, Adam Victor <adam@tgds.com>, avj@adamsforkenergy.com, "Patrick E. Ward" <PEWard@potesta.com>
Cc: "Crowder, Laura M" <Laura.M.Crowder@wv.gov>, "McCumbers, Carrie" <Carrie.McCumbers@wv.gov>, Joseph R Kessler <joseph.r.kessler@wv.gov>, Nicole D Ernest <nicole.d.ernest@wv.gov>, "Williams, Jerry" <jerry.williams@wv.gov>, "Johnson, Rebecca H" <Rebecca.H.Johnson@wv.gov>

Please find attached the Draft Permit R13-3714, Engineering Evaluation and Public Notice for TransGas Development Systems, LLC's Adams Fork Harless Data Center Energy Campus located in Mingo County.

The public notice will be published in *The Williamson Daily News* on Wednesday, July 9, 2025 and the thirty day comment period will end on Friday, August 8, 2025.

Should you have any questions or comments, please contact the permit writer, Jerry Williams, at 304-926-0499 ext. 41214 or Jerry.Williams@wv.gov.

--

Stephanie Mink

Environmental Resources Associate

West Virginia Department of Environmental Protection

Division of Air Quality, Title V & NSR Permitting

601 57th Street SE

Charleston, WV 25304

Phone: 304-926-0499 x41281

3 attachments

059-00133_PERM_13-3714 draft.pdf
390K

059-00133_EVAL_13-3714 draft.pdf
5157K

R13-3714_AirQualityPermitNotice.pdf
71K

west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV 25304
Phone (304) 926-0475 • FAX: (304) 926-0479

Harold D. Ward, Cabinet Secretary
dep.wv.gov

ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.:	R13-3714
Plant ID No.:	059-00133
Applicant:	TransGas Development Systems, LLC
Facility Name:	Adams Fork Harless Data Center Energy Campus
Location	Holden, Mingo County
NAICS Code:	221112 – Fossil Fuel Electric Power Generation
Application Type:	Construction
Received Date:	March 26, 2025 (Revised application submitted May 14, 2025)
Engineer Assigned:	Jerry Williams
Fee Amount:	$2,000 ($1,000 45 CSR 13 Application Fee, $1,000 NSPS Fee)
Date Received:	April 2, 2025
Complete Date:	June 4, 2025
Due Date:	September 2, 2025
Applicant Ad Date:	April 9, 2025
Newspaper	*Williamson Daily News*
UTM's:	Easting: 401.420 km Northing: 4,179.002 km Zone: 17
Latitude/Longitude:	37.75302 / -82.11905
Description:	Construction and operation of an off-grid power generation facility.

CONFIDENTIAL BUSINESS INFORMATION OVERVIEW

TransGas Development Systems, LLC (TransGas) submitted an air permit application for an off-grid power generation facility to be located near Holden in Mingo County. This permit application included confidential business information (CBI) submitted under 45 CSR 31, entitled "Confidential Information". Therefore, both a CBI and redacted version of the application were submitted. TransGas provided all CBI under the requirements of 45 CSR 31, which is the Division of Air Quality (DAQ)

regulation that establishes the requirements for claiming information submitted to the DAQ as confidential and the procedures for determinations of confidentiality in accordance with the provisions of W. Va. Code §22-5-10.

The reason for the CBI submittal according to TransGas is that the application contains information that is fully protected under non-disclosure and confidentiality agreements between the applicant and equipment provider concerning development of the process and facility design. Release of this information could cause substantial harm to TransGas' competitive position in the market. For each submission of information any portion of which is claimed to be confidential, a complete set of the information, including the document justifying the claim of confidentiality shall be submitted simultaneously on uncolored paper with the information claimed to be confidential blacked out, and with the words "redacted copy – claim of confidentiality" marked clearly on each such page, so that such a set of information is suitable for public disclosure and provides notice to the public that a claim of confidentiality has been made. DAQ allows for electronic submittals (via email) of redacted permit applications. However, all CBI applications must be submitted via mail or hand delivered. During the Notice of Application period, the DAQ received a public comment concerning the proposed project, which specifically requested the release of information that has been redacted.

As stated in 45 CSR 31, Section 4, during the course of the DAQ's review of whether the information claimed to be confidential is a trade secret in accordance with this rule, the DAQ shall consider the following:

- The claim of confidentiality has not expired by its terms, nor been waived or withdrawn;
- The person asserting the claim of confidentiality has satisfactorily shown that it has taken reasonable measures to protect the confidentiality of the information, and that it intends to continue to take such measures;
- The information claimed confidential is not, and has not been, reasonably obtainable without the person's consent by other persons (other than governmental bodies) by use of legitimate means (other than discovery based on a showing of special need in a judicial or quasi-judicial proceeding);
- No statute specifically requires disclosure of the information; and
- Either the person has satisfactorily shown that disclosure of the information is likely to cause substantial harm to the business's competitive position or the information is voluntarily submitted information, and its disclosure would likely to impair the State's ability to obtain necessary information in the future.

Additionally, 45 CSR 31, Section 6, states that no person shall claim as confidential, information concerning the types and amounts of pollutants discharged. "Types and amounts of air pollutants discharged" is defined in 45 CSR 31 Section 2.4. Furthermore, 45 CSR 31B entitled "Confidential Business Information and Emission Data" is an interpretive rule that provides guidance and clarification concerning the term "types and amounts of air pollutants discharged" defined under 45CSR§31-2.4, the DAQ's legislative rule entitled "Confidential Information," and thus what information may not be claimed confidential in accordance with 45CSR§31-6.

The aforementioned public comment received during the Notice of Application comment period triggered a review of the CBI claims by the DEP's Office of the General Counsel (OGC). A letter dated

April 28, 2025, from the OGC was issued to TransGas that stated that the information claimed as CBI may not qualify for such designation as it falls under the definition of "Types and Amounts of Pollutants Discharged" as excluded under §45-31-6 as defined under §45-31-2.4 (and further defined under 45 CSR 31B). This letter was made available to the public on the WVDEP Application Xtender (AX) website at that time. There was also concern that the claimed CBI may not meet the eligibility requirements under §45-31-4.1(b) and 4.1(c). The letter requested further justification that the information claimed as CBI is not defined as "Types and Amounts of Pollutants Discharged" and also does not conflict with the eligibility requirements of §45-31-4.1(b) and 4.1(c). The letter requested a written response within 15 days.

TransGas provided a response to this request on May 2, 2025. This response was made available to the public on the AX website at that time. TransGas proposed to revise the CBI claim to cover the company names for the engine and control systems designers and manufacturers. This includes the engine model number which would identify the engine company. All other previously claimed CBI would be removed from the request. Upon reviewing this information, the WVDEP issued a letter to TransGas on May 9, 2025, stating that a permit application so submitted would be in compliance with the requirements governing the submission of CBI under 45 CSR 31 and 45 CSR 31B. TransGas provided the revised application to DAQ on May 14, 2025, and the application was made available to the public on the AX website at that time.

This engineering evaluation/fact sheet contains only the information that was provided in the redacted copy of the permit application. Furthermore, the information contained herein is more than adequate to make the appropriate permitting determinations and can be used to determine compliance with all applicable rules and regulations. This includes all necessary monitoring, recordkeeping, reporting, and testing that will be required as part of the proposed draft permit.

DESCRIPTION OF PROCESS

The following process description was taken from Permit Application R13-3714:

The Adams Fork Harless Data Center Energy Campus is a unique off-grid, electric generating facility designed to provide power to adjacent data center operations. The facility encompasses 117 engines (Source ID# 1S – 117S) with 114 engines operating full-time and 3 engines in reserve. Each engine has a proposed control strategy (Emission Point ID# 1E – 117E). The facility will contain 39 powerhouses with each containing 3 generator setups with each generator having a nameplate capacity of 25 MWe. Actual power generation will depend on the operating mode of the engines. Each engine will have a maximum power output of 21 MW, therefore, the theoretically installed power output would be 2,457 MW. The effective and continuously delivered power output will be 1,796 MW.

The engines are configured to be dual-fuel units and have the ability to operate on natural gas or diesel fuel, or can be operated on diesel fuel only, in backup mode. Under normal operation, the engines consume natural gas as their primary fuel with a pilot injection of ultra-low sulfur diesel (ULSD). Under natural gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% in emergency operation.

The engines can operate under the following operational profiles:

Normal Operation
To ensure peak operation conditions, the engines will be regularly serviced. With 1-2 weeks of downtime per engine per year, 3 engines are going to be off-line at any time of the year. Under normal operations, the engines will be run at 75% power only. Therefore, the continuously delivered power will be 1,796 MW.

Compensation Mode
In the case of one or more, or in the unrealistic, but foreseen case of up to 29 engines out of service, the rest of the field will compensate, increasing their power output to 100%. For the calculation of the yearly emissions the worst case is assumed, when 29 engines go offline and the remaining 85 are operated at 100%.

Emergency Mode
In case the pipeline is down, or the gas cannot be delivered for any other reason, the engines can switch to diesel fuel mode immediately and are then operated on diesel fuel only. Apart from the different fuel type, the engines are controlled in the same way as in Normal Operation.

Startup Mode
To start an engine and bring power production online, several steps are necessary. In the first phase the emission control system is not operational temperature, therefore the control rate is not optimal. The following is a simplification and a representation of the worst case for emissions emission-wise. The different steps can be reduced to four main sub-modes:

- Speed up
  Bring the engine from standstill to nominal speed (89 rpm). This is done in diesel mode. The emission control system is still offline at this point, as it is not at optimal temperature. Once nominal speed is set and the minimum load for a fuel switch is reached (less than 5 minutes), the system initiates the next sub mode.

- Fuel Switch
  For about two minutes the load is kept constant, and the fuel is changed from 100% diesel to 98% gas & 2% diesel.

- Generator switched on
  On gas operation, the load is further increased until the generator can by energized and synchronized with the rest of the engine fleet. This takes no more than 5 minutes. For the emissions calculation of all these steps the emission control system is looked at as non-operational, even though the exhaust gases will have heated it already and some abatement is taking place, even at a reduced level.

- Load up cold control
  Once the generator is online and synchronized, then the engine is powered up to its set point (75% in normal operation mode). For reasons of simplicity and to ensure a conservative view on the problem, during engine load up the control system is looked at as cold and operational at

25% only. This is even though in reality the system was heated up constantly by the exhaust gases and reaching operational condition during the load up.

Shut Down
The shut down procedure consists of three phases:

- Ramp down
  The load is constantly reduced to a minimum load.

- Min Load
  At minimum load the generator is decoupled from the grid and the engine's load and speed setting are zero.

- Spin out
  Due to the zero-load setting the injection systems are turned off and the engine is spun out until full stop. In this entire sequence the emission control system is still operational due to its thermal inertia. Therefore, until the injection is stopped the emissions are treated.

The engines will operate on ULSD and natural gas depending on the operating status. ULSD will be stored in 40 storage tanks (Source ID# 118S – 157S, Emission Point ID# 118E – 157E) on the property. Natural gas will be delivered via pipeline. Tanks for control device liquids will be located at each powerhouse. There will be 39 tanks each of hydrous ammonia, caustic soda, sulfuric acid, sodium chlorite, and sodium hydrosulfide. These tanks are considered de minimis due to minimal emissions. Liquids and supplies for these tanks will be trucked to the site.

There is no steam-power production at the site. Cooling will be provided by mine pool water as needed. Therefore, there are no requirements for cooling towers.

SITE INSPECTION

A site inspection of the proposed location was conducted on May 20, 2025, by the writer and Joe Kessler (NSR Program Manager) of the DAQ. This is a greenfield site, and no construction or equipment installation was visible at the time of the site inspection. The proposed site is located in an industrial park with no residences nearby. There is a business (Coal Mac) located adjacent to the proposed location.

Directions to the site:

The facility will be located on the property at the Harless Industrial Park near Holden. This site can be accessed from U.S. Route 119 going south from Holden. Turn left onto 22 Mine Road. The proposed location is adjacent to Mohawk Industries.

Aerial view of the proposed site:

The site will be located in an industrial park and situated approximately close to the arrow in the photo found below.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Emissions associated with this facility consist of the equipment listed in the following table and fugitive emissions.

Emission Unit ID#	Process Equipment	Calculation Methodology
1S – 117S	Engine 1 – Engine 117 28,194 HP (each)	Manufacturer Data (NOx, CO, PM, VOC, SO_2) EPA AP-42 Emission Factors Chapter 3.2 (HAPs)
118S – 157S	40 – Diesel Storage Tanks 170,000 gal (each)	EPA TANKS Emissions Estimation Software, Version 4.0.9d
De Minimis	39 – Hydrous Ammonia Storage Tanks	De Minimis
De Minimis	39 – Caustic Soda Storage Tanks	De Minimis
De Minimis	39 – Sulfuric Acid Storage Tanks	De Minimis
De Minimis	39 – Sodium Chlorite Storage Tanks	De Minimis
De Minimis	39 – Sodium Hydrosulfide Storage Tanks	De Minimis
HR	Paved Haul Roads	EPA AP-42 Emission Factors, Chapter 13.2.1

The potential emissions from the engines were estimated using the ability to fire the units with natural gas or diesel. The engines at the facility are capable of firing either fuel. The operating hours, operational mode and throughput of each type of fuel will be continuously monitored and recorded. TransGas will keep records of the total amount of hours each engine uses natural gas as a fuel and the total amount of hours each engine uses diesel as a fuel. The 12-month rolling sum of emissions will be calculated monthly.

The emission control systems for the engines consist of two main systems. The dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, which is downstream of the turbocharger. The dry systems consist of an oxidation catalyst and an SCR catalyst. The catalytic reduction of CO has a reduction efficiency of over 99%. The same system oxidizes VOC emissions with a reduction efficiency of 99%. The de-NOx unit is a urea based SCR technology, and the reduction efficiency exceeds 90%. The wet system consists of four (4) stages, which reduce NOx further with 90.9% reduction efficiency and SO_2 with 70% reduction efficiency.

The emission abatement system that will be employed on each engine results in the following emissions reductions when operating in the following modes:

Mode	NOx (%)	CO (%)	VOC/HAP (%)	PM (%)	SO_2 (%)
Speed Up	0	0	0	0	95.0
Fuel Changeover	0	0	0	0	99.0
Generator Switched On	0	0	0	0	99.0
Load Up Cold Control	25.0	25.0	25.0	0	99.0
Normal Operation	99.0	99.0	99.0	25.0	99.0
Compensation Mode	99.0	95.0	99.0	25.0	99.0
Ramp Down	99.0	94.0	99.0	25.0	99.0
Min Load	70.0	50.0	70.0	0	70.0
Spin Out	40.0	35.0	40.0	0	40.0
Emergency	98.0	91.0	99.0	25.0	99.0

As discussed in the DESCRIPTION OF PROCESS and also as shown in the above table, the engines will operate in multiple modes. Under normal operations, the engine will remain comfortably below the PSD threshold. However, to ensure that the facility can be operated under worst-case conditions, the following worst-case scenario was examined.

The pipeline is out for eight (8) days, which equates to 192 hours. During this outage, the facility would be operated only on diesel fuel. During the same year, an unplanned event resulted in 31 engines are down and the remaining 86 engines are operated in compensation mode and will continue to deliver full power. This would increase the engines output to 99.4% load. It was estimated that the compensation mode would last for 24 days or 567 hours. Finally, the engines would have to go through 5 startups and shutdowns in place of the scheduled one (1) event. Using this worst case scenario results in the following hourly breakdown by operational mode:

Mode	Hours
Speed Up	0.42
Fuel Changeover	0.17
Generator Switched On	0.42
Load Up Cold Control	0.83
Normal Operation	7996.80
Compensation Mode	567.20
Ramp Down	1.67
Min Load	0.42
Spin Out	0.08
Emergency	192
Total Time	**8,760**

The operating hours used for the worst-case scenario results in the following potential to emit (PTE) for all of the engines:

Pollutant	**Annual Emissions (tons/year)**
Nitrogen Oxides	194.30
Carbon Monoxide	205.62
Volatile Organic Compounds	116.59
Particulate Matter-10/2.5	186.53
Sulfur Dioxide	9.93
Benzene	0.45
Toluene	0.16
Xylenes	0.11
Formaldehyde	0.046
Acrolein	0.0045
Acetaldehyde	0.013
Naphthalene	0.075
Total Hazardous Air Pollutants	0.86

The following table represents the maximum hourly and annual emissions during *normal operations* for one engine:

Pollutant	**Hourly Emissions (lb/hr)**	**Annual Emissions (tons/year)**
Nitrogen Oxides	0.14	0.61
Carbon Monoxide	0.34	1.47
Volatile Organic Compounds	0.23	0.99
Particulate Matter-10/2.5	0.34	1.49
Sulfur Dioxide	0.01	0.03
Benzene	0.00088	0.00352
Toluene	0.00032	0.00128
Xylenes	0.00022	0.00088
Formaldehyde	0.00009	0.00036
Acrolein	0.00001	0.00004
Acetaldehyde	0.00003	0.00012
Naphthalene	0.00015	0.0006
Total Hazardous Air Pollutants	0.0017	0.0068

Storage Tanks
The potential aggregate emissions for the 40 – 170,000 gallon diesel storage tanks include the losses from working and breathing. Due to the very low vapor pressure of diesel fuel (0.007 psia), the emissions associated with the diesel fuel tanks are low. EPA TANKS 4.09d allows users to enter specific information about a storage tank (dimensions, construction, paint condition, etc.), the liquid contents (chemical components and liquid temperature), and the meteorological conditions and location of the tank (nearest city, ambient temperature, etc.) to generate an air emissions report. Report features include estimates of monthly, annual, or partial year emissions for each chemical or mixture of chemicals stored in the tank. The closest meteorological location available in EPA TANKS 4.09d that was used was Charleston. As stated above, due to the very low vapor pressure of diesel fuel, the emissions associated with the diesel fuel tanks are low. The results of the EPA TANKS 4.09d analysis resulted in the following diesel storage tank emissions:

Pollutant	**Hourly Emissions (lb/hr)**	**Annual Emissions (tons/year)**
Volatile Organic Compounds	7.34	0.75

Truck Loading
There will also be potential emissions associated with the truck loading of the 40 – 170,000 gallon diesel storage tanks. These emissions were accounted for and included as working losses in the aforementioned storage tank emissions.

