City of Follansbee Contact Info 2/27/2025

Wednesday, April 9, 2025 1:42 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

RE: Availability for a call?

1 message

Farley R. Wood, P.E. <fwood@empirede.com> Thu, Feb 27, 2025 at 11:08 AM
To: "Andrews, Edward S" <edward.s.andrews@wv.gov>

Ed,

Thanks for the email.

I will get working on that today.

The new City Manager for Follansbee is Christine (Chris) Stover. The number at the city building is 304-527-1330.

EMPIRE Diversified Energy

Farley R. Wood, P.E.
Vice President of Engineering

Main Office: (304) 935-5851
Fax: 304-914-4625
Mobile: (304) 650-2023
Work: 304 609 3854

From: Andrews, Edward S <edward.s.andrews@wv.gov>
Sent: Wednesday, February 26, 2025 1:44 PM
To: Farley R. Wood, P.E. <fwood@empirede.com>
Subject: Fwd: Availability for a call?

Farley,

Here is that marked up version of the application.

Also, if it is not too much trouble, could you forward me the contact information on the new city manager for Follansbee.

Thanks,

Ed

304-414-1244

---------- Forwarded message ---------
From: **Andrews, Edward S** <edward.s.andrews@wv.gov>
Date: Wed, Feb 5, 2025 at 9:11 AM
Subject: Availability for a call?
To: Kathy Beckett <Kathy.beckett@steptoe-johnson.com>

Kathy,

Thank-you very much for making yesterday's meeting possible.

I have looked over the application and identified a few areas that might need to be addressed based on our discussion yesterday.

If possible I would like to talk to you about the Empire's NHSM determination. I am available anytime upto 2:30 PM today; anytime on Thursday except from 10 to 11; and all day on Friday.

Thanks,

Ed

--

Edward Andrews, P.E.

Engineer

WVDEP/Division of Air Quality

304-414-1244

601 57th Street, SE

Charleston, WV 25304

External Email. Please make sure you trust this sender before clicking on any links or opening attachments. Learn why this is important

Availability for a Call? 2/26/2025

Wednesday, April 9, 2025 1:34 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

Fwd: Availability for a call?

1 message

Andrews, Edward S <edward.s.andrews@wv.gov> Wed, Feb 26, 2025 at 1:43 PM
To: Farley Wood <fwood@empiredc.com>

Farley,

Here is that marked up version of the application.

Also, if it is not too much trouble, could you forward me the contact information on the new city manager for Follansbee.

Thanks,
Ed
304-414-1244
-------- Forwarded message --------
From: **Andrews, Edward S** <edward.s.andrews@wv.gov>
Date: Wed, Feb 5, 2025 at 9:11 AM
Subject: Availability for a call?
To: Kathy Beckett <Kathy.beckett@steptoe-johnson.com>

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Thanks,
Ed

--
Edward Andrews, P.E.
Engineer
WVDEP/Division of Air Quality
304-414-1244
601 57th Street, SE
Charleston, WV 25304

R13-3555 Modification_Application_EGG - Redacted_Final Rev_AfterWg_markup.pdf
23788K

R13-3555 Modificat...

NSR (45CSR13) APPLICATION FORM

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street, SE
Charleston, WV 25304
(304) 926-0475
www.dep.wv.gov/dep

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*): Empire Green Generation, LLC
2. Federal Employer ID No. (**FEIN**): 87-3587920
3. Name of facility (*if different from above*): Follansbee Operations
4. The applicant is the: ☐ OWNER ☐ OPERATOR ☒ BOTH

5A. Applicant's mailing address: 1400 Main Street, Follansbee, WV 26037
5B. Facility's present physical address: 601 Koppers Rd, Follansbee, WV 26037

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 Certification as **Attachment A**.

7. If applicant is a subsidiary corporation, please provide the name of parent corporation:

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: Own and Operate
- 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.): Plastics Recycling By Pyrolysis
10. North American Industry Classification System (**NAICS**) code for the facility: 562920

11A. DAQ Plant ID No. (for existing facilities only): 009 – 00141
11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only): R13-3555

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

Page 1 of 4

NSR/Title V Permit Revision Application Form (Rev. Nov. 1, 2020)
Revised: 12/2020

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**.

Turn off of WV-2 onto Veterans Drive (0.6 miles). Turn right onto Koppers Road (0.2 miles). Facility location will be on the right.

12.B. New site address (if applicable):	12C. Nearest city or town: Follansbee	12D. County: Brooke
12.E. UTM Northing (KM): 40.338090	12F. UTM Easting (KM): -80.600429	12G. UTM Zone: 17T

13. Briefly describe the proposed change(s) at the facility:
The facility will be recycling plastics via pyrolysis instead of medical waste as originally permitted.

14A. Provide the date of anticipated installation or change: 1/2/2024
- 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: 1/2/2024

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:
Hours Per Day 24 Days Per Week 7 Weeks Per Year52

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
☐ Grey Iron and Steel Foundry
☒ Indirect Heat Exchanger
☐ Storage Tanks
☐ General Emission Unit, specify

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

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:

☐ 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: Bernard R. Brown (Please use blue ink) DATE: 11/30/2023 (Please use blue ink)

35B. Printed name of signee: Barnard Brown 35C. Title: Chief Operating Officer

35D. E-mail: bbrown@ergalode.com	35E. Phone: 681-287-5093	35F. FAX:
36A. Printed name of contact person (if different from 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.

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF AIR QUALITY
601 57th Street, SE
Charleston, WV 25304
Phone: (304) 926-0475
www.dep.wv.gov/dep

PERMIT DETERMINATION FORM (PDF)

FOR AGENCY USE ONLY: PLANT ID # _____
PDF # _____ PERMIT WRITER _____

1. NAME OF APPLICANT (AS REGISTERED WITH THE WV SECRETARY OF STATE'S OFFICE):
Empire Green Generation, LLC

2. NAME OF FACILITY (IF DIFFERENT FROM ABOVE):
Follansbee Operations

3. NORTH AMERICAN INDUSTRY CLASSIFICATION SYSTEM (NAICS) CODE:
562920

4A. MAILING ADDRESS: 1400 Main Street, Follansbee, WV 26037

4B. PHYSICAL ADDRESS: 89 Hoppes Rd, Follansbee WV 26037

5A. DIRECTIONS TO FACILITY (PLEASE PROVIDE MAP AS ATTACHMENT A): Turn off of WV-2 onto Veterans Drive (0.5 miles). Turn right onto Hoppes Rd (0.2 miles). Facility on the right.

5B. NEAREST ROAD: WV-2
5C. NEAREST CITY OR TOWN: Follansbee, WV
5D. COUNTY: Brooke

5E. UTM NORTHING (NN): 4470000
5F. UTM EASTING (NN): 493842.8
5G. UTM ZONE: 17T

6A. INDIVIDUAL TO CONTACT IF MORE INFORMATION IS REQUIRED: Bernard Brown
6B. TITLE: Chief Technology Officer
6C. TELEPHONE: 681.397.6920
6D. FAX:
6E. E-MAIL: bbrown@empiricle.com

7A. DAQ PLANT ID NO. (FOR AN EXISTING FACILITY ONLY): 009 - 00141
7B. PLEASE LIST ALL CURRENT 45CSR13, 45CSR14, 45CSR19 AND/OR TITLE V (45CSR30) PERMIT NUMBERS ASSOCIATED WITH THIS PROCESS (FOR AN EXISTING FACILITY ONLY):
R13-3555

7C. IS THIS PDF BEING SUBMITTED AS THE RESULT OF AN ENFORCEMENT ACTION? IF YES, PLEASE LIST:

8A. TYPE OF EMISSION SOURCE (CHECK ONE):
☐ NEW SOURCE ☐ ADMINISTRATIVE UPDATE
☒ MODIFICATION ☐ OTHER (PLEASE EXPLAIN IN 11B)

8B. IF ADMINISTRATIVE UPDATE, DOES DAQ HAVE THE APPLICANT'S CONSENT TO UPDATE THE EXISTING PERMIT WITH THE INFORMATION CONTAINED HEREIN?
☐ YES ☐ NO

9. IS DEMOLITION OR PHYSICAL RENOVATION AT AN EXISTING FACILITY INVOLVED? ☐ YES ☒ NO

10A. DATE OF ANTICIPATED INSTALLATION OR CHANGE: 4 / 15 / 2024

10B. DATE OF ANTICIPATED START-UP: 3 / 15 / 2024

11A. PLEASE PROVIDE A **DETAILED PROCESS FLOW DIAGRAM** SHOWING EACH PROPOSED OR MODIFIED PROCESS EMISSION POINT AS **ATTACHMENT B.**

11B. PLEASE PROVIDE A **DETAILED PROCESS DESCRIPTION** AS **ATTACHMENT C.**

12. PLEASE PROVIDE **MATERIAL SAFETY DATA SHEETS (MSDS)** FOR ALL MATERIALS PROCESSED, USED OR PRODUCED AS **ATTACHMENT E**. FOR CHEMICAL PROCESSES, PLEASE PROVIDE A MSDS FOR EACH COMPOUND EMITTED TO AIR.

13A. **REGULATED AIR POLLUTANT EMISSIONS:**
→ FOR A **NEW FACILITY**, PLEASE PROVIDE PLANT WIDE EMISSIONS BASED ON THE POTENTIAL TO EMIT (PTE) FOR THE FOLLOWING AIR POLLUTANTS INCLUDING ALL PROCESSES.
→ FOR AN **EXISTING FACILITY**, PLEASE PROVIDE THE PROPOSED CHANGE IN EMISSIONS BASED ON THE PTE OF ALL PROCESS CHANGES FOR THE FOLLOWING AIR POLLUTANTS.
PTE FOR A GIVEN POLLUTANT IS TYPICALLY **BEFORE OR EXHAUSTION CONTROL DEVICES** AND IS COLLECTED BASED ON THE MAXIMUM DESIGN CAPACITY OF PROCESS EQUIPMENT.

POLLUTANT	HOURLY PTE (LB/HR)	YEARLY PTE (TON/YR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR) DIVIDED BY 2000 LB/TON
PM	5.7	25.0
PM_{10}	3.20	14.0
VOC_{TV}	5.48	24.0
CO	22.60	99.0
NO_x	5.48	24.0
SO_2	8.90	39.0
Pb	NA	NA
HAPs (AGGREGATE AMOUNT)	0.46	2.0
TAPs (INDIVIDUALLY)*	0.46	2.0
OTHER (INDIVIDUALLY)*	[illegible]	[illegible]

* ATTACH ADDITIONAL PAGES AS NEEDED

13B. PLEASE PROVIDE ALL **SUPPORTING CALCULATIONS** AS **ATTACHMENT E**.
CALCULATE AN HOURLY AND YEARLY PTE OF EACH PROCESS EMISSION POINT (ENDPIPE) IN YOUR DETAILED PROCESS FLOW DIAGRAM FOR ALL AIR POLLUTANTS LISTED ABOVE INCLUDING INDIVIDUAL HAPS LISTED IN SECTION 112(B) OF THE 1990 CAAA, TAPS LISTED IN 45CSR27, AND OTHER AIR POLLUTANTS (E.G. POLLUTANTS LISTED IN TABLE 45-13A OF 45CSR13, SYNERGIC CODES PER 45CSR7, ETC.).

14. **CERTIFICATION OF DATA:**
I, Bernard Brown, FOR MYSELF AND THE ENTITY THAT I AM CONTACTING ON BEHALF OF, HEREBY CERTIFY THAT ALL THE REPRESENTATIONS CONTAINED IN THIS APPLICATION, OR ATTACHED HERETO, ARE TRUE, ACCURATE, AND COMPLETE TO THE BEST OF MY KNOWLEDGE BASED ON INFORMATION AVAILABLE, BY OTHER REASONABLE INQUIRY, AND THAT I AM A **RESPONSIBLE OFFICIAL** ** (PRESIDENT, VICE PRESIDENT, SECRETARY OR TREASURER, GENERAL PARTNER OR SOLE PROPRIETOR) OF THE APPLICANT.

SIGNATURE OF RESPONSIBLE OFFICIAL: Bernard R. Brown

TITLE: Chief Technology Officer DATE: 11 / 30 / 2023

** THE DEFINITION OF THE PHRASE **RESPONSIBLE OFFICIAL** CAN BE FOUND AT 45CSR13, SECTION 2.23.

NOTE: PLEASE CHECK ENCLOSED ATTACHMENTS:
☒ ATTACHMENT A ☒ ATTACHMENT B ☒ ATTACHMENT C ☒ ATTACHMENT D ☒ ATTACHMENT E
REMEMBER TO ALL ENCLOSE ANY REQUIRED TO BE SENT AND ADDITIONAL SHEETS FOR THIS (2) PAGE.
THE PERMIT DETERMINATION FORM WITH THE INSTRUCTIONS CAN BE FOUND ON DAQ'S PERMITTING SECTION WEB SITE:
www.dep.wv.gov/daq

ATTACHMENT A

Business Certificate

City of Follansbee

CITY LICENSE

Follansbee, West Virginia

This is to certify that the undersigned, in pursuance of the authority vested in him by law has this day granted to:

Name of Establishment: **EMPIRE GREEN GENERATION LLC**

Address: **1400 MAIN ST**

FOLLANSBEE WV 26037-1218

Name of Owner: **FRANK ROSSO**

Address: **401 EAST LAS OLAS BLVD SUITE 1400**

FORT LAUDERDALE FL 33301-2218

a license to engage in, conduct or operate the business of, or devices for which license tax has been assessed and paid as shown in license schedule herein.

Date Issued: **28-Jul-2022**

Expiration Date: **30-Jun-2023**

WV Contractors #

PAID

07/28/2022

City of Follansbee

Any automatic device licensed herein is that which is not a gambling device under city ordinance or the laws of the State of West Virginia

LICENSE No: 208

John G McIntosh

City Manager

DISPLAY IN A CONSPICUOUS PLACE

State of West Virginia

Certificate

I, Mac Warner, Secretary of State of the State of West Virginia, hereby certify that

EMPIRE GREEN GENERATION, LLC

was duly authorized under the laws of this state to transact business in West Virginia as a foreign limited liability company on December 09, 2021.

The company is filed as an at-will company, for an indefinite period.

I further certify that the company has not been revoked or administratively dissolved by the State of West Virginia nor has the West Virginia Secretary of State issued a Certificate of Cancellation or Termination to the company.

Accordingly, I hereby issue this Certificate of Authorization

CERTIFICATE OF AUTHORIZATION

Validation ID:8WV3R_VAJBM

Given under my hand and the Great Seal of the State of West Virginia on this day of

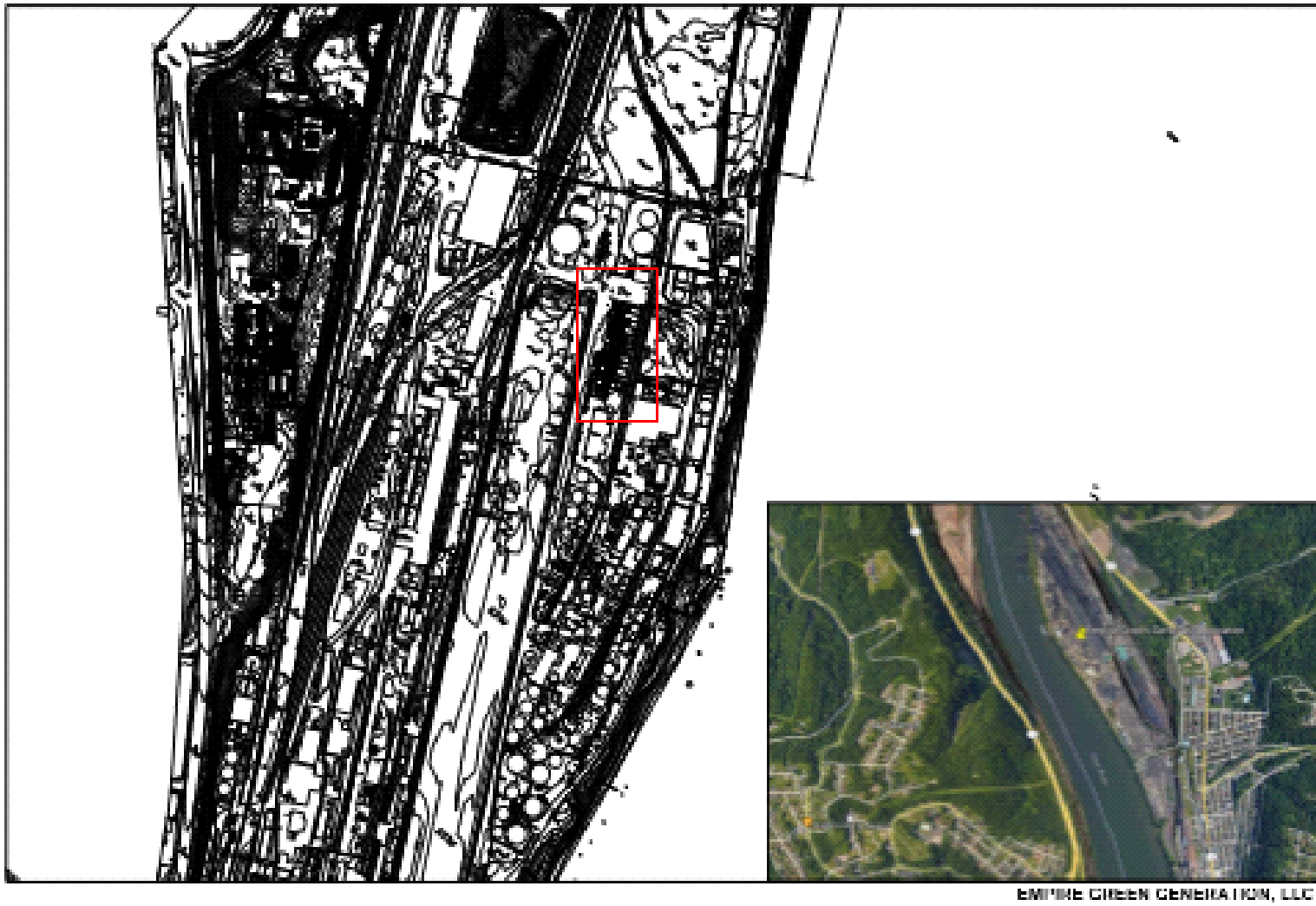
January 07, 2022

Mac Warner

Secretary of State

ATTACHMENT B

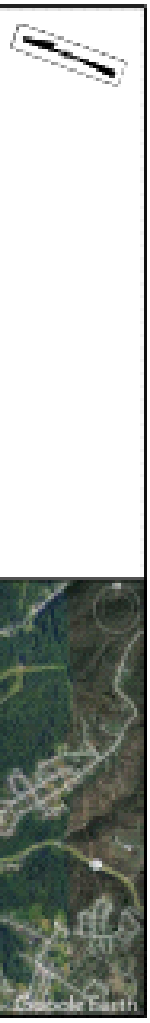
Maps



EMPIRE GREEN GENERATION, LLC
POLLANSBEE, WV
SITE MAP AND LAYOUT

ATTACHMENT C

Installation and Startup Schedule


Google Earth

ATTACHMENT C: INSTALLATION AND START UP SCHEDULE

Unit	Start of Installation	Approximate Start of Operations
900 & 1000 (Thermal Oxidizer and Stack Exhaust)	October 2022	February 2024

ii

ATTACHMENT D

Regulatory Discussion

iii

1.1 West Virginia State Requirements

The Facility will be a minor source of emissions under the NSR Program as well as the Title V Operating Permit program under §45CSR30. However, the potential uncontrolled emissions for the Facility will exceed the permitting threshold of 6 pounds per hour (lb/hr) and/or 144 pounds per day (lb/day) in accordance with WVDEP §45CSR13-2.24. Accordingly, Empire Green Generation, LLC is submitting this application for a minor source permit to install and operate.

In addition to regulations, state regulations that pertain to this Facility are listed in Table 1-1. Titles shown in capital letters in the table are permits, notifications, and/or reports that will be needed for construction and operation of the Facility.

Federal authority is delegated to the State of West Virginia, and all permit applications will be submitted to West Virginia Department of Environmental Protection (WVDEP). The following list of air permits is applicable to the proposed facility:

Table 1-1 West Virginia DEP Applicable Regulations

Rule	Description
45CSR02	Control of visible and particulate emissions from stationary sources
45CSR08	Ambient Air Quality Standards
45CSR10	General emission limit provisions for sulfur dioxide
45CSR11	Prevention Of Air Pollution Emergency Episodes
45CSR13	Permits-to-Install New Sources and Permit-to-Install and Operate Program
45CSR17	Restrictions of emissions of fugitive dust
45CSR21	Control of emissions of VOCs from stationary sources

1.1.1 Permit Applicability

Air pollution control regulations have been established by the WVDEP for air emissions associated with stationary sources and fugitive emissions resulting from material transfer activities.

To determine permit applicability for the Facility's emission sources, the Potential-to-Emit (PTE) emissions have been presented in Attachment J and Permit Determination Form, the proposed Facility will be considered a minor source with potential uncontrolled PM emissions greater than 25 tons per year (tpy) and less than major source thresholds. Therefore, the Facility will need to obtain a permit to construct and operate. Applicable federal regulations present in Table 1-2 below.

Table 1-2 Federal Applicable Regulations

Rule	Description
40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines
40 CFR 60 Subpart A	General Provisions
40 CFR 60.18	General control device and work practice requirements

1.1.2 Criteria For Fuel

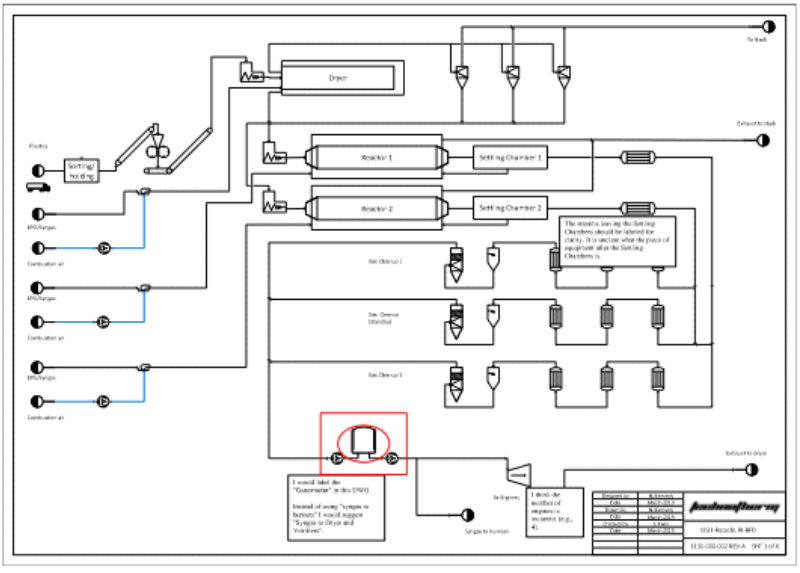
Processing the plastic feed stock is not viewed as a waste disposal through incineration, the plastics are being used as a fuel to create a syngas. The process for producing the syngas is through pyrolysis which is classified as an advanced recycling in West Virginia's House Bill 4048.