Paved Haul Roads
There are paved haul road activities associated with this facility. The following table indicates the assumptions made in estimating the emissions:

Operating Condition	**Parameter**
Potential Operating Days	365
Estimated Roundtrip Distance per Vehicle	1.25 miles/vehicle
Fluid Delivery Trucks per Year	5,583
Miscellaneous Vehicles per Year	4,380

Using these operating conditions, the potential emissions associated with these haul road operations result in the following:

Pollutant	**Hourly Emissions (lb/hr)**	**Annual Emissions (tons/year)**
Particulate Matter	2.88	7.16
Particulate Matter-10	0.58	1.43
Particulate Matter-2.5	0.15	0.38

Fugitive Emission Leaks
The fugitive equipment leaks (VOC/HAP) associated with fugitive components (valves, pressure relief valves, connections, flanges, etc.) were estimated using EPA's Protocol for Equipment Leak Emission Estimates Table 2-1 (SOCMI average emission factors) and Table 2-5 (SOCMI screening ranges emission factors) and the component counts associated with the proposed facility. Based on this

analysis, the fugitive equipment leaks associated with this facility would be 0.31 tons per year of VOC and less than 0.01 tons per year of HAPs. The permit does require minimization of fugitive emissions and further requires any above-ground piping, valves, pumps, etc. that shows signs of excess wear that have a reasonable potential for fugitive emissions of regulated air pollutants to be repaired or replaced.

The following table represents the emissions associated with this 45CSR13 construction permit:

Emission Source	Annual Emissions (tons/year)					
	NO_x	**CO**	**VOC**	**SO_2**	**PM_{10}**	**Total HAPs**
Engines	194.30	205.62	116.59	9.93	186.53	0.86
Storage Tanks	-	-	0.75	-	-	-
Paved Haul Roads	-	-	-	-	1.43	-
Fugitive Leaks	-	-	0.31	-	-	0.01
Facility PTE	**194.30**	**205.62**	**117.66**	**9.93**	**187.96**	**0.87**

REGULATORY APPLICABILITY

State

45 CSR 2 - Particulate Air Pollution from Combustion of Fuel in Indirect Heat Exchangers ***(not applicable)***

This rule establishes emission limitations for smoke and particulate matter which are discharged from fuel burning units. 45 CSR 2 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 4 (weight emission standard), 5 (control of fugitive particulate matter), 6 (registration), 8 (testing, monitoring, recordkeeping, reporting) and 9 (startups, shutdowns, malfunctions). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. A fuel burning unit is defined in 45 CSR 2 section 2.10 as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. The engines are not fuel burning units because this operation is not their primary purpose. Therefore, these units would not be subject to this rule.

45 CSR 4 - To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors

The purpose of this rule is to prevent and control the discharge of pollutants into the open air which causes or contributes to an objectionable odor or odors. This facility would generally be subject to this rule, however, this type of facility normally does not have issues with odors. However, the DAQ will, using the authority under this rule to respond to complaints involving objectionable odors if confirmed while the facility is operating, and may require mitigation at that time to reduce the odor potential of the source. An objectionable odor must be determined by the DAQ in the course of an inspection or investigation of an actual odor, and is possible to prove quantitatively, pursuant to this rule, that an objectionable odor will be present before a facility is in operation.

45 CSR 10 - To Prevent and Control Air Pollution from the Emissions of Sulfur Oxides ***(not applicable)***

This rule establishes emission limitations for sulfur dioxide which are discharged from fuel burning units. 45 CSR 10 states that any fuel burning unit that has a heat input under ten (10) million B.T.U.'s per hour is exempt from sections 3 (weight emission standard), 6 (registration), 7 (permits), and 8 (testing, monitoring, recordkeeping, reporting). However, failure to attain acceptable air quality in parts of some urban areas may require the mandatory control of these sources at a later date. A fuel burning unit is defined in 45 CSR 10 section 2.8 as any furnace, boiler apparatus, device, mechanism, stack or structure used in the process of burning fuel or other combustible material for the primary purpose of producing heat or power by indirect heat transfer. The engines are not fuel burning units because this operation is not their primary purpose. Therefore, these units would not be subject to this rule.

45 CSR 13 (Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation)

Pursuant to §45-13-5.1, "[n]o person shall cause, suffer, allow or permit the construction, modification, relocation and operation of any stationary source to be commenced without . . . obtaining a permit to construct."

Based upon the potential emissions for the facility, TransGas is required to obtain a permit under 45CSR13 for this facility.

As required under §45-13-8.3 ("Notice Le vel A"), TransGas placed a Class I legal advertisement in the *Williamson Daily News* on April 9, 2025. Additionally, TransGas paid the appropriate application fee of $2,000 ($1,000 45 CSR 13 permit application fee, $1,000 NSPS fee) on April 2, 2025.

45 CSR 14 - Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants ***(not applicable)***
45 CSR 19 - Permits for Construction and Major Modification of Major Stationary Sources of Air Pollution which Cause or Contribute to Nonattainment ***(not applicable)***

45CSR14 establishes and adopts a preconstruction permit program for the construction and major modification of major stationary sources in areas of attainment with the National Ambient Air Quality Standards (NAAQS). Mingo County is currently classified as in attainment/unclassifiable with the NAAQS and, therefore, a proposed new "major stationary source" in Mingo County would be subject to the provisions of 45CSR14. The proposed facility is not defined as a source listed under §45-14-2.43(a), therefore, pursuant to 2.4(b), would be defined as a "major stationary source" if any regulated pollutant has a PTE in excess of 250 TPY. The proposed facility, however, does not have a PTE of any regulated pollutant in excess of 250 TPY as shown in the table on the following page, therefore, not defined as a major stationary source and is not subject to the provisions of 45 CSR 14. 45 CSR 19 applies to sources that are located in areas that are classified as non-attainment with the NAAQS. Mingo County is an attainment/unclassified area, therefore, 45 CSR 19 would not apply.

Pollutant	PSD (45CSR14) Threshold (TPY)	NANSR (45CSR19) Threshold (TPY)	Facility PTE (TPY)	45CSR14 or 45CSR19 Review Required?
Carbon Monoxide	250	NA	205.62	No
Nitrogen Oxides	250	NA	194.30	No
Sulfur Dioxide	250	NA	9.93	No
Particulate Matter 2.5	250	NA	186.53	No
Ozone (VOC)	250	NA	117.35	No

45 CSR 16 - Standards of Performance for New Stationary Sources

This rule incorporates the federal Clean Air Act (CAA) standards of performance for new stationary sources (NSPS) set forth in 40 CFR Part 60 by reference. 45 CSR 16 applies to this source by reference of 40 CFR 60 Subpart IIII. These requirements are discussed under that rule below.

45 CSR 17 - To Prevent and Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage and Other Sources of Fugitive Particulate Matter

The purpose of this rule is to prevent and control particulate matter air pollution from materials handling, preparation, storage and other sources of fugitive particulate matter. TransGas will ensure appropriate precautions are taken to prevent the escape of fugitive particulate matter beyond the boundary lines of the property.

45 CSR 21 - Control of Air Pollution from the Emission of Volatile Organic Compounds ***(not applicable)***

This rule establishes reasonably available control technology to control emissions of volatile organic compounds from sources that manufacture, mix, store, use, or apply materials containing volatile organic compounds that are located in Cabell, Kanawha, Putnam, Wayne and Wood Counties. This facility is located in Mingo County, and therefore, not applicable to this rule.

45 CSR 27 - To Prevent and Control the Emissions of Toxic Air Pollutants ***(not applicable)***

The purpose of this rule is to prevent and control the discharge of toxic air pollutants requiring the application of best available technology (BAT) for chemical processing units. Section 2.4 defines a chemical processing unit as an assembly of reactors, tanks, distillation columns, heat exchangers, vaporizers, compressors, dryers, decanters, and/or other equipment used to treat, store, manufacture, or use toxic air pollutants. For the purpose of this rule, the term chemical processing unit includes surface coating equipment or similar equipment utilizing a toxic air pollutant as a solvent or for other purposes but does not include equipment used in the production and distribution of petroleum products providing that such equipment does not produce or contact materials containing more than 5% benzene by weight. Potential emissions of toxic air pollutants from this facility result from the combustion of natural gas or diesel in the engines. Regulation of emissions of toxic air pollutants from these unit types are not included in this rule, and therefore, not applicable.

45 CSR 30 - Requirements for Operating Permits

The facility is a major source and is subject to 45CSR30 based upon CO, NOx, PM, and VOC emissions each exceeding 100 tons per year. Due to this facility's PTE over 100 tons per year of a criteria pollutant, TransGas is required to have an operating permit pursuant to Title V of the Federal Clean Air Act as amended and 45CSR30. TransGas is required to pay the appropriate annual operating fees and submit an annual Certified Emissions Statement.

45 CSR 31 - Confidential Information

The purpose of this rule is to establish the requirements for claiming information submitted to the Director as confidential and the procedures for determinations of confidentiality in accordance with the provisions of W. Va. Code §22-5-10. The reason for the CBI submittal is that the application contains information that is fully protected under non-disclosure and confidentiality agreements between the applicant and equipment provider concerning development of the process and facility design. This was previously discussed in detail in the CONFIDENTIAL BUSINESS INFORMATION section.

45 CSR31B – Confidential Business Information and Emission Data

The purpose of this rule is to provide guidance and clarification concerning the term "types and amounts of pollutants discharged" defined under 45 CSR §31-2.4, the DAQ's legislative rule (45 CSR 31) and thus what information may not be claimed confidential in accordance with 45 CSR §31-6. An in-depth discussion regarding this was previously discussed in detail in the CONFIDENTIAL BUSINESS INFORMATION section.

45 CSR 33 - Acid Rain Provisions and Permits ***(not applicable)***

This rule establishes and adopts general provisions and the operating permit program requirements for affected sources and affected units under the Acid Rain Program promulgated by the United States Environmental Protection Agency under Title IV of the Clean Air Act, as amended (CAA). The rule and associated reference methods, performance specifications and other test methods which are appended to these standards are adopted by reference. These units are exempt under the New Unit Exemption in §40-72.7. See explanation below in Federal for 40 CFR 72 (Permits Regulation).

45 CSR 34 - Emission Standards for Hazardous Air Pollutants

This rule incorporates the federal Clean Air Act (CAA) national emission standards for hazardous air pollutants (NESHAPs) set forth in 40 CFR Parts 61 and 63 by reference. 45 CSR 34 applies to this source by reference of 40 CFR 63 Subpart ZZZZ. These requirements are discussed under that rule below.

45 CSR 40 - Control of Ozone Season Nitrogen Oxide Emissions ***(not applicable)***

The purpose of this rule is to establish ozone season NOx emission limitation, monitoring, recordkeeping, reporting, excess emissions, and NOx budget demonstration requirements for large industrial boilers and combustion turbines that have a maximum design heat input greater than 250

MMBTU/hr, in accordance with 40 CFR §51.121. Ozone season is defined as May 1 through September 30 in the same calendar year. This facility does not have industrial boilers or combustion turbines, therefore, this rule does not apply.

Federal

40 CFR 51.166 - Prevention of Significant Deterioration of Air Quality ***(not applicable)***

Federal construction permitting programs regulate new and modified sources of attainment pollutants under Prevention of Significant Deterioration (PSD) and new and modified sources of non-attainment pollutants under Non-Attainment New Source Review (NANSR). The provisions of this section are captured in the West Virginia state rules discussed above known as 45 CSR 14 (PSD) and 45 CSR 19 (NANSR). Both of these rules are part of West Virginia's State Implementation Plan (SIP).

Mingo County is designated as attainment/unclassifiable for all criteria pollutants. PSD regulations apply when a new source is constructed in which emissions exceed major source thresholds, an existing minor source undergoes modification in which emission increases exceed PSD major source thresholds, or an existing major source undergoes a modification in which emission increases exceed PSD significant emission rates. PSD major source thresholds are 250 tons per year of a regulated pollutant, except for the 28 regulated facility categories. This facility is not one of listed 28 regulated facility categories. Therefore, the PSD major source threshold is 250 tons per year of a regulated pollutant. The emissions associated with this facility is less than the PSD major source threshold, therefore, this rule does not apply.

40 CFR 60 Subpart Kc - Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After October 4, 2023 ***(not applicable)***

Subpart Kc applies to storage vessels of volatile organic liquids with capacities greater than or equal to 20,000 gallons for which construction commenced after October 4, 2023. § 60.110c(b)(8) exempts storage vessels that only store volatile organic liquids with a maximum true vapor pressure less than 0.25 psia (1.7 kPa absolute). Each storage vessel at the facility has a capacity of 170,000 gallons. However, the maximum vapor pressure of the storage vessels is 0.007 psia, which is less than 0.25 psia. Therefore, this rule does not apply.

40 CFR 60 Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

Subpart IIII applies to owners and operators of compression ignition internal combustion engines that commenced construction after July 11, 2005, and were manufactured after April 1, 2006, and not a fire pump engine.

The 28,194 HP engines (1S – 117S) are configured to be dual-fuel units and have the ability to operate on natural gas or diesel fuel, or can be operated on diesel fuel only, in backup mode. Under normal operation, the engines consume natural gas as their primary fuel with a pilot injection of ULSD. Under

natural gas operation, 2% of the energy comes from the pilot fuel, which can be increased to 100% in emergency operation.

The engines commenced construction after July 11, 2005, are non-emergency engines, were manufactured after April 1, 2006, utilizes diesel fuel, have displacements greater than 30 liters per cylinder, less than 130 rpm, not reducing PM by 60%, do not have diesel particulate filters, and were installed after January 1, 2016. Due to these parameters, the following are the regulatory requirements for each pollutant:

NOx

Emission Limit	3.4 g/KW-hr (2.5 g/HP-hr)
Standards	§60.4204(c)(3)
Monitoring/Testing	§60.4213(e)

PM

Emission Limit	0.15 g/kW-hr (0.11 g/HP-hr)
Standards	§60.4204(c)(4)
Monitoring/Testing	§60.4213(f)

Based upon the proposed hourly emission limits for the engines, the regulatory emission limits will be met.

The following requirements also apply to these pollutants:

Standards	§60.4206, §60.4207(d), §60.4211(d)
Monitoring/Testing	§60.4213(a), (b), (c); §60.4211(d)(1), (d)(3)
Recordkeeping	§60.4214(a)(2), §60.4211(d)(2)
Reporting	§60.4214(a)(1), §60.4211(d)(2)

40 CFR 60 Subpart TTTTa - Standards of Performance for Greenhouse Gas Emissions for Modified Coal-Fired Steam Electric Generating Units and New Construction and Reconstruction Stationary Combustion Turbine Electric Generating Units ***(not applicable)***

Subpart TTTTa applies to stationary combustion turbines that commence construction after May 23, 2023, that also serve a generator or generators capable of selling greater than 25 MW of electricity to a utility power distribution system. There are no combustion turbines at the proposed facility, therefore, Subpart TTTTa is not applicable.

40 CFR 63 Subpart EEEE - National Emission Standards for Hazardous Air Pollutants: Organic Liquids Distribution (Non-Gasoline) ***(not applicable)***

Subpart EEEE applies to organic liquids storage and distribution at major sources of HAPs. The facility is not a major source of HAPs because its PTE of total HAPs is less than 25 tons per year and its PTE of any single HAP is less than 10 tons per year. Therefore, Subpart EEEE does not apply.

40 CFR 63 Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE)

Subpart ZZZZ applies to stationary combustion RICE at area and major sources of HAPs. As stated in §63.6590(c), stationary RICE that are subject to regulations under 40 CFR 60 (IIII) must meet those requirements, and no further requirements apply for these units under this subpart.

40 CFR 64 - Compliance Assurance Monitoring ***(not applicable)***

Compliance Assurance Monitoring (CAM) applies to pollutant-specific emissions units at a major source under 40 CFR 70. The facility is not a major source under 40 CFR 70; therefore, CAM does not apply.

40 CFR 72 - Permits Regulation ***(not applicable)***

The purpose of this part is to establish certain general provisions and the operating permit program requirements for affected sources and affected units under the Acid Rain Program, pursuant to title IV of the Clean Air Act, 42 U.S.C. 7401, et seq., as amended by Public Law 101-549 (November 15, 1990).

The nameplate capacity of the generators attached to each unit is 25 MWe or less. The units do not burn coal or a coal-derived fuel, and burns fuel with sulfur of 0.05% or less by weight. Therefore, these units are exempt under the New Unit Exemption in Section 72.7 and are exempt from permit requirements, monitoring, and allowance holdings, except for the provisions of §72.7 itself, and §72.2 through 72.6 (definitions, measurements, abbreviations, and acronyms, federal authority, state authority, and applicability) and 72.10 through 72.13 (availability of information, computation of time, administrative appeals, and incorporation by reference).

40 CFR 97 Subpart DDDDD - Federal NOx Budget Trading Program, CAIR NOx and SO_2 Trading Programs, CSAPR NOx and SO_2 Trading Programs, and Texas SO_2 Trading Program ***(not applicable)***

This rule sets forth the general, designated representative, allowance, and monitoring provisions for the Cross-State Air Pollution Rule (CSAPR) SO_2 Group 2 Trading Program, under section 110 of the Clean Air Act and §52.39 of this chapter, as a means of mitigating interstate transport of fine particulates and sulfur dioxide.

This rule applies to fossil-fuel-fired combustion turbines serving at any time, on of after January 1, 2005, a generator with a nameplate capacity of more than 25 MWe producing electricity for sale. These units are RICEs and not combustion turbines. Additionally, the nameplate capacity of the generators attached to each unit is 25 Mwe. Therefore, this regulation does not apply.

ANALYSIS OF NON-CRITERIA REGULATED POLLUTANTS

This section provides information on those regulated pollutants that are not classified as "criteria pollutants". Criteria pollutants are defined as Carbon Monoxide (CO), Lead (Pb), Oxides of Nitrogen (NOx), Ozone, Particulate Matter (PM_{10} and $PM_{2.5}$), and Sulfur Dioxide (SO_2). These pollutants have National Ambient Air Quality Standards (NAAQS) set for each that are designed to protect public health and welfare. Other pollutants of concern, although designated as non-criteria *and without national air quality standards*, are regulated through various state and federal programs designed to limit their emissions and public exposure. These programs include federal source-specific HAP regulations promulgated under 40 CFR 61 and 40 CFR 63 (NESHAPS/MACT), and WV Legislative Rule 45 CSR 27 that regulates certain HAPs as Toxic Air Pollutants (TAPs). Any potential applicability to these programs were addressed in the REGULATORY APPLICABILITY section of this document.

The majority of non-criteria regulated pollutants fall under the definition of HAPs which, with some revision since, were 188 compounds identified under Section 112(b) of the Clean Air Act (CAA) as pollutants or groups of pollutants that EPA knows, or suspects *may* cause cancer or other serious human health effects. These adverse health effects may be associated with a wide range of ambient concentrations and exposure times and are influenced by source-specific characteristics such as emission rates and local meteorological conditions. Health impacts are also dependent on multiple factors that affect variability in humans such as genetics, age, health status (e.g., the presence of pre-existing disease) and lifestyle. As stated previously, *there are no federal or state ambient air quality standards for these specific chemicals*. It is also important to note that the USEPA does not divide the various HAPs into further classifications based on toxicity or if the compound is a suspected carcinogen. The HAP emissions associated with this application are found in the ESTIMATE OF EMISSIONS section of this document. For a complete discussion of the known health effects of each compound refer to the IRIS database located at *www.epa.gov/iris*.

The HAPs emitted from the proposed facility are created during the combustion of natural gas and diesel fuel. The HAP emission values were estimated using EPA AP-42: Compilation of Air Emissions Factors from Stationary Sources. AP-42 contains emission factors and process information for more than 200 air pollution source categories. AP-42 Chapter 3.2 contains HAP emission factors for reciprocating engines.

The table on the following page lists each HAP currently identified by TransGas as potentially being emitted based upon the information available in AP-42 Chapter 3.2, Tables 3.2-1, 3.2-3, and 3.2-4. Additionally, the Chemical Abstracts Service (CAS) registry number, the type of HAP, the PTE of the individual HAP, and any potentially applicable Most Available Control Technology (MACT) is provided.

Pollutant	CAS #	Type	PTE (TPY)	MACT[1]
Acetaldehyde	75-07-0	VOC	0.013	None
Acrolein	107-02-8	VOC	0.0045	None
Benzene	71-43-2	VOC	0.448	None
Formaldehyde	50-00-0	VOC	0.046	None
Naphthalene	91-20-3	VOC	0.075	None
Toluene	108-88-3	VOC	0.163	None
Xylenes	1330-20-7	VOC	0.111	None

[1] Does a MACT apply to this specific HAP for any emission unit at the facility? See REGULATORY APPLICABILITY section for discussion.

AIR QUALITY IMPACT ANALYSIS

Modeling was not required of this source because the facility is not subject to 45CSR14 (Permits for Construction and Major Modification of Major Stationary Sources of Air Pollutants) as discussed in the Regulatory Discussion Section.

SOURCE AGGREGATION

"Building, structure, facility, or installation" is defined as all the pollutant emitting activities which belong to the same industrial grouping, are located on one or more contiguous and adjacent properties, and are under the control of the same person.

TransGas has an option on the site with the current owner, therefore, they do have control of the proposed site. There are no other emission units belonging to the same industrial grouping, under common control, and located on contiguous or adjacent properties with the facility. Therefore, the emissions from the Adams Fork Harless Data Center facility should not be aggregated in determining Title V or PSD status.

MONITORING, RECORDKEEPING, REPORTING, AND TESTING (MRRT) OF OPERATIONS

TransGas will be required to perform the following MRRT:

- **Operational Limitations**
  - Operating limits will be established on the engines. TransGas will be required to monitor the operating hours, operational mode, and the throughput of each type of fuel will be continuously monitored and recorded for each engine. Required to keep records of the total amount of hours each engine uses natural gas as a fuel and the total amount of hours each engine uses diesel as a fuel. The 12-month rolling sum of emissions will be calculated monthly.
- **40 CFR 60 Subpart IIII MRRT**
  - Monitor and utilize diesel fuel that meets a maximum per-gallon sulfur content of 1,000 ppm. [§60.4207(d)]
  - Conduct an initial performance test to demonstrate initial compliance with the emission standards as specified in §60.4213. [§60.4211(d)(1)]
  - Conduct an annual performance test to demonstrate initial compliance with the emission standards as specified in §60.4213. [§60.4211(d)(3)]
  - Keep records of the information in paragraphs (a)(2)(i) through (iv) of this section.
    - (i) All notifications submitted to comply with this subpart and all documentation supporting any notification.
    - (ii) Maintenance conducted on the engine.
    - (iii) If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.
    - (iv) If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards. [§60.4214(a)(2)]
  - Establish operating parameters to be monitored continuously to ensure the stationary internal combustion engine continues to meet the emission standards. The owner or operator must petition the Administrator for approval of operating parameters to be monitored continuously. The petition must include the information described in paragraphs (d)(2)(i) through (v) of this section.
    - (i) Identification of the specific parameters you propose to monitor continuously;
    - (ii) A discussion of the relationship between these parameters and NOX and PM emissions, identifying how the emissions of these pollutants change with changes in these parameters, and how limitations on these parameters will serve to limit NOX and PM emissions;
    - (iii) A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;
    - (iv) A discussion identifying the methods and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and
    - (v) A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters. [§60.4211(d)(2)]

- Submit an initial notification as required in § 60.7(a)(1). The notification must include the information in paragraphs (a)(1)(i) through (v) of this section. Beginning on February 26, 2025, submit the notification electronically according to paragraph (g) of this section.
  - (i) Name and address of the owner or operator;
  - (ii) The address of the affected source;
  - (iii) Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;
  - (iv) Emission control equipment; and
  - (v) Fuel used. [§60.4214(a)(1)]

- **Tank Throughput and Loading**
  - TransGas will be required to monitor the tank throughput and loading operations for each storage tank. The 12-month rolling sum of throughputs/emissions will be calculated monthly.
- **45 CSR 17 Fugitive Sources of Particulate Matter**
  - Sources of fugitive particulate matter at the facility include diesel truck and employee traffic on paved plant roads. Conduct a visual inspection of the paved roads once each operating day to ensure no fugitive emissions are generated. When needed, roads will be swept and/or watered to minimize fugitive dust. Records will be kept of the inspections and any corrective actions.
- Maintain records of testing conducted in accordance with the permit. Said records shall be maintained on-site or in a readily accessible off-site location.
- Maintain the corresponding records specified by the on-going monitoring requirements of and testing requirements of the permit.
- Maintain a record of all PTE HAP calculations for the entire facility.

The records shall be maintained on site or in a readily available off-site location maintained by TransGas for a period of five (5) years.

STATUTORY AUTHORITY OF THE DAQ

The statutory authority of the DAQ is given under the Air Pollution Control Act (APCA) – West Virginia Code §22-5-1, *et. seq.* – which states, under §22-5-1 ("Declaration of policy and purpose"), that:

> It is hereby declared that public policy of this state and the purpose of this article is to achieve and maintain such levels of air quality ***as will*** (underlining and emphasis added) protect human health and safety, and to the greatest degree practicable, prevent injury to plant and animal life and property, foster the comfort and convenience of the people, promote the economic and social development of this state and facilitate the enjoyment of the natural attractions of this state.

Therefore, while the code states that the intent of the rule includes the criteria outlined in the latter part of the above sentence, it is clear by the underlined and bolded section of the above sentence that the scope of the delegated authority does not extend beyond the *impact of air quality* on these criteria. Based on the language under §22-5-1, *et. seq.*, the DAQ, in making determinations on issuance or denial of permits under WV Legislative Rule 45 CSR 13 (45 CSR 13), does not take into consideration

substantive non-air quality issues such as job creation, economic viability of proposed project, strategic energy issues, non-air quality environmental impacts, nuisance issues, etc.

The basis for issuance or denial of an air quality permit is given under 45 CSR 13. Pursuant to §45-13-5.7, the DAQ shall issue a permit unless:

> a determination is made that the proposed construction, modification, registration or relocation will violate applicable emission standards, will interfere with attainment or maintenance of an applicable ambient air quality standard, cause or contribute to a violation of an applicable air quality increment, or be inconsistent with the intent and purpose of this rule or W. Va. Code § 22-5-1, et seq., in which case the Secretary shall issue an order denying such construction, modification, relocation and operation. The Secretary shall, to the extent possible, give priority to the issuance of any such permit so as to avoid undue delay and hardship.

It is clear under 45 CSR 13 that denial of a permit must be based on one of the above explicitly stated criteria or, as noted, is inconsistent with 45 CSR 13 or §22-5-1, *et. seq*. As is stated above, it is the DAQ's position that the intent of both the APCA and 45 CSR 13 is to circumscribe the authority of the DAQ to air quality issues as outlined in the APCA and in West Virginia's State Implementation Plan (SIP).

The air quality issues evaluated relating to TransGas' proposed construction are outlined in this document. All applicable and potentially applicable rules were evaluated in the REGULATORY DISCUSSION section. The items covered under that section represent the extent of the substantive air quality issues over which the DAQ has authority to evaluate under 45 CSR 13 and the APCA as relating to this permit application.

RECOMMENDATION TO DIRECTOR

The information provided in permit application R13-3714 indicates that compliance with all applicable state and federal air quality regulations will be achieved. Therefore, I recommend to the Director that the DAQ go to public notice with a preliminary determination to issue Permit Number R13-3714 to TransGas for the proposed construction of the Adams Fork Harless Data Center Energy Campus located in Holden, Mingo County, WV.

Jerry Williams

Digitally signed by: Jerry Williams
DN: CN = Jerry Williams email = jerry.williams@wv.gov C = US
Date: 2025.06.27 09:57:22 -04'00'

Jerry Williams, P.E.
Engineer

West Virginia Department of Environmental Protection

Harold D. Ward
Cabinet Secretary

Construction Permit

R13-3714

This permit is issued in accordance with the West Virginia Air Pollution Control Act (West Virginia Code §§22-5-1 et seq.) and 45 C.S.R. 13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation. The permittee identified at the above-referenced facility is authorized to construct the stationary sources of air pollutants identified herein in accordance with all terms and conditions of this permit.

Issued to:

TransGas Development Systems, LLC
Adams Fork Harless Data Center Energy Campus
059-00133

Laura M. Crowder
Director, Division of Air Quality

Issued: Draft

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Facility Location:	Off of 22 Mine Road, Holden, Mingo County, West Virginia
Mailing Address:	630 First Avenue, Suite 30C, New York, NY 10016-3799
Facility Description:	Off-grid Power Generation Facility
NAICS Codes:	221112 – Fossil Fuel Electric Power Generation
UTM Coordinates:	401.420 km Easting • 4,179.002 km Northing • Zone 17
Latitude/Longitude:	37.75302 / -82.11905
Permit Type:	Construction
Description of Change:	Construction and operation of an off-grid power generation facility.

Any person whose interest may be affected, including, but not necessarily limited to, the applicant and any person who participated in the public comment process, by a permit issued, modified or denied by the Secretary may appeal such action of the Secretary to the Air Quality Board pursuant to article one [§§22B-1-1 et seq.], Chapter 22B of the Code of West Virginia. West Virginia Code §§22-5-14.

As a result of the granting of this permit, the source is subject to 45CSR30. The Title V (45CSR30) application will be due within twelve (12) months after the date of the commencement of the operation or activity (activities) authorized by this permit, unless granted a deferral or exemption by the Director from such filing deadline pursuant to a request from the permittee.

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1.0. Emission Units

Emission Unit ID	Emission Point ID	Emission Unit Description	Year Installed	Design Capacity	Control Device
1S – 117S	1E – 117E	Engine 1 – Engine 117	2026	28,194 HP (each)	1C – 117C
118S – 157S	118E – 157E	ULSD Tanks (TK1 – TK40)	2026	170,000 gal (each)	None
DM	DM	Hydrous Ammonia Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Caustic Soda Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Sulfuric Acid Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Sodium Chlorite Tanks 1-39	2026	4,600 gal (each)	None
DM	DM	Sodium Hydrosulfide Tanks 1-39	2026	4,600 gal (each)	None
UNLOAD	UNLOAD-E	Diesel Truck Unloading	2026	3,907,000 gal (normal operation)	None

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2.0. General Conditions

2.1. Definitions

2.1.1. All references to the "West Virginia Air Pollution Control Act" or the "Air Pollution Control Act" mean those provisions contained in W.Va. Code §§ 22-5-1 to 22-5-18.

2.1.2. The "Clean Air Act" means those provisions contained in 42 U.S.C. §§ 7401 to 7671q, and regulations promulgated thereunder.

2.1.3. "Secretary" means the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W.Va. Code §§ 22-1-6 or 22-1-8 (45CSR§30-2.12.). The Director of the Division of Air Quality is the Secretary's designated representative for the purposes of this permit.

2.2. Acronyms

CAAA	Clean Air Act Amendments
CBI	Confidential Business Information
CEM	Continuous Emission Monitor
CES	Certified Emission Statement
C.F.R. *or* CFR	Code of Federal Regulations
CO	Carbon Monoxide
C.S.R. *or* CSR	Codes of State Rules
DAQ	Division of Air Quality
DEP	Department of Environmental Protection
dscm	Dry Standard Cubic Meter
FOIA	Freedom of Information Act
HAP	Hazardous Air Pollutant
HON	Hazardous Organic NESHAP
HP	Horsepower
lbs/hr	Pounds per Hour
LDAR	Leak Detection and Repair
M	Thousand
MACT	Maximum Achievable Control Technology
MDHI	Maximum Design Heat Input
MM	Million
MMBtu/hr *or* mmbtu/hr	Million British Thermal Units per Hour
MMCF/hr *or* mmcf/hr	Million Cubic Feet per Hour
NA	Not Applicable
NAAQS	National Ambient Air Quality Standards
NESHAPS	National Emissions Standards for Hazardous Air Pollutants
NO_X	Nitrogen Oxides
NSPS	New Source Performance Standards
PM	Particulate Matter
$PM_{2.5}$	Particulate Matter less than 2.5 µm in diameter
PM_{10}	Particulate Matter less than 10µm in diameter
Ppb	Pounds per Batch
Pph	Pounds per Hour
Ppm	Parts per Million
Ppm_V or ppmv	Parts per Million by Volume
PSD	Prevention of Significant Deterioration
Psi	Pounds per Square Inch
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
TAP	Toxic Air Pollutant
TPY	Tons per Year
TRS	Total Reduced Sulfur
TSP	Total Suspended Particulate
USEPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
VEE	Visual Emissions Evaluation
VOC	Volatile Organic Compounds
VOL	Volatile Organic Liquids

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2.3. Authority

This permit is issued in accordance with West Virginia air pollution control law W.Va. Code §§ 22-5-1. et seq. and the following Legislative Rules promulgated thereunder:

2.3.1. 45CSR13 – *Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits and Procedures for Evaluation*;

2.4. Term and Renewal

2.4.1. This Permit shall remain valid, continuous and in effect unless it is revised, suspended, revoked or otherwise changed under an applicable provision of 45CSR13 or any other applicable legislative rule;

2.5. Duty to Comply

2.5.1. The permitted facility shall be constructed and operated in accordance with the plans and specifications filed in Permit Application R13-3714 and any modifications, administrative updates, or amendments thereto. The Secretary may suspend or revoke a permit if the plans and specifications upon which the approval was based are not adhered to;
[45CSR§§13-5.10 and -10.3.]

2.5.2. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the West Virginia Code and the Clean Air Act and is grounds for enforcement action by the Secretary or USEPA;

2.5.3. Violations of any of the conditions contained in this permit, or incorporated herein by reference, may subject the permittee to civil and/or criminal penalties for each violation and further action or remedies as provided by West Virginia Code 22-5-6 and 22-5-7;

2.5.4. Approval of this permit does not relieve the permittee herein of the responsibility to apply for and obtain all other permits, licenses, and/or approvals from other agencies; i.e., local, state, and federal, which may have jurisdiction over the construction and/or operation of the source(s) and/or facility herein permitted.

2.6. Duty to Provide Information

The permittee shall furnish to the Secretary within a reasonable time any information the Secretary may request in writing to determine whether cause exists for administratively updating, modifying, revoking, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Secretary copies of records to be kept by the permittee. For information claimed to be confidential, the permittee shall furnish such records to the Secretary along with a claim of confidentiality in accordance with 45CSR31. If confidential information is to be sent to USEPA, the permittee shall directly provide such information to USEPA along with a claim of confidentiality in accordance with 40 C.F.R. Part 2.

2.7. Duty to Supplement and Correct Information

Upon becoming aware of a failure to submit any relevant facts or a submittal of incorrect information in any permit application, the permittee shall promptly submit to the Secretary such supplemental facts or corrected information.

2.8. Administrative Update

The permittee may request an administrative update to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-4.]

2.9. Permit Modification

The permittee may request a minor modification to this permit as defined in and according to the procedures specified in 45CSR13.
[45CSR§13-5.4.]

2.10 Major Permit Modification

The permittee may request a major modification as defined in and according to the procedures specified in 45CSR14 or 45CSR19, as appropriate.
[45CSR§13-5.1]

2.11. Inspection and Entry

The permittee shall allow any authorized representative of the Secretary, upon the presentation of credentials and other documents as may be required by law, to perform the following:

a. At all reasonable times (including all times in which the facility is in operation) enter upon the permittee's premises where a source is located or emissions related activity is conducted, or where records must be kept under the conditions of this permit;

b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

c. Inspect at reasonable times (including all times in which the facility is in operation) any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit;

d. Sample or monitor at reasonable times substances or parameters to determine compliance with the permit or applicable requirements or ascertain the amounts and types of air pollutants discharged.

2.12. *[Reserved]*

2.13. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a permittee in an enforcement action that it should have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit. However, nothing in this paragraph shall be construed as precluding consideration of a need to halt or reduce activity as a mitigating factor in determining penalties for noncompliance if the health, safety,

or environmental impacts of halting or reducing operations would be more serious than the impacts of continued operations.

2.14. Suspension of Activities

In the event the permittee should deem it necessary to suspend, for a period in excess of sixty (60) consecutive calendar days, the operations authorized by this permit, the permittee shall notify the Secretary, in writing, within two (2) calendar weeks of the passing of the sixtieth (60) day of the suspension period.

2.15. Property Rights

This permit does not convey any property rights of any sort or any exclusive privilege.