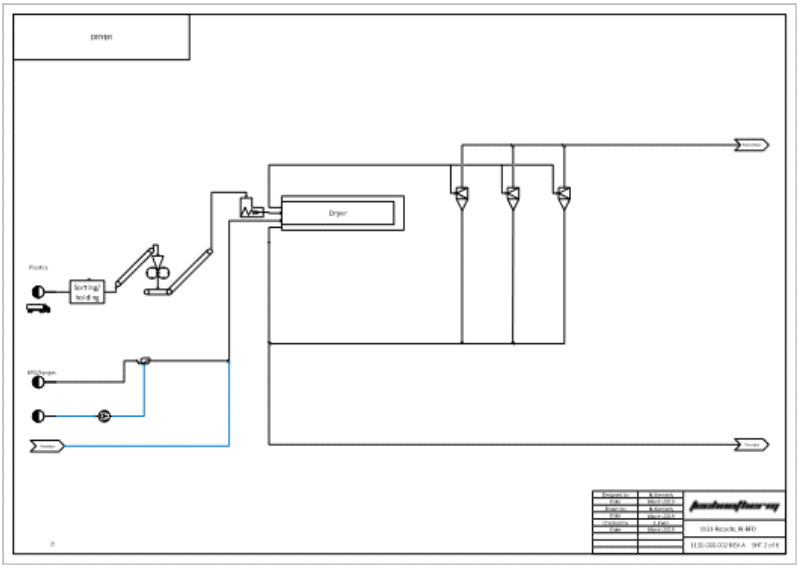
ATTACHMENT E

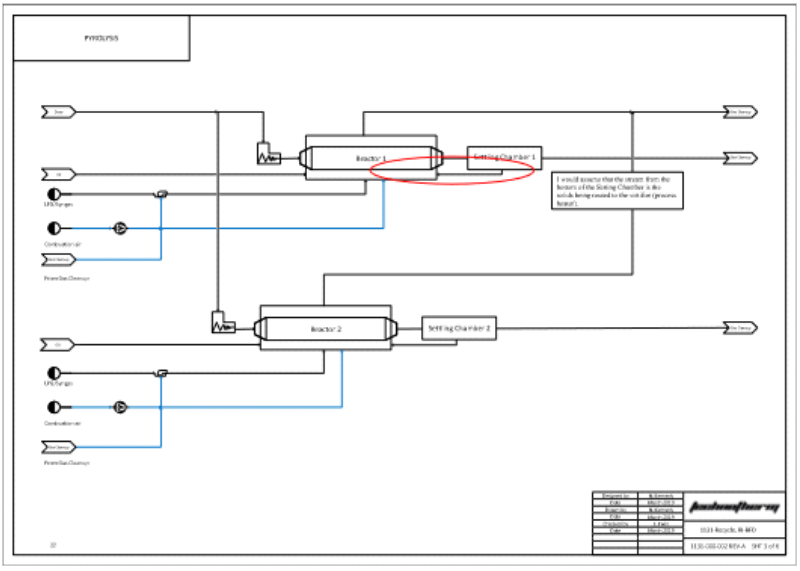
Plot Plan

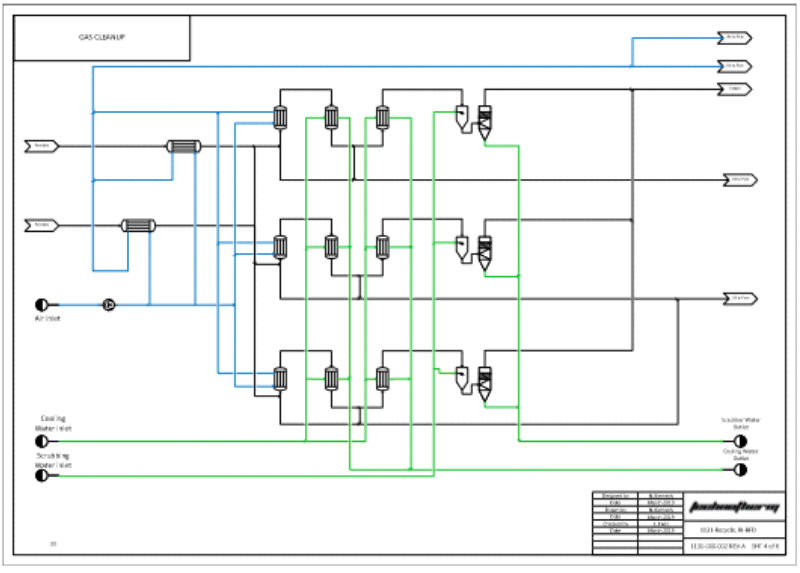
ATTACHMENT F

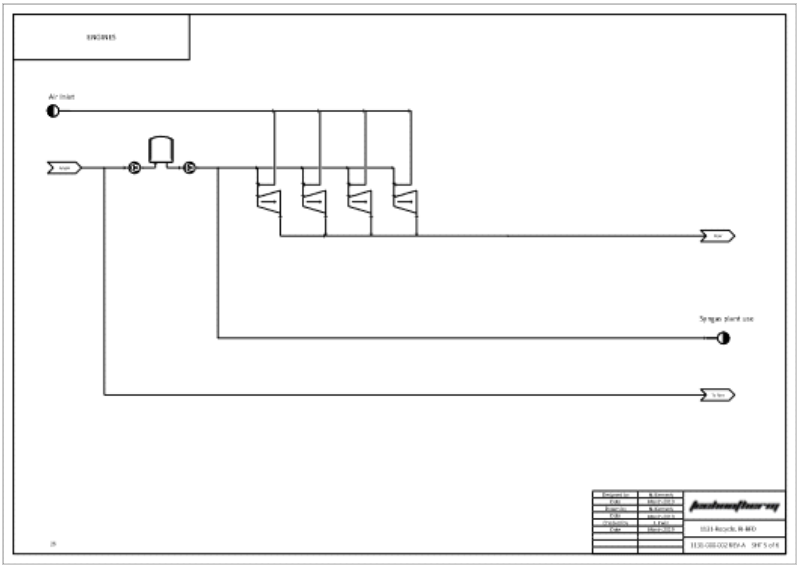
Process Flow Diagram

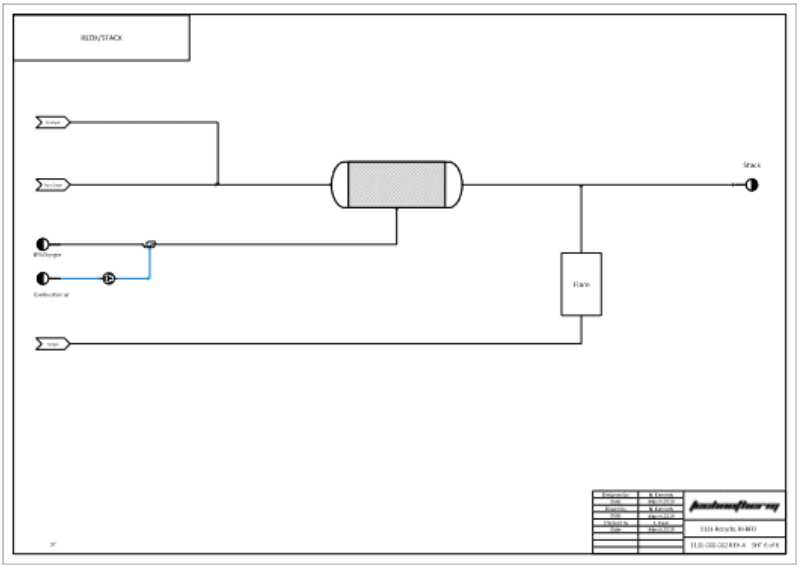



DRYER
Dryer
Plastics
Sorting/ Welding
Hot Gas
Vapor
1131-Recycle, R-WD
1130-000-002 REV-A SHT 2 of 6


PYROLYSIS
Reactor 1
Settling Chamber 1
Reactor 2
Settling Chamber 2
1131-Recycle, R-WD
1130-000-002 REV-A SHT 3 of 6


GAS CLEANUP
Air Inlet
Cooling Water Inlet
Scrubbing Water Inlet
Scrubber Water Outlet
Cooling Water Outlet
1131-Recycle, R-WD
1130-000-002 REV-A SHT 4 of 6





ATTACHMENT G

Process Description

REQUESTED REVISIONS

The following revisions from the original permit submittal are the following:

- All feedstock is now plastics, no residual waste will be processed through this system.
- Calorific value of the feed stock
- Plastics will be staged at a separate facility and brough on site as needed.
- Hydrochloric Acid (HCL) truck loading and associated scrubber system details added.

1. *PRE-PROCESSING HANDLING*

Feedstock will be sourced from recyclers, manufacturing, and plastic producers. Referring to Figure 1, Plastics will be received at an offsite location located in the state of Ohio. The plastics will be sorted by hand and sent to a shredder; the shredder is a diesel-powered generator which will be covered under an Ohio EPA General Air Permit 9.14. The plastics will be shredded to 1"to 4" these pieces will then be baled or placed into super sacks and loaded onto trucks for delivery to the facility as needed. The trucks into the site will be controlled by Empire Green Generation and the anticipated truck traffic is to be 4-6 trucks a day entering into the site via Route 2 from the north.

Figure 1. Flow Diagram for Pre-Processing Handling

2. *GENERAL PROCESS DESCRIPTION*

Overall process takes plastics, received by a transporting company, and thermally processes it in a pyrolysis system operating at 800°C - 900°C (1,472°F - 2,162°F). Waste composition will consist of plastics with resin numbers one through seven. Organic matter and hydrocarbons from the plastics are thermally decomposed without oxygen forming a syngas that can directly be used as a fuel source for electrical generating engines. Oil and tar are produced where the oil is recycled through the pyrolysis system to make more syngas and the tar is used to heat a vitrification system in which solids from the process are vitrified and made inert. The electrical generator's exhausts from the engines are sent to a drying unit where the plastic is dried prior to be introduced into the pyrolysis system. All exhaust gasses are sent to a Thermal Oxidizer where they are conditioned for release to atmosphere via a stack at a temperature of 850°C (1,562°F).

3. *DETAILED PROCESS DESCRIPTION*

Referring to Figure 2 below, a detailed description of the process follows where Plastics (#100) is received, sent to Staging (#120) and then to the Macerator (#200). Macerator (#200) operating at negative pressure of -0.024 kilopascals (kPa) reduces the Plastics to less than or equal to 20 mm (0.78-inch). Plastics (#130) moves from the Macerator (#200) to the Dryer (#220) and is dried from the exhaust of the four (4) Engines (#600). Once the Plastics (#130) is dried, it moves to the Feed Silo (#240) through load lock valves. When the Pyrolysis (#300) system is ready to accept feed, load locking valves are actuated such that the feed in put into the Pre-Pyrolysis (#300) system. Coordinated valve actuation is used to keep oxygen level from air below 2.0% in the Pre-Pyrolysis (#300) and Pyrolysis (#350) system. Chlorides are driven off in the Pre-Pyrolysis (#300) and processed into hydrochloric acid to be sold. As plastics (#100) is being processed in the Pyrolysis (#350) system, organic matter and hydrocarbons are thermally decomposed forming syngas and moves to the Gas Cleanup (#400). The Gas Cleanup (#400) removes particulate matter and performs the bulk of neutralizing acid forming gasses. Next, the gas passes to the Scrubber (#420) where any acid gasses are further removed from the syngas. The syngas then proceeds to the Gasometer (#500) which helps regulate the pressure in the Engine (#600). Syngas is combusted in the Engine (#600) and the exhaust is sent to Dryer (#220). Exhaust from the dryer is diverted through the Cyclone (#620) and then to the Feed Silo (#240). The Vitrifier (#600) exhaust flows to the Pyrolysis (#300) system, then makes a single pass through the outer chamber of the Pyrolyser (#350) system where additional heat is provided. Next the gases flow through the Dryer (#220). Gases from the Dryer (#220) outlet is sent to the Thermal Oxidizer (TO) (#900) through Cyclone (#620). Tar (#720) is mixed with Air (#820) and heats the Vitrifier (#600) sufficiently to make an inert solid product (#840) which is ready for disposal. Oil (#700) is continuously recycled through the Pyrolysis (#300) system. Off-gas from the Thermal Oxidizer (#900) are sent through the Stack (#1000), which includes and emergency fans, prior to being released into the atmosphere.

Figure 2. Block flow diagram for detailed process description.

General observation is that this process should fairly match with the other diagrams and process descriptions. The one box that now, which contains solids going to the vitrifier and a stream exiting going to "solids disposal". Also, the HCL should be omitted.

SUB-SYSTEM OPERATION PRIME EQUIPMENT DETAIL

Prime Equipment & Systems

The following descriptions supplements the Process Flow Diagrams (PFDs) shown in Figure 1.

1. **Delivery of Plastics**

   The material will be offloaded from five (5) tractor-trailers per day and tipped onto the receiving conveyor with the use of bin tipping stations as shown in Figure 2.

Figure 2: Illustration of typical bin tipping station

The waste operator will record the weight of each load prior to tipping. Additionally, a weighbridge operator records the weight of the trucks as they enter and exit the plant.

The material will automatically feed the Maserator required and dictated by the plant control philosophy.

An air extraction system is built into the Maserator with an extraction fan pulling from the topside of the Maserator at a rate of 1.2 m³/sec. Maserator will be under negative pressure of -0.024 kPa at all times during operations.

Negative Pressure Transmitter

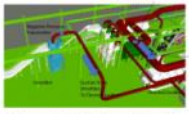
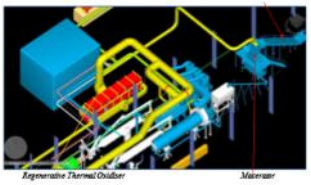


Figure 4. Negative Pressure from Maserator to Thermal Oxidizer.
Note all areas prior to thermal degradation are sealed and under negative pressure

Further detail, qualifying waste in prepared sealed containers are delivered to the plant and placed on an input conveyor. After placing on the conveyor operator has no further involvement with the waste.

Material input conveyor



Regenerative Thermal Oxidizer *Maserator*

Figure 5.

2. **Materials input conveyor to Maserator under negative pressure to Thermal Oxidizer.**

   The shredder / maserator has a single opening that is sealed, allowing the waste to enter as presented through a single entry point under suction that is closed when waste is not presented for an extended period or during shut down mode.

   The entire facility is closed to the operating environment and operates under a negative pressure (-0.024 kPa), ensuring no escape of odors or pathogens.

   Transfer from the Maserator to the dryer and from the dryer to the thermal pre-cyclone is also sealed to the environment operating under a negative pressure.

Progression to the high temperature pyrolysis unit (Fig. 3) is again sealed.

The main item that is creating a negative pressure is an Induced Draft Fan. This fan is connected to the regenerative thermal oxidizer, from the thermal oxidizer to the Maserator, dryer and all material interfaces.

Regenerative Thermal Oxidizer to eliminate egress *Main suction points*

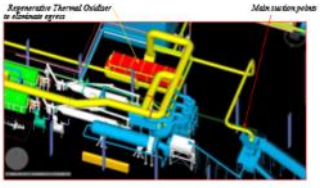


Figure 6. The Regenerative thermal oxidizer is maintained at 850°C.

2.1 **Interlocks: The plant cannot be energized unless the ID fan is on and the Thermal oxidizer at temperature. There is no possibility of odors.**

If the Thermal Oxidize goes below a predetermined temperature, the plant goes into shut down mode. In the event of a power failure the main control functions are connected via UPS. At this time a normally closed solenoid valve will have closed the only orifice on the plant which is where the waste is admitted.
In the unlikely event of an ID fan failure (never had one in 25 years) the plant will again default to shut down mode.

2.2 Maceration Negative Pressure

Maceratior material (feed stock) is conveyed to the thermal dryer feed hopper. Figure 6 shows a typical Maceratior system.

Figure 7. Picture of a typical Maceratior/Shredder system.

3. Thermal Dryer

The drying of the feed stock is carried out in a direct heated, parallel flow, rotary twin drum type dryer using a combination of engine exhaust and, if necessary during start-up or unusual operating conditions, syngas and, as a last resort, propane.

Feed stock is transported from the dryer feed hopper into the dryer by means of a screw conveyor. Upon entering the dryer inner retort, the moist feed stock comes into direct contact with the parallel streams of hot

flue gases.

Lifters and progression plates ensure intimate contact between the feed stock and flue gas therefore facilitating efficient drying, sterilization and movement of feed stock along the retort. Once both feed stock and flue gases reach the closed end of the dryer they are discharged from the inner concentric retort into the outer retort and return to the entry end of the dryer, discharging 10% moisture level feed stock into an expansion chamber. Coarse dry feed stock falls to the bottom of the chamber forming a heap on the belt conveyor located beneath.

The flue gas exhaust, contaminated with light particulate feed stock material, is also discharged from the expansion chamber and ducted to a bank of cyclones where separation occurs. Fine particulate falls to the bottom of each cyclone and is discharged via rotary valves into a common screw conveyor. The screw conveyor discharges the fine product onto the belt conveyor joining the dryer exit material and fine product. This conveyor transfers the combined dry feed stock streams onto a conveyor feeding an intermediate storage hopper that feeds both Pyrolyzers.

The cooled flue gas streams from the cyclones is directed to the Thermal

Oxidizer. 7 and 8 shows photos of a typical dryer in operation.

Figure 8. Photo of a typical dryer in operation from first floor level.

Figure 9. Photo of a typical dryer in operation from ground floor level.

4. Pyrolyzer & Vitrification Furnace

Overview

The Pyrolyzer train is fed dried feed stock from a thermal dryer as described in the previous section. The Pyrolysis train consists of two identical Pyrolyzers. Per unit, the source of indirect heat is primarily hot exhaust flue gas from a vitrification furnace located beneath the pyrolysis retort. These hot flue gasses exit the Pyrolysis Retorts and then progress to the medium grade heat applications (Thermal Dryer and during start up Syngas Cooler and Tar Condenser). Supplemental heating of the pyrolysis retort is being provided by firing a portion of the cleanest syngas. Natural gas / LPG is available for initial startup or any start-up where insufficient syngas is available. After passing through the dryers the gas is progressed to the Thermal Oxidizer.

Detailed Description

Feed stock is transferred from the dryer to a live bottom screw hopper, which feed an inlet hopper complete with horizontal material feed screw. Material is fed from a gas-tight, storage hopper into the horizontal, conically shaped, rotary drum Pyrolyzer Retort by a rotary screw.

As the material passes through the pyrolysis retort, it undergoes thermal degradation releasing volatile organic syngas compounds that aredischarged from the retort. The crude syngas off-takes are collected into a common manifold that transfers the syngas to the syngas cleaning system.

The heavier particles, mainly comprising of ash and fixed carbon, collect in a specially designed high temperature de-acceleration chamber where the particles are collected and returned to the vitrification furnace.

The Pyrolyzers must be designed and arranged such that no propensity for harmonic vibrations shall exist under any load condition and shall be complete with all ancillary equipment for safe, reliable and efficient operation, and be of proven design capable of the required continuous, intermittent and transient operation and be suitable for its intended location. The design and materials of construction shall take fully into account the location.

Ash and carbonaceous residue produced by the Pyrolyzers drops off the dust from the aforementioned de-acceleration chamber screw conveyors, together with the main residue collected from the base of the Pyrolyzer into a Vitrifier, a refractory lined furnace fired by recovered tars (described below in the syngas cleaning equipment). The heat liberated by burning the tars and oils is sufficient to heat the ash from the Pyrolysis units above their eutectic temperature with excess, preheated air to burn off the tars. The char is completely combusted into CO2 and H2O.

Figure 10, 11 and 2 show photos of Pyrolyzers in operation.

Figure 10. Photo A of typical high temperature pyrolysis unit.

Figure 11. Photo B of typical high temperature pyrolysis unit.

Figure 12. Photo of typical low temperature pyrolysis unit.

5. Syngas Cleanup

Particulate Matter (PM) Cleanup

Raw syngas is retrieved from the Pyrolysis Retorts, as described above, and passes through a de-acceleration chamber and then hot cyclones. The cyclones are arranged for parallel flow to ensure maximum PM removal efficiency during start-up and shutdown as the flow varies. PM drops to specially designed hot screw conveyors and from there is directed to the vitrification furnaces described above.

Syngas Coolers

The partially cleaned, still hot, flue gas flows next through stainless steel tubular syngas coolers. The cooler is in essence a Heat Exchanger which indirectly transfers heat from syngas to the combustion air heaters.

Tar Condensers

The syngas from the coolers described above flows to a stainless-steel shell & tube Heat Exchanger/ cooler that is cooled by an air blower system. Tars are condensed out and drop into heated troughs, the heat source of which is engine exhaust. Hot condensed tar is pumped to the vitrification furnaces described above. The common installed spare set of coolers uses engine exhaust flue gas to heat the heat exchangers and thereby cause the tars to drop into the heated trough below.

Oil Condensers

The syngas from the tar condensers described above flows to a shell & tube Heat Exchangers/cooler that are cooled by water cooling system. Condensed oils, which also contain condensed water, are collected and is pumped to the vitrification furnace described previously. The corrosion resistant spare set of coolers uses engine exhaust flue gas to heat the heat exchangers and thereby cause the oils to drop into the heated trough below.

Venturi Scrubbers

From the oil condensers the syngas flows through a high pressure-drop Venturi Scrubber to remove any remaining PM.

Figure 13 and 14 show photos of a typical gas cleanup system in operation.

Figure 13. Photo A of a typical gas cleanup system in operation

Figure 14. Photo B of a typical gas clean up system in operation

Gas Bladder (Syngas Storage tank)

The syngas storage tank provides surge capacity of cleaned syngas to level out flow and composition variations. It shall be a bladder contained within a dimensioned area. The bladder will operate with an internal pressure of 38 to 40 millibar gauge.