2.16. Severability

The provisions of this permit are severable and should any provision(s) be declared by a court of competent jurisdiction to be invalid or unenforceable, all other provisions shall remain in full force and effect.

2.17. Transferability

This permit is transferable in accordance with the requirements outlined in Section 10.1 of 45CSR13. **[45CSR§13-10.1.]**

2.18. Notification Requirements

The permittee shall notify the Secretary, in writing, no later than thirty (30) calendar days after the actual startup of the operations authorized under this permit.

2.19. Credible Evidence

Nothing in this permit shall alter or affect the ability of any person to establish compliance with, or a violation of, any applicable requirement through the use of credible evidence to the extent authorized by law. Nothing in this permit shall be construed to waive any defense otherwise available to the permittee including, but not limited to, any challenge to the credible evidence rule in the context of any future proceeding.

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3.0. Facility-Wide Requirements

3.1. Limitations and Standards

3.1.1. **Open burning.** The open burning of refuse by any person, firm, corporation, association or public agency is prohibited except as noted in 45CSR§6-3.1.
[45CSR§6-3.1.]

3.1.2. **Open burning exemptions.** The exemptions listed in 45CSR§6-3.1 are subject to the following stipulation: Upon notification by the Secretary, no person shall cause, suffer, allow or permit any form of open burning during existing or predicted periods of atmospheric stagnation. Notification shall be made by such means as the Secretary may deem necessary and feasible.
[45CSR§6-3.2.]

3.1.3. **Asbestos.** The permittee is responsible for thoroughly inspecting the facility, or part of the facility, prior to commencement of demolition or renovation for the presence of asbestos and complying with 40 C.F.R. § 61.145, 40 C.F.R. § 61.148, and 40 C.F.R. § 61.150. The permittee, owner, or operator must notify the Secretary at least ten (10) working days prior to the commencement of any asbestos removal on the forms prescribed by the Secretary if the permittee is subject to the notification requirements of 40 C.F.R. § 61.145(b)(3)(i). The USEPA, the Division of Waste Management, and the Bureau for Public Health - Environmental Health require a copy of this notice to be sent to them.
[40CFR§61.145(b) and 45CSR§34]

3.1.4. **Odor.** No person shall cause, suffer, allow or permit the discharge of air pollutants which cause or contribute to an objectionable odor at any location occupied by the public.
[45CSR§4-3.1] ***[State Enforceable Only]***

3.1.5. **Permanent shutdown.** A source which has not operated at least 500 hours in one 12-month period within the previous five (5) year time period may be considered permanently shutdown, unless such source can provide to the Secretary, with reasonable specificity, information to the contrary. All permits may be modified or revoked and/or reapplication or application for new permits may be required for any source determined to be permanently shutdown.
[45CSR§13-10.5.]

3.1.6. **Standby plan for reducing emissions.** When requested by the Secretary, the permittee shall prepare standby plans for reducing the emissions of air pollutants in accordance with the objectives set forth in Tables I, II, and III of 45CSR11.
[45CSR§11-5.2.]

3.2. Monitoring Requirements

3.2.1. **Emission Limit Averaging Time.** Unless otherwise specified, compliance with all annual limits shall be based on a rolling twelve month total. A rolling twelve month total shall be the sum of the measured parameter of the previous twelve calendar months. Compliance with all hourly emission limits shall be based on the applicable NAAQS averaging times or, where applicable, as given in any approved performance test method.

3.3. Testing Requirements

3.3.1. **Stack testing.** As per provisions set forth in this permit or as otherwise required by the Secretary, in accordance with the West Virginia Code, underlying regulations, permits and orders, the permittee shall conduct test(s) to determine compliance with the emission limitations set forth in this permit and/or established or set forth in underlying documents. The Secretary, or his duly authorized representative, may at his option witness or conduct such test(s). Should the Secretary exercise his option to conduct such test(s), the operator shall provide all necessary sampling connections and sampling ports to be located in such manner as the Secretary may require, power for test equipment and the required safety equipment, such as scaffolding, railings and ladders, to comply with generally accepted good safety practices. Such tests shall be conducted in accordance with the methods and procedures set forth in this permit or as otherwise approved or specified by the Secretary in accordance with the following:

a. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with 40 C.F.R. Parts 60, 61, and 63 in accordance with the Secretary's delegated authority and any established equivalency determination methods which are applicable. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.

b. The Secretary may on a source-specific basis approve or specify additional testing or alternative testing to the test methods specified in the permit for demonstrating compliance with applicable requirements which do not involve federal delegation. In specifying or approving such alternative testing to the test methods, the Secretary, to the extent possible, shall utilize the same equivalency criteria as would be used in approving such changes under Section 3.3.1.a. of this permit. If a testing method is specified or approved which effectively replaces a test method specified in the permit, the permit may be revised in accordance with 45CSR§13-4. or 45CSR§13-5.4 as applicable.

c. All periodic tests to determine mass emission limits from or air pollutant concentrations in discharge stacks and such other tests as specified in this permit shall be conducted in accordance with an approved test protocol. Unless previously approved, such protocols shall be submitted to the Secretary in writing at least thirty (30) days prior to any testing and shall contain the information set forth by the Secretary. In addition, the permittee shall notify the Secretary at least fifteen (15) days prior to any testing so the Secretary may have the opportunity to observe such tests. This notification shall include the actual date and time during which the test will be conducted and, if appropriate, verification that the tests will fully conform to a referenced protocol previously approved by the Secretary.

d. The permittee shall submit a report of the results of the stack test within sixty (60) days of completion of the test. The test report shall provide the information necessary to document the objectives of the test and to determine whether proper procedures were used to accomplish these objectives. The report shall include the following: the certification described in paragraph 3.5.1.; a statement of compliance status, also signed by a responsible official; and, a summary of conditions which form the basis for the compliance status evaluation. The summary of conditions shall include the following:

1. The permit or rule evaluated, with the citation number and language;
2. The result of the test for each permit or rule condition; and,
3. A statement of compliance or noncompliance with each permit or rule condition.

[WV Code § 22-5-4(a)(14-15) and 45CSR13]

3.4. Recordkeeping Requirements

3.4.1. **Retention of records.** The permittee shall maintain records of all information (including monitoring data, support information, reports, and notifications) required by this permit recorded in a form suitable and readily available for expeditious inspection and review. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation. The files shall be maintained for at least five (5) years following the date of each occurrence, measurement, maintenance, corrective action, report, or record. At a minimum, the most recent two (2) years of data shall be maintained on site. The remaining three (3) years of data may be maintained off site, but must remain accessible within a reasonable time. Where appropriate, the permittee may maintain records electronically (on a computer, on computer floppy disks, CDs, DVDs, or magnetic tape disks), on microfilm, or on microfiche.

3.4.2. **Odors.** For the purposes of 45CSR4, the permittee shall maintain a record of all odor complaints received, any investigation performed in response to such a complaint, and any responsive action(s) taken.
[45CSR§4. *State Enforceable Only.*]

3.5. Reporting Requirements

3.5.1. **Responsible official.** Any application form, report, or compliance certification required by this permit to be submitted to the DAQ and/or USEPA shall contain a certification by the responsible official that states that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

3.5.2. **Confidential information.** A permittee may request confidential treatment for the submission of reporting required by this permit pursuant to the limitations and procedures of W.Va. Code § 22-5-10 and 45CSR31.

3.5.3. **Correspondence.** All notices, requests, demands, submissions and other communications required or permitted to be made to the Secretary of DEP and/or USEPA shall be made in writing and shall be deemed to have been duly given when delivered by hand, or mailed first class or by private carrier with postage prepaid to the address(es), or submitted in electronic format by email as set forth below or to such other person or address as the Secretary of the Department of Environmental Protection may designate:

DAQ:
Director
WVDEP
Division of Air Quality
601 57th Street
Charleston, WV 25304-2345

US EPA:
Section Chief, USEPA, Region III
Enforcement and Compliance Assurance Division
Air Section (3ED21)
Four Penn Center
1600 John F Kennedy Blvd
Philadelphia, PA 19103-2852

DAQ Compliance and Enforcement[1]:
DEPAirQualityReports@wv.gov

[1]For all self-monitoring reports (MACT, GACT, NSPS, etc.), stack tests and protocols, Notice of Compliance Status Reports, Initial Notifications, etc.

3.5.4. **Operating Fee**

3.5.4.1. In accordance with 45CSR30 – Operating Permit Program, the permittee shall submit a certified emissions statement and pay fees on an annual basis in accordance with the submittal requirements of the Division of Air Quality. A receipt for the appropriate fee shall be maintained on the premises for which the receipt has been issued, and shall be made immediately available for inspection by the Secretary or his/her duly authorized representative.

3.5.4.2. In accordance with 45CSR30 – Operating Permit Program, enclosed with this permit is a Certified Emissions Statement (CES) Invoice, from the date of initial startup through the following June 30. Said invoice and the appropriate fee shall be submitted to this office no later than 30 days prior to the date of initial startup. For any startup date other than July 1, the permittee shall pay a fee or prorated fee in accordance with Section 4.5 of 45CSR22. A copy of this schedule may be found attached to the Certified Emissions Statement (CES) Invoice.

3.5.5. **Emission inventory.** At such time(s) as the Secretary may designate, the permittee herein shall prepare and submit an emission inventory for the previous year, addressing the emissions from the facility and/or process(es) authorized herein, in accordance with the emission inventory submittal requirements of the Division of Air Quality. After the initial submittal, the Secretary may, based upon the type and quantity of the pollutants emitted, establish a frequency other than on an annual basis.

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4.0. Source-Specific Requirements

4.1. Limitations and Standards

4.1.1. The facility shall consist of only the pollutant-emitting equipment and processes identified under Section 1.0 of this permit. In accordance with the information filed under Permit Application R13-3714, the equipment shall be installed, maintained and operated so as to minimize any fugitive escape of pollutants and the equipment/processes shall use the specified air pollution control devices.

4.1.2. **Maximum Horsepower.** The maximum horsepower of each engine (1S – 117S) shall be 28,194 hp.

4.1.3. **Operation Modes.** The engines (1S – 117S) have the ability to operate in the following operational modes. Each operation mode shall abide by the descriptions included in Permit Application R13-3714.

Operation Mode
Normal
Compensation
Emergency
Startup (Speed Up, Fuel Switch, Generator Switched On, Load Up Cold Control)
Shutdown (Ramp Down, Min Load, Spin Out)

4.1.4. The maximum hourly emissions during each operating mode shall not exceed the following for each engine (1S – 117S):

a. Normal

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	0.14
Carbon Monoxide	0.34
Volatile Organic Compounds	0.23
Particulate Matter-10/2.5[1]	0.34
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.004

[1] Includes both filterable and condensable particulate matter.

b. Compensation

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	0.46
Carbon Monoxide	1.41
Volatile Organic Compounds	0.27
Particulate Matter-10/2.5[1]	0.53
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.005

[1] Includes both filterable and condensable particulate matter.

c. Emergency

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	10.35
Carbon Monoxide	0.58
Volatile Organic Compounds	0.29
Particulate Matter-10/2.5[1]	1.29
Sulfur Dioxide	0.11
Total Hazardous Air Pollutants	0.005

[1] Includes both filterable and condensable particulate matter.

d. Startup – Speed Up

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	89.54
Carbon Monoxide	2.50
Volatile Organic Compounds	19.49
Particulate Matter-10/2.5[1]	0.34
Sulfur Dioxide	0.10
Total Hazardous Air Pollutants	0.32

[1] Includes both filterable and condensable particulate matter.

e. Startup – Fuel Switch

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	4.81
Carbon Monoxide	8.65
Volatile Organic Compounds	13.07
Particulate Matter-10/2.5[1]	0.53
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.22

[1] Includes both filterable and condensable particulate matter.

g. Startup – Generator Switched On

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	8.15
Carbon Monoxide	9.25
Volatile Organic Compounds	12.48
Particulate Matter-10/2.5[1]	0.46
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.21

[1] Includes both filterable and condensable particulate matter.

h. Startup – Load Up Cold Control

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	6.94
Carbon Monoxide	7.16
Volatile Organic Compounds	9.14
Particulate Matter-10/2.5[1]	0.43
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.15

[1] Includes both filterable and condensable particulate matter.

i. Shutdown – Ramp Down

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	0.10
Carbon Monoxide	0.83
Volatile Organic Compounds	0.15
Particulate Matter-10/2.5[1]	0.32
Sulfur Dioxide	0.01
Total Hazardous Air Pollutants	0.003

[1] Includes both filterable and condensable particulate matter.

j. Shutdown – Min Load

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	2.44
Carbon Monoxide	4.62
Volatile Organic Compounds	3.75
Particulate Matter-10/2.5[1]	0.46
Sulfur Dioxide	0.07
Total Hazardous Air Pollutants	0.06

[1] Includes both filterable and condensable particulate matter.

k. Shutdown – Spin Out

Pollutant	Maximum Hourly Emissions (lb/hr)
Nitrogen Oxides	2.89
Carbon Monoxide	5.62
Volatile Organic Compounds	7.84
Particulate Matter-10/2.5[1]	0.53
Sulfur Dioxide	0.07
Total Hazardous Air Pollutants	0.13

[1] Includes both filterable and condensable particulate matter.

4.1.5. The maximum aggregate total annual emissions[1] from the engines (1S – 117S) shall not exceed the following:

Pollutant	Maximum Annual Emissions (tons/year)[1]
Nitrogen Oxides	194.30
Carbon Monoxide	205.62
Volatile Organic Compounds	116.59
Particulate Matter-10/2.5[2]	186.53
Sulfur Dioxide	9.93
Total Hazardous Air Pollutants	0.86

[1] Includes all operation modes in permit condition 4.1.4.
[2] Includes both filterable and condensable particulate matter.

Compliance with the annual emission limits shall be determined by multiplying each operational mode hourly emissions in permit condition 4.1.4 by the hours operated in each operation mode.

4.1.6. The permittee shall meet the air pollution control technology requirements for each engine (1S – 117S). The emission control systems for the engines consist of two main systems. The dry system on the high pressure side of the engine (before the turbocharger) and the wet system on the low pressure side, which is downstream of the turbocharger. The dry systems consist of an oxidation catalyst and an SCR catalyst. The catalytic reduction of CO has a reduction efficiency of over 99%. The same system oxidizes VOC emissions with a reduction efficiency of 99%. The de-NOx unit is a urea based SCR technology, and the reduction efficiency exceeds 90%. The wet system consists of four (4) stages, which reduce NOx further with 90.9% reduction efficiency and SO2 with 70% reduction efficiency. The emission abatement system (dry and wet) that will be employed on each engine shall meet the following emissions reductions when operating in the following modes:

Mode	NOx (%)	CO (%)	VOC (%)	PM (%)	SO_2 (%)
Speed Up	0	0	0	0	95.0
Fuel Changeover	0	0	0	0	99.0
Generator Switched On	0	0	0	0	99.0
Load Up Cold Control	25.0	25.0	25.0	0	99.0
Normal Operation	99.0	99.0	99.0	25.0	99.0
Compensation Mode	99.0	95.0	99.0	25.0	99.0
Ramp Down	99.0	94.0	99.0	25.0	99.0
Min Load	70.0	50.0	70.0	0	70.0
Spin Out	40.0	35.0	40.0	0	40.0
Emergency	98.0	91.0	99.0	25.0	99.0

4.1.7. During startup and shutdown operations, the permittee shall minimize emissions by:

a. Operating and maintaining the engines (1S – 117S) and associated air pollution control devices (1C – 117C) in accordance with good combustion and air pollution control practices, safe operating practices, and protection of the facility. Good combustion and air pollution control practices shall mean proper operation and maintenance of the engine control systems and air pollution control equipment in accordance with manufacturer specifications. Additionally, it shall mean such practices that promote sufficient residence time of fuel in the combustion zone, thorough mixing of air and fuel, and proper combustion temperatures.

b. Implementing operations and maintenance practices comprised of maintaining a high level of steady state operation time and minimizing (as much as practicable) the frequency of startup and shutdown events.

4.1.8. **Fuel Throughput Parameters.** The engines (1S – 117S) are capable of firing natural gas with co-firing diesel or diesel fuel only. The following maximum hourly fuel consumptions apply to the engines:

Mode	Maximum NG Hourly Throughput (scf/hr per engine)	Maximum Diesel Hourly Throughput (gal/hr per engine)[1]
Speed Up	0	143.46
Fuel Changeover	13,994	1.43
Generator Switched On	27,459	2.35
Load Up Cold Control	33,993	2.61
Normal Operation	98,924	3.91
Compensation Mode	138,112	3.91
Ramp Down	52,882	3.13
Min Load	27,459	2.35
Spin Out	13,994	1.43
Emergency	0	798.13

[1] Sulfur content of ultra-low sulfur diesel (ULSD) fuel shall be less than 15 ppm.

4.1.9. **Annual Operational Limitation.**

a. The operating hours of each engine (1S – 117S), the throughput of each type of fuel (natural gas/diesel), and operation mode (permit condition 4.1.3) will be continuously monitored and recorded. The permittee will keep records of the fuel consumption (natural gas/diesel), and operating hours (natural gas/diesel) for each engine. The 12-month rolling sum of emissions will be calculated monthly.

b. Natural gas and diesel fuel meters shall be installed on each engine (1S – 117S).

c. Operational hour meters shall be installed on each engine (1S – 117S).

4.1.10. In order to minimize NOx emissions, within 180 days of startup, the permittee shall determine the optimal injection rate of aqueous ammonia into the SCR. The permittee shall then operate the SCR at the determined optimal injection rate.

4.1.11. The permittee shall meet the following emission standards:

a. For engines (1S – 117S) installed on or after January 1, 2016, limit the emissions of NOX in the stationary CI internal combustion engine exhaust to the following:

i. 3.4 g/KW-hr (2.5 g/HP-hr) when maximum engine speed is less than 130 rpm;
ii. Reduce particulate matter (PM) emissions by 60 percent or more, or limit the emissions of PM in the stationary CI internal combustion engine exhaust to 0.15 g/KW-hr (0.11 g/HP-hr).

[40CFR§60.4204(c)]

4.1.12. The permittee must operate and maintain stationary CI ICE that achieve the emission standards as required in §§ 60.4204 and 60.4205 over the entire life of the engines (1S – 117S).
[40CFR§60.4206]

4.1.13. The permittee shall meet the following fuel requirements:

a. Beginning June 1, 2012, owners and operators of stationary CI ICE subject to this subpart with a displacement of greater than or equal to 30 liters per cylinder must use diesel fuel that meets a maximum per-gallon sulfur content of 1,000 parts per million (ppm).
[40CFR§60.4207(d)]

4.1.14. The engines (1S – 117S) shall use the air pollution control devices (1C – 117C) specified in Section 1.0 and permit condition 4.1.6 and identified in Permit Application R13-3714 at all times when in operation except during periods of startup and shutdown when operating temperatures do not allow for proper use of the air pollution control devices.

4.1.15. The maximum annual throughput of diesel fuel to the storage tanks shall not exceed the following:

Storage Tank ID	Nominal Capacity (gal)	Product Stored	Maximum Annual Throughput (gal/yr)
TK1 – TK40	170,000 (each)	Diesel Fuel	3,907,000 (all tanks) Normal Operation

4.1.16. The storage tanks (TK1 – TK40) shall be designed and operated as specified in the paragraphs (a) through (c).

a. The cover and all openings on the cover (e.g., access hatches, sampling ports, pressure relief valves and gauge wells) shall form a continuous impermeable barrier over the entire surface area of the liquid in the storage vessel.

b. Each cover opening shall be secured in a closed, sealed position (e.g., covered by a gasketed lid or cap) whenever material is in the unit on which the cover is installed except during those times when it is necessary to use an opening as follows:

(i) To add material to, or remove material from the unit (this includes openings necessary to equalize or balance the internal pressure of the unit following changes in the level of the material in the unit);

(ii) To inspect or sample the material in the unit; or

(iii) To inspect, maintain, repair, or replace equipment located inside the unit.

c. The storage tanks (TK1 – TK40) thief hatch shall be weighted and properly seated. **[45CSR§13-5.10]**

4.1.17. The permittee shall comply with all applicable provisions of 45 CSR 17 to minimize fugitive particulate matter emissions on the haul roads.

4.1.18. **Operation and Maintenance of Air Pollution Control Equipment.** The permittee shall, to the extent practicable, install, maintain, and operate all pollution control equipment listed in Section 1.0 and associated monitoring equipment in a manner consistent with safety and good air pollution control practices for minimizing emissions, or comply with any more stringent limits set forth in this permit or as set forth by any State rule, Federal regulation, or alternative control plan approved by the Secretary.
[45CSR§13-5.10]

4.1.19. The permittee shall install, maintain, and operate all above-ground piping, valves, pumps, etc. that service lines in the transport of potential sources of regulated air pollutants to minimize any fugitive escape of regulated air pollutants (leak). Any above-ground piping, valves, pumps, etc. that shows signs of excess wear that have a reasonable potential for fugitive emissions of regulated air pollutants shall be repaired or replaced.
[45CSR§13-5.10]

4.2. Monitoring Requirements

4.2.1. To determine compliance with permit conditions 4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.1.6, and 4.1.9, the permittee shall monitor the operation type (listed in permit condition 4.1.4), number of startup/shutdown events, and hours of operation in each operating mode (natural gas/diesel) on a daily basis.

4.2.2. To demonstrate compliance with permit condition 4.1.8, the permittee shall monitor fuel consumption (natural gas/diesel) on a daily basis.

4.2.3. To demonstrate compliance with permit conditions 4.1.10 and 4.1.14, the permittee shall monitor the operating times for the air pollution control devices on at least an hourly basis.

4.2.4. The permittee will install air pollution control devices on the engines (1S – 117S) to show compliance with permit condition 4.1.6.b. The air pollution control devices shall be continuously

monitored to verify proper operation. The permittee shall operate the air pollution control devices in accordance with manufacturer specifications. **[45CSR§13-5.10]**

4.2.5. To demonstrate compliance with permit condition 4.1.15, the permittee shall monitor diesel fuel unloading on a daily basis.

4.2.6. To demonstrate compliance with permit condition 4.1.17, the permittee shall conduct a visible inspection of the paved roads once each operating day to ensure no fugitive particulate matter emissions from diesel truck and employee traffic are generated. If necessary, roads will be swept and/or watered to minimize fugitive particulate matter.

4.2.7. The permittee shall, at the time of initial startup, maintain on-site and have readily available to be made available to the Director or his/her representative upon request, a copy of the all current vendor guarantees relevant to the air emissions associated with the facility. This includes information relating to the performance of both emission units and control devices.

4.2.8. The permittee shall meet all applicable requirements, including those not specified above, as given under 45 CSR 4, 45 CSR 13, 45 CSR 16, 45 CSR 17, 45 CSR 30, 45 CSR 34, 40 CFR 60, Subpart IIII, and 40 CFR 63 Subpart ZZZZ. Any final revisions made to the above rules will, where applicable, supercede those specifically cited in this permit.

4.2.9. **Record of Monitoring.** The permittee shall keep records of monitoring information that include the following:

a. The date, place as defined in this permit, and time of sampling or measurements;
b. The date(s) analyses were performed;
c. The company or entity that performed the analyses;
d. The analytical techniques or methods used;
e. The results of the analyses; and
f. The operating conditions existing at the time of sampling or measurement.

4.3. Testing Requirements

4.3.1. See Facility-Wide Testing Requirements Section 3.3.

4.3.2. The permittee shall meet the following testing requirements for the engines (1S – 117S):

a. Conduct an initial performance test to demonstrate initial compliance with the emission standards as specified in § 60.4213.

b. Establish operating parameters to be monitored continuously to ensure the stationary internal combustion engine continues to meet the emission standards. The owner or operator must petition the Administrator for approval of operating parameters to be monitored continuously. The petition must include the information described in paragraphs (d)(2)(i) through (v) of this section.

i. Identification of the specific parameters you propose to monitor continuously;

ii. A discussion of the relationship between these parameters and NOX and PM emissions, identifying how the emissions of these pollutants change with changes in these parameters, and how limitations on these parameters will serve to limit NOX and PM emissions;

iii. A discussion of how you will establish the upper and/or lower values for these parameters which will establish the limits on these parameters in the operating limitations;

iv. A discussion identifying the methods and the instruments you will use to monitor these parameters, as well as the relative accuracy and precision of these methods and instruments; and

v. A discussion identifying the frequency and methods for recalibrating the instruments you will use for monitoring these parameters.

c. For non-emergency engines with a displacement of greater than or equal to 30 liters per cylinder, conduct annual performance tests to demonstrate continuous compliance with the emission standards as specified in § 60.4213.

[40CFR§4211(d)]

4.4. Recordkeeping Requirements

4.4.1. To determine compliance with permit conditions 4.1.5, 4.1.8, and 4.1.9, the permittee shall keep records of the operating hours of each engine, the throughput of each type of fuel (natural gas/diesel), and operation type (as outlined in permit condition 4.1.4) on a daily basis. The permittee shall multiply the hourly operation type emissions in permit condition 4.1.4 by the number of hours operated in that operational mode. The permittee shall calculate the emissions monthly and on a twelve-month rolling total. A twelve-month rolling total shall mean the sum of operating hours at any given time during the previous twelve consecutive calendar months.

4.4.2. To determine compliance with permit condition 4.2.7, the permittee shall keep records of the daily road particulate matter fugitive inspections and any corrective actions taken.

4.4.3. To determine compliance with permit conditions 4.1.15 and 4.2.6, the permittee shall keep records of the diesel unloading on a daily basis. Compliance with the throughput limit shall be determined on a 12 month rolling total basis.

4.4.4. To demonstrate compliance with permit condition 4.1.19, the permittee shall keep records of the fugitive emissions components repairs and replacements.

4.4.5. The permittee shall keep the following engine (1S – 117S) records:

a. All notifications submitted to comply with this subpart and all documentation supporting any notification.

b. Maintenance conducted on the engine.

c. If the stationary CI internal combustion is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards.

d. If the stationary CI internal combustion is not a certified engine, documentation that the engine meets the emission standards.

[40CFR§4214(a)(2)]

4.5. Reporting Requirements

4.5.1. See Facility-Wide Reporting Requirements Section 3.5.

4.5.2. The permittee shall submit notifications of the date construction commences, the actual date of initial startup as required under §60.7. The notification must include the information below. Beginning on February 26, 2025, submit the notification electronically according to paragraph (g) of this section.

a. Name and address of the owner or operator;

b. The address of the affected source;

c. Engine information including make, model, engine family, serial number, model year, maximum engine power, and engine displacement;

d. Emission control equipment; and

e. Fuel used.
[40CFR§4214(a)(1)]

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CERTIFICATION OF DATA ACCURACY

I, the undersigned, hereby certify that, based on information and belief formed after reasonable inquiry, all information contained in the attached _____, representing the period beginning _____ and ending _____, and any supporting documents appended hereto, is true, accurate, and complete.

Signature[1] (please use blue ink) _____ Responsible Official or Authorized Representative _____ Date

Name & Title (please print or type) _____ Name _____ Title

Telephone No. _____ Fax No. _____

[1] This form shall be signed by a "Responsible Official." "Responsible Official" means one of the following:

a. For a corporation: The president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(i) the facilities employ more than 250 persons or have a gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), or

(ii) the delegation of authority to such representative is approved in advance by the Director;

b. For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

c. For a municipality, State, Federal, or other public entity: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of U.S. EPA); or

d. The designated representative delegated with such authority and approved in advance by the Director.

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off-grid power generation facility (Adams Fork Harless Data Center Energy Campus) located at 22 Mine Road, near Holden, Mingo County WV at latitude 37.75302 and longitude -82.11905. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3714.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.66 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 193.69 TPY; Particulate Matter less than 10 microns in diameter, 187.96 TPY; Particulate Matter less than 2.5 microns in diameter, 186.91 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304-926-0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

Williams, Jerry <jerry.williams@wv.gov>

DAQ Public Notice

1 message

Mink, Stephanie R <stephanie.r.mink@wv.gov> Wed, Jul 9, 2025 at 7:59 AM
To: Terry A Fletcher <terry.a.fletcher@wv.gov>
Cc: Jerry Williams <jerry.williams@wv.gov>, DEP Legal Notices <DEPLegalNotices@wv.gov>

Please find attached the Public Notice for Draft Permit R13-3714 for TransGas Development Systems, LLC's Adams Fork Harless Data Center Energy Campus located in Mingo County.

The public notice will be published in *The Williamson Daily News* on Wednesday, July 9, 2025 and the thirty day comment period will end on Friday, August 8, 2025.

A PDF is attached for DEP Legal Notices to be posted through Friday, August 8, 2025.

--

Stephanie Mink

Environmental Resources Associate

West Virginia Department of Environmental Protection

Division of Air Quality, Title V & NSR Permitting

601 57th Street SE

Charleston, WV 25304

Phone: 304-926-0499 x41281

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off-grid power generation facility (Adams Fork Harless Data Center Energy Campus) located at 22 Mine Road, near Holden, Mingo County WV at latitude 37.75302 and longitude -82.11905. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3714.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.66 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 193.69 TPY; Particulate Matter less than 10 microns in diameter, 187.96 TPY; Particulate Matter less than 2.5 microns in diameter, 186.91 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304-926-0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

R13-3714_AirQualityPermitNotice.pdf
71K

Ad Number 298262

Received
July 21, 2025
WV DEP/Div of Air Quality

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

I Elisha Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper published in the county of Mingo, West Virginia, hereby certify that the annexed publication was inserted in said newspaper _____

The cost of publishing said annexed advertisement as aforesaid was $ 64.50

Commencing On: 07/09/2025

Ending On: 07/09/2025

Given under my hand this day 07/09/2025

Sworn to and subscribed before me 07/09/2025
at Williamson, Mingo County, West Virginia

Cheylan Lewis

Notary Public of, in and for Mingo County, West Virginia

OFFICIAL SEAL - NOTARY PUBLIC
STATE OF WEST VIRGINIA
CHEYLAN LEWIS
6266 Aracoma Road
Huntington WV, 25705
My Commission Expires April 8, 2030

MY COMMISSION EXPIRES: 4-8-30

Elisha Queen

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, TransGas Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an offgrid power generation facility (Adams Fork Harless Data Center Energy Campus) located at 22 Mine Road, near Holden, Mingo County WV at latitude 37.75302 and longitude 82.11905. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3714.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.66 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 193.69 TPY; Particulate Matter less than 10 microns in diameter, 187.96 TPY; Particulate Matter less than 2.5 microns in diameter, 186.91 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted

Acc.Id:	69164	
Name:	AIR QUALITY–WV DEP	
Phone:	304-926-0499	
Address:	601 57TH ST SE	
City:	CHARLESTON	
State:	WV	
Postcode:	25304	
Class:	9010	Legal Notices
Edition:	WDN	
Start:	07/09/2025	
Stop:	07/09/2025	
Issues:	1	
Units	130.0	
Order ID:	HC 298262	
TFN:	C	
TFN cycle:		
Rep:	EQUEEN	
Status:	CF	
Source:	EM	
Paytype:	BI	
Rate:	LG	
Cost EXC GST:	64.50	
Tax:	0.00	
Total Charge:	64.50	

Printed on: 06/30/2025 10:40:46
Printed by: EQUEEN

at the address listed below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304 926 0499, ext. 41214
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx

LH-298262
07-09;2025

CLASSIFIEDS

ANNOUNCEMENTS

Special Notices

Sunset Sing at Liberty Shrine Church of God Sat 7/12 @ 7 PM

Fundraiser. The Lin Lee Family, The Kings Sisters and John Meza as a Bluegrass Gospel Group

Refreshments after. The cost for gospel sing or refreshments. Everyone welcome!

STUFF

Cemetery Lots

FOR SALE
4 Cemetery Plots
Mountain View Memory Gardens, Maher, WV
Garden of Sermon on the Mount Sect.
$1,750.00 ea. + deed transfer
(704) 256-2838

Legal Notices

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, Translogic Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off-grid power generation facility (Adams Fork Data Center Energy Campus) located at 2902 Twisted Gun Road, Wharncliffe, Mingo County WV at latitude 37.59372 and longitude -81.86491. It is the DAQ's evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3715.

The following potential emissions will be authorized by the permit action: Volatile Organic Compounds, 117.88 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 0.93 TPY; Total Particulate Matter, 215.17 TPY; Particulate Matter less than 10 microns in diameter, 193.26 TPY; Particulate Matter less than 2.5 microns in diameter, 187.96 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304/926-0499, ext. 41213
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/R13-Permit-Applications.aspx

LH-298264
07-09-2025

In the Circuit Court of Kanawha County, West Virginia

Case No.
CC-20-2025-C-212

Judge
Richard D. Lindsay

Lewis Glasser PLLC,
Plaintiff,

v.

Sidney Gilman, Jr.,
Defendant

ORDER OF PUBLICATION

The object of the above-entitled action is a breach of contract brought by Plaintiff Lewis Glasser PLLC against Defendant, Sidney Gilman, Jr.

It appearing by an affidavit filed in this action by Hannah K.W. Pelmas, attorney for Plaintiff, that due diligence has been used to ascertain the whereabouts of Sidney Gilman, Jr., without effect, it is ordered that Defendant Sidney Gilman Jr. do serve upon Hannah K.W. Pelmas and the law firm of Lewis Glasser PLLC at 300 Summers Street, Suite 700, Charleston, West Virginia 25301 an answer to the Complaint or other defense to the Complaint filed in this action on or before July 1, 2025, otherwise, judgment by default will be taken against Defendant. Sidney Gilman, Jr. at any time thereafter. A copy of said Petition can be obtained from the undersigned Clerk at her office.

(s/ Richard D. Lindsay
Circuit Court Judge
35th Judicial Circuit

LH-298253
07-02,09,16-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:
Betty Lee Newsome

LH-298284
07-09,16,2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:
Bettie James

LH-297152
07-02,09-2025

AIR QUALITY PERMIT NOTICE

Notice of Intent to Approve

On March 26, 2025, Translogic Development Systems, LLC applied to the WV Department of Environmental Protection, Division of Air Quality (DAQ) for a permit to construct an off-grid power generation facility (Adams Fork Data Center Energy Campus) located at 22 Mine Road, near Nolan, Mingo County WV at latitude 37.75302 and longitude -82.11905. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the proposed facility. The DAQ is providing notice to the public of its preliminary determination to issue the permit as R13-3714.

The following potential emissions will be authorized by this permit action: Volatile Organic Compounds, 117.88 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 0.93 TPY; Total Particulate Matter, 193.89 TPY; Particulate Matter less than 10 microns in diameter, 187.96 TPY; Particulate Matter less than 2.5 microns in diameter, 186.91 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

Written comments or requests for a public meeting must be received by the DAQ before 5:00 p.m. on Friday, August 8, 2025. A public meeting may be held if the Director of the DAQ determines that significant public interest has been expressed, in writing, or when the Director deems it appropriate.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed construction will meet all state and federal air quality requirements. The purpose of the public review process is to accept public comments on air quality issues relevant to this determination. Only written comments received at the address noted below within the specified time frame, or comments presented orally at a scheduled public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

Jerry Williams, P.E.
WV Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Telephone: 304/926-0499, ext. 41216
Email: jerry.williams@wv.gov

Additional information, including copies of the draft permit, application and all other supporting materials relevant to the permit decision may be obtained by contacting the engineer listed above. The draft permit and engineering evaluation can be downloaded at:

https://dep.wv.gov/daq/permitting/Pages/R13-Permit-Applications.aspx

LH-298262
07-09-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:
Carlos Dana Ellis

LH-298258
07-02,09-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred.

Name:
Norman Paul Perry

LH-301451
07-09,16,2025

We shall not be liable for any loss or expense that results from the publication or omission of an advertisement.