Figure 15 shows a typical gas bladder in operation.

I would suggest using either "Gas Bladder or "Gasometer" but not both throughout the application.

Figure 15. Picture of typical gas bladder

Stack

The hot gasses progress through the stack in to the atmosphere after passing through the Thermal Oxidizer (discussed in next section).

6. Thermal Oxidizer

After passing through a scrubber the flue gasses enter a Thermal Oxidizer comprising of a rectangular box shaped furnace. The internal dimensions are determined by the total volume that needs to be raised to 850 °C and maintained for 2 seconds.

Figure 16 shows a typical Thermal Oxidizer in operation. Please refer to the technical specification file for more details if required.

Figure 16 Photo of a typical Thermal Oxidizer in operation

7. Syngas Engines

Each syngas engine shall be a fully packaged unit complete with all associated components and auxiliaries. These engines are of robust design and have been proven on low and medium calorific value gas fuels.

The engine package will be complete to allow the engine to start, synchronize, operate continuously at base or part load and shut down.

The syngas engines shall be assembled in containers as indicated on the plant layout. The containerized engines shall conform to a sound pressure level of 85 dBA (2005 Noise Regulations 1st Action Level) as measured one meter from the enclosure at two meter above floor level.

Notwithstanding the syngas clean up equipment and systems described in the Syngas Clean up Section above, the syngas engine exhaust systems shall be designed and installed such that they meet emissions standards as of the Commencement Date.

The Engine cooling will be by means of external radiators, they shall be designed and constructed with sufficient margin and spare surface area for the maximum heat rejection duty under all operational conditions.

The radiators shall incorporate features to minimize corrosion and erosion on the air and waterside and suitable provisions for cleaning and core replacement.

The radiators and all of their component parts shall be of proven design and arranged so as to minimize maintenance work.

Figure 17 and Figure 18 illustrates the containerized engines in production.

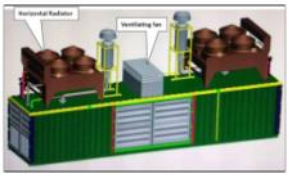


Figure 17. Illustration A of containerized engines in production

ATTACHMENT H

Material Data Safety Sheets (MSDSs)

Safety Data Sheets (SDSs)

DAKOTA GASIFICATION COMPANY

SAFETY DATA SHEET

RESPONSIBLE CARE

Section 1: Identification

Product identifier

Product Name - ynthetic Natural Gas

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

Recommended use • Fuel for combustion applications, raw material for chemical reactions

Details of the supplier of the safety data sheet

Manufacturer • Dakota Gasification
420 County Road 26
Beulah, ND 58523-9400
United States
www.dakotagas.com

Telephone (General) • 701-873-2100

Emergency Contact information

Email • DGCEmergency@tepo.com

Manufacturer • (701) 873-4600

CHEMTREK • 800-424-9300

Section 2: Hazard Identification

United States (US)

According to OSHA 29 CFR 1910.1200 HCS

Classification of the substance or mixture

OSHA HCS 2012 • Flammable Gases 1 - H220
Compressed Gas - H280
Simple Asphyxiant

Label elements

OSHA HCS 2012

DANGER

Hazard statements • Extremely flammable gas - H220
Contains gas under pressure; may explode if heated - H280
May displace oxygen and cause rapid suffocation.

Precautionary statements

Prevention • Keep away from heat, sparks, open flames and/or hot surfaces. - No smoking. - P210

Response • Leaking gas fire: Do not extinguish, unless leak can be stopped safely. - P377
Eliminate all ignition sources if safe to do so. - P381

Storage/Disposal • Protect from sunlight. Store in a well-ventilated place. - P410+P403

Other hazards

OSHA HCS 2012 • Under United States Regulations (29 CFR 1910.1200 - Hazard Communication Standard), this product is considered hazardous.

Canada

According to WHMIS

Classification of the substance or mixture

WHMIS • Compressed Gas - A
Flammable Gases - B1

Label elements

WHMIS

• Compressed Gas - A
Flammable Gases - B1

Other hazards

WHMIS • This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces.
In Canada, the product mentioned above is considered hazardous under the Workplace Hazardous Materials Information System (WHMIS).

Section 3 - Composition/Information on ingredients

Substances

• Material does not meet the criteria of a substance.

Mixtures

Composition					
Chemical Name	Identifiers	%	LD50/LC50	Classification According to Regulation/Directive	Comments
Methane	CAS-74-82-8	95%	NDA	OSHA HCS 2012: Flam. Gas 1; Press. Gas - Compr., Simp. Asphyx.	NDA
Hydrogen	CAS-1333-74-0	2.1%	NDA	OSHA HCS 2012: Flam. Gas 1; Press. Gas - Compr., Simp. Asphyx.	NDA
Carbon dioxide	CAS-124-38-9	1.1%	Inhalation-Rat LC50 - 470000 ppm 30 Minutes	OSHA HCS 2012: Press. Gas - Compr., Simp. Asphyx.	NDA

Section 4: First-Aid Measures

Description of first aid measures

Inhalation • IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Administer oxygen if breathing is difficult. Give artificial respiration if victim is not breathing. If signs/symptoms continue, get medical attention.

Skin • IF ON SKIN: Wash with plenty of soap and water. If skin irritation occurs: Get medical advice/attention. Wash contaminated clothing before reuse.

Eye • IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

Ingestion • Ingestion is not anticipated to be a likely route of exposure to this product.

Most important symptoms and effects, both acute and delayed

• Refer to Section 11 - Toxicological Information.

Indication of any immediate medical attention and special treatment needed

Notes to Physician • All treatments should be based on observed signs and symptoms of distress in the patient. Consideration should be given to the possibility that overexposure to materials other than this product may have occurred.

Other information

• Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves. RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO GASES WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus must be worn. Victim(s) who experience any adverse effect after over-exposure to this gas mixture must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of the label and the MSDS to physician or other health professional with victim(s).

Section 5: Fire-Fighting Measures

Extinguishing media

Suitable Extinguishing Media • SMALL FIRES: Dry chemical or CO2.
LARGE FIRES: Water spray or fog.

Unsuitable Extinguishing Media • No data available

Special hazards arising from the substance or mixture

Unusual Fire and Explosion Hazards • EXTREMELY FLAMMABLE
Will form explosive mixtures with air.
Vapors may travel to source of ignition and flash back.
Cylinders exposed to fire may vent and release flammable gas through pressure relief devices.
Containers may explode when heated.
Ruptured cylinders may rocket.

Burns with a pale, faintly luminous flame; air containing more than 14% methane burns without noise.

Hazardous Combustion Products • No data available

Advice for firefighters

• Structural firefighters' protective clothing provides limited protection in fire situations ONLY; it is not effective in spill situations where direct contact with the substance is possible.
Wear positive pressure self-contained breathing apparatus (SCBA).
DO NOT EXTINGUISH A LEAKING GAS FIRE UNLESS LEAK CAN BE STOPPED
Move containers from fire area if you can do it without risk.
FIRE: If tank, rail car or tank truck is involved in a fire, ISOLATE for 1600 meters (1 mile) in all directions; also, consider initial evacuation for 1600 meters (1 mile) in all directions.
FIRE INVOLVING TANKS: ALWAYS stay away from tanks engulfed in fire.
FIRE INVOLVING TANKS: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
FIRE INVOLVING TANKS: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
FIRE INVOLVING TANKS: Cool containers with flooding quantities of water until well after fire is out.
FIRE INVOLVING TANKS: Do not direct water at source of leak or safety devices, icing may occur.
FIRE INVOLVING TANKS: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Section 6 - Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Personal Precautions • Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Do not walk through spilled material. Ventilate the area before entry.

Emergency Procedures • ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area). As an immediate precautionary measure, isolate spill or leak area for at least 100 meters (330 feet) in all directions. Stop leak if you can do it without risk. Keep unauthorized personnel away. Keep out of low areas. Stay upwind. LARGE SPILL: Consider initial downwind evacuation for at least 800 meters (1/2 mile) if uncontrolled leakage is encountered which cannot be stopped by shutting off the closest appropriate valve or main supply valve (without risk), implement a plan for evacuation and quickly contact the local fire department.

Environmental precautions

• Prevent spreading of vapors through sewers, ventilation systems and confined areas.

Methods and material for containment and cleaning up

Containment/Clean-up Measures • All equipment used when handling the product must be grounded.
Stop leak if you can do it without risk.
If possible, turn leaking containers so that gas escapes rather than liquid.
Use water spray to reduce vapors, do not put water directly on leak, spill area or inside container.
Do not direct water at spill or source of leak.
Isolate area until gas has dispersed.

Section 7 - Handling and Storage

Precautions for safe handling

Handling: • Keep away from heat and ignition sources – No Smoking. Take precautionary measures against static charges. All equipment used when handling the product must be grounded. Use only non-sparking tools. Use only with adequate ventilation. Ventilate closed spaces before entering. Be aware of any signs of dizziness or fatigue, especially if work is done in a poorly ventilated area; exposures to false concentrations of this gas mixture could occur without any significant warning symptoms, due to olfactory fatigue or oxygen deficiency. Cylinders should be firmly secured to prevent falling or being knocked-over. Use explosion-proof – electrical, ventilating and/or lighting equipment. Do not attempt to repair, adjust, or in any other way modify cylinders. If there is a malfunction or another type of operational problem, contact nearest distributor immediately. Empty containers retain product residue and can be hazardous. Do not cut, weld, puncture or incinerate container

Conditions for safe storage, including any incompatibilities

Storage • Cylinders should be stored in dry, well-ventilated areas away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 52C (125F). Cylinders must be protected from the environment, and preferably kept at room temperature approximately 21C (70F). Protect cylinders against physical damage. Cylinders should be firmly secured to prevent falling or being knocked-over. Store locked up.

Section 8 - Exposure Controls/Personal Protection

Control parameters

Exposure Limits/Guidelines				
	Region	ACGIH	NIOSH	OSHA
Carbon dioxide (124-38-9)	TWAs	5000 ppm TWA	5000 ppm TWA; 9000 mg/m3 TWA	5000 ppm TWA; 9000 mg/m3 TWA
	STELs	30000 ppm STEL	30000 ppm STEL; 54000 mg/m3 STEL	Not established
Methane (74-82-8)	TWAs	1000 ppm TWA (listed under Aliphatic hydrocarbon gases - Alkane C1-4)	Not established	Not established

Exposure controls

Engineering Measures/Controls • Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Use explosion-proof - electrical, ventilating and/or lighting equipment.

Personal Protective Equipment

Respiratory • Follow the OSHA respirator regulations found in 29 CFR 1910.134 Use a NIOSH/MSHA approved respirator if exposure limits are exceeded or symptoms are experienced.

Eye/Face Skin • Wear safety glasses.

Body • Wear leather gloves when handling cylinders.

Environmental/ Exposure Controls • Follow best practice for site management and disposal of waste. Controls should be engineered to prevent release to the environment, including procedures to prevent spills, atmospheric release and release to waterways.

Key to abbreviations

ACGIH = American Conference of Governmental Industrial Hygiene
NIOSH = National Institute of Occupational Safety and Health
OSHA = Occupational Safety and Health Administration
STEL = Short Term Exposure Limits are based on 15-minute exposures
TWA = Time-Weighted Average disclosed as 8-hour, 40-hour exposures

Section 9 - Physical and Chemical Properties

Information on Physical and Chemical Properties

Material Description			
Physical Form	Gas	Appearance/Description	Colorless gas with a mild sweet odor
Color	Colorless	Odor	Mild, sweet
Odor Threshold	200 ppm		
General Properties			
Boiling Point	-258.32 F(-161.4 C)	Melting Point	-296.5 F(-182.5 C)
Decomposition Temperature	No data available	pH	Non-relevant
Specific Gravity/Relative Density	0.422 (Water=1 @ -160 C) 288 F) Gas)	Bulk Density	No data available
Water Solubility	Mildly Soluble	Viscosity	No data available
Explosive Properties	No data available	Oxidizing Properties	No data available
Volatility			
Vapor Pressure	Very high	Vapor Density	0.416 (air=1) 68.4kN/
Evaporation Rate	No data available	Volatile (Vol.)	100 %
Flammability			
Flash Point	-306 F(-187.7778 C)	LEL	5.0 %
UEL	15 %	Autoignition	999 F(537.2222 C)
Flammability (solid, gas)	Flammable Gas		
Environmental			
Octanol/Water Partition coefficient	No data available		

Section 10: Stability and Reactivity

Reactivity

• No dangerous reaction known under conditions of normal use.

Chemical stability

• stable

Possibility of hazardous reactions

• Hazardous polymerization will not occur.

Conditions to avoid

• Incompatible materials. Avoid contact with heat and ignition sources. Excess heat.

Incompatible materials

• Reacts violently with powerful oxidizers (e.g. bromine pentafluoride, chlorine trifluoride, chlorine, fluorine, iodine heptafluoride, dioxygenyl tetrafluoroborate, dioxygen difluoride, trioxygen difluoride, liquid oxygen.

Hazardous decomposition products

• No data available

Section 11 - Toxicological Information

Information on toxicological effects

Components		
Methane (99%)	74-82-8	**Acute Toxicity:** Inhalation-Mouse LC50 = 326 g/m^3 (2 Hours)
Carbon dioxide (1.1%)	124-38-9	**Acute Toxicity:** Inhalation-Rat LC50 = 470000 ppm (30 Minutes); Inhalation-Human TCLo = 7 ppm **Acute toxicity; Irritability; Brain and Coverings Other degenerative changes; Kidneys and ureter Metabolic Changes in Chemistry or Temperature Body temperature decrease.** **Reproductive:** Inhalation-Rat TCLo = 5 ppm (24 Hours) 100 (mg) **Reproductive Effects Specific Developmental Abnormities Musculoskeletal system; Reproductive Effects Specific Developmental Abnormities Cardiovascular (circulatory) system; Reproductive Effects Specific Developmental Abnormities Respiratory system**

GHS Properties	Classification
Acute toxicity	GSIIA REG 2012 Data lacking
Aspiration Hazard	GSIIA REG 2012 Data lacking
Carcinogenicity	GSIIA REG 2012 Data lacking
Germ Cell Mutagenicity	GSIIA REG 2012 Data lacking
Skin corrosion/Irritation	GSIIA REG 2012 Data lacking
Skin sensitization	GSIIA REG 2012 Data lacking
STOT-RE	GSIIA REG 2012 Data lacking
STOT-SE	GSIIA REG 2012 Data lacking
Toxicity for Reproduction	GSIIA REG 2012 Data lacking
Respiratory sensitization	GSIIA REG 2012 Data lacking
Serious eye damage/Irritation	GSIIA REG 2012 Data lacking

Potential Health Effects

Inhalation

Acute (Immediate) • This material is a simple asphyxiant. May displace or reduce oxygen available for breathing especially in confined spaces. If this material is released in a small, poorly ventilated area (i.e. an enclosed or confined space), an oxygen-deficient environment may occur. Individuals breathing such an atmosphere may experience symptoms which include headaches, ringing in ears, dizziness, drowsiness, unconsciousness, nausea, vomiting, and depression of all the senses. Under some circumstances of over-exposure, death may occur. The following effects associated with decreased levels of oxygen: increase in breathing and pulse rate, emotional upset, abnormal fatigue, nausea, vomiting, collapse, loss of consciousness, convulsive movements, respiratory collapse and death.

Chronic (Delayed): • No data available

Skin

Acute (Immediate) • Under normal conditions of use, no health effects are expected.

Chronic (Delayed): • No data available

Eye

Acute (Immediate) • Under normal conditions of use, no health effects are expected.

Chronic (Delayed): • No data available

Ingestion

Acute (Immediate) • Under normal conditions of use, no health effects are expected.

Chronic (Delayed): • No data available

Key to abbreviations
LC = Lethal Concentration
TC = Toxic Concentration

Section 12 - Ecological information

Toxicity

• Material data lacking.

Persistence and degradability

• Material data lacking.

Bioaccumulative potential

• Material data lacking.

Mobility in Soil

• Material data lacking.

Results of PBT and vPvB assessment

• PBT and vPvB assessment has not been conducted for this material.

Other adverse effects

• No studies have been found.

Section 13 - Disposal Considerations

Waste treatment methods

Product waste • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Packaging waste • Dispose of content and/or container in accordance with local, regional, national, and/or international regulations.

Section 14 - Transport information

	UN number	UN proper shipping name	Transport hazard class(es)	Packing group	Environmental hazards
DOT	UN1954	Compressed gas, flammable, n.o.s. (Methane and Hydrogen)	2.1	N/A	N/A
TDG	UN1954	COMPRESSED GAS, FLAMMABLE, N.O.S.(Methane and Hydrogen)	2.1	N/A	Marine Pollutant
IMDG/IMO	UN1954	Compressed gas, flammable, n.o.s. (Methane and Hydrogen)	2.1	N/A	N/A

Special precautions for user • Cylinders should be transported in a secure position, in a well-ventilated vehicle. The transportation of compressed gas cylinders in automobiles or in closed-body vehicles

can present serious safety hazards. If transporting these cylinders in vehicles, ensure these cylinders are not exposed to extremely high temperatures (as may occur in an enclosed vehicle on a hot day). Additionally, the vehicle should be well-ventilated during transportation.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code • No data available

Section 15 - Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture

SARA Hazard Classifications • Acute, Fire, Pressure/Sudden Release of)

Inventory							
Component	CAS	Canada DSL	Canada NDSL	EU EINECS	EU ELINCS	Korea KECL
Carbon dioxide	124-38-9	Yes	No	Yes	No	Yes
Hydrogen	1333-74-0	Yes	No	Yes	No	Yes
Methane	74-82-8	Yes	No	Yes	No	Yes

Canada

Labor

Canada - WHMIS - Classification of Substances

•Hydrogen	1333-74-0	A, B1
•Carbon dioxide	124-38-9	A, Uncontrolled product according to WHMIS classification criteria (solid)
•Methane	74-82-8	A, B1

Canada - WHMIS - Ingredient Disclosure List

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	1 %
•Methane	74-82-8	Not Listed

Environment

Canada - CEPA - Priority Substances List

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

United States

Labor

U.S. - OSHA - Process Safety Management - Highly Hazardous Chemicals

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

U.S. - OSHA - Specifically Regulated Chemicals

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

Environment

U.S. - CAA (Clean Air Act) - HAP Hazardous Air Pollutants

•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed

•Methane	74-82-8	Not Listed
U.S. - CERCLA/SARA - Hazardous Substances and their Reportable Quantities		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - CERCLA/SARA - Radionuclides and Their Reportable Quantities		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances EPCRA RQs		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - CERCLA/SARA - Section 302 Extremely Hazardous Substances TPQs		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - CERCLA/SARA - Section 313 - Emission Reporting		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - CERCLA/SARA - Section 313 - PBT Chemical Listing		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
Inventory - United States - Section 8(b) Inventory (TSCA) - PMN Number to EPA Accession Number Link		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

United States - California

Environment

U.S. - California - Proposition 65 - Carcinogens List		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - California - Proposition 65 - Developmental Toxicity		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - California - Proposition 65 - Maximum Allowable Dose Levels (MADL)		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - California - Proposition 65 - No Significant Risk Levels (NSRL)		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Female		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed
U.S. - California - Proposition 65 - Reproductive Toxicity - Male		
•Hydrogen	1333-74-0	Not Listed
•Carbon dioxide	124-38-9	Not Listed
•Methane	74-82-8	Not Listed

Section 16 - Other information

Last Revision Date - 02/October/2019
Preparation Date - 01/October/2014

Key to abbreviations
NDA = No data available

Disclaimer/Statement of Liability - The information contained in this Safety Data Sheet (SDS) is believed to be correct since it was obtained from sources we believe are reliable. However no representation, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications, hazards connected with the use of the material, or the results to be obtained from the use thereof. User assumes all risks and liability of any use, processing or handling of any material, variations in methods, conditions and equipment used to store, handle, or process the material and hazards connected with the use of the material are solely the responsibility of the user and remain at his sole discretion. Compliance with all applicable federal, state, and local laws and regulations remains the responsibility of the user, and the user has the responsibility to provide a safe work place to examine all aspects of its operation and to determine if or where precautions, in addition to those described herein, are required.

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Material Name: Propane - UN1075 Specific SDS ID: 0024B010

Section 1 - PRODUCT AND COMPANY IDENTIFICATION

Material Name
Propane - UN1075 Specific
Synonyms
DIETHYLMAL PROPANE; MTG MIZIB-96; N-PROPANE; DIMETHYLMETHANE; PROPYLHYDRIDE; R-290; PROPYLHYDRIDE; LIQUEFIED PETROLEUM GAS; LPG; >90% NATURAL GRADE; >99.9% PURE GRADE; UN 1978; C3H8
Chemical Family
Hydrocarbon, aliphatic
Product Description
Classification determined in accordance with Compressed Gas Association standards
Product Use
Industrial and Specialty Gas Applications.
Restrictions on Use
None known.
Details of the supplier of the safety data sheet
MATHESON TRI-GAS, INC.
959 Lake Carolyn Parkway
Suite 1100
Irving, TX 75039
General Information: 1-800-416-2505
Emergency #: 1-800-424-9300 (CHEMTREC)
Outside the US: 703-527-3887 (Collect calls)

Section 2 - HAZARDS IDENTIFICATION

Classification in accordance with paragraph (d) of 29 CFR 1910.1200.
Flammable Gases - Category 1
Gases Under Pressure - Liquefied gas
Simple Asphyxiant
GHS Label Elements
Symbol(s)

Signal Word
Danger
Hazard Statement(s)
Extremely flammable gas
Contains gas under pressure; may explode if heated
May displace oxygen and cause rapid suffocation
Precautionary Statement(s)
Prevention
Keep away from heat/sparks/open flame/hot surfaces. - No smoking.
Response

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Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
Eliminate all ignition sources if safe to do so.

Storage
Protect from sunlight. Store in a well-ventilated place.

Disposal
Dispose of contents/container in accordance with local/regional/national/international regulations.

Other Hazards
May cause frostbite upon sudden release of liquefied gas.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

CAS	Component Name	Percent
74-98-6	Propane	>96

Section 4 - FIRST AID MEASURES

Inhalation
If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Skin
If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115°F; 41-46°C). DO NOT USE HOT WATER. If warm water is not available, gently wrap affected parts in blankets. Get immediate medical attention.

Eyes
Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Then get immediate medical attention.