Legal Notices

Advertisement

Notice is hereby given that Coal-Mac, LLC, 1345 22 Mine Road, Holden, WV 25625 has submitted an application to the Division of Environmental Protection (DEP) at 1101 George Kostas Drive, Logan, WV 25601 for an Article 3 permit for the surface disturbance of approximately 536.4 acres, in order to Area/Contour Mine with Auger and/or Highwall Mine and Construct a Haul Road, and disturb within 100 feet of Lot Nos. 53 Right of Way and change the post mining land use from Forestland to Fish and Wildlife Habitat, in the Middle Tributaries, Middle Tributaries Lower, Five Block, Stockton, Cuddlery, Rolen Fourteen, Buffalo Creek and all rights and ridge seams, thereof, seam of coal. The proposed operation is discharging into Unnamed Tributaries of/and Hell Creek, Unnamed Tributaries of/and Pigeonroost Creek, Unnamed Tributaries of/and Hell Creek, Unnamed Tributaries of/and Pigeonroost Creek, Unnamed Tributary of Stonepost Branch, all of Pigeon Creek, Unnamed Tributaries of Pigeon Creek, Miller Creek, and Buffalo Creek, all of Tug Fork River of the Big Sandy River and is located 1.4 miles southwest of Delbarton in Lee, Hardee and Tug River Districts of Mingo County at Longitude 81-57-30 and Latitude 37-42-30. (Coordinates from USGS Topographic Map)

Surface of the area associated herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface	Elberta Marcum Goodwin, et al. (Life), P.O. Box 418, Lenore, WV 25676-418
Mineral	Wanda Lee (Marcum) Bowen et al (Life), P.O. Box 23, P.O. Box 23, Chattaroy, WV 25667
Surface	Rockhaven Surface Interests, LLC, 800 Princeton Ave, Bluefield, WV 24701
Surface and Mineral	Mathew J. Dean, et ux, Rt. 1 Box 207, Williamson, WV 25661
Surface and Mineral	Colliga Development Company, 8258 Germantown Ave, Philadelphia, WV 19118-1401
Surface	Mingo County Redevelopment Authority, P.O. Box 286, 1607 East Fourth Avenue, Williamson, WV 25661
Surface and Mineral	Savannah 608, LLC, 114 Morningside Street, Charleston, WV 25302
Surface	Mary Maynard, (Life) 4th Street, Huntington, WV 25705
Surface	Everett Hatmaker et ux, Box 377, Varney, WV 25696
Surface	Coal-Mac, LLC, 1345 22 Mine Road, Holden, WV 25625
Surface	WV Division of Highways (Right of Way), 801 Madison Avenue, Huntington, WV 25701-1888
Surface	Elberta Marcum Goodwin, et al. (Life), P.O. Box 418, Lenore, WV 25676-418
Mineral	Wanda Lee (Marcum) Bowen et al (Life), P.O. Box 23, P.O. Box 23, Chattaroy, WV 25667
Surface and Mineral	Mathew J. Dean, et ux, Rt. 1 Box 207, Williamson, WV 25661
Surface	Rockhaven Surface Interests, LLC, 800 Princeton Ave, Bluefield, WV 24701
Surface	Bessie Lane, 536 Meltzear Drive, Delbarton, WV 25670
Surface	Raymond Mark Sizemore, et ux, P.O. Box 710, Delbarton, WV 25670

Written comments and/or requests for an informal conference of the surface mining application shall identify the applicant and application number and will be received by the Permit Supervisor at the DEP address above until 8/08/2025, or thirty (30) days from date of final publication. A copy of the application will be available for review until 8/08/2025, or thirty (30) days from date of final publication in the DEP Regional Office located at the address above and is available at:

http://apps.dep.wv.gov/WebApps/_dep/Search/Information/eSermitting/ApplicationSearchPage.cfm

The above link can be accessed from a computer at all West Virginia public libraries.

Comments on or requests for Public Hearing regarding conducting mining activities within 100' of US Route 52 (right of Way) shall be submitted, and must state the nature of the issues proposed to be raised in the hearing.

DEP Telephone No. (304) 792-7250 Permit No. S5005-23

Location Map
General Highway Map
Article 3 No: S-5005-23 / WVNPDES No: WV1031295
Majestic Quad
Stafford District, Mingo County
Scale: 1" = 1 Mile
Receiving Streams: Unnamed Tributaries of/and Talley Hollow of Alum Creek, Unnamed Tributary of Alum Creek, a tributary of the Tug Fork River, a tributary of the Big Sandy River, a tributary of the Ohio River

Advertisement

Notice is hereby given that Magid Highwall Mining, LLC, (Ben's Creek Operation (WV LLC) 12081 Virginia Boulevard, Ashland, Kentucky 41102 has submitted an application to the Department of Environmental Protection (DEP), Division of Mining and Reclamation (DMR) located at 1101 George Kostas Drive, Logan, WV 25601 for an Article 3 permit for the surface disturbance of approximately 108.33 acres in order to Surface, Ridge, and Highwall Mine in the 2 Gas ---- Kanawha Trace ---- Kanawha Powellton ---- Kanawha Powellton ---- Upper ---- Kanawha Powellton A ---- Kanawha Williamson ---- Kanawha seams of coal. The proposed operation is discharging into Talley Hollow, a tributary to Alum Creek, a tributary to the Tug Fork River, a tributary to the Big Sandy River or Big Sandy River and is located 3.9 miles, Northwest of Wharncliffe in Stafford District of Mingo County, Longitude 82° 08' 11" and Latitude 37° 35' 26".

Surface of the area associated herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface and Mineral	Carbon Fork Properties, LLC, PO Box 5220, Ashland, KY 41105
Surface and Mineral	Magid Highwall Mining, LLC, 12081 Virginia Boulevard, Ashland, KY 41102

Surface of the area associated within 100 feet of the permit area herewith and the mineral associated herewith is owned by:

Surface or Mineral	Name and Address
Surface and Mineral	Carbon Fork Properties, LLC, PO Box 5220, Ashland, KY 41105
Surface and Mineral	Magid Highwall Mining, LLC, 12081 Virginia Boulevard, Ashland, KY 41102

This application was advertised in the past with Ben's Creek Operations WV, LLC listed as the applicant. Written comments and/or requests for an informal conference of the surface mining applications shall identify the applicant and application number and will be received by the Permit Supervisor at the DEP address above until 7/19/2025, or ten (10) days from date of final publication. A copy of the application will be available for review until 7/19/2025, or ten (10) days from date of final publication in the DEP Regional Office located at the address above and is available at:

http://apps.dep.wv.gov/WebApps/_dep/Search/Information/eSermitting/ApplicationSearchPage.cfm

The above link can be accessed from a computer at all West Virginia public libraries.

DEP Telephone Number 304-792-7250 Permit Number S5005-23

Williams, Jerry <jerry.williams@wv.gov>

WV Draft Permit R13-3714 for TransGas Development Systems, LLC; Adams Fork Harless Data Center Energy Campus

1 message

Whapham, Joseph <Whapham.Joseph@epa.gov> Tue, Jul 22, 2025 at 2:53 PM
To: "Williams, Jerry" <jerry.williams@wv.gov>
Cc: "Supplee, Gwendolyn" <Supplee.Gwendolyn@epa.gov>

Microsoft Teams Need help?

Join the meeting now

Meeting ID: 255 477 651 988 5

Passcode: wf2KP3zb

Dial in by phone

+1 202-991-0477,,51263874# United States, Washington

Find a local number

Phone conference ID: 512 638 74#

Join on a video conferencing device

Tenant key: sip:teams@video.epa.gov

Video ID: 112 658 879 9

More info

For organizers: Meeting options | Reset dial-in PIN

This meeting may be recorded. If the meeting is recorded, it will be announced via a banner showing "this meeting is being recorded." Participation in a recorded meeting will be deemed as consent to be recorded. Meeting recordings may be official agency records subject to appropriate policy, rules and regulations.

From: Williams, Jerry <jerry.williams@wv.gov>
Sent: Tuesday, July 22, 2025 10:06 AM
To: Whapham, Joseph <Whapham.Joseph@epa.gov>
Subject: Re: WV Draft Permit R13-3714 for TransGas Development Systems, LLC; Adams Fork Harless Data Center Energy Campus

Caution: This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Adam,

Both days work for me. How about any time between 10 am and 2 pm on either day?

Thank you,

Jerry

On Tue, Jul 22, 2025 at 9:01 AM Whapham, Joseph <Whapham.Joseph@epa.gov> wrote:

> Hi Jerry,
>
> As we talked about when going over the Fundamental Data permit, we have a few suggestions with the TransGas permits (R13-3714 & R13-3715). Do you have availability next Thursday (7/31) or Friday (8/1) for a call? My schedule is clear for both days so I can make any time work.
>
> Thank you,
>
> Adam

J. Adam Whapham
Environmental Engineer
Region 3, Air Permits Branch
US EPA Mid-Atlantic Region
Phone 215-814-2160
Email whapham.joseph@epa.gov

From: Mink, Stephanie R <stephanie.r.mink@wv.gov>
Sent: Wednesday, July 9, 2025 7:59 AM
To: Supplee, Gwendolyn <Supplee.Gwendolyn@epa.gov>; Whapham, Joseph <Whapham.Joseph@epa.gov>; Adam Victor <adam@tgds.com>; avj@adamsforkenergy.com; Patrick E. Ward <PEWard@potesta.com>
Cc: Crowder, Laura M <Laura.M.Crowder@wv.gov>; McCumbers, Carrie <Carrie.McCumbers@wv.gov>; Joseph R Kessler <joseph.r.kessler@wv.gov>; Nicole D Ernest <nicole.d.ernest@wv.gov>; Williams, Jerry <jerry.williams@wv.gov>; Johnson, Rebecca H <Rebecca.H.Johnson@wv.gov>
Subject: WV Draft Permit R13-3714 for TransGas Development Systems, LLC; Adams Fork Harless Data Center Energy Campus

Caution: This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Please find attached the Draft Permit R13-3714, Engineering Evaluation and Public Notice for TransGas Development Systems, LLC's Adams Fork Harless Data Center Energy Campus located in Mingo County.

The public notice will be published in *The Williamson Daily News* on Wednesday, July 9, 2025 and the thirty day comment period will end on Friday, August 8, 2025.

Should you have any questions or comments, please contact the permit writer, Jerry Williams, at 304-926-0499 ext. 41214 or Jerry.Williams@wv.gov.

--

Stephanie Mink

Environmental Resources Associate

West Virginia Department of Environmental Protection

Division of Air Quality, Title V & NSR Permitting

601 57th Street SE

Charleston, WV 25304

Phone: 304-926-0499 x41281

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Jerry Williams, P.E.
Engineer, Division of Air Quality

WV Department of Environmental Protection
601 57th Street SE, Charleston, WV 25304
Phone 304-414-1214
Web dep.wv.gov **Email** jerry.williams@wv.gov

invite.ics
9K

Williams, Jerry <jerry.williams@wv.gov>

Publication of Class I Legal Ad for the WV Division of Air Quality

Mink, Stephanie R <stephanie.r.mink@wv.gov> Thu, Jul 31, 2025 at 7:55 AM
To: Southern WV Legals <swvlegals@hdmediallc.com>
Cc: Jerry Williams <jerry.williams@wv.gov>, Nicole D Ernest <nicole.d.ernest@wv.gov>

Please publish the information below as a Class I legal advertisement (one time only) in the Wednesday, August 6, 2025 issue of the *The Williamson Daily News*. Please let me know that this has been received and will be published as requested. Thank you.

Send the invoice for payment and affidavit of publication to:

Stephanie Mink

Stephanie.R.Mink@wv.gov **

WV Department of Environmental Protection

DIVISION OF AIR QUALITY

601- 57th Street

Charleston, WV 25304

****To expedite payments for legal notices we are asking that all invoices and affidavits be emailed to the requestor. Any invoices which are mailed to the office are subject to delays. Thank you for your assistance.**

DEP to Hold Virtual Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits to construct an off-grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus is to be located off of 22 Mine Road, near Holden at latitude 37.75302 and longitude -82.11905. TransGas Development Systems LLC's Adams Fork Data Energy Center is to be located at 2002 Twisted Gun Road, in Wharncliffe at latitude 37.59372 and longitude -81.95491. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities.

The following potential emissions will be authorized by each permitting action: Volatile Organic Compounds, 117.93 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 215.17 TPY; Particulate Matter less than 10 microns in diameter, 192.26 TPY; Particulate Matter less than 2.5 microns in diameter, 188.03 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

The West Virginia Department of Environmental Protection's Division of Air Quality (DAQ) will hold a virtual public meeting at 6:00 p.m. on Monday, August 18, 2025 to provide information on both

facilities. DAQ staff members will be available to provide a presentation and answer questions before taking comments from the public about TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus (Draft Permit R13-3714), and TransGas Development Systems LLC's Adams Fork Data Center Energy Campus (Draft Permit R13-3715). Instructions to register for the public meeting and to provide a comment are below.

Registration for the public meeting is required by 4:00 p.m. on Monday, August 18, 2025. To register, please complete the registration form at: https://forms.gle/H4VUfdWDrpxKv9qx7. To register to ask questions and/or provide oral comments, please indicate "yes" you want to ask a question and/or provide oral comments on the record when you register. A confirmation email will be sent with your responses when you register. A separate email with information on how to join the public meeting will be sent after registration closes at 4:00 p.m. on Monday, August 18, 2025. If you do not have internet access and want to register to participate via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes. Video demonstrations and screen sharing by commenters is not permitted.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed permits will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to this determination. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

The public comment period has been extended to 5:00 p.m. on Friday, August 22, 2025. Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with "TransGas Development Comments" as the subject line, or
- Mail: WVDEP - Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permit, application, and all other supporting materials relevant to the permit decision is available at: https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx.

Received
August 6, 2025
WV DEP/Div of Air Quality

Ad Number 324554

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

I Elisha Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper published in the county of Mingo, West Virginia, hereby certify that the annexed publication was inserted in said newspaper _____

The cost of publishing said annexed advertisement as aforesaid was $ 94.50

Commencing On: 08/06/2025

Ending On: 08/06/2025

Given under my hand this day 08/06/2025

Sworn to and subscribed before me 08/06/2025
at Williamson, Mingo County, West Virginia

Notary Public of, in and for Mingo County, West Virginia

MY COMMISSION EXPIRES: 4-8-30

OFFICIAL SEAL - NOTARY PUBLIC
STATE OF WEST VIRGINIA
CHEYLAN LEWIS
6266 Aracoma Road
Huntington WV, 25705
My Commission Expires April 8, 2030

Elisha Queen

DEP to Hold Virtual Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits to construct an off grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus is to be located off of 22 Mine Road, near Holden at latitude 37.75302 and longitude 82.11905. TransGas Development Systems LLC's Adams Fork Data Energy Center is to be located at 2002 Twisted Gun Road, in Wharncliffe at latitude 37.59372 and longitude 81.95491. A preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities.

The following potential emissions will be authorized by each permitting action: Volatile Organic Compounds, 117.93 tons per year (TPY); Nitrogen Oxides, 194.30 TPY; Carbon Monoxide, 205.62 TPY; Sulfur Dioxide, 9.93 TPY; Total Particulate Matter, 215.17 TPY; Particulate Matter less than 10 microns in diameter, 192.26 TPY; Particulate Matter less than 2.5 microns in diameter, 188.03 TPY; Total Hazardous Air Pollutants, 0.87 TPY.

The West Virginia Department of Environmental Protection's Division of Air Quality (DAQ) will hold a virtual public meeting at 6:00 p.m. on Monday, August 18, 2025 to provide information on both facilities. DAQ staff members will be available to provide a presentation and answer questions before taking comments from the public about TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus (Draft Permit R13-3714), and TransGas Development Systems LLC's Adams Fork Data Center Energy Campus (Draft Permit R13-3715). Instructions

Acc.Id:	69164	
Name:	AIR QUALITY--WV DEP	
Phone:	304-926-0499	
Address:	601 57TH ST SE	
City:	CHARLESTON	
State:	WV	
Postcode:	25304	
Class:	9010	Legal Notices
Edition:	WDN	
Start:	08/06/2025	
Stop:	08/06/2025	
Issues:	1	
Units	190.0	
Order ID:	HC 324554	
TFN:	C	
TFN cycle:		
Rep:	EQUEEN	
Status:	CF	
Source:	EM	
Paytype:	BI	
Rate:	LG	
Cost EXC GST:	94.50	
Tax:	0.00	
Total Charge:	94.50	

Printed on: 07/31/2025 10:39:19
Printed by: EQUEEN

to register for the public meeting and to provide a comment are below.

Registration for the public meeting is required by 4:00 p.m. on Monday, August 18, 2025. To register, please complete the registration form at: **https://forms.gle/H4VUfdWDrpxKv9qx7**. To register to ask questions and/or provide oral comments, please indicate "yes" you want to ask a question and/or provide oral comments on the record when you register. A confirmation email will be sent with your responses when you register. A separate email with information on how to join the public meeting will be sent after registration closes at 4:00 p.m. on Monday, August 18, 2025. If you do not have internet access and want to register to participate via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes. Video demonstrations and screen sharing by commenters is not permitted.

The purpose of the DAQ's permitting process is to make a preliminary determination if the proposed permits will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to this determination. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permit. All such comments will become part of the public record.

The public comment period has been extended to 5:00 p.m. on Friday, August 22, 2025. Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with "Trans Gas Development Comments" as the subject line, or
- Mail: WVDEP Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permit, application, and all other supporting materials relevant to the permit decision is available at: **https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx.**

LH-324554
08-06;2025

CLASSIFIEDS

JOBS

Looking to Hire PREP PLANT CREW LEADER POSITIONS for Maintenance and New Construction

Top hourly wage, com pany truck, gas card, paid holidays. Call Bill at 304-412-4681.

Legal Notices

GEP to Hold Virtual Public Meeting and Extend Public Comment Period

On March 25, 2025, Transitus Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits to construct an integral power generation facility at two distinct locations in Mingo County. Transitus Development Systems, LLC's Adams Fork Hardlass Data Center Energy Campus (Draft Permit R13-3715) and Trans Gas Development Systems LLC's Adams Fork Data Center Energy Campus (Draft Permit R13-3715). Instructions to register for the public meeting and to provide a comment are below.

Registration for the public meeting is required by 4:00 p.m. on Monday, August 18, 2025. To register, please confirm the registration form at: https://forms.gle/M4VMMPCzpqh1Wkgp7. To register by phone, questions and/or provide oral comments, please indicate "yes" you want to use a question and/or provide oral comments on the record when you register. A confirmation email will be sent with your response when you register. A separate email with information on how to join the public meeting will be sent after registration closes at 4:00 p.m. on Monday, August 18, 2025. If you do not have internet access and want to register by phone/phone, please contact Nicole Ernest at (304) 926-0475 x41256. Oral comments are limited to five (5) minutes. Video demonstrations and screen sharing by commenters is not permitted.