Ingestion
If swallowed, get medical attention.

Most Important Symptoms/Effects

Acute
Drowsiness, suffocation

Delayed
No information on significant adverse effects.

Indication of any immediate medical attention and special treatment needed
For inhalation, consider oxygen. Treat symptomatically and supportively.

Section 5 - FIRE FIGHTING MEASURES

Extinguishing Media

Suitable Extinguishing Media
regular dry chemical, carbon dioxide, Large fires: water spray or fog

Unsuitable Extinguishing Media
Do not direct water at source of leak or safety devices; icing may occur.

Special Hazards Arising from the Chemical
Severe fire hazard. Severe explosion hazard. Gas/air mixtures are explosive. The vapor is heavier than air. Vapors or gases may ignite at distant ignition sources and flash back. Electrostatic discharges may be generated by flow or agitation resulting in ignition or explosion.

Hazardous Combustion Products
Oxides of carbon

Fire Fighting Measures

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Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Apply water from a protected location or from a safe distance. Stay away from the ends of tanks. For fires in cargo or storage area: Cool containers with water from unmanned hose holder or monitor nozzles until well after fire is out. If this is impossible then take the following precautions: Keep unnecessary people away, isolate hazard area and deny entry. Let the fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tanks due to fire. For tank, rail car or tank truck, Evacuation radius: 1600 meters (1 mile). Stop leak if possible without personal risk. Let burn unless leak can be stopped immediately. For smaller tanks or cylinders, extinguish and isolate from other flammables.

Special Protective Equipment and Precautions for Firefighters
Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

Section 6 - ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment and Emergency Procedures
Wear personal protective clothing and equipment, see Section 8.

Methods and Materials for Containment and Cleaning Up
Avoid heat, flames, sparks and other sources of ignition. All equipment used when handling the product must be grounded. Remove sources of ignition. Do not touch or walk through spilled material. Stop leak if possible without personal risk. If possible, turn leaking containers so that gas escapes rather than liquid. Use water spray to reduce vapors or divert vapor cloud drift. Avoid allowing water runoff to contact spilled material. Do not direct water at spill or source of leak. Keep unnecessary people away, isolate hazard area and deny entry. Ventilate closed spaces before entering.

Environmental Precautions
Avoid release to the environment.

Section 7 - HANDLING AND STORAGE

Precautions for Safe Handling
Keep away from heat, sparks, open flame, and hot surfaces - No smoking. Avoid breathing dust/fume/gas/mist/vapors/spray. Use only outdoors or in a well-ventilated area. Wash hands thoroughly after handling. Close valve after each use and when empty. Never put cylinders into unventilated areas of passenger vehicles. Do not open valve until connected to equipment prepared for use.

Conditions for Safe Storage, Including any Incompatibilities
Protect from sunlight. Store in a well-ventilated place.
Store and handle in accordance with all current regulations and standards. Keep container tightly closed. Grounding and bonding required. Keep separated from incompatible substances.

Incompatible Materials
combustible materials, oxidizing materials

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

Component Exposure Limits

Propane	74-98-6
ACGIH:	(See Appendix F: Minimal Oxygen Content, explosion hazard)
NIOSH:	1000 ppm TWA ; 1800 mg/m3 TWA
	2100 ppm IDLH (10% LEL)
OSHA (US):	1000 ppm TWA ; 1800 mg/m3 TWA

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Mexico:	1000 ppm TWA [VLE-PPT]

ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)
There are no biological limit values for any of this product's components.

Engineering Controls
Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust ventilation system. Ensure compliance with applicable exposure limits. Use a back flow preventive device in the piping.

Individual Protection Measures, such as Personal Protective Equipment

Eye/face protection
For the gas: Eye protection not required, but recommended. For the liquid: Wear splash resistant safety goggles. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.

Skin Protection
For the gas: Protective clothing is not required. For the liquid: Wear appropriate protective, cold insulating clothing.

Respiratory Protection
The following respirators and maximum use concentrations are drawn from NIOSH and/or OSHA. 2000 ppm. Any supplied-air respirator. Any self-contained breathing apparatus with a full facepiece. Emergency or planned entry into unknown concentrations or IDLH conditions: - Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode. Any supplied-air respirator with a full facepiece that is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode. Escape - Any appropriate escape-type, self-contained breathing apparatus.

Glove Recommendations
Wear insulated gloves.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

Appearance	colorless gas	**Physical State**	gas
Odor	gasoline odor	**Color**	colorless
Odor Threshold	5000 - 20000 ppm	**pH**	Not available
Melting Point	-190 °C (-310 °F)	**Boiling Point**	-40 °C (-40 °F)
Boiling Point Range	Not available	**Freezing point**	Not available
Evaporation Rate	Not available	**Flammability (solid, gas)**	Flammable gas
Autoignition Temperature	450 °C (842 °F)	**Flash Point**	-105 °C (-157 °F)
Lower Explosive Limit	2.1 %	**Decomposition temperature**	Not available
Upper Explosive Limit	9.5 %	**Vapor Pressure**	6196 mmHg @ 20.0 °C
Vapor Density (air=1)	1.55	**Specific Gravity (water=1)**	0.5051 @ -45 °C

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Water Solubility	(Very slightly soluble)	**Partition coefficient: n-octanol/water**	Not available
Viscosity	Not available	**Kinematic viscosity**	Not available
Solubility (Other)	Not available	**Density**	Not available
Log KOW	2.36	**Physical Form**	Liquefied gas
Molecular Formula	C-H3-C-H2-C-H3	**Molecular Weight**	44.11
Critical Temperature	96.74 °C		

Solvent Solubility
Soluble
absolute alcohol, ether, chloroform, benzene, turpentine

Section 10 - STABILITY AND REACTIVITY

Reactivity
No reactivity hazard is expected.
Chemical Stability
Stable at normal temperatures and pressure.
Possibility of Hazardous Reactions
Will not polymerize.
Conditions to Avoid
Avoid heat, flames, sparks and other sources of ignition. Minimize contact with material. Containers may rupture or explode if exposed to heat.
Incompatible Materials
combustible materials, oxidizing materials
Hazardous decomposition products
Oxides of carbon

Section 11 - TOXICOLOGICAL INFORMATION

Information on Likely Route of Exposure
Inhalation
nausea, suffocation , vomiting, irregular heartbeat, headache, drowsiness, dizziness, disorientation, mood swings, loss of coordination, convulsions, unconsciousness, coma
Skin Contact
blisters, frostbite
Eye Contact
frostbite, blurred vision
Ingestion
ingestion of a gas is unlikely
Acute and Chronic Toxicity
Component Analysis - LD50/LC50
The components of this material have been reviewed in various sources and the following selected endpoints are published:
Propane (74-98-6)
Inhalation LC50 Rat - 800000 ppm 15 min

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Product Toxicity Data
Acute Toxicity Estimate

Inhalation - Gas	20000 ppm

Immediate Effects
frostbite, suffocation
Delayed Effects
No information on significant adverse effects.
Irritation/Corrosivity Data
No data available
Respiratory Sensitization
No data available
Dermal Sensitization
No data available
Component Carcinogenicity
None of this product's components are listed by ACGIH, IARC, NTP, DFG or OSHA.
Germ Cell Mutagenicity
No data available
Teratogenic Data
No data available
Reproductive Toxicity
No data available
Specific Target Organ Toxicity - Single Exposure
No target organs identified.
Specific Target Organ Toxicity - Repeated Exposure
No target organs identified.
Aspiration hazard
Not applicable
Medical Conditions Aggravated by Exposure
None known.
Additional Data
Stimulants such as epinephrine may induce ventricular fibrillation.

Section 12 - ECOLOGICAL INFORMATION

Component Analysis - Aquatic Toxicity
No LOLC ecotoxicity data are available for this product's components.
Persistence and Degradability
This material is expected to biodegrade.
Bioaccumulative Potential
Bioconcentration potential in aquatic organisms is low based on a BCF value of 43.
Mobility
Expected to have moderate mobility in soil.
Other Toxicity
No additional information is available.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Methods
Dispose in accordance with all applicable regulations.
Component Waste Numbers

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The U.S. EPA has not published waste numbers for this product's components.

Section 14 - TRANSPORT INFORMATION

US DOT Information:
Shipping Name: PETROLEUM GASES, LIQUEFIED
Hazard Class: 2.1
UN/NA #: UN1075
Required Label(s): 2.1

IMDG Information:
Shipping Name: PETROLEUM GASES, LIQUEFIED
Hazard Class: 2.1
UN#: UN1075
Required Label(s): 2.1
International Bulk Chemical Code
This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

Section 15 - REGULATORY INFORMATION

U.S. Federal Regulations
None of this product's components are listed under SARA Sections 302/304 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), or require an OSHA process safety plan.
SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories
Flammable, Gas Under Pressure, Simple Asphyxiant
U.S. State Regulations
The following components appear on one or more of the following state hazardous substances lists:

Component	CAS	CA	MA	MN	NJ	PA
Propane	**74-98-6**	No	Yes	Yes	Yes	Yes

California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)
Not listed under California Proposition 65.
Component Analysis - Inventory
Propane (74-98-6)

US	CA	AU	CN	EU	JP - ENCS	JP - ISHL	KR KECI - Annex 1	KR KECI - Annex 2
Yes	DSL	Yes	Yes	EIN	Yes	Yes	Yes	No

KR - REACH CCA	MX	NZ	PH	TH-TECI	TW-CN	VN (Draft)
No	Yes	Yes	Yes	Yes	Yes	Yes

Section 16 - OTHER INFORMATION

NFPA Ratings
Health: 2 Fire: 4 Instability: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe
Preparation Date
New SDS: 10/05/2015

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Material Name: Propane – UN1075 Specific **SDS ID: 0024501G**

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CAMA MW WI PA - California Massachusetts Minnesota New Jersey Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations; CFR; CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC - European Commission; EEC - European Economic Community; EIN - European Inventory of Existing Commercial Chemical Substances; EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; INEL - Japan Industrial Safety and Health Law; IOCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol-water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI)/ Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; KR REACH CCA - Korea Registration and Evaluation of Chemical Substances Chemical Control Act; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOEL - Lowest Effect Level™ - ChemADVISOR's Regulatory Database; MAC - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX - Mexico; Na- Non-specific; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; Nq - Non-quantitative; NSL - Non-Domestic Substance List (Canada); NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL - Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH - Registration, Evaluation, Authorization, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit; TCCA - Korea Toxic Chemicals Control Act; TDG - Transportation of Dangerous Goods; TH TECI - Thailand - FDA Existing Chemicals Inventory (TECI); TLV - Threshold Limit Value; TSCA - Toxic Substances Control Act; TW - Taiwan; TWA - Time Weighted Average; TEL - Upper Explosive Limit; UNPNA - United Nations North American; US - United States; VLE - Exposure Limit Value (Mexico); VN (Draft) - Vietnam (Draft); WHMIS - Workplace Hazardous Materials Information System (Canada)

Other Information

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Safety Data Sheet

according to 29CFR1910/1200 and GHS Rev. 3

Effective date - 01.06.2015 Page 1 of 8

Hydrofluoric Acid,ACS

SECTION 1 : Identification of the substance/mixture and of the supplier

Product name : **Hydrofluoric Acid,ACS**

Manufacturer/Supplier Trade name.

Manufacturer/Supplier Article number **S25358**

Recommended uses of the product and uses restrictions on use:

Manufacturer Details:

AquaPhoenix Scientific
9 Barnhart Drive, Hanover, PA 17331

Supplier Details:

Fisher Science Education
15 Jet View Drive, Rochester, NY 14624

Emergency telephone number

Fisher Science Education Emergency Telephone No., 866.928.0789

SECTION 2 : Hazards identification

Classification of the substance or mixture:

Corrosive
Serious eye damage, category 1
Corrosive to metals, category 1
Skin corrosion, category 1B

Acute
Specific target organ toxicity Respiratory tract irritation, Category 3

Corr. Metals 1
Corr. Skin 1B
Eye Damage 1
STOT, SE 3

Signal word Danger

Hazard statements:

May be corrosive to metals
Causes severe skin burns and eye damage
May cause respiratory irritation

Precautionary statements

If medical advice is needed, have product container or label at hand
Keep out of reach of children
Read label before use
Use only outdoors or in a well-ventilated area
Wear protective gloves/protective clothing/eye protection/face protection
Keep only in original container
Do not get in eyes, on skin, or on clothing
Wash skin thoroughly after handling
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting

Safety Data Sheet

according to 29CFR1910/1200 and GHS Rev. 3

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Hydrofluoric Acid,ACS

IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing
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/physician
Specific treatment (see supplemental first aid instructions on this label)
Wash contaminated clothing before reuse
Absorb spillage to prevent material damage
Store in a well-ventilated place. Keep container tightly closed
Store locked up
Store in corrosive resistant stainless steel container with a resistant inner liner
Dispose of contents and container to an approved waste disposal plant

Other Non-GHS Classification:

WHMIS

D1A

E

NFPA/HMIS

NFPA SCALE 0-4

HMIS RATINGS 0-4

SECTION 3 : Composition/information on ingredients

Ingredients:

CAS 7664-39-3	Hydrofluoric Acid,ACS	50.50 %
CAS 7732-18-5	Water	49.50 %
		Percentages are by weight

SECTION 4 : First aid measures

Description of first aid measures

After inhalation: Move exposed individual to fresh air. Loosen clothing as necessary and position individual in a comfortable position. Seek medical attention. If irritation or coughing persists,

After skin contact: Wash affected area with soap and water. Immediately remove contaminated clothing and shoes. Rinse thoroughly with plenty of water for at least 15 minutes. Immediately seek medical attention.

After eye contact: Protect unexposed eye. Flush thoroughly with plenty of water for at least 15

minutes,Remove contact lenses while rinsing,Continue rinsing eyes during transport to hospital.

After swallowing: Rinse mouth thoroughly. Do not induce vomiting. Have exposed individual drink cups of water. Immediately seek medical attention.

Most important symptoms and effects, both acute and delayed:

Inhalation may cause irritation to nose and upper respiratory tract, ulceration, coughing, chest tightness and shortness of breath. Higher concentrations cause laryngospasm, pulmonary oedema and suffocation . Ingestion may cause corrosion of lips, mouth, oesophagus and stomach. dysphagia and vomiting,Pain, eye ulceration, conjunctival irritation, cataracts and glaucoma may occur ?Meeting eye exposure,Erythema and skin irritation, as well as chemical burns to skin and mucous membranes may arise following skin exposure.Potential regular following ingestion of hydrochloric acid include perforation, scarring of the oesophagus or stomach and stricture formation causing dysphagia or gastric outlet obstruction. In some cases. RADS may develop. Respiratory symptoms may take up to 36 hours to develop.Symptoms of burning sensation, cough, wheezing, laryngitis, shortness of breath, spasm, inflammation, edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema. Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes and skin.

Indication of any immediate medical attention and special treatment needed:

Provide SDS to Physician.Physician should treat symptomatically.

SECTION 5 : Firefighting measures

Extinguishing media

Suitable extinguishing agents: Use water, dry chemical, chemical foam, carbon dioxide, or alcohol-resistant foam.

For safety reasons unsuitable extinguishing agents:

Special hazards arising from the substance or mixture:

Combustion products may include carbon oxides or other toxic vapors if in contact with metals.Toxic fumes may be released.

Advice for firefighters:

Protective equipment: Wear protective eyewear, gloves, and clothing. Refer to Section 8. Wear respiratory protection.

Additional information (precautions): The mist decomposition can produce poisoning chlorine. Hydrochloric acid reacts also with many organic materials with liberation of heat.Avoid inhaling gases, fumes, dust, mist, vapor, and aerosols. Avoid contact with skin, eyes, and clothing.

SECTION 6 : Accidental release measures

Personal precautions, protective equipment and emergency procedures:

Ensure adequate ventilation. Ensure that ventilating systems are operational.

Environmental precautions:

Should not be released into environment. Prevent from reaching drains, sewer, or waterway.

Methods and material for containment and cleaning up:

Always obey local regulations. If necessary use trained response staff or contractor. Evacuate personnel to safe areas. Containerize for disposal. Refer to Section 13. Keep in suitable closed container for disposal. Soak up with inert absorbent material and dispose of as hazardous waste. Cover spill with soda ash or calcium carbonate. Mix and add water to form slurry.Wear protective eyewear, gloves, and clothing. Refer to Section 8.

Reference to other sections:

SECTION 7 : Handling and storage

Precautions for safe handling:

Prevent formation of aerosols. Never use hot water and never add water to the acid.Do not allow contact between hydrochloric acid, metal and organics.Follow good hygiene procedures when handling chemical materials. Refer to Section 8. Prevent contact with skin, eyes, and clothing. Follow proper disposal methods. Refer to Section 13. Do not eat, drink, smoke or use personal products when handling chemical substances. Use only in well ventilated areas.Avoid splashes or spray in enclosed areas.

Conditions for safe storage, including any incompatibilities:

Store in a cool place. Keep away from food and beverages. Protect from freezing and physical damage. Store away from incompatible materials. Provide ventilation for containers. Keep container tightly sealed.Containers for hydrochloric acid must be made from corrosion resistant materials: glass, polyethylene, polypropylene, polyvinylchloride, carbon steel lined with rubber or plastic.

SECTION 8 : Exposure controls/personal protection

Control Parameters: 7647-01-0: Hydrochloric Acid, ACGIH: 2 ppm Ceiling
7647-01-0: Hydrochloric Acid, NIOSH: 5 ppm Ceiling; 7 mg/m3 Ceiling

Appropriate Engineering controls: Provide exhaust ventilation or other engineering controls to keep the airborne concentrations of vapor and mists below the applicable workplace exposure limits (Occupational Exposure Limits (OEL) indicated above. Emergency eye wash fountains and safety showers should be available in the immediate vicinity of handling.

Respiratory protection: Not required under normal conditions of use. Where risk assessment shows air-purifying respirators are appropriate use a full face particle respirator type N100 (US) or type P3 (EN 143) respirator cartridges as a backup to engineering controls. When necessary use NIOSH approved breathing equipment.

Protection of skin: Select glove material impermeable and resistant to the substance. Select glove material based on rates of diffusion and degradation. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Use proper glove removal technique without touching outer surface. Avoid skin contact with used gloves. Wear protective clothing.

Eye protection: Face shield (8 inch minimum).Tightly fitting safety goggles.

General hygienic measures: Perform routine housekeeping. Wash hands before breaks and immediately after handling the product. Avoid contact with skin, eyes, and clothing. Before reopening wash contaminated clothing.

SECTION 9 : Physical and chemical properties

Appearance (physical state,color):	Clear, colorless liquid.	**Explosion limit lower Explosion limit upper**	Non Explosive Non Explosive
Odor:	Pungent odor	**Vapor pressure:**	5.3mmHg @ 0C
Odor threshold:	0.1 - 16.8 mg/m3	**Vapor density:**	1.27 (Air=1)
pH value:	< 1	**Relative density:**	1.0 - 1.2

Melting/Freezing point:	-74 C	**Solubility:**	Miscible
Boiling point/Boiling range:	81.5 - 110 C	**Partition coefficient (n-octanol/water):**	Not Determined
Flash point (closed cup):	Not Applicable	**Auto/Self-ignition temperature:**	Not Determined
Evaporation rate:	>1.00	**Decomposition temperature:**	Not Determined
Flammability (solid,gaseous):	non combustible	**Viscosity:**	a. Kinematic: Not Determined b. Dynamic: Not Determined

Density: Not Determined
Hydrochloric Acid:PPM 9.20,AM

SECTION 10 : Stability and reactivity

Reactivity: Reacts violently with bases and is corrosive.
Chemical stability: No decomposition if used and stored according to specifications.
Possible hazardous reactions: Attacks many metals in the presence of water forming flammable explosive gas (hydrogen).Reacts violently with oxidants forming toxic gas (chlorine).
Conditions to avoid: Incompatible materials.
Incompatible materials: Bases. Amines. Alkali metals. Metals. permanganates (potassium permanganate). Fluorine. Metal acetylides. Hexafluorium dioxide.
Hazardous decomposition products: Hydrogen chloride gas,Carbon oxides.

SECTION 11 : Toxicological information

Acute Toxicity		
Inhalation:	7647-01-0	LD50 Rat 3124 ppm/hour
Oral:	7647-01-0	LD50 Rat 238 - 277 mg/kg
Dermal:	7647-01-0	LD50 Rabbit >5010 mg/kg
Chronic Toxicity: No additional information.		
Corrosion Irritation		
Dermal:	7647-01-0	Skin - rabbit Result: Causes burns.
Ocular:	7647-01-0	Eyes - rabbit Result: Corrosive to eyes
Sensitization:		No additional information.
Single Target Organ (STOT):		7647-01-0: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.
Numerical Measures:		No additional information.
Carcinogenicity:		No additional information.
Mutagenicity:		No additional information.

Reproductive Toxicity.	No additional information.

SECTION 12 : Ecological information

Ecotoxicity

7647-01-0: Toxicity to fish LC50 - Gambusia affinis (Mosquito fish) - 282 mg/l - 96 h Hydrochloric acid

Persistence and degradability

Bioaccumulation potential

Mobility in soil

Other adverse effects.

SECTION 13 : Disposal considerations

Waste disposal recommendations

Do not allow product to reach sewage system or open water. It is the responsibility of the waste generator to properly characterize all waste materials according to applicable regulatory entirety (US 40CFR262.11, Contact a licensed professional waste disposal service to dispose of this material. Dispose of empty containers as unused product. Product or containers must not be disposed together with household garbage. Chemical waste generators must determine whether a discarded chemical is classified as a hazardous waste. Chemical waste generators must also consult local, regional, and national hazardous waste regulations. Ensure complete and accurate classification.

SECTION 14 : Transport information

UN-Number

1789

UN proper shipping name

HYDROCHLORIC ACID

Transport hazard class(es)

Class:
8 Corrosive substances

Packing group II

Environmental hazard

Transport in bulk

Special precautions for user

SECTION 15 : Regulatory information

United States (USA)

SARA Section 311/312 (Specific toxic chemical listings).

Acute

SARA Section 313 (Specific toxic chemical listings)

7647-01-0 Hydrochloric acid

RCRA (hazardous waste code)

None of the ingredients is listed

TSCA (Toxic Substances Control Act)

All ingredients are listed.

CERCLA (Comprehensive Environmental Response, Compensation, and Liability Act):

7647-01-0 Hydrochloric acid 5000 lbs

Proposition 65 (California):

Chemicals known to cause cancer:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for females:

None of the ingredients is listed

Chemicals known to cause reproductive toxicity for males:

None of the ingredients is listed

Chemicals known to cause developmental toxicity:

None of the ingredients is listed

Canada

Canadian Domestic Substances List (DSL)

All ingredients are listed.

Canadian NPRI Ingredient Disclosure list (limit 0.1%):

None of the ingredients is listed

Canadian NPRI Ingredient Disclosure list (limit 1%):

7647-01-0 Hydrochloric acid

SECTION 16 : Other information

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.Note:. The responsibility to provide a safe workplace remains with the user.The user should consider the health hazards and safety information contained herein as a guide and should take these precautions required in an individual operation to instruct employees and develop work practice procedures for a safe work environment.The information contained herein is, to the best of our knowledge and belief, accurate.However, since the conditions of handling and use are beyond our control, we make no guarantee of results, and assume no liability for damages incurred by the use of this material.It is the responsibility of the user to comply with all applicable laws and regulations applicable to this material.

GHS Full Text Phrases:

Abbreviations and acronyms:

IMDG: International Maritime Code for Dangerous Goods
PNEC: Predicted No-Effect Concentration (REACH)
CFR: Code of Federal Regulations (USA)
SARA: Superfund Amendments and Reauthorization Act (USA)
RCRA: Resource Conservation and Recovery Act (USA)
TSCA: Toxic Substances Control Act (USA)
NPRI: National Pollutant Release Inventory (Canada)
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)

Effective date : 01.06.2015
Last updated : 05.26.2015

ATTACHMENT I

Emission Units Table

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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*	Emission Point ID*	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type* and Date of Change	Control Device**
000	1000	Thermal Oxidizer (Re-Ox)	2024	1.7 MMBTU/hr	New	1C
1000	1000	Emergency Flare (Back)	2024	12,247 lbs/hr	New	2C
200	1000	Macerator/Shredder	2024	3.542 Ton/hr	New	N/A
220	1000	Dryer	2024	7,700 lb/hr	New	1C/2C
300	300	Pyrolysers	2024	70 tpd	New	1C/2C
400	1000	Gas Cleanup System	2024		New	1C/2C
600	1000	Engines	2024	120 kW	New	1C/2C

* For Emission Units (or Sources) use the following numbering system: 10, 20, 30... or other appropriate designation.
* For Emission Points use the following numbering system: 1E, 2E, 1E... or other appropriate designation.
*New, modification, removal
** For Control Devices use the following numbering system: 1C, 2C, 3C... or other appropriate designation.

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Emission Units Table
(11/2007

ATTACHMENT J

Emission Points Data Summary Sheet

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Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data

Emission Point ID No. (Must match Emission Unit Table & Plot Plan)	Emission Point Type [1]	Emission Unit Vented Through This Point (Must match Emission Unit Table & Plot Plan)		Air Pollution Control Device (Must match Emission Unit Table & Plot Plan)		Vent Time for Emission Unit (Chemical processes only)		All Regulated Pollutants - Chemical Name/CAS[2] (Speciate VOCs & HAPs)	Maximum Potential Uncontrolled Emissions [3]		Maximum Potential Controlled Emissions [3]		Emission Form or Phase (at exit conditions, solid, liquid or gas/vapor)	Est. Method Used [4]	Emission Concentration [5] (ppm or mg/m³)
		ID No.	Device	ID No.	Device Type	Start (hr/yr)	Stop (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
1000	Thermal Oxidizer (RTO) Flare Stack		RTO (1000) Flare (1001) Stretcher (20) Draw (22) Pickover (30) Gas Cleanup System (40) Engine (50)	1000	Stack (RTO) Flare)		8,760	NOx CO SO2 PM-10 PM-2.5 VOC Methane (CH4) HAP	4.75 23.80 3.00 4.00 1.00 3.00 0.00	20.8 104.3 13.1 17.5 4.4 13.1 0.0	4.75 23.80 3.00 4.00 1.00 3.00 0.00	20.8 104.3 13.1 17.5 4.4 13.1 0.0	gas	EE	20 ppm 0.099 ppm 0.234 ppm 0.0 ppm 0.0 ppm 0.0 ppm 0.0 ppm

The EMISSION POINTS DATA SUMMARY SHEET provides a summation of emissions by emission unit. Note that unsaturated process emission and emissions are not typically considered to be fugitive and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSIONS 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. unsaturated emissions).

[1] Please add descriptions 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., 10 minutes). Indicate as many rates as needed to clarify frequency of venting (e.g. 1 minutes; 2 daily).

[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. 1/hr VOCD minute batch).

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

[6] 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/m³) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR6). If the pollutant is SO_2, use units of ppmv (See 45CSR10).

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Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data

Emission Point ID No. (Must match Emission Unit 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
1000	2.20	1,742	11,484	TBD	TBD	TBD	TBD	TBD

Is there going to be two stacks (e.g., RTO stack and Flare) or a single emission point with the RTO exhaust venting to the flare? Plus, there should be no TBDs in this form.

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

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ATTACHMENT K

Fugitive Emissions Data Summary Sheet

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Attachment K
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 unsaturated 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. unsaturated 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 ☐ 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", to

Page 1 of 2 Revision 2/11

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						
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks	Synthetic Natural Gas/74-82-8 Propane/74-98-6		60.41			
General Cleanup VOC Emissions						
Other						

There should be some potential leaks due to the handling of oil and gas. Also the haul road emissions should be identified as well.

[1] List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. List Acids, CO, CSs, VOCs, H2S, Inorganics, Lead, Organics, O3, NO, NO2, SO2, SO3, all applicable Greenhouse Gases (including CO2 and methane), etc. DO NOT LIST H2, H2O, N2, O2, 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 Units Data Sheet

Attachment L
EMISSIONS UNIT DATA SHEET
CHEMICAL PROCESS

For chemical processes please fill out this sheet and all supplementary forms (see below) that apply. Please check all supplementary forms that have been completed.

- ☐ ***Emergency Vent Summary Sheet***
- ☐ ***Leak Sources Data Sheet***
- ☐ ***Topology Data Sheet***
- ☐ ***Reactor Data Sheet***
- ☐ ***Distillation Column Data Sheet***

1. Chemical process area name and equipment ID number (as shown in ***Equipment List Form***)

2. Standard Industrial Classification Codes (SICs) for process(es)

3. List raw materials and ☐ attach MSDSs

4. List Products and Maximum Production and ☐ attach MSDSs

Description and CAS Number	Maximum Hourly (lb/hr)	Maximum Annual (ton/year)

5. Complete the ***Emergency Vent Summary Sheet*** for all emergency relief devices.

6. Complete the ***Leak Source Data Sheet*** and describe below or attach to application the leak detection or maintenance programs to minimize fugitive emissions. Include detection instruments, calibration gases or methods, planned inspection frequency, and record-keeping, and similar pertinent information. If subject to a rule requirement (e.g., 40CFR60, Subpart VV), please list those here.

7. Clearly describe below or attach to application Accident Procedures to be followed in the event of an accidental spill or release.

8A. Complete the **Toxicology Data Sheet** or attach to application a toxicology report (an up-to-date material safety data sheets (MSDS) may be used) outlining the currently known acute and chronic health effects of each compound or chemical entity emitted to the air. If these compounds have already been listed in Item 3, then a duplicate MSDS sheet is not required. Include data such as the OSHA time weighted average (TWA) or mutagenicity, teratogenicity, irritation, and other known or suspected effects should be addressed. Indicate where these are unknown, and provide references. 8B. Describe any health effects testing or epidemiological studies on these compounds that are being or may be conducted by the company or required under TSCA, RCRA or other federal regulations. Discuss the persistence in the environment of any emission (e.g. pesticides, etc.).	
9. **Waste Products** - Waste products status: (If source is subject to RCRA or 45CSR25, please contact the Hazardous Waste Section of WVDEP, OAQ at (304) 926-3647.)	
9A. Types and amounts of wastes to be disposed:	
9B. Method of disposal and location of waste disposal facilities. Carrier: Phone:	
9C. Check here if approved USEPA/State Hazardous Waste Landfill will be used ☐	

10. Maximum and Projected Typical Operating Schedule for process or project as a whole (circle appropriate units).

circle units:	(hrs/day) (hr/batch)	(days), (batches/day), (batches/week)	(days/yr), (weeks/year)
10A. Maximum			
10B. Typical			

11. Complete a ***Reactor Data Sheet*** for each reactor in this chemical process.

12. Complete a ***Distillation Column Data Sheet*** for each distillation column in this chemical process.

13. **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
REPORTING	TESTING

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 or 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 or air pollution control device.

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

INFORMATION REQUIRED FOR CHEMICAL PROCESSES

The notes listed below for chemical processes are intended to help the applicant submit a complete application to the OAQ; these notes are not intended to be all inclusive. The requirements for a complete application for a permit issued under 45CSR13 are designed to provided enough information for a permit reviewer to begin a technical review. Additional information beyond that identified may be required to complete the technical review of any individual application.

Process Description

Please keep these points in mind when completing your process description as part of this permit application.

1. Provide a general process overview. This brief, but complete, process description should include chemical or registered trademark names of chemical products, intermediates, and/or raw materials to be produced or consumed, and the ultimate use(s) of the product(s). A list of the various chemical compounds is helpful.
2. Describe each process step. Include the process chemistry and stoichiometrically balanced reaction equation or material mass balance on all components.
3. Describe the methods and equipment used to receive, store, handle, and charge raw materials.
4. Describe the methods and equipment used to handle, store, or package final products and intermediates.
5. Provide process flow diagrams or equipment layout drawings which clearly show the process flow relationships among all pieces of process and control equipment. Identify all air emission discharge points. Discuss instrumentation and controls for the process.
6. Discuss the possibilities of process upsets, the duration and frequency of upsets, and consequences (including air emissions) of these upsets. Include a description of rupture discs, pressure relief valves, and secondary containment systems.
7. Discuss any fugitive emissions and the methods used to minimize them.
8. Include the following plans for the process if available:
   a. preventative maintenance and malfunction abatement plan (recommended for all control equipment).
   b. continuous emissions (in-stack) monitoring plan
   c. ambient monitoring plan
   d. emergency response plan

Regulatory Discussion

The following state and federal air pollution control regulations may be applicable to your chemical process. You should review these regulations carefully to determine if they apply to your process. Please summarize the results of your review in your permit application along with any other regulations you believe are applicable.

- Title 45 Legislative Rule Division of Environmental Protection, Office of Air Quality contains West Virginia's air pollution control regulations, including the following promulgated rules which may require emissions reductions or control technologies for your chemical process.
  a. 45CSR27 - Best Available Technology (BAT) for Toxic Air Pollutants (TAPs)
  b. 45CSR21 - VOC emissions controls for ozone maintenance in Kanawha, Cabell, Putnam, Wayne, and Wood counties.
  c. 45CSR13 (Table 45-13A) - plantwide emission thresholds for permitting for certain pollutants.
- Federal Guidelines for case-by-case MACT determinations under section 112(g) of the 1990 CAAA for individual and total HAPs greater than 10 and 25 tons per year, respectively.
- There are also subparts of the federal Standards of Performance for New Stationary Sources (NSPS), 40CFR60 60, and the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40CFR61 and 40CFR63, which apply to various chemical and nonchemical processes. These subparts are too numerous to list here, but these areas of the federal regulations should be consulted carefully to determine applicability to your process.

Emissions Summary and Calculations

Please keep these points in mind when submitting your emissions calculations as part of this permit application.

1. For each pollutant, provide the basis for the emissions estimate and for all emission reduction(s) or control efficiency(ies) claimed.
2. For all batch processes provide the following
   a. Emissions of each pollutant in pound(s) per batch, from each process step
   b. Annual emissions based on number of batches requested per year
   c. The total time for each process step and the duration of the emissions during the process step
   d. Total batch time, total emissions per batch (or per day), and annual emissions based on the number of batches requested per year.

EMERGENCY VENT SUMMARY SHEET

List below all emergency relief devices, rupture disks, safety relief valves, and similar openings that will vent only under abnormal conditions.

Emission Point ID[1]	Equipment to Relief Vent (type, ID if available)[2]	Relief Vents (type) & Set Pressure (psig)	Name of Chemical(s) or Pollutants Controlled	Worst Case Emission per Release Event (lbs)

All routine vents (non-emergency) should be listed on the ***Emission Point Data Summary Sheet***.

[1] Indicate the emission point, if any, to which source equipment normally vents. Do not assign emission point ID numbers to each emergency relief vent or device.

[2] List all emergency relief devices next to the piece of equipment from which they control releases.

LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average time to Repair (days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	light liquid VOC[6,7]				
	heavy liquid VOC[7]				
	Non-VOC[7]				
Valves[12]	Gas VOC				
	Light Liquid VOC				
	Heavy Liquid VOC				
	Non-VOC				
Safety Relief Valves[1]	Gas VOC				
	Non VOC				
Open-ended Lines[10]	VOC				
	Non-VOC				
Sampling Connections[11]	VOC				
	Non-VOC				
Compressors	VOC				
	Non-VOC				
Flanges	VOC				
	Non-VOC				
Other	VOC				
	Non-VOC				

[1, 12] See notes on the following page.

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q/S/A/O" means the time period between inspections as follows:

   Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

   If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with non checked at any other frequency, you would put in the category "valves, gas service": 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance, EE - engineering estimate, EPA - emission factors established by EPA (cite document used), O - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR § 51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.

9. LIST CO, H_2S, mineral acids, NO, NO_2, SO_2, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.

12. Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

TOXICOLOGY DATA SHEET[1]

Descriptor Name/CAS Number[2]	OSHA Limits[3] TWA	OSHA Limits[3] C/L	Acute[4] TC_{LO} - Animal LC_{LO} - Animal LD_{LO} - Animal	Chronic[4]	Irritation[5]	References

[1] Indicate by "ND" where no data exists, in company's knowledge.
[2] Time Weighted Average, Ceiling Limit, or other, with units.
[3] If inhalation data is not available, provide other data as available
[4] Relying on animal or human studies. Indicate if any data suggests: C = carcinogenicity, M = mutagenicity, T = teratogenicity, O = oncogenicity.
[5] Indicate if there are dermal or eye irritation effects and whether they are considered to be low, moderate, or severe.

REACTOR DATA SHEET

Provide the following information for each piece of equipment that is a potential or actual source of emissions as shown on the **Equipment List Form** and other parts of application.

Identification Number (as shown on **Equipment List Form**): 106

1. Name and type of equipment (e.g. CSTR, plug flow, batch, etc.)
   Pyrolyzers

2. Type of operation: ☐ Batch ☒ Continuous ☐ Semi-batch

3. Projected Actual Equipment Operating Schedule (complete appropriate lines):
   24 hrs/day 7 days/week 52 weeks/year
   hrs/batch batches/day, weeks day, weeks/yr (Circle one) (Circle one)

4. Feed Data Flow In = Varies on Batch gal/hr, or gal/batch

Material Name & CAS No.	Phase[a]	Specific Gravity	Vapor Pressure[b]	Charge Rate Normal	Charge Rate Max	Charge Rate Units	Fill Time (min/batch, run)[c]
Varies	S	TBD	N/A	Varies	70	tpd	Varies

a. S = Solid, L = Liquid, G = gas or vapor
b. At feed conditions
c. Total time that equipment is filling per batch or run (staircase), for tank or vessel-type equipment.

5. Provide all **chemical reactions** that will be involved (if applicable), including the residence time and any side reactions that may occur as well as gases that may be generated during these reactions. Indicate if the reaction(s) are exothermic or endothermic.

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☐

6. Maximum Temperature		7A. Maximum Pressure 7B. Max. Set Pressure for venting			
300	°C	-0.15	mmHg	-0.15	mmHg
☒ N/A	°F	N/A	psig	N/A	psig

8. Output Data Flow Out = gal/hr or gal/batch

Material Name and CAS No.	Phase	Specific Gravity	Vapor Pressure	Hourly or Batch Output Rate Normal	Maximum	Units
Varies per feed	VOC	TBD	TBD	TBD	TBD	
☐						

9. Complete the following emission data for equipment connected to a header exhaust system, giving emissions levels before entering header system (i.e. before control equipment).

Check here if not applicable

Emission Point ID (exhaust point of header system): 1000

Material Name and CAS No.	Maximum Potential Emission Rate (lb/hr)	Method **
TBD		

** MB - material balance; EE - Engineering Estimate; TM - Test Measurement (submit test data); O - other (Explain)

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10. Provide the following information pertaining to each condenser that may be attached to this reactor. Attach additional pages as necessary if more than one condenser is used for this reactor. Complete the Condenser Air Pollution Control Device Sheet if necessary.

Check here if not applicable

10A. Cooling material

10B. Minimum and Maximum flowrate of cooling material (gal/hr)

10C. Inlet temperature of cooling material (°F)

10D. Outlet temperature of cooling material (°F)

10E. Pressure drop of gas to be condensed from inlet to outlet (psig)

10F. Inlet temperature of gas stream (°F)

10G. Outlet temperature of gas stream (°F)

10H. Number of passes

10I. Cooling surface area

11. Provide the following pertaining to auxiliary equipment that burns fuel (heaters, dryers, etc.)

Check here if not applicable

11A. Type of fuel and maximum fuel burn rate, per hour:

Natural Gas for startup at 122cfm for 8hrs, syngas to continue process once start-up has been completed.

11B. Provide maximum percent sulfur (S), ash content of fuel, and the energy content using appropriate units.

%S % Ash BTU/lb, std. ft³/day, gal

(circle one)

11C. Theoretical combustion air requirement in SCFD per unit of fuel (circle appropriate unit) @ 70°F and 14.7 PSIA:

SCFD/lb, SCFD, gal (circle one)

11D. Percent excess air: %

11E. Type, amount, and BTU rating of burners and all other firing equipment that are planned to be used.

11F. Total maximum design heat input: x10⁶ BTU/hr.

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12. **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
Weekly and monthly inspections according to manufacturer specifications.

RECORDKEEPING
All Weekly and Monthly inspections along with any malfunctions.

REPORTING
Any malfunctions.

TESTING
Per request

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 OR 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 OR AIR POLLUTION CONTROL DEVICE.

13. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
N/A

NOTE: An **AIR POLLUTION CONTROL DEVICE SHEET** must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this reactor.

DISTILLATION COLUMN DATA SHEET

Identification Number (as assigned on **Equipment List Form**):

1. Name and type of equipment
2. Projected actual equipment operating schedule (complete appropriate lines):
   hrs/day days/week weeks/year
   hrs/batch batches/day, batches/week: (circle one) days/yr, weeks/yr (circle one)
2. Number of stages (plates), excluding condenser
3. Number of feed plates and stage location
4. Specify details of any reheating, recycling, or stage conditioning along with the stage locations
5. Specify reflux ratio, R (where R is defined as the ratio of the reflux to the overhead product, given symbolically as R=L/D, where L = liquid down column, D = distillation product)
6. Specify the fraction of feed which is vaporized, f (where f is the molar fraction of the feed that leaves the feed plate continuously as vapor).

7A. Type of condenser used: total partial multiple other
7B. For each condenser provide process operating details including all in let and outlet temperatures, pressures, and compositions.

8. Feed Characteristics
   A. Molar composition
   B. Individual vapor pressure of each component
   C. Total feed stage pressure
   D. Total feed stage temperature
   E. Total mass flow rate of each stream into the system
9. Overhead Product
   A. Molar composition of components
   B. Vapor pressure of components
   C. Total mass flow rate of all streams leaving the system as overhead products
10. Bottom Product
   A. Molar composition of all components
   B. Total mass flow rate of all streams leaving the system as bottom products

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Email: info@technotherm.co.za | Tel: 010 045 3883
VAT: 4080172245 | CK No: 2001/000284/07
All trade enquiries, please quote quote no.
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F. Any other information necessary of describe the operation of this distillation column.

12. **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

REPORTING

TESTING

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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 OR 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 OR AIR POLLUTION CONTROL DEVICE.

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

NOTE: An **AIR POLLUTION CONTROL DEVICE SHEET** must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this distillation column.

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Pyrolyser Plant

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(Area-010)

Phase Pyroliser for Power Plant

[redacted]

PYROLYSER PLANT
(Area-010)

[redacted] MEDRECYCLER – 010

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Attachment L

Emission Unit Data Sheet

(INCINERATOR)

Control Device ID No. (must match Air Forms): 460

Equipment Information

1. Manufacturer: Technotherm	2. Model No. Regenerative Thermal Oxidizer

3. On a separate sheet sketch or draw the proposed incinerator showing the location and dimensions (inside and out) of (1) the primary combustion chamber, (2) the secondary combustion chamber, (3) the flame port, (4) auxiliary burners, and (5) dampers **with special emphasis on dimensions of the flame port and secondary combustion chambers (inside). Also,** sketch in the minimum distance the gas travels through the secondary combustion chamber.

4. Rated capacity of the incinerator for the type of waste to be burned: Maximum. 110,000 lb/hr; Typical. ~72,970 lb/hr; Annual. ~297,716 tons/yr

5. By what means is waste charged? Batch Continuous Periodically

6. Type: Multiple Chamber Single Chamber Other, specify:

7. Projected operating schedule: 24 hr/day 365 days/yr

Primary Combustion Chamber

8. Volume: ft³	9. Effective grate area: ft²
10. Maximum temperature: 1362 °F	11. Burning rate: lb/ft²/hr
12. Heat release in primary chamber: BTU/hr/ft³	13. Total heat release in incinerator: BTU/hr/ft³

Secondary Combustion Chamber

14. Volume: N/A ft³	15. Cross sectional area: ft²
16. Volume of gas through secondary combustion chamber: ACFM @ °F	17. Gas velocity through secondary combustion chamber: ft/sec
18. Minimum gas temperature: °F	19. Minimum retention time of gas: sec
20. Minimum distance of gas travel through secondary combustion chamber: ft.	21. Location of air admission:

22. Auxiliary fuel: Natural Gas Propane Other: None

23. I really need the volume of the RTO and heat release into to be able to calculate the resident time for the unit.

24.