The purpose of the DAQ's permitting projects is to make a preliminary determination if the proposed permits will meet all State and federal requirements. The permits will meet all State and federal requirements. The permits will be written to limit Volatile Organic Compounds, 117.93 tons per year (TPY), Nitrogen Oxides, 194.30 TPY, Carbon Monoxide, 305.62 TPY, Sulfur Dioxide, 2.69 TPY, Total Particulate Matter, 215.17 TPY, Particulate Matter less than 10 microns in diameter, 192.26 TPY, Particulate Matter less than 2.5 microns in diameter, 188.05 TPY, Total Hazardous Air Pollutants, 6.87 TPY.

The West Virginia Department of Environmental Protection's Division of Air Quality (DAQ) will hold a virtual public meeting at 6:00 p.m. on Monday, August 18, 2025 to provide information on both facilities. DAQ staff members will be available to provide a presentation and answer questions before taking comments from the public about Transitus Development Systems LLC's Adams Fork Hardlass Data Center Energy Campus (Draft Permit R13-3715), Instructions to register for the public meeting and to provide a comment are below.

Registration for the public meeting is required by 4:00 p.m. on Monday, August 18, 2025. To register, please confirm the registration form at: https://forms.gle/M4VMMPCzpqh1Wkgp7. To register by phone, questions and/or provide oral comments, please indicate "yes" you want to use a question and/or provide oral comments on the record when you register. A confirmation email will be sent with your response when you register. A separate email with information on how to join the public meeting will be sent after registration closes at 4:00 p.m. on Monday, August 18, 2025. If you do not have internet access and want to register by phone/phone, please contact Nicole Ernest at (304) 926-0475 x41256. Oral comments are limited to five (5) minutes. Video demonstrations and screen sharing by commenters is not permitted.

The purpose of the DAQ's permitting projects is to make a preliminary determination if the proposed permits will meet all State and federal requirements. The permits will meet all State and federal requirements. The permits will be written to limit Volatile Organic Compounds, 117.93 tons per year (TPY), Nitrogen Oxides, 194.30 TPY, Carbon Monoxide, 305.62 TPY, Sulfur Dioxide, 2.69 TPY, Total Particulate Matter, 215.17 TPY, Particulate Matter less than 10 microns in diameter, 192.26 TPY, Particulate Matter less than 2.5 microns in diameter, 188.05 TPY, Total Hazardous Air Pollutants, 6.87 TPY.

The West Virginia Department of Environmental Protection's Division of Air Quality (DAQ) will hold a virtual public meeting at 6:00 p.m. on Monday, August 18, 2025 to provide information on both facilities. DAQ staff members will be available to provide a presentation and answer questions before taking comments from the public about Transitus Development Systems LLC's Adams Fork Hardlass Data Center Energy Campus (Draft Permit R13-3715).

Williams, Jerry <jerry.williams@wv.gov>

Request for a copy of received comments on Applications/Draft Permits for R13-3714 and R13-3715

2 messages

Patrick E. Ward <PEWard@potesta.com> Mon, Aug 11, 2025 at 3:47 PM
To: "Williams, Jerry" <jerry.williams@wv.gov>
Cc: "Rhonda L. Henson" <rlhenson@potesta.com>

Please send us a copy of all the comments that have been submitted regarding the two air permit applications (R13-3714 and R13-3715).

Let me know if you need anything other than this email to provide the requested documents.

Regards,

Patrick Ward

Potesta & Associates, Inc.

7012 MacCorkle Avenue, S.E.

Charleston, West Virginia 25304

Ph: (304) 342-1400

Direct: (304) 414-4751

Fax: (304) 343-9031

This electronic communication and its attachments contain confidential information. The recommendations and/or design data included herein are provided as a matter of convenience and should not be used for final design or ultimate decision making. Rely only on the final hardcopy materials bearing the consultant's original signature and seal. If you have received this information in error, please notify the sender immediately.

From: Williams, Jerry <jerry.williams@wv.gov>
Sent: Tuesday, July 22, 2025 10:18 AM
To: Patrick E. Ward <PEWard@potesta.com>
Subject: Fwd: Public Meeting Request - Adams Fork Data Center Permits

This is a sample of the public meeting requests that we have received.

---------- Forwarded message ---------
From: **Robin Blakeman** <rbrobinjh@everyactioncustom.com>
Date: Wed, Jul 16, 2025 at 7:56 AM

Subject: Public Meeting Request - Adams Fork Data Center Permits
To: <jerry.williams@wv.gov>

Dear Division of Air Quality Jerry Williams,

I urge you to host two public hearings on the Adams Fork Harless Data Center Energy Campus and Adams Fork Data Center Energy Campus permits. These proposals are unique, especially for this area, and are part of a broad vision. Therefore, I request that you hold one meeting in the City of Logan and another in the Town of Gilbert. Each meeting should cover both permits.

My main concern is that NO additional fees or costs should be passed on to existing rate payers - residential or business - because of this proposed facility. Rate payers in WV are already heavily burdened with utility costs; many residential customers are being forced to choose between paying their electric bill or paying for other necessities - like food and medicine.

This should be a priority because the impacts of these permits span from Whitman Creek to Ben Creek. We need an opportunity to learn more from WVDEP, speak with the developer, and voice our concerns regarding these permits.

Sincerely,
Robin Blakeman
32 Nedra Dr Barboursville, WV 25504-1023
rbrobinjh@gmail.com

--

Jerry Williams, P.E.
Engineer, Division of Air Quality

WV Department of Environmental Protection
601 57th Street SE, Charleston, WV 25304
Phone 304-414-1214
Web dep.wv.gov **Email** jerry.williams@wv.gov

Williams, Jerry <jerry.williams@wv.gov> Tue, Aug 12, 2025 at 10:37 AM
To: "Patrick E. Ward" <PEWard@potesta.com>
Cc: "Rhonda L. Henson" <rlhenson@potesta.com>

Patrick,

Thank you for your email. Could you please submit this request through the DEP FOIA process? The link is below:

https://dep.wv.gov/pio/Pages/FOIA.aspx

Please let me know if you have any questions.

Thank you,
Jerry
[Quoted text hidden]

RECEIVED
SEP 08 2025
WV DEP / DIV OF AIR QUALITY

MINGO MESSENGER

PO BOX 802
PIKEVILLE, KY 41502
606-437-4054

ADVERTISING INVOICE

West Virginia Dept. of Environmental Protection
DIVISION OF AIR QUALITY
601 – 57th Street
Charleston, WV 25304
ATTN: Stephanie Mink

BILLING DATED: 8/27/2025
ACCOUNT NO. #13064

DATE	Description	RATE	UNITS	TOTAL
9/5	Public Meeting Air Quality	6.00	29	$174.00

AMOUNT DUE: $174.00

REMIT TO:
Mingo Messenger
PO Box 802
Pikeville KY 41502

Acct. Name: WVDEP – Division of Air Quality
Billed Acct No: #13064
Amount Due: $174.00
Application No: Public Meeting

Mingo
MESSENGER
YOUR SOURCE FOR ALL THINGS MINGO

NEWSPAPER AFFIDAVIT

APPLICATION NO: TransGas Development Systems LLC

I, Beth McPeek, Administrative Assistant of the **Mingo Messenger** newspaper, a newspaper in Mingo County, West Virginia, do hereby certify that from my own knowledge and a check of the files of this newspaper that the advertisement of In-person public meeting, Extend comment period for WVDEP Division of Air Quality was inserted in the **Mingo Messenger** on the following dates:

DATE 9/5	PAGE NO. 4B & 7B
DATE _____	PAGE NO. _____
DATE _____	PAGE NO. _____
DATE _____	PAGE NO. _____

SIGNATURE Beth McPeek DATE 9-8-25

Subscribed and Sworn to before me by Beth McPeek

This 8th day of September, 2025.

NOTARY PUBLIC Deborah Chambers

ID No KyNP11291 State Ky

My commission expires: July 28, 2028

Mingo MESSENGER CLASSIFI

PHONE: (800) 539-4054
MAIL: classads@mingomessenger.com
MAIL: P.O. Box 802 • Pikeville, KY 41502
AX: (606) 437-4246

Deadline is Wednesday @ 5 PM

Pre-Pay
All major credit

To Our Readers

PLEASE CHECK YOUR AD

lease read your l the first day appears in the ıper. Report ıy errors imme-ately and we ill gladly cor-ct any errors ıblished. Cred- will be issued r one (1) day ily. After the :st day the ad n be corrected r the remain-g number of ns, but credit ill not be is-ıed for days ad n incorrectly.

POLICIES

ıe Mingo Mes-nger reserves ıe right to edit, operly classify, ncel or decline ıy ad. We will ot knowingly cept advertis-g that discrim-ates on the ba-s of sex, age, ligion, race, ational origin physical dis-bility.

PUBLISHER'S NOTICE

l real estate adver-ing in this news-per is subject to Fair Housing t which makes it

To Our Readers

illegal to advertise "any preference, limitation or discrimination based on race, color, religion, sex, handicap, familial status or national origin, or an intention to make any such preference, limitation or discrimination.". Familial includes children under the age of 18 living with parents or legal custodians, pregnant women and people securing custody of children under 18. This newspaper will not knowingly accept any advertising for real estate which is in violation of the law. Our readers are hereby informed that all dwellings advertised in this newspaper are available on an equal opportunity basis. To complain of discrimination, call HUD toll-free at 1-800-669-9777. The toll-free number for the hearing impaired is 1-800-927-9275.

EQUAL HOUSING OPPORTUNITY

Legals

DEP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13-3714 and R13-3715) to construct an off-grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLCs Adams Fork Harless Data Center Energy Campus is proposed to be located off of 22 Mine Road, near Holden, at latitude 37.75302 and longitude -82.11905. TransGas Development Systems LLCs Adams Fork Data Energy Center is proposed to be located at 2002 Twisted Gun Road, in Wharncliffe, at latitude 37.59372 and longitude -81.95491. On July 9, 2025,

RECEIVED
SEP 08 2025
WV DEP / DIV OF AIR QUALITY

E-FI
Mir

ORDER OF PUBLICATION
IN THE CIRCUIT COURT OF MINGO COUNTY, WEST V

State of West Virginia,
Petitioner,
AND
Ariel Nicole Carver,
Co-Petitioner,
Vs. Juvenile Case Nos.
Derrick Brewer,
Respondents,
IN THE INTEREST OF THESE MINOR CHILDRE

C.B. DOB: 08-14-2017
O.B. DOB: 03-01-2019
D.B. DOB: 08-28-2020

The object of the above entitled action is to terminate the parental and or other custodians of the above named children and to place permanent cu West Virginia Department of Human Services.

To: Derrick Brewer

It appearing that the above named Respondent, Derrick Brewer, ma Mingo County, West Virginia, and it is hereby Ordered that the said Derrick advised by this Publication to appear in the Circuit Court of Mingo County, in October 8, 2025, at 9:30 a.m., for a preliminary/adjudicatory/dispositional he result in the termination of his parental/custodial rights in and to the above men

Jim Pajarillo, Attorney at Law, whose address is P.O. Box 1082, Willia Number (304) 928-3037, has been appointed to represent the Respon be contacted at the address and telephone number listed.

Should said Respondent, Derrick Brewer, fail to appear on October and trial he is hereby notified and advised that his parental/custodial rights may

A copy of the Petition giving rise to the aforesaid court proceedir undersigned Clerk at his office.

Entered by the Clerk of said Court on this the 22nd day of August, 202

Legals

e DAQ notified e public that a eliminary eval- tion has deter- ined that all ate and Federal quality re- irements will met by the two cilities and ade available a aft permit and gineering eval- tion for each cility. A virtual blic meeting to scuss these per- itting actions as held by the AQ on August , 2025. ow, upon re- uest, the DAQ ll hold an addi- onal in-person blic meeting to ovide informa- on, answer estions, and ac- pt oral com- ents for the cord for both rmitting ac- ons. The meet- g will be held at e Larry Joe arless Commu- ty Center, 202 rry Joe Harless ive, Gilbert, V 25621, on ursday, ptember 18, 25, at 4:30 p.m. ors will open 4:00 p.m. to gister atten- es. you plan to at- nd the in-per- n public meet- g, to save time d ensure all rticipants in tendance are gistered, please l out the pre- gistration form <https://forms. e/16EakUxukcv kMY9> by 5:00

Legals

p.m. on Wednesday, September 17, 2025. While pre-registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register to ask questions and/or provide oral comments, please indicate yes that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five The purpose of the DAQs permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to these determinations. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the pub-

Legals

lic meeting, will be considered prior to final action on the permits. All such comments will become part of the public record. The public comment period has been extended to 5:00 p.m. on Friday, September 19, 2025. Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with "TransGas Development Comments" as the subject line, or
- Mail: WVDEP - Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permits, applications, and all other supporting materials relevant to the permit decisions, are available at: https://dep.wv.gov/daq/permitting /Pages /NSK-Pemit-Applications.aspx.

Real Estate for Rent

FOR RENT: Commercial and Residential Property in Williamson, WV. Call 304-235-5395 or 304-687-0410.

PUBLIC NOTICE • LEGAL NOTICE

West Virginia State Auditor's Office
County Collections Division 1900 Kanawha Boulevard East
Building 1, Room W-114
Charleston, West Virginia 25305

(2024-C-0000141-MINGO COUNTY-WVTB LLC)
The Mingo Messenger
PO Box 802
Pikeville KY 41502

To: TODD JENKINS, KARRIE JENKINS, TODD JENKINS, KARRIE JENKINS, TODD JENKINS, KARRIE JENKINS, OCCUPANT, IRS, ATTN: ADVISORY CONSOLIDATED RECEIPTS, WV STATE TAX DEPARTMENT, or heirs at law, devisees, creditors, representatives, successors, assigns, all known heirs, guardians, conservators, fiduciaries, administrators, lienholders, co-owners, other parties having an undivided interest in the delinquent property, and other parties that may have any interest in the subject property.

DISTRICT LEE MAP 366 PARCEL 0023 0000 0000

You will take notice that WVTB LLC, the purchaser of the following real estate, Cert. No. 2024-C-000141, located in LEE District, .77 FEE PIGEON CR which was returned delinquent or nonentered in the name of JENKINS TODD ET UX, and was sold by the deputy commissioner of delinquent and nonentered lands of MINGO County at the sale for the delinquent taxes on June 17, 2025, WVTB LLC requests that you be notified that a deed for such real estate will be made on or after February 1, 2026, as provided by law, unless before that day you redeem such real estate. The amount needed to redeem on or before January 31, 2026, will be as follows:

- Amount equal to the taxes and charges due on the date of the certification, with interest, for tax year ticket number 2023 - 8623 ... $930.82
- Back tax tickets, with interest, and charges due on the date of certification for ticket number ... $0.00
- Subsequent of taxes paid on the property, with interest to for tax year 2024 - 8611 ... $824.69
- Additional taxes with interest ... $0.00
- Auditor's Certification, Publication, and Redemption fee plus interest ... $210.20
- Amount paid for Title Examination, notice to redeem, publication, personal service, Secretary of State with interest ... $904.74
- Additional Statutory Fees with Interest ... $0.00
- Total Amount Due and Payable to WV State Auditor - cashier check, money order, certified or personal check ... $2,870.45

You may redeem at any time before January 31, 2026, by paying the above total less any unearned interest.

If the above real estate is your primary residence, you may petition the Auditor to redeem the real estate in not more than three incremental payments that equal the total amount required to redeem the real estate prior to the issuance of the deed described above.

Given under my hand August 13, 2025.

Christal G. Perry
Christal G. Perry
Deputy Commissioner of Delinquent and Nonentered Lands of MINGO County, State of West Virginia

Please Return this letter and payment to the West Virginia State Auditor's Office, County Collections Division, 1900 Kanawha Boulevard East, Building 1, Room W-114 Charleston, West Virginia, 25305. Questions please call 1-888-509-6568

PUBLIC NO

West Virginia State Auditor
County Collections Division
Building 1, Room W-114
Charleston, West Virginia 2

(2024-C-0000204-MINGO
The Mingo Messenger
PO Box 802
Pikeville KY 41502

To: IRS, ATTN: ADVISOR DEPARTMENT, EMMA MOU or heirs at law, devisees, cr known heirs, guardians, co ers, co-owners, other parti quent property, and other property.

DISTRICT MAGNOLIA MAP

You will take notice that estate, Cert. No. 2024-C-0 (2 TRS) TUG RIVER which name of MOUNTS EMMA, linquent and nonentered quent taxes on June 17, 2 a deed for such real estate provided by law, unless be amount needed to redeem lows:

- Amount equal to the tax certification, with interest $183.48
- Back tax tickets, with inte certification for ticket nun
- Subsequent of taxes pai 2024 - 12131 ... $135.7
- Additional taxes with int
- Auditor's Certification, P $210.20
- Amount paid for Title Exa personal service, Secretar
- Additional Statutory Fee
- Total Amount Due and P money order, certified or

You may redeem at any tim above total less any unearn

If the above real estate is y Auditor to redeem the real payments that equal the to prior to the issuance of the

Given under my hand Aug

Christal G. Perry
Christal G. Perry
Deputy Commissioner of D County, State of West Virgi

Please Return West Virg Coun 1900 Kanawha Bou Charlest Questions

Ad Number 340359

RECEIVED
SEP 10 2025
WV DEP / DIV OF AIR QUALITY

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Logan, TO-WIT

I Elisha Queen, Classified Advertising

Representative of The Logan Banner, a newspaper published in the county of Logan, West Virginia, hereby

certify that the annexed publication was inserted in said newspaper _____

_____

The cost of publishing said annexed advertisement

as aforesaid was $ 86.50

Commencing On: 09/03/2025

Ending On: 09/03/2025

Given under my hand this day 09/03/2025

Sworn to and subscribed before me 09/03/2025
at Logan, Logan County, West Virginia

Lee Ann Welch

Notary Public of, in and for Logan County, West Virginia

MY COMMISSION EXPIRES: Jan. 3, 2028

Elisha Queen

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
LEE ANN WELCH
190 Rotary Road, Huntington, WV 25702
My Commission Expires January 03, 2028

DEP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13 3714 and R13 3715) to construct an off grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus is proposed to be located off of 22 Mine Road, near Holden, at latitude 37.75302 and longitude 82.11905. TransGas Development Systems LLC's Adams Fork Data Energy Center is proposed to be located at 2002 Twisted Gun Road, in Wharncliffe, at latitude 37.59372 and longitude 81.95491. On July 9, 2025, the DAQ notified the public that a preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and engineering evaluation for each facility. A virtual public meeting to discuss these permitting actions was held by the DAQ on August 18, 2025.