25. ACFM @ °F

Combustion Air

26. Type of draft: Natural Stack Damper Forced Induced Recirculation damper	29. If draft is forced or induced, describe ID fans or blowers:
Windshielding? Yes No	Number: 1 for
30. Theoretical air/fuel ratio: % excess	HP rating: 69 HP
31. Percent of total air applied as:	Rated flow: 1,216 ft³/min
primary air	Rated speed: RPM
secondary air	Fan rated: in. H_2O
	Motor: @ °F

Auxiliary Burners

32. Proposed type and fuel: NG

33. Primary Burner	34. Secondary Burner
Capacity: 1.79 MMBTU/hr	Capacity: N/A MMBTU/hr
Number: 2	Number:
Manufacture: Technotherm	Manufacture:
Model: 7500	Model:
Estimated capacity: BTU/hr	Estimated capacity: BTU/hr
Fuel: NG	Fuel:
How controlled? Auto	How controlled?
Is there a temperature indicator? Yes No	Is there a temperature indicator? Yes No
How temperature monitored? thermocouples transmitter	

Miscellaneous Devices and Components (Describe and/or record)

35. Automatic loading devices: Yes No	36. Self closing doors: Yes No
If yes, describe: Gas flow	
37. Sparks arrestor: Yes No	38. Flame failure protection equipment: Yes No
39. Method of creating turbulence for combustion gases: Describe.	40. Method of cleaning secondary or settling chamber: Describe.
41. Other interlocking devices or controls. If yes, describe: Yes No	
Maintenance and fire protection	

Installation

42. Indoor Installation: Yes No	43. Outdoor Installation: Yes No
If yes, describe method of supplying combustion air.	

Stack or Vent Data

44. Inside diameter or dimensions: 2.38 ft	45. Gas exit temperature: 500 °F
46. Height: 49.21 ft	47. Stack venting: This equipment only; Other equipment also vented (type and rating of all other equipment exhausted through this stack or vent)
48. Gas flow rate: 43,72 dscfm	
49. Estimated percent of moisture: %	

50. Source of waste: Hospital Restaurant Store Industry Apartment Community Warehouse Public Institution Other, specify: Waste

51. Describe fully, in detail, the composition of waste fed to the incinerator:
The waste feed is Gas, and is a combination of all of the emissions from the process equipment and engines.

52. Approved BTU/lb on file? BTU/lb	53. Daily amount: lb
54. Does incinerator have a charge hopper? Yes No	55. What is the volume of the charge hopper? ft³
56. Does the charge hopper have automatic control? Yes No	57. Is the waste charged to the incinerator weighed? Yes No
58. Is the secondary chamber preheated prior to charging waste? Yes No	59. At what secondary temperature does waste charging begin? °F
60. Is the ash waste quenched? Yes No	61. Is all the waste burned generated on site? Yes No
62. For hospital waste, is the ash inspected for recognizable combustible components? Yes No	
63. For hospital waste, are recognizable combustible components of the ash re-burned? Yes No	
64. Is any waste received from outside the local government boundary? Yes No	
65. Are hazardous or special waste burned? Yes No	66. Are potential infectious waste burned? Yes No

If yes, please describe:

67. How will the waste material from process and control equipment be disposed of? Through the stack. Gas.

68. Method of charging waste solids: Manual: Manual charge hopper; Automatic charge hopper; Other, specify: N/A	69. Method of feeding liquids: Lab pack; Injection as a primary burner fuel; Injection as a secondary burner fuel; Other, specify: N/A
70. Rated steam flow - heat recovery boiler: lbs/hr	71. Rated pressure - recovery boiler: PSIG

Emissions Stream

72. Emission rates: Emission Rates Vary by Feed

Pollutant	Pounds per Hour lb/hr	pounds/hr	lb/hr	lb/hr	Tons per Year tons/yr	Parts per Million ppm
CO						
Hydrocarbons						
NO_x						
Pb						
PM_{10}						
SO_2						
VOCs						
Other (specify)						

73. If an ***Air Pollution Control Device*** is not submitted, the emission rates should be the same as those reported home 'Maximum Potential and Maximum Actual Emissions' on the ***Emission Points Data Summary Sheet***.

74. Emissions rates should be substantiated by submitting ***stack test data*** and/or ***calculations***.

Fuel Usage Data

75. Estimated annual fuel cost: $

76. Firing rate: Maximum: mmBTU/hr; Typical: mmBTU/hr; Design: mmBTU/hr

77. Fuel type: Natural Gas, Coal, Fuel Oil, No., Other, specify:

78. Typical heating content of fuel:

79. Typical fuel sulfur content: wt. %

80. Typical fuel ash content: wt. %

81. Annual fuel usage:

82. Please complete an ***Air Pollution Control Device Sheet(s)*** for the control(s) used on the Emission Unit, if applicable.

83. Have you included the ***air pollution rates*** on the Emissions Points Data Summary Sheet?

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Supplemental Data to Air Pollution Control Device

Technotherm (Pty) Ltd. Phone: 010 045 7800
All letters addressed to Technotherm (Pty) Ltd.

MONITORING: Please describe the proposed monitoring, recordkeeping, reporting, and testing.
Monitoring will be accomplished using the TO control panel. The facility personnel will conduct monthly inspections for visible stack emissions and incidents. The 30 stack emission observations will not be required to be performed by a person certified as a qualified observer under EPA Method 9 for Visual Determination of Opacity of Emissions from Stationary Sources.

TESTING PLAN: Please describe any proposed emissions testing for the process equipment or air pollution control device.
TBD

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.
Record all upsets to the system. Visual inspections will be documented on site in the control room.

REPORTING: Please describe the proposed frequency of reporting of the recordkeeping.
Report to WVDEP if upset occurs to the flare.

86. Please describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Annual shutdown of two weeks. Maintenance manual provided to the plant.

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Regenerative Thermal Oxidiser for [redacted] Plant

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REGENERATIVE
THERMA[redacted]

Equi[redacted]

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Equipment No. General-850

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SUPERIOR THERMAL TECHNOLOGIES

Regenerative Thermal Oxidiser
Equipment No. General-850

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Regenerative Thermal Oxidiser
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Regenerative Thermal Oxidiser
Equipment No. General-950

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Haul Road Fugitives

Attachment L

Emission Unit Data Sheet
(INDIRECT HEAT EXCHANGER)

Control Device ID No. (must match List Forms): 800

Equipment Information

1. Manufacturer: Technoterm	2. Model No. Serial No.
3. Number of units: Gas desuperheater chamber with Cyclones, Desuperheater Heat Exchanger, Tar Condensers, Oil Condensing Scrubbers, Wet Alkali-based Gas Scrubbers, APR (?) Settling tanks (per scrubber), Centrifuge Cleaning system	4. Use: Gas Clean-Up System
5. Rated Boiler Horsepower: N/A hp	6. Boiler Serial No.:
7. Date constructed:	8. Date of last modification and explain:
9. Maximum design heat input per unit: N/A ×10⁶ BTU/hr	10. Peak heat input per unit: ×10⁶ BTU/hr
11. Steam produced at maximum design output: N/A LB/hr PSIG	12. Projected Operating Schedule: Hours/Day 24 Days/Week 7 Weeks/Year 52
13. Type of firing equipment to be used: ☐ Pulverized coal ☐ ☐ Spreader stoker ☐ Oil burners Natural Gas Burner ☐ Others, specify ☐	14. Proposed type of burners and orientation: Vertical Front Wall Opposed ☐ Tangential Others, specify
15. Type of draft: ☐ Forced ☐ Induced	16. Percent of ash retained in furnace: %
17. Will flyash be reinjected? Yes No	18. Percent of carbon in flyash: %

Stack or Vent Data

19. Inside diameter or dimensions: ft.	20. Gas exit temperature: 392 °F
21. Height: ft.	22. Stack serves: This equipment only Other equipment also (submit type and rating of all other equipment exhausted through this stack or vent)
23. Gas flow rate: ft³/min	
24. Estimated percent of moisture: %	

Fuel Requirements

25. Type	Fuel Oil No.	Natural Gas	Gas (other, specify)	Coal, Type:	Other:
Quantity (at Design Output)	@ 60°F	ft³/hr	ft³/hr	TPH	
Annually	×10³ gal	×10⁶ ft³/hr	×10⁶ ft³/hr	tons	
Sulfur	Maximum wt. % Average wt. %	gr/100 ft³	gr/100 ft³	Maximum wt. %	
Ash (%)				Maximum	
B.T.U. Content	BTU/Gal. Heating Oil @ 60°F	BTU/ft³	BTU/ft³	BTU/lb	
Source					
Supplier					
Halogens (Yes/No)					
Lead and Identify Metals					

26. ~~Gas burner mode of control~~:
Manual
~~Automatic full modulation~~
Automatic 3-low
Automatic on-off

27. Gas burner manufacture:

28. Oil burner manufacture:

29. ~~If fuel oil is used, how is it atomized?~~
Oil Pressure
Compressed Air
Steam Pressure
Rotary Cup
Other, specify

30. ~~Fuel oil preheated?~~ Yes No

31. If yes, indicate temperature: °F

32. Specify the calculated theoretical air requirements for combustion of the fuel or mixture of fuels described above actual cubic feet (ACF) per unit of fuel:
32 °F, PSIA, % moisture

33. ~~Emission rate at rated capacity~~: lb/hr

34. Percent excess air actually required for combustion of the fuel described: %

Coal Characteristics

35. Seams:

36. Proximate analysis (Dry basis): % of Fixed Carbon: % of Sulfur:
% of Moisture: % of Volatile Matter:
% of Ash:

Emissions Stream

37. What quantities of pollutants will be emitted from the boiler before controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	at °F	PSIA
CO				
Hydrocarbons				
NO_x				
Pb				
PM_{10}				
~~SO_2~~				
VOCs				
Other (specify)				

38. What quantities of pollutants will be emitted from the boiler after controls?

Pollutant	Pounds per Hour lb/hr	grain/ACF	at °F	PSIA
CO				
Hydrocarbons				
NO_x				
Pb				
PM_{10}				
SO_2				
VOCs				
Other (specify)				

39. How will waste material from the process and control equipment be disposed of?
Back WWL Level3

40. Have you completed an ***Air Pollution Control Device Sheet(s)*** for the control(s) used on this Emission Unit: Y

41. Have you included the ***air pollution rates*** on the Emissions Points Data Summary Sheet?

SUPERIOR THERMAL TECHNOLOGY

Superthermal (Pty) Ltd t/a TECHNOTHERM

For Process Monitoring, Recordkeeping, Reporting, and Testing.

Modification Date: 11 [illegible] and reporting in order to demonstrate compliance with the Operating Permit for a Thermal Unit. Please propose testing in order to demonstrate compliance with the [illegible]

Email: [illegible] Fax No: [illegible]

www.technothermsa.com

MONITORING PLAN: Please (1) describe the process parameters and how they were chosen (2) the ranges and how they were established for monitoring to demonstrate compliance with the operation of this process equipment operation or air pollution control device.

Weekly and monthly inspections according to manufacturer specifications. Instrumentation to assist in preventing issues.

TESTING PLAN: Please describe any proposed emissions testing for this process equipment or air pollution control device.

Per request.

RECORDKEEPING: Please describe the proposed recordkeeping that will accompany the monitoring.

Any Malfunctions

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[redacted]

REPORTING: Please describe the proposed frequency of reporting of the recordkeeping.

All Weekly and Monthly inspections along with any malfunctions

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

The gas clean-up system will be monitored via instrumentation for any errors or blockages requiring maintenance. Remaining regular maintenance procedures to be provided by manufacturer

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Technotherm
SUPERIOR THERMAL TECHNOLOGIES

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FUNCTIONAL SPECIFICATION

[redacted]

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Synthesis Gas Cleaning System

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Synthesis Gas Cleaning System

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Synthesis Gas Cleaning System

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Synthesis Gas Cleaning System

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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*): 120

1. Name or type and model of proposed affected source: Dryer Technotherm
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.
3. Name(s) and maximum amount of proposed process material(s) charged per hour: 7,312.6 lb/hr
4. Name(s) and maximum amount of proposed material(s) produced per hour: 7,500 lb/hr dryer maximum
5. Give chemical reactions, if applicable, that will be involved in the generation of air pollutants: N/A

* 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:

Natural gas for burners during start-up then will use syngas

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

Natural gas
Syngas will vary in composition

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

29660 @ 60 °F and 14.7 psia

(d) Percent excess air:

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

1 burner

(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:

N/A

(g) Proposed maximum design heat input: 4.70 x 10⁶ 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:

@ N/A °F and psia

a. NO_x	N/A	lb/hr	N/A	grains/ACF
b. SO_2	N/A	lb/hr	N/A	grains/ACF
c. CO	N/A	lb/hr	N/A	grains/ACF
d. PM_{10}	N/A	lb/hr	N/A	grains/ACF
e. Hydrocarbons	N/A	lb/hr	N/A	grains/ACF
f. VOCs	N/A	lb/hr	N/A	grains/ACF
g. Pb	N/A	lb/hr	N/A	grains/ACF

h. Specify other(s)

	lb/hr	grains/ACF
	lb/hr	grains/ACF
	lb/hr	grains/ACF
	lb/hr	grains/ACF

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.

Equitherm (Pty) Ltd t/a TECHNOTHERM
Manufacturers of Industrial Process Equipment
Manufacturers of Industrial Process Equipment
Unit 1, 1 Ashburton Road, Ashburton, Pietermaritzburg, 3201
Unit 1, 1 Ashburton Road, Ashburton, Pietermaritzburg, 3201
Tel: +27 (0) 33 - 387 0000 Fax: +27 (0) 33 - 387 0001
Tel: +27 (0) 33 - 387 0000 Fax: +27 (0) 33 - 387 0001
Email: technotherm@equitherm.co.za
Email: technotherm@equitherm.co.za
VAT: 4020174184 Co. Reg. No. 2001/000 [illegible]
VAT: 4020174184 Co. Reg. No. 2001/000 [illegible]
24 hours: Mobile: 083 626 211 8238
24 hours: Mobile: 083 626 211 8238

equitherm thermal technologies
www.technotherm.co.za

Weekly and monthly inspections according to manufacturer specifications.

REC: Please propose testing in order to demonstrate compliance with emissions limits.
All Weekly and Monthly inspections along with any malfunctions.

REPORTING
Any malfunctions.

TESTING
Upon request.

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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 ITS 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.

Routine maintenance (lubrication) do not require shut down. Major maintenance issues to involve a shut-down.

Technotherm
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TECHNICAL FILE
(Area 030)

Dryer for Power Plant

[redacted]

DRYER PLANT

[redacted]

Equipment No. General-030

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1.19
Revision Record

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Equipment No. General-030

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Equipment No. General-030

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Equipment No. General-030

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Equipment No. General-030

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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*): 200

1. Name or type and model of proposed affected source:

Macerator/Shredder
Medical Waste Shredder by Technotherm

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.

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

2,542.7 lb/hr

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

2,542.7 lb/hr

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

N/A

* 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:

N/A

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

N/A

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

N/A @ °F and psia

(d) Percent excess air: N/A

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

N/A

(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:

N/A

(g) Proposed maximum design heat input N/A x 10⁶ 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:

@ N/A °F and psia

a. NO_x	N/A	lb/hr	N/A	grains/ACF
b. SO_2	N/A	lb/hr	N/A	grains/ACF
c. CO	N/A	lb/hr	N/A	grains/ACF
d. PM_{10}	N/A	lb/hr	N/A	grains/ACF
e. Hydrocarbons	N/A	lb/hr	N/A	grains/ACF
f. VOCs	N/A	lb/hr	N/A	grains/ACF
g. Pb	N/A	lb/hr	N/A	grains/ACF

h. Specify other(s)

	lb/hr	grains/ACF
	lb/hr	grains/ACF
	lb/hr	grains/ACF
	lb/hr	grains/ACF

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.

G 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
Weekly and monthly inspections according to manufacturer specifications.	All Weekly and Monthly inspections along with any malfunctions.

4kW

REPORTING	TESTING
Any malfunctions.	No air emissions associated with equipment

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.

To describe of operating ranges and maintenance procedures required by manufacture to maintain warranty
Operation is at -Size 4 -0.005inch

A	21.11.2019	FIRST ISSUE

SHALL INCORPORATE ANTI-ERR.COLOR / WARNING ANTI-ERR.COLOR

RIDDE RECYCLER - R2
SHREDDING AREA
MEDICAL WASTE SHREDDER
GENERAL ARRANGEMENT

A1 1:50 1131-020-001 1/1 A

Attachment L
EMISSIONS UNIT DATA SHEET
BULK LIQUID TRANSFER OPERATIONS

Furnish the following information for each new or modified bulk liquid transfer area or loading rack, as shown on the *Equipment List Form* and other parts of this application. This form is to be used for bulk liquid transfer operations such as to and from drums, marine vessels, rail tank cars, and tank trucks.

Identification Number (as assigned on *Equipment List Form*):	HCL
1. Loading Area Name:	1300
2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply): G Drums G Marine Vessels G Rail Tank Cars G Tank Trucks	1000
3. Loading Rack or Transfer Point Data	600
Number of pumps	75
Number of liquids loaded	
Maximum number of marine vessels, tank trucks, tank cars, and/or drums loading at one time	
4. Does ballasting of marine vessels occur at this loading area? G Yes G No G Does not apply	
5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point:	
6. Are cargo vessels pressure tested for leaks at this or any other location? G Yes G No If YES, describe:	

7. Projected Maximum Operating Schedule (for rack or transfer point as a whole):

Maximum	Jan. - Mar	Apr. - June	July - Sept	Oct. - Dec.
hours/day				
days/week				
weeks/quarter				

8. Bulk Liquid Data (*add pages as necessary*):

Pump ID No.							
Liquid Name							
Max. daily throughput (1000 gal/day)							
Max. annual throughput (1000 gal/yr)							
Loading Method [1]							
Max. Fill Rate (gal/min)							
Average Fill Time (min/loading)							
Max. Bulk Liquid Temperature (°F)							
True Vapor Pressure [2]							
Cargo Vessel Condition [3]							
Control Equipment or Method [4]							
Minimum control efficiency (%)							
Maximum Emission Rate: Loading (lb/hr)							
Maximum Emission Rate: Annual (lb/yr)							
Estimation Method [5]							

[1] BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill

[2] At maximum bulk liquid temperature

[3] B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)

[4] List as many as apply (complete and submit appropriate *Air Pollution Control Device Sheets*): CA = Carbon Adsorption LDA = Lean Oil AbsorptionCO = Condensation SC = Scrubber (Absorption)CRA = Compressor-Refrigeration-Absorption TO = Thermal Oxidation or Incineration CRC = Compression-Refrigeration-Condensation VB = Dedicated Vapor Balance (closed system) O = other (describe)

[5] EPA = EPA Emission Factor as stated in AP-42
MB = Material Balance

TM = Test Measurement based upon test data submittal
O = other (describe)

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
REPORTING	**TESTING**

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 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

ATTACHMENT M

Air Pollution Control Device Sheet

Attachment L

FUGITIVE EMISSIONS FROM UNPAVED HAULROADS

UNPAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)		
p =	Number of days per year with precipitation >0.01 in.		

Item Number	Description	Number of Wheels	Mean Vehicle Weight (tons)	Mean Vehicle Speed (mph)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1									
2									
3									
4									
5									
6									
7									
8									

Source: AP-42 Fifth Edition – 13.2.2 Unpaved Roads

$E = k \times 5.9 \times (s \div 12) \times (S \div 30) \times (W \div 3)^{0.7} \times (w \div 4)^{0.5} \times (365 - p) \div 365) =$ lb/Vehicle Mile Traveled (VMT)

Where:

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)		
S =	Mean vehicle speed (mph)		
W =	Mean vehicle weight (tons)		
w =	Mean number of wheels per vehicle		
p =	Number of days per year with precipitation >0.01 in.		

For lb/hr: [lb = VMT] × [VMT = trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb = VMT] × [VMT = trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF UNPAVED HAULROAD EMISSIONS

Item No.	PM				PM-10			
	Uncontrolled		Controlled		Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY	lb/hr	TPY
1								
2								
3								
4								
5								
6								
7								
8								
TOTALS								

FUGITIVE EMISSIONS FROM PAVED HAULROADS

INDUSTRIAL PAVED HAULROADS (including all equipment traffic involved in process, haul trucks, endloaders, etc.)

i =	Industrial augmentation factor (dimensionless)	
n =	Number of traffic lanes	
s =	Surface material silt content (%)	
L =	Surface dust loading (lb/mile)	

Item Number	Description	Mean Vehicle Weight (tons)	Miles per Trip	Maximum Trips per Hour	Maximum Trips per Year	Control Device ID Number	Control Efficiency (%)
1							
2							
3							
4							
5							
6							
7							
8							

Source: AP-42 Fifth Edition – 11.2.6 Industrial Paved Roads

$E = 0.077 \times i \times (s \div 10) \times (L \div 1000) \times (W \div 3)^{0.7} =$ lb/Vehicle Mile Traveled (VMT)

Where:

i =	Industrial augmentation factor (dimensionless)	
n =	Number of traffic lanes	
s =	Surface material silt content (%)	
L =	Surface dust loading (lb/mile)	
W =	Average vehicle weight (tons)	

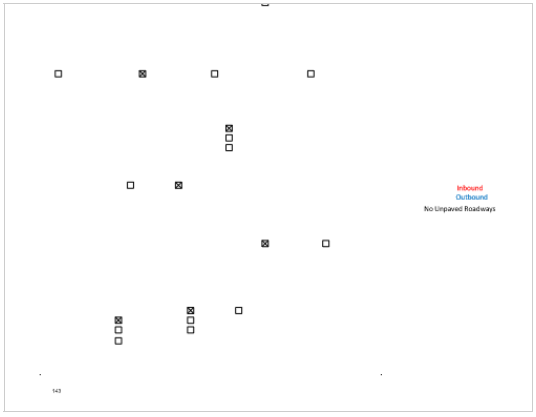
For lb/hr: [lb = VMT] × [VMT = trip] × [Trips ÷ Hour] = lb/hr

For TPY: [lb = VMT] × [VMT = trip] × [Trips ÷ Hour] × [Ton ÷ 2000 lb] = Tons/year

SUMMARY OF PAVED HAULROAD EMISSIONS

Item No.	Uncontrolled		Controlled	
	lb/hr	TPY	lb/hr	TPY
1				
2				
3				
4				
5				
6				
7				
8				
TOTALS				

Empire Green Gene
Follansbee WV O
Brooke County
January 20



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Attachment M
Air Pollution Control Device Sheet
(FLARE SYSTEM)

Control Device ID No. (must match Emission Units Table): 1000

Equipment Information

1. Manufacturer: Technoflare Model No. To Be Determined	2. Method: Elevated flare Ground flare Other Describe Stack/Emergency Flare
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. Method of system used: Steam-assisted Air-assisted	Pressure-assisted Non-assisted
5. Maximum capacity of flare: 15,239 scf/min scf/hr	6. Dimensions of stack: Diameter 2.36 ft. Height 49.21 ft.
7. Estimated combustion efficiency: (Waste gas destruction efficiency) Estimated: >98 % Minimum guaranteed: >98 %	8. Fuel used in burners: Natural Gas Fuel Oil, Number Other, Specify: Syn Gas
9. Number of burners: 1 Rating: 12,247 BTU/hr	11. Describe method of controlling flame:
10. Will preheat be used? Yes No	
12. Flare height: 49.21 ft.	14. Natural gas flow rate to flare pilot flame per pilot light: 0.20 scf/min 12.0 scf/hr
13. Flare tip inside diameter: 2.36 ft.	
15. Number of pilot lights: 1 Total 12,247 BTU/hr	16. Will automatic re-ignition be used? Yes No
17. If automatic re-ignition will be used, describe the method: An electrical ignition assembly will be used to ignite the gases and including ignitor rods and an electrical control assembly to provide a spark. The assembly will be employed to light the pilot. A pilot flame thermocouple and a stack flame thermocouple will monitor the system and provide the spark for re-ignition when necessary.	
18. Is pilot flame equipped with a monitor? Yes No If yes, what type? Thermocouple Infra-Red Ultra Violet Camera with monitoring control room Other, Describe:	
19. Hours of unit operation per year: 24 hours per day; 7 days per week	

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Steam Injection

20. Will steam injection be used? Yes No	21. Steam pressure PSIG Minimum Expected Design Maximum
22. Total Steam flow rate: LB/hr	23. Temperature: °F
24. Velocity ft/sec	25. Number of jet streams
26. Diameter of steam jets: in	27. Design basis for steam injected: LB steam/LB hydrocarbon
28. How will steam flow be controlled if steam injection is used?	

Characteristics of the Waste Gas Stream to be Burned

29. Name	Quantity (Grams at 68/100 °F)	Quantity (LB/hr, ft/hr, etc.)	Source of Material
Hydrocarbon	TBD		
Cyanide Compounds	TBD		
Ammonia	TBD		
CO	TBD		
Hydrogen	TBD		
NOx / SOx	TBD		

30. Estimate total combustible to flare: 66,000 (max) ~~cubic~~ or ACF/hr
(Maximum mass flow rate of waste gas) scfm

31. Estimated total flow rate to flare including materials to be burned, carrier gases, auxiliary fuel, etc.:
5,100 LB/hr or ~~ACF/hr~~

32. Give composition of carrier gases:
TBD Syngas

33. Temperature of emission stream: 1,562 °F max Heating value of emission stream: TBD BTU/ft³ Mean molecular weight of emission stream: MW = TBD lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned: Not Applicable BTU/scf BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: 1512 °F	36. Flare gas flow rate: 11,000 scf/min
37. Flare gas heat content: TBD BTU/ft³	38. Flare gas exit velocity: TBD scf/min
39. Maximum rate during emergency for one major piece of equipment or process unit: N/A scf/min	
40. Maximum rate during emergency for one major piece of equipment or process unit: N/A BTU/min	

41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
Not Applicable

42. Describe the collection material disposal system:
Not Applicable

43. Have you included ***Flare Control Device*** in the Emissions Points Data Summary Sheet? Yes

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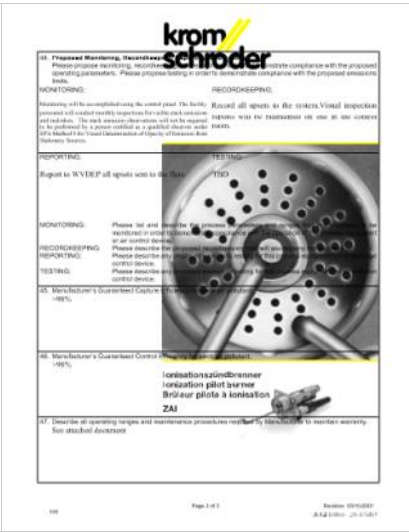

krom schroder

44. Proposed Monitoring, Recordkeeping, Reporting and Testing

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

MONITORING: RECORDKEEPING:

Monitoring will be accomplished using the control panel. The facility personnel will conduct monthly inspections for visible stack emissions and odors. The stack emission observations will not be required to be performed by a person certified as a qualified observer under EMMS. EPA Method 9 the Visual Determination of Opacity of Emission from Stationary Sources.

Record all upsets to the system.Visual inspection reports will be maintained on site in an easy accessible

REPORTING: TESTING:

Report to WVDEP all upsets sent to the State. TBD

MONITORING: Please list and describe the process [illegible] monitored in order to demonstrate [illegible] or air control device.

RECORDKEEPING: Please describe the proposed recordkeeping [illegible]

REPORTING: Please describe any [illegible] control device.

TESTING: Please describe any [illegible] control device.

45. Manufacturer's Guaranteed Capture [illegible] >99%.

46. Manufacturer's Guaranteed Control [illegible] >99%.

Ionisationszündbrenner
Ionization pilot burner
Brûleur pilote à ionisation
ZAI

47. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty. See attached document

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JKE Editor: 26-5/5/07

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Ionisationszündbrenner ZAI

Anwendung

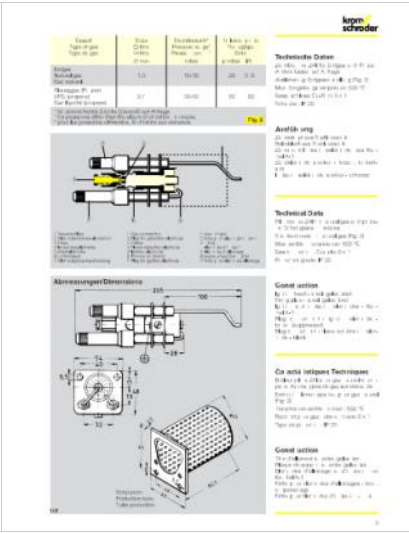
Ionization pilot burner ZAI

Fig. 1

Application

Brûleur pilote à ionisation ZAI

Application



krom schroder

Technische Daten

Anfüllung

Technical Data

Gaset ution

Abmessungen/Dimensions

Ca acté istiques Techniques

Gaset ution

kromschroder

Fig. 3

Fig. 4

Fig. 5

Fig. 6

Zubehö

Weite e Zündli eme und B enve

Accesso ies

Ottic zündbu ne s ond bu ne s

Accessoi es

D'aut ecb ûleu s d'allumage et b ûleu s

2019/07/19

Specification sheet

Equipment type:	Stack
Equipment name:	Stack
Project:	1131-MedRecycler

Design velocity (m/s)	20	
Design exhaust flow (m³/s)	2.004	914,296.721 cfm 15,238.29 cfmm
Material of construction	mild steel, painted	
Inner diameter (mm)	700	
Total height above ground (mm)	15000	
Height from ground to air inlet (mm)	2000	
Distance insulated from air inlet (mm)	2000	
Outer diameter insulated zone (mm)	1020	
Rain hood	none	

Disclaimer: values are subject to change.

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1141 – General Operations and Maintenance

Company: Empire Diversified Energy
Address: 600 Veterans Drive
Follansbee WV
USA

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Introduction

Project Overview

The Project as a commercial Plant using advanced conversion technology in the nature of a waste acceptance facility using plastics with moisture content of 35% from which a clean syngas is produced and subsequently combusted in reciprocating engine generator sets to produce electricity for export.

The Project comprises of a macerator, rotary thermal dryer, 2 sets of pyrolysers , 3 sets of syngas clean-up equipment, a hydrochloric acid recovery system, gas bladder (syngas accumulator), reciprocating engine generators, thermal oxidiser, a stack and flare. The Facility is a 3 tph swallowing capacity plastics to renewable energy power plant producing baseload electricity for export to the grid. The Project is operated on a continuous basis and is designed with sufficient plant redundancy to negate any single point total plant failures.

Waste heat is recovered from the exhaust of the engines and the Pyrolyser to dry the plastics once shredded. Site available natural gas provides start-up and standby thermal energy. The plant design and configuration is comprised of equipment that results in low life cycle costs, high operational efficiency and operational flexibility consistent with the results of the design reviews, RAM and HAZOP studies conducted during the project execution.

Supplier

Company Name	TECHNOTHERM
Physical Address	86 Rand Vaal Road Rand Vaal, Gauteng South Africa
Telephone	+27 (0)10 045 3603
Facsimile	+27 (0)86 586 5921
Website	www.technotherm.co.za

Plant and Equipment

This instruction manual relates to a WASTE TO ENERGY PLANT Scheme.
The design is for 900ºC maximum process temperature.
It essentially comprises of a

- Shredder
- Dryer
- Pyrolysers
- Hydrochloric acid recovery system
- Gas clean-up system
- Gas temporary storage
- Engines
- Regenerative thermal oxidiser
- Stack and flare

Operating Philosophy

Overall process takes plastics, received by a transporting company, and thermally processes it in a pyrolysis system operating at 800ºC - 900ºC (1,472ºF - 2,1652ºF). Organic matter from the plastics is evaporated forming a syngas that can directly be used as a fuel source for electrical generating engines. Oil and tar are produced where the oil is recycled through the pyrolysis system to make more syngas, and the tar is used to heat a vitrification system where solids from the process are vitrified and made inert. Exhaust from the engines are sent to a drying unit, where the plastics is dried prior to being introduced into the pyrolysis system. All gasses are sent to a Thermal Oxidizer operating at 850ºC (1,562ºF), after which they are conditioned for release to atmosphere via a stack.

Shredder Section

Plastics received at the facility will be in sealed containers about 2 feet square and they are not opened. Each box has an inventory, so Empire Green Generation knows what is in the box prior to being fed into the Pyrolysis System. Plastics in boxes are not stored on site but are processed as they arrive after cataloging the wastes.

Sealed containers will be fed into the Macerator. In the Macerator, operating under negative pressure, the plastics in sealed containers will be reduced to 25 mm or less.

Drying Section

The drying of the feedstock is carried out in a direct heated, parallel flow, rotary twin drum type dryer using a combination of engine exhaust and, if necessary during start-up or unusual operating conditions, syngas and, as a last resort, natural gas.

Feedstock is transported from the dryer feed hopper into the dryer by means of a screw conveyor. Upon entering the dryer inner retort, the moist feedstock comes into direct contact with the parallel stream of hot flue gases.

Lifters and progression plates ensure intimate contact between the feedstock and flue gas therefore facilitating efficient drying and movement of feedstock along the retort.

Once both feedstock and flue gases reach the closed end of the dryer they are discharged from the inner concentric retort into the outer retort and return to the entry end of the dryer, discharging 10% moisture level feedstock into an expansion chamber. Coarse dry feedstock falls to the bottom of the chamber forming a heap on the conveyor located beneath.

The flue gas exhaust, contaminated with light particulate feedstock material, is also discharged from the expansion chamber and ducted to a bank of cyclones where separation occurs. Fine particulate falls to the bottom of each cyclone and is discharged via rotary valves into a common screw conveyor. The screw conveyor discharges the fine product onto the conveyor joining the dryer exit material and fine product. This conveyor transfers the combined dry feedstock streams onto a conveyor feeding an intermediate storage hopper that feeds both pyrolysers.

HCl Recovery System

This system is fed with dried feedstock from a thermal dryer via a live bottom screw hopper. Material is fed from a gas-tight, storage hopper into the horizontal pre-pyrolyser retort by a rotary screw. The feedstock passes through a pre-pyrolyser chamber where it is

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heated in an inert environment to allow gradual release of Chlorine. The gas is removed and condensed to form hydrochloric acid where after it is bottled.

Pyrolyser

The pyrolyser train is fed dried and partially reconstructed feedstock from the HCl recovery system as described in the previous section. The pyrolysis train consists of two identical pyrolysers. Per unit, the source of indirect heat is primarily hot exhaust flue gas from a furnace located beneath the pyrolysis retort. These hot flue gasses exit the pyrolysis retorts and then progress to the medium grade heat applications (Thermal dryer and during start up syngas cooler and tar condenser). Supplemental heating of the pyrolysis retort is being provided by firing a portion of the cleaned syngas. Natural gas is available for initial start-up or any start-up where insufficient syngas is available. After passing through the dryers the flue gas is progressed to the thermal oxidiser.

As the material passes through the pyrolysis retort, it undergoes thermal degradation releasing volatile organic syngas compounds that is discharged from the retort. The crude syngas off-takes are collected into a common manifold that transfers the syngas to the syngas cleaning system.

The heavier particles, mainly comprising of ash and fixed carbon, collect in a specially designed high temperature de-acceleration chamber where the particles are collected and returned to the furnace for energy recovery.

Ash and carbonaceous residue produced by the pyrolysers drops off the dust from the aforementioned de-acceleration chamber screw conveyors, together with the main residue collected from the base of the pyrolyser into a refractory lined furnace fired by recovered tars (described below in the syngas cleaning equipment). The heat liberated by burning the tars and oils is sufficient to heat the ash from the pyrolysis units above their eutectic temperature with excess, preheated air to burn off the tars. The [redacted] is completely combusted into CO_2 and H_2O.

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Syngas Clean-up

Particulate Matter Clean-up

Raw syngas is removed from the pyrolysis retorts, as described above, and passes through a de-acceleration chamber and then hot cyclones. The cyclones are arranged for parallel flow to ensure maximum PM removal efficiency during start-up and shutdown as the flow varies. PM drops to specially designed hot screw conveyors and from there is directed to the vitrification furnaces described above.

Syngas Coolers

The partially cleaned, still hot, flue gas flows next through stainless steel tubular syngas coolers. The cooler is in essence a heat exchanger which indirectly transfers heat from syngas to the combustion air heaters.

Tar Condensers

The syngas from the coolers described above flows to a stainless steel shell & tube heat exchanger/cooler that is cooled by an air blower system. Tars are condensed out and drop into heated troughs, the heat source of which is engine exhaust. Hot condensed tar is pumped to the vitrification furnaces described above. The common installed spare set of coolers uses engine exhaust flue gas to heat the heat exchangers and thereby cause the tars to drop into the heated trough below.

Oil Scrubbers

The syngas from the tar condensers described above flows to a scrubber with interconnected oil and water separator.

Dosing Scrubbers

From the oil scrubber the syngas flows through a high pressure drop venturi scrubber which is kept at a set pH to neutralise the gas before progressing to temporary storage.

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Gas Bladder (Syngas Storage Tank)

The syngas storage tank provides surge capacity of cleaned syngas to level out flow and composition variations. The bladder is contained within a demarcated area. The bladder will operate with an internal pressure of 30 to 40 millibar gauge.

Thermal Oxidiser

All flue gasses enter a thermal oxidiser comprising of a rectangular box shaped furnace. The internal dimensions are determined by the total volume that needs to be raised to 850°C and maintained for 2 seconds.

Stack and Flare

The stack and flare comprises of the following:

1. Induced Draft Fan
2. Flare Stack (combined with plant stack) and
3. Plant Stack (5 m above nearest building x 720 mm dia.)

The treated hot gasses progress through the stack and disperses into the atmosphere after passing through the thermal oxidiser.

Gas Engines

Each syngas engine is a fully packaged unit complete with all associated components and auxiliaries. These engines are of robust design and have been proven on low and medium calorific value gas fuels.

The engine package allows the engine to start, synchronise, operate continuously at base or part load and shut down.

The syngas engines are situated in containers as indicated on the plant layout and engine cooling will occur by means of external radiators.

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Maintenance

Scheduled Maintenance

It is assumed that the plant will be subject to the same general routine maintenance discipline, in respect of cleanliness, neatness corrosion control etc. as the other plant and equipment in the factory.

General

- Work to be done must be cleared with the operator or his designee before commencement.
- Ensure the area is clean and free of contamination.
- Inspect labels and warning signs location, clear visibility and damage. Repair / replace if necessary.
- Inspect the equipment for any signs of build up or deposits.
- Check that all fasteners and mounting hardware is in place.
- Always stand to the side when observing interior or opening the Pyrolyser to avoid sudden exposure to heat.
- Frequent visual inspection of the equipment should be done. Any leaks, in piping, tanks, equipment casings, covers and all associated equipment or hose connections must be reported.
- If any fault occurs, analyse and permanently remove the cause. Do not remain on temporary repair.
- Immediately report any signs of abnormal equipment operation or unusual instrument readings.

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- After maintenance, ensure that all bolts, fittings, guards and other fasteners are correctly tightened.
- Metal parts must be painted to avoid corrosion. Where painting is not possible suitable oil or grease must be utilized

Maintenance Tasks

The maintenance schedule specifies the frequency of the inspections and checks that are expected under normal operating conditions. In the event that the prevailing conditions are abnormal, appropriate adjustments could be expected.

Weekly Maintenance

- Check seal integrity on front and rear pre-Pyrolyser and Pyrolyser bellows
- Check seal integrity on knife gate valves
- Check limit switches and/or proxy switches ensuring holding bolts are tight
- Check striker arms on limit switches are secure
- Check thermocouples are secure
- Check for uneven movement / misalignment of mechanisms
- Check temperature controller and over temperature controller for proper operation
- Check retort rollers are tight and no excessive wear is taking place
- Grease wheels with high temperature graphite grease
- Listen for undue mechanical noise from the installation, investigate and repair if necessary
- Check all seals and gaskets for possible leaks on the hydraulic system.
- Check that all bearings are properly greased and operating correctly.

Monthly Maintenance

- Repeat weekly scheduled maintenance
- Check all bolts are tight, tighten if necessary

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- Ensure all guards, louvers, brackets are in place and secure.
- Visually inspect modules and insulation blankets are properly in position and secure, repair / replace if necessary.
- Check ducts for foreign materials causing obstruction.
- Check structural steelwork for signs of corrosion and paint damage. Metal parts must be painted to avoid corrosion.
- Check blower impeller by hand to ensure free rotation. Check that there is not fouling between rotating and stationary components.
- Check that all blower fasteners are secure and that all components are in good order at the cooling section.
- Ensure that the blower guard is in place and secure.
- Keep electric motors' air inlets and outlets free and clean. The air blown out by the motor shall not enter again. The distance between the air inlet and the wall must be approximately ¼ of the inlet opening diameter.
- Check retort mechanism main track roller for alignment
- Check all pre-Pyrolyser and Pyrolyser in feed system for any possible obstructions and charge clearances
- Check knife gate valves and proxy switch positions
- Check all pre-Pyrolyser and Pyrolyser front and rear door seal
- Check all booster fan clearance and rotation direction

Three Monthly Maintenance

- Repeat Monthly Maintenance
- Clean booster fan and clean all interconnecting pipes

Six Monthly Maintenance

- Repeat Three Monthly Maintenance
- Booster Fan Maintenance:

[redacted]

- Refer [redacted]
- After [redacted]
  shoul [redacted]
  operi [redacted]

Annual Maintenance [redacted]

- Lubricate al [redacted]
  applicati [redacted]
- Refer to the [redacted]

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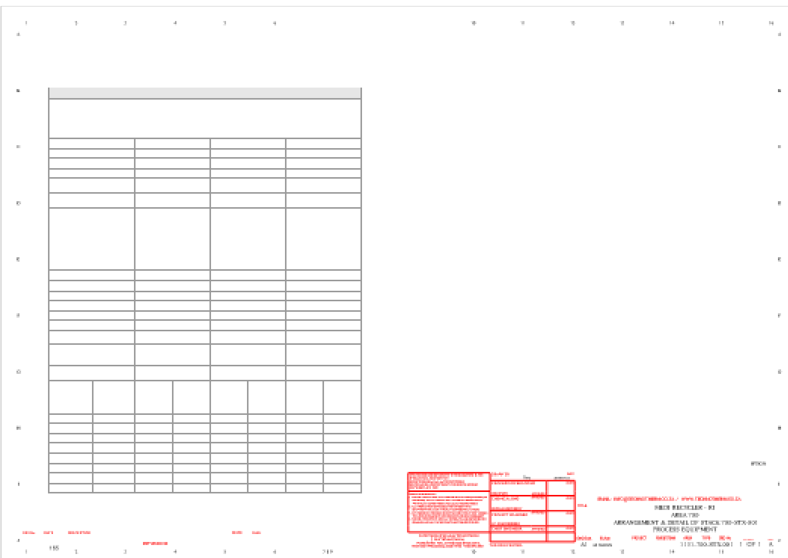

ATTACHMENT M – INTERNAL COMBUSTION ENGINE DATA SHEET

Complete this data sheet for each internal combustion engine at the facility. Include manufacturer performance data sheet(s) or any other supporting document if applicable. Use extra pages if necessary. ***Generator(s) and microturbine generator(s) shall also use this form.***

Emission Unit ID#[1]	GE-1, GE-2, GE-3, GE-4		
Engine Manufacturer/Model	[illegible]		
Manufacturers Rated bhp/rpm	470, 1500/1800		
Source Status[2]	NS		
Date Installed/ Modified/Removed/Relocated[3]	2022		
Engine Manufactured /Reconstruction Date[4]			
Check all applicable Federal Rules for the engine (include EPA Certificate of Conformity if applicable)[5]	40CFR60 Subpart JJJJ; JJJJ Certified?; 40CFR60 Subpart IIII; IIII Certified?; 40CFR63 Subpart ZZZZ; NESHAP ZZZZ/ NSPS JJJJ Window; NESHAP ZZZZ Remote Sources	40CFR60 Subpart JJJJ; JJJJ Certified?; 40CFR60 Subpart IIII; IIII Certified?; 40CFR63 Subpart ZZZZ; NESHAP ZZZZ/ NSPS JJJJ Window; NESHAP ZZZZ Remote Sources	40CFR60 Subpart JJJJ; JJJJ Certified?; 40CFR60 Subpart IIII; IIII Certified?; 40CFR63 Subpart ZZZZ; NESHAP ZZZZ/ NSPS JJJJ Window; NESHAP ZZZZ Remote Sources
Engine Type[6]	4SLB		
APCD Type[7]	A/F		
Fuel Type[8]	syngas		
H_2S (gr/100 scf)	Varies with Feed		
Operating bhp/rpm	1500/1800rpm		
BSFC (BTU/bhp-hr)	8,700-9		
Hourly Fuel Throughput	3,136 ft³/hr gal/hr	ft³/hr gal/hr	ft³/hr gal/hr
Annual Fuel Throughput (Must use 8,760 hrs/yr unless emergency generator)	25.6 MMft³/yr gal/yr	MMft³/yr gal/yr	MMft³/yr gal/yr
Fuel Usage or Hours of Operation Metered	Yes ☒ No ☐	Yes ☐ No ☐	Yes ☐ No ☐

Calculation Methodology[9]	Pollutant[10]	Hourly PTE (lb/hr)[11] (EACH ENGINE)	Annual PTE (tons/year)[11] (EACH ENGINE)	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]	Hourly PTE (lb/hr)[11]	Annual PTE (tons/year)[11]
MD/AP	NO_x	0.68	2.53				
MD/AP	CO	1.17	3.89				
MD/AP	VOC	0.48	1.78				
MD/AP	SO_2	0.002	0.01				
MD/AP	PM_{10}	0.03	0.10				
MD/AP	Formaldehyde	0.20	0.89				
MD/AP	Total HAPs	0.28	1.21				
MD/AP	GHG (CO_2e)	401.39	1,662				

PLEASE NOTE: ALL EMISSION VARY BY FEED AND ARE ROUTED TO THE RTO PRIOR TO BEING EMITTED TO THE ATMOSPHERE. PLEASE SEE GENERATOR EMISSIONS CALCULATIONS.

1 Enter the appropriate Source Identification Number. For each natural gas-fuelled reciprocating internal combustion compressor/generator engine located at the compressor station, Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Generator engines should be designated GE-1, GE-2, GE-3 etc. Dehydration generator engines should be designated DE-1, DE-2, DE-3 etc. If more than 15 engines exist, please use additional forms.

2 Enter the Source Status using the following codes:

NS	Construction of New Source (installation)	ES	Existing Source
MS	Modification of Existing Source	RS	Relocated Source
RSM	Removal of Source		

3 Enter the date (or anticipated date) of the engine's installation (construction of an area), modification, relocation or removal.

4 Enter the date that the engine was manufactured, modified or reconstructed.

5 If the engine is certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ/ZZZZ? Yes, the engine and control device ☐ must be operated and maintained in accordance with the manufacturer's emission-related written instructions. You must keep records of conducted maintenance to demonstrate compliance, but no performance testing is required. If the certified engine is not operated and maintained in accordance with the manufacturer's emission-related written instructions, the engine will be considered a non-certified engine and you must demonstrate compliance as appropriate.

Provide a manufacturer's data sheet for all engines being registered.

6 Enter the Engine Type designation using the following codes:

2SLB	Two Stroke Lean Burn	4SRB	Four Stroke Rich Burn
4SLB	Four Stroke Lean Burn		

7 Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes

A/F	Air/Fuel Ratio	IS	Ignition Retard
HEIS	High Energy Ignition System	SPC	Screw in Precombustion Chambers
PSC	Prescombustion Chamber	LEC	Low Emission Combustion
NSCR	Non-Selective Catalytic Reduction	OxCat	Oxidation Catalyst
SCR	Selective Catalytic Reduction		

8 Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas / Production Gas	D	Diesel

9 Enter the Potential Emission Data Reference designation using the following codes. Attach all reference data used.

MD	Manufacturer's Data	AP	AP-42
GR	GRI-HAPCalc™	OT	Other (please list)

10 Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE should be calculated at maximum manufacturer's specification horsepower and may reflect reduction efficiencies of Best Available Control Devices. Emergency generator engines may use 500 hours as a default when calculating PTE. PTE data. Two ten data sheet should be incorporated by reference. **Document Accuracy Note.**

11 PTE for engines shall be calculated from manufacturer's data unless unavailable.

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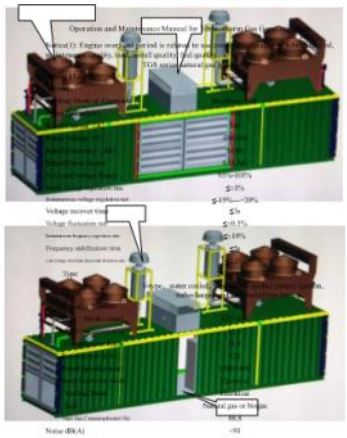
Engine Air Pollution Control Device
(Emission Unit ID#____, use extra pages as necessary) N/A

Air Pollution Control Device Manufacturer's Data Sheet included?	YES ☐ NO ☐ N/A ☐
☐ SCR ☐ NSCR ☐ Oxidation Catalyst	
Provide details of process control and for proper working control of catalyst upon with gas stream	
Manufacturer:	Model #:
Design Operating Temperature: °F	Design gas volume: m³/h
Normal operation required: ☐ Yes ☐ No	Operation temperature range (in °F) Rich Lean
Normal gas flow: m³/h or ft³	Rich: °F to °F
Rich/Lean operation mode:	Operation of the system:
Provide design against catalyst fouled/dirty Rich/Lean:	catalyst fouled:
Provide description of starting which certain that protects unit when operation is not meeting design conditions:	
Is a temperature and pressure drop of a catalyst required to be monitor as per 40CFR63 Subpart ZZZZ?	
☐ Yes ☐ No	
How ~~Does the catalyst recommendation required to be replaced because of operation?~~	
How often is catalyst replaced (on average)?	
Serial	
Model	
Approx. 8,760 hours of operation	
Catalyst replacement	
Major/Scheduled maintenance required. If so, give options for any maintenance required and the applicable reference in	
Manufacturer	

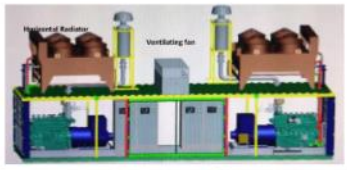
Engine

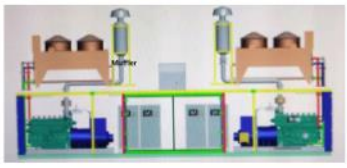
108



Noise (dB(A)	<80
Overload cycle (h)	2,500[1]
Overall dimension(L×W×H)(mm)	12500×3000×3200
Net Weight (kg)	2850

109





Passage

170

Container size: (L*W*H) 11.5m*2.2m*2.45m

3 containers in total

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Attachment M
Air Pollution Control Device Sheet
(WET COLLECTING SYSTEM-SCRUBBER)

Control Device ID No. (must match Emission Units Table):

Equipment Information

1. Manufacturer: Poly Processing Model No. 7' X 7' Scrubber	2. Method: Packed Bed / Spray Tower / Mechanical / Other, specify / Venturi / Cyclone / Orifice
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. Provide a scale diagram of the scrubber showing internal construction. Please include packing type and size, spray configurations, baffle plates, and mist eliminators.	
5. What type of liquid entrainment eliminators or systems will be used? Submit a schematic diagram showing thickness, mesh, and material of construction.	
6. Describe the scrubber's construction material. Polyethylene (SLPE) tank with PVC internals and exterior piping. Water with NaOH is added to the vessel above the set level. Vent gas from the HCl tank passes through the gas diffuser where HCl forms are neutralized before the scrubbed gas is vented from the top.	
7. What will be the power requirements of the collector? Fan: NO HP Inlet scrubbing liquid pump: NA HP	
8. What type of fan(s) will be used? Type of fan blade: None Number of blades: None Diameter of blade: None in. Also supply a fan curve for each fan to be used.	
9. Estimated gas pressure drop at maximum flow rate: 1 inches H_2O	

Scrubbing Liquor Characteristics

10. Scrubbing Liquor

Composition	Weight %
1 Water	99
2 NaOH	1
3	
4	

11. Scrubbing liquor losses (evaporation, etc.):
0.5 gal/1000 ACF gas

12. Liquor pressure to scrubber: 9.25 PSIA

13. Pressure drop through scrubber: 4 in. H_2O

14. Source of liquor (explain):
Batch liquid added to tank ☐
☐

15. Liquor flow rates to scrubber:
☐ Design maximum: 1,000 gal/min
☒ Average expected: 500 gal/min

16. Describe system to be used to supply liquor to collector:
☐ Head drum and re-fill process ☐

17. Give the expected solids content of the liquor.
No suspended solids will be created. The scrubber will convert HCl gas vapors will react with NaOH to form water (H_2O) and solid (NaCl). Water will be changed out well before NaCl concentration reaches saturation.

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18. If the liquor is to be recirculated, describe any treatment performed:

19. Data for Venturi Scrubber:
Throat Dimensions: NA
(Specify area)
Throat Velocity: Na ft/sec

20. Data for Packed Towers:
Type of Packing: NA
Superficial Gas Velocity through Bed:

Gas Stream Characteristics

21. Gas flow into the collector:
1000 ACF @ 29 °F and 14.7 PSIA

22. Gas stream temperature:
Inlet: ambient °F
Outlet: ambient °F

23. Gas flow rate:
Design Maximum: 115 ACFM
Average Expected: 67 ACFM

24. Particulate Grain Loading in grains/scf:
Inlet: NA
Outlet: NA

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

Pollutant	IN lb/hr	IN grains/acf	OUT lb/hr	OUT grains/acf	Guaranteed Minimum Collection Efficiency
A HCl	0.03lb/hr		0.0003lb/hr		99
B					
C					
D					
E					

26. Type of pollutant(s) controlled: SO_2 Odor
Particulate (type): Other: HCl

27. By what method were the uncontrolled emissions calculated? Material Balance Stack Test
Pilot Test Other:

28. Dimensions of stack: Height 4'-9" ft Diameter 1'-1" ft

29. Supply air-equilibrium curve and/or solubility data (at various temperatures) for the proposed system.

30. Supply a curve showing proposed collection efficiency versus gas volume from 25 to 100 percent of design rating of collector.

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Particulate Distribution

31. Complete the table. Particulate Size Range (microns)	Particle Size Distribution at Inlet to Collector Weight % for Size Range	Fraction Efficiency of Collector Weight % for Size Range
0 – 2	NA, vapor to liquid-vent condenser	
2 – 4		
4 – 6		
6 – 8		
8 – 10		
10 – 12		
12 – 16		
16 – 20		
20 – 30		
30 – 40		
40 – 50		
50 – 60		
60 – 70		
70 – 80		
80 – 90		
90 – 100		
>100		

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

33. Describe the collection material disposal system:
Neutralized HCl gas will become a salt brine that will be disposed of in accordance with local, state (PADEP), and federal regulations.

34. Have you included ***Wet Collecting (Scrubber) Control Device*** in the Emissions Points Data Summary Sheet? Yes

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35. **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:

REPORTING: TESTING:

2

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.

36. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.

37. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
≥ 99%

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

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Attachment L
EMISSIONS UNIT DATA SHEET
BULK LIQUID TRANSFER OPERATIONS

Furnish the following information for each new or modified bulk liquid transfer area or loading rack, as shown on the *Equipment List Form* and other parts of this application. This form is to be used for bulk liquid transfer operations such as to and from drums, marine vessels, rail tank cars, and tank trucks.

Identification Number (as assigned on *Equipment List Form*):	HCL
1. Loading Area Name:	1300
2. Type of cargo vessels accommodated at this rack or transfer point (check as many as apply): G Drums G Marine Vessels G Rail Tank Cars G Tank Trucks	1000
3. Loading Rack or Transfer Point Data	500
Number of pumps	75
Number of liquids loaded	
Maximum number of marine vessels, tank trucks, tank cars, and/or drums loading at one time	
4. Does ballasting of marine vessels occur at this loading area? G Yes G No G Does not apply	
5. Describe cleaning location, compounds and procedure for cargo vessels using this transfer point:	
6. Are cargo vessels pressure tested for leaks at this or any other location? G Yes G No If YES, describe:	

7. Projected Maximum Operating Schedule (for rack or transfer point as a whole):

Maximum	Jan. - Mar	Apr. - June	July - Sept	Oct. - Dec.
hours/day				
days/week				
weeks/quarter				

8. Bulk Liquid Data (*add pages as necessary*):

Pump ID No.						
Liquid Name						
Max. daily throughput (1000 gal/day)						
Max. annual throughput (1000 gal/yr)						
Loading Method [1]						
Max. Fill Rate (gal/min)						
Average Fill Time (min/loading)						
Max. Bulk Liquid Temperature (°F)						
True Vapor Pressure [2]						
Cargo Vessel Condition [3]						
Control Equipment or Method [4]						
Minimum control efficiency (%)						
Maximum Emission Rate: Loading (lb/hr)						
Maximum Emission Rate: Annual (lb/yr)						
Estimation Method [5]						

[1] BF = Bottom Fill SP = Splash Fill SUB = Submerged Fill

[2] At maximum bulk liquid temperature

[3] B = Ballasted Vessel, C = Cleaned, U = Uncleaned (dedicated service), O = other (describe)

[4] List as many as apply (complete and submit appropriate *Air Pollution Control Device Sheets*): CA = Carbon Adsorption CLA = Lean Oil Absorption CO = Condensation SC = Scrubber (Absorption) CRA = Compression-Refrigeration-Absorption TO = Thermal Oxidation or Incineration CRC = Compression-Refrigeration-Condensation VB = Dedicated Vapor Balance (closed system) O = other (describe)

[5] EPA = EPA Emission Factor as stated in AP-42
MB = Material Balance

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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
REPORTING	TESTING

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.

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

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Web: www.v-syst.com

Telephone: 412-828-9200
Fax: 412-828-9155

Quote #2023-560-H-R

July 26, 2023

Mr. Farley R. Wood, P.E.
Vice President of Engineering
Empire Diversified Energy
1400 Main Street
Follansbee, WV 26037

Subject: Chemical System - Scrubber – Quote #2023-560-H-R

Dear Mr. Wood,

Please find attached our proposal for the above referenced equipment/project. We appreciate the opportunity to provide a quote for this opportunity.

You will also find our most recent line card attached for your reference. I hope you will think of us during your next project. If you would have any questions or require additional information, please give us a call at (412) 828-9200.

Sincerely,

Russell C. Huffmyer
President & CEO
V-Systems, Inc.
101 Fairview Avenue
Pittsburgh, PA 15238

Enclosure
srhr

rrr

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Web: www.v-syst.com

Telephone: 412-828-9200
Fax: 412-828-9155

Quotation:

Project Name: Chemical System - Scrubber
Company Name: Empire Diversified Energy
Address/Street: 1400 Main Street
City/State/Zip: Follansbee, WV 26037

Contact Name: Farley Wood
Email Per: fwood@empirelle.com
Phone: 304-914-2624
Date: July 21, 2023 / Revised July 26, 2023
Quote Number: 2023-560-H-R

Thank you for the opportunity to provide you with the following quote.

Quantity	Item Description	Net Price Each	Total Net Price
Eqp: Scrubber Tank			
1	PolyScrub Scrubber Tank, 700 Open Top, Rated: 1.90 Specific Gravity Wall Thickness, Material: Crosslinked Polyethylene (XLPE)●, Color: Natural (yellowish white) • (1) Lid/Manway - 61" Cover Assembly Open Top /Stainless Steel Pe • (1) Vent - 6" Lvent PVC • (1) Outlet / Overflow - 1" Scrubber Outlet/Overflow PrC/Vitharge Viton /o-276 • (1) Scrubber - 6" Scrubber Assembly PVC/Vitharge Viton • (1) Fill - 1" Bulkhead Fitting Assembly Socket x thread PVC/Vitharge Viton • Warranty - 5 Years, Full Replacement, Non-Prorated Includes Product Engineering / Permitting Support for Permit Application	$16,500.00	$16,500.00
Eqp: Tank			
1	10,305-Gallon Vertical Tank, Rated: 1.90 Specific Gravity Wall Thickness, Material: Crosslinked Polyethylene (XLPE)●, Color: Natural (yellowish white) • (1) Lid/Manway - 24" Manway Cover 24" Purge Tight /Stainless Steel/pe • (1) Fill - 2" Bulkhead Fitting Assembly Socket x thread PVC/EPDM • (2) Dome Fitting - 2" Bulkhead Fitting Assembly Socket x thread PVC/EPDM • (3) Sidewall Fitting - 2" Bolted Flange Fitting Socket PVC/o-ring/EPDM • (1) Vent - 4" Lvent with Bolted Flange PVC/o-276/EPDM • WARRANTY: 5 Years, Full Replacement, Non-Prorated	$39,675.00	$39,675.00

rrr

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Telephone: 412-828-9200
Fax: 412-828-9155

Eqp: Pump			
2	March Model # TE-10X-MD 3PH 10 HP - Inlet: 3"MPT, Outlet: 2"MPT, Wet End: Natural Kynar (Front Housing, Rear Housing), Glass Filled Kynar (Impeller) with 6.625" Impeller Trim, Viton (Gasket), Carbon (Bushing), Ceramic (Shaft, Thrust Washers), and driven by a 10 HP, 3600 RPM, 3/60/230/460, TEFC Motor **Note** • Lead Time is currently 1 Week, A.R.O. • FOB out of March in IL (must ship by LTL due to size and weight)	$7,920.00	$15,840.00
Eqp: VFD(s)			
2	Kylere, Variable Frequency Drives, 10 HP, 460-3-60, NEMA 3R, BACnet **Note** • Lead Time is currently at 7 Weeks, A.R.O.	$7,790.00	$15,580.00
Eqp: Chem Feed Skid			
1	SBT-C_FLOOR_SKID_PVDF/EPDM_PO PPPN Prominent Skid for solenoid driven pumps, (20"W x 18"D x 48"H) 1.0" PVC/EPDM socket weld pipe and flange style strainer Socket PVC calibration column 16oz CPVC/EPDM pulsation dampeners Pressure relief valves Pressure gauge with isolator Back pressure valve Plumbing and components rated at 100 PSI regardless of pump pressure. • (1) GMXA078PVT2G000UDC1300PN Prominent Gamma/X 2 GPH/100PSI, PVDF/PTFE, bleed valve w/spring, 4-20mA output • (1) Prominent CP: ONE PUMP 120VAC SCADA PANEL	$21,995.00	$21,995.00

Total Quoted Amount: $109,090.00

QUOTED BY: RUSS HUFFMYER

If you need further information concerning the products that have been included in the quote, please feel free to contact me at 412-826-5000 and/or rhuffmyer@v-syst.com.

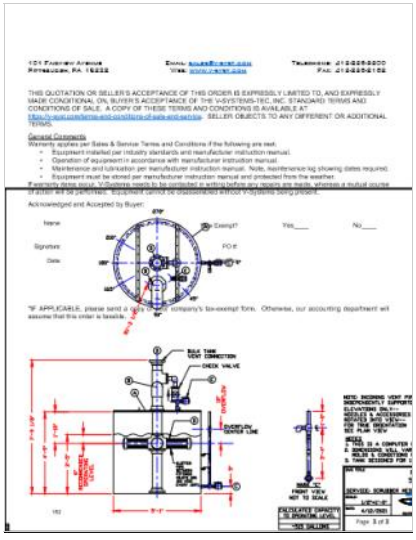
We appreciate the opportunity to provide you with this quote and look forward to working with you on this important project.

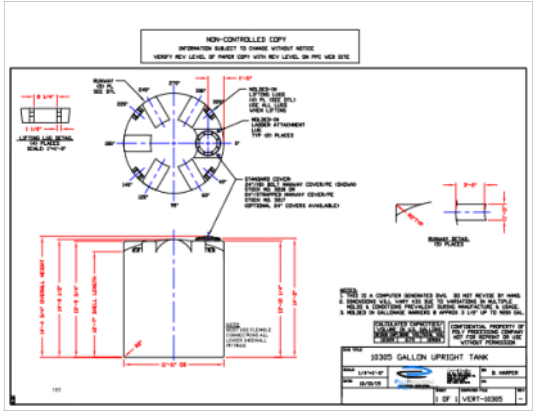
Thank you,

Russell C. Huffmyer
President & CEO

srhr

rrr


THIS QUOTATION OR SELLER'S ACCEPTANCE OF THIS ORDER IS EXPRESSLY LIMITED TO, AND EXPRESSLY MADE CONDITIONAL ON, BUYER'S ACCEPTANCE OF THE V-SYSTEMS-TEC, INC. STANDARD TERMS AND CONDITIONS OF SALE. A COPY OF THESE TERMS AND CONDITIONS IS AVAILABLE AT
SELLER OBJECTS TO ANY DIFFERENT OR ADDITIONAL TERMS.
General Comments
Warranty applies per Sales & Service Terms and Conditions if the following are met.
Equipment installed per industry standards and manufacturer instruction manual.
Operation of equipment in accordance with manufacturer instruction manual.
Maintenance and lubrication per manufacturer instruction manual. Note, maintenance log showing dates required.
Equipment must be stored per manufacturer instruction manual and protected from the weather.
If warranty does occur, V-Systems needs to be contacted in writing before any repairs are made, whereas a mutual course of action will be performed. Equipment cannot be disassembled without V-Systems being present.
Acknowledged and Accepted by Buyer:
Name
Signature
Date
Tax Exempt?
Yes___
No___
PO #
*IF APPLICABLE, please send a copy of your company's tax-exempt form. Otherwise, our accounting department will assume that this order is taxable.
BULK TANK VENT CONNECTION
CHECK VALVE
FRONT VIEW NOT TO SCALE
FULL/LEFT CAPACITY TO DRAINING LEVEL
*105 GALLONS
Page 3 of 8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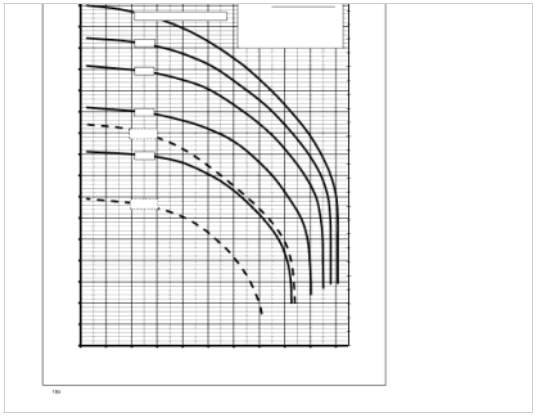
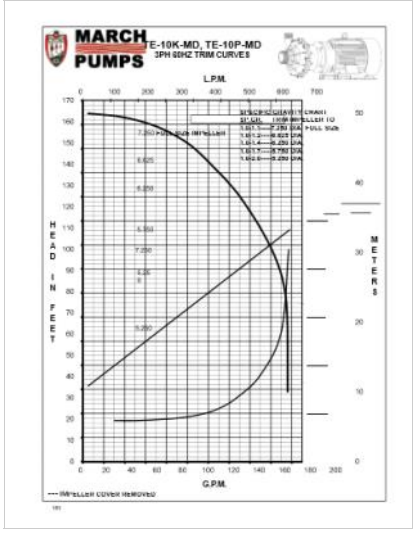