Now, upon request, the DAQ will hold an additional in-person public meeting to provide information, answer questions, and accept oral comments for the record for both permitting actions. The meeting will be held at the Larry Joe Harless Community Center, 202 Larry Joe Harless Drive, Gilbert, WV 25621, on Thursday, September 18, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at **https://forms.gle/16Eak0xukcv12MMY9** by 5:00 p.m. on Wednesday, September 17, 2025. While pre-

Acc.Id:	69164	
Name:	AIR QUALITY--WV DEP	
Phone:	304-926-0499	
Address:	601 57TH ST SE	
City:	CHARLESTON	
State:	WV	
Postcode:	25304	
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Edition:	LOG	
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Rate:	LG	
Cost EXC GST:	86.50	
Tax:	0.00	
Total Charge:	86.50	

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registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register to ask questions and/or provide oral comments, please indicate 'yes' that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes.

The purpose of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to these determinations. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permits. All such comments will become part of the public record.

The public comment period has been extended to **5:00 p.m. on Friday, September 19, 2025**. Written comments may be submitted by:

- Email: Jerry Williams at Jerry.Williams@WV.gov with 'Trans Gas Development Comments' as the subject line, or
- Mail: WVDEP Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

Instructions for downloading additional information, including copies of the draft permits, applications, and all other supporting materials relevant to the permit decisions, are available at: **https://dep.wv.gov/daq/permitting/Pages/NSR-Permit-Applications.aspx.**

LH-340359
09-03;2025

Colleges struggle amid Trump policies

By LUENA RODRIGUEZ-FEO VILLEBA, MAKIYA SEMINERA and COLLIN BINKLEY
The Associated Press

The Carew Student Union at Case University in Cleveland, Tenn., is shown Friday, May 30, 2025.

One international student after another told the University of Central Missouri this summer that they couldn't get a visa and many struggled to even land an interview for one.

Even though demand was four as high as ever, half as many new international graduate students showed up for fall classes compared to last year.

The decline represents a hit to the bottom line for Central Missouri, a small public university that operates close to its margins with an endowment of only $65 million. International students typically account for nearly a quarter of its tuition revenue.

"We aren't able to subsidize domestic students as much when we have fewer international students who are bringing revenue to us," said Roger Best, the university's president.

Signs of a decline in international students have universities around the U.S. College with large numbers of foreign students and small endowments have little financial cushion to protect them from steep losses in tuition money.

International students represent at least 20% of enrollment at more than 100 colleges with endowments of less than $250,000 per student, according to an Associated Press analysis. Many are small Christian colleges, but the group also includes large universities such as Northeastern and Carnegie Mellon.

International student numbers face new scrutiny

Any part of a broader effort to reshape higher education, President Donald Trump has pressured colleges to limit their numbers of international students and heightened scrutiny of student visas. His administration has moved to deport foreign students involved in pro-Palestinian activism, and new student visa appointments were put on hold for weeks as it ramped up vetting of applicants' social media.

On Wednesday, the Department of Homeland Security said it will propose a rule that would put new limits on the time foreign students can stay in the U.S.

The policies have increased severe financial instability for colleges, said Justin Gest, a professor at George Mason University who studies the politics of immigration.

Foreign students are not eligible for federal financial aid and often pay full price for tuition — double or even triple the in-state rate paid by domestic students at public universities.

"To put it more dollars and cents-wise, if an international student comes in and pays $80,000 a year in tuition, that gives universities the flexibility to offer lower fees and more scholarship money to American students," Gest said.

Sudanese student barely made it to the US for class

Ahmed Ahmed, a Sudanese student, nearly didn't make it to the U.S. for his freshman year at the University of Rochester.

The Trump administration in June announced a travel ban on 12 countries, including Sudan. Diplomatic officials assured Ahmed he could still enter the U.S. because his visa was issued before the ban. But when he tried to board a flight to leave for the U.S. from Uganda, where he stayed with family during the summer, he was turned away and advised to contact an embassy about his visa.

With the help of the University of Rochester's international office, Ahmed was able to book another flight.

At Rochester, where he received a scholarship to study electrical engineering, Ahmed, 19, said he feels supported by the staff. But he also finds himself on edge and understands why other students might not want to subject themselves to the scrutiny in the U.S., particularly those who are entirely paying their own way.

"I feel like I made it through, but I'm one of the last people to make it through," he said.

Colleges are looking at ways to blunt the impact

In recent years, international students have made up about 30% of enrollment at Central Missouri, which has a total of around 12,800 students. In anticipation of the hit to international enrollment, Central Missouri cut a cost of living raise for employees. It has pushed off infrastructure improvements planned for its campus and has been looking for other ways to cut costs.

Small schools — typically classified as those with no more than 5,000 students — tend to have less financial flexibility and will be especially vulnerable, said Dick Startz, an economics professor at the University of California, Santa Barbara.

Lee University, a Christian institution with 3,500 students in Tennessee, is expecting 50 to 60 international students enrolled this fall, down from 82 the previous school year, representing a significant drop in revenue for the school, said Roy V. Chan, the university's director of graduate studies.

The school already has increased tuition by 20% over the past five years to account for a decrease in overall enrollment, he said.

"Since we're a smaller liberal arts campus, tuition can't cut our main, primary revenue," Chan said, as opposed to government funding or donations.

The strains on international enrollment only add to distress for schools already on the financial brink.

Colleges around the country have been closing as they cope with declines in domestic enrollment, a consequence of changing demographics and the effects of the pandemic. Nationwide, private colleges have been closing at a rate of about two per month, according to the Show Higher Education Executive Officers Association.

The number of high school graduates in the U.S. is expected to decline through 2041, when there will be 13% fewer compared to 2024, according to projections from the Western Interstate Commission for Higher Education.

"That means that if your [participation from] international students is even worse," Startz said.

CLASSIFIEDS

Ad Number 340361

Affidavit of Legal Publication and Posting

STATE OF WEST VIRGINIA

COUNTY OF Mingo, TO-WIT

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SEP 10 2025
WV DEP / DIV OF AIR QUALITY

I Linda Queen, Classified Advertising

Representative of the The Williamson Daily News, a newspaper

published in the county of Mingo, West Virginia, hereby

certify that the annexed publication was inserted in said

newspaper _____

The cost of publishing said annexed advertisement

as aforesaid was $ 86.50

Commencing On: 09/03/2025

Ending On: 09/03/2025

Given under my hand this day 09/03/2025

Sworn to and subscribed before me 09/03/2025
at Williamson, Mingo County, West Virginia

Lee Ann Welch

Notary Public of, in and for Mingo County, West Virginia

MY COMMISSION EXPIRES: Jan. 3, 2028

Linda Queen

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
LEE ANN WELCH
190 Rotary Road, Huntington, WV 25705
My Commission Expires January 03, 2028

DEP to Hold In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, TransGas Development Systems LLC applied to the WV Department of Environmental Protection (WVDEP), Division of Air Quality (DAQ) for two separate permits (R13-3714 and R13-3715) to construct an off-grid power generation facility at two distinct locations in Mingo County. TransGas Development Systems LLC's Adams Fork Harless Data Center Energy Campus is proposed to be located off of 22 Mine Road, near Holden, at latitude 37.75302 and longitude 82.11905. TransGas Development Systems LLC's Adams Fork Data Energy Center is proposed to be located at 2002 Twisted Gun Road, in Whamcliffe, at latitude 37.59372 and longitude 81.95491. On July 9, 2025, the DAQ notified the public that a preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and engineering evaluation for each facility. A virtual public meeting to discuss these permitting actions was held by the DAQ on August 18, 2025.

Now, upon request, the DAQ will hold an additional in-person public meeting to provide information, answer questions, and accept oral comments for the record for both permitting actions. The meeting will be held at the Larry Joe Harless Community Center, 202 Larry Joe Harless Drive, Gilbert, WV 25621, on Thursday, September 18, 2025, at 4:30 p.m. Doors will open at 4:00 p.m. to register attendees.

If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at **https://forms.gle/16EakUxukcv12kMY9** by 5:00 p.m. on Wednesday, September 17, 2025. While pre-

Acc.Id:	69164
Name:	AIR QUALITY–WV DEP
Phone:	304-926-0499
Address:	601 57TH ST SE
City:	CHARLESTON
State:	WV
Postcode:	25304
Class:	9010 Legal Notices
Edition:	WDN
Start:	09/03/2025
Stop:	09/03/2025
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Units	174.0
Order ID:	HC 340361
TFN:	C
TFN cycle:	
Rep:	EQUEEN
Status:	CF
Source:	EM
Paytype:	BI
Rate:	LG
Cost EXC GST:	86.50
Tax:	0.00
Total Charge:	86.50

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WV DEP / DIV OF AIR QUALITY

2025. While pre registration is not required, it is encouraged to save time and ensure all participants in attendance are registered. To register to ask questions and/or provide oral comments, please indicate "yes" that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ernest at (304) 926-0499 x41256. Oral comments are limited to five (5) minutes.

The purpose of the DAQ's permitting process is to determine if the proposed facilities will meet all state and federal requirements. The purpose of the public review process is to provide information and accept public comments on air quality issues relevant to these determinations. Only written comments received at the addresses noted below within the specified time frame, or comments presented orally at the public meeting, will be considered prior to final action on the permits. All such comments will become part of the public record.

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- Email: Jerry Williams at Jerry.Williams@WV.gov with "Trans Gas Development Comments" as the subject line, or

- Mail: WVDEP Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304.

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LH-340361
09-03;2025

SUBSCRIBE NOW

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Terry Joan Hohensee

LH-3327692
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Hilland Dale

LH-3327565
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Myrtle Thursa Lester

LH-3325648
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Nellunia Nell

LH-3327276
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Mayte Thursa Lester

LH-3325558
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Ricky Howard Spaulding

LH-3326801
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Ruth Jessene Hinkle

LH-3313239
08-27,09-03-2025

NOTICE

Notice is hereby given that settlement of the estate of the following named decedents will proceed without reference to a fiduciary commissioner unless within 60 days from the first publication of the notice such reference is requested by a party of interest or unpaid claims or reason to be referred

Name:
Hackey Doyle
aka Mayo T

LH-3058310
08-27,09-03-2025

ORDER OF PUBLICATION

IN THE FAMILY COURT OF MINGO COUNTY, WEST VIRGINIA

CIVIL ACTION No. 25D-93

IN RE THE MARRIAGE OF:

Jose Luis Gonzalez
PETITIONER,

AND

Mark A. Gonzalez
RESPONDENT

THE OBJECT OF THIS SUIT IS TO OBTAIN A DIVORCE

TO THE ABOVE NAMED PETITIONER/RESPONDENT:

It appearing by affidavit filed in this action that Mark A. Gonzalez is a nonresident of the State of West Virginia or has a nonresident address, it is hereby ordered that Mark A. Gonzalez serve upon Jose Luis Gonzalez, CIRCUIT CLERK'S OFFICE, whose address is 75 Last 2nd Avenue, Room 237, Williamson, West Virginia 25661, an Answer, including any related counterclaim or defense you may have to the above named action on or before October 1, 2025, 9:30 AM or you fail to do so, thereafter judgment, upon proper hearing, may be taken against you for the relief demanded in the Petition.

A copy of said Petition can be obtained from the undersigned Clerk's office

RUN PUBLICATION ONCE A WEEK FOR TWO CONSECUTIVE WEEKS.

Entered by the Clerk of said Mingo County

Lonnie Hunsuck
Clerk of
Mingo County

LH-3326214
08-27,09-03-2025

In the Circuit Court of Mingo County, West Virginia

Case No.
CC-30-2025-C-55

Judge Joshua Butcher

Kentucky Financial Leasing Partnership,
Plaintiff,

v.

Rocky Kennedy,
Defendant.

Order for Publication

1. In the civil action and pursuant to Plaintiff's Mar 13, 2025 Complaint, Plaintiff seeks an entry of judgment of Court for Plaintiff for all money owed to it for Defendant's default of his 60% Master under seven contracts made between Defendant's property company Emerald Coal LLC, Pawgeant, and Plaintiff and the payments made between Defendant and Plaintiff, in an amount of not less than $1,021,737.75, plus all costs and fees incurred by Plaintiff in connection with the enforcement of this matter, including attorneys fees, an award of pre-judgment and post-judgment interest, an award of all other amounts due to Plaintiff under the Contracts, Guaranty, and applicable law, and all other relief the Court deems possible and just.

2. Between July 30, 2021 and October 28, 2024, Plaintiff made periodic and deliveries seven Conditional Sale Contracts Agreements (the "Contracts") to Defendant Industrial Machinery Finders, which required Division to pay under certain amounts as such Buyers.

3. Under each of signed and transferred to Plaintiff all are rights, titles, and interests in and to the Contracts.

4. Division defaulted under the Contracts by failing and refusing to make the required payments to Plaintiff.

5. Defendant made, executed, and delivered to Plaintiff a guaranty (the "Guaranty"), pursuant to which Defendant is personally liable for the Contracts obligations under the Contracts.

6. As of the time of the Complaint, Defendant was in default of his obligations under the Contracts and the Guaranty in an amount of not less than $1,021,737.75

7. Plaintiff, despite its delights efforts, pursuant to Rule 4(e)(1)(C) of the West Virginia Rules of Civil Procedure, is unable to ascertain the present location or whereabouts of Defendant.

8. Accordingly, Plaintiff has been unable to serve Defendant through certified mail at his last known address or by hand delivery. Plaintiff through a private process server

9. A copy of the Complaint in this matter can be obtained from the undersigned Clerk's or the Office of the Mingo County Circuit Clerk, located at the Mingo County Courthouse, 78 East Second Avenue, Williamson, West Virginia 25661.

10. It appearing by affidavit filed in this action that the location or whereabouts of the Defendant is unknown, and Plaintiff has made diligent but futile efforts to serve the Complaint upon Defendant at Defendant's last known address and through the Mingo County Sheriff's Office, it is accordingly ORDERED that he be published once a week for two consecutive weeks in the Mingo County Daily News, a newspaper of general circulation published in Mingo County, West Virginia, and that after the expiration of thirty days after the last publication of this Order, Defendant be required to appear and answer the Complaint or other pleading asserting the claims set forth therein, or in default thereof, the allegations of the Complaint shall be taken as confessed and a final judgment by default may be rendered against him as may be just and proper.

The Clerk is directed to provide a copy of this Order to counsel listed below.

/s/ Joshua Butcher
Circuit Court Judge
11th Judicial Circuit

Prepared By:
/s/ James M. Davis
James Matthew Davis
WV State Bar No. 10820
JACKSON KELLY PLLC
P.O. Box 553
Charleston
West Virginia 25322
(304) 340-1000
Counsel for Plaintiff

LH-3328210
09-03,10-2025

REP to read
In-Person Public Meeting and Extend Public Comment Period

On March 26, 2025, Tom Gas Development Systems LLC applied to the WV Department of Environmental Protection's Division of Air Quality (DAQ) for two separate permits (R13-3716 and 915337151) to construct an oil and gas powered generator facility at two distinct locations in Logan County, Transgas Development Systems LLC's Adkins Fork Natural Gas Data Center Energy Campus is proposed to be located off of 23 Mile Road, near Holden at latitude 37.75303 and longitude -81.95491. On July 9, 2025, the DAQ notified the public that a preliminary evaluation has determined that all State and Federal air quality requirements will be met by the two facilities and made available a draft permit and engineering evaluation for each facility. A virtual public meeting to discuss these permitting actions was held by the DAQ on August 18, 2025.

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If you plan to attend the in-person public meeting, to save time and ensure all participants in attendance are registered, please fill out the pre-registration form at http://tinyurl.com/TGSDataCenterEnergyCampus by 5:00 p.m. on Wednesday, September 17, 2025. While pre-registration is not required, it is encouraged to save time and ensure all participants in attendance are registered to register to ask questions and/or provide oral comments, please ensure you have indicated that you want to ask a question and/or provide oral comments for the record when you register. A confirmation email will be sent with your responses when you register. If you do not have internet access and want to register via telephone, please contact Nicole Ennis at (304) 926-0499 ext. 1256. Oral comments are invited to the public meeting.

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• Mail WVDEP - Air Quality, Attention: Jerry Williams, 601 57th Street SE, Charleston, WV 25304

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LH-3403411
09-03,2025

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION DIVISION OF MINING AND RECLAMATION

PUBLIC NOTICE OF BLASTING OPERATIONS

LEGAL ADVERTISEMENT

Notice is hereby given that:

Defendant's Energy, LLC
109 Dog Lot Street
Gilbert, WV 25621

Phone Number:
(681) 307-7373
Solicitor Mike
Permit Number:
S-5009-22

situated on the Southern District of Mingo County, approximately 3.5 miles northeast of Gilbert, WV and is accessing existing access roads and is approved by the Department of Environmental Protection.

Blasting activities will occur Monday through Saturday from sunrise to sunset. No blasting shall be conducted on Sunday. Blasting is to commence on August 31, 2025 and continue through August 31, 2026.

Ten minutes prior to and immediately after each blast, all access to the special areas will be safeguarded from unauthorized entry. The warning signal prior to each blast shall be from an air horn, siren or other device audible to at least one (1) mile from the blast. The warning will be given three (3) minutes prior to detonation and will consist of three (3) short blasts of two (2) seconds duration with one (1) second between each blast. The all clear signal shall be one long blast from an air horn, siren or other device of twenty (20) seconds duration.

Blasting shall be conducted in such a way as to prevent adverse impacts to the public or the environment.

Blasting activities will not be conducted at times other than those announced in the blasting schedule except in the event of an emergency situation where law enforcement or other responsible emergency personnel determine that blasting must be conducted immediately.

ERRORS MUST BE REPORTED ON THE FIRST DAY OF PUBLICATION

We shall not be liable for any error or omission that occurs from the publication or omission of an advertisement

ALL THINGS BASEMENTY

WE FIX THIS ...AND THIS

...AND THIS ...AND THIS

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$250 Off Any Crawl Space Repair

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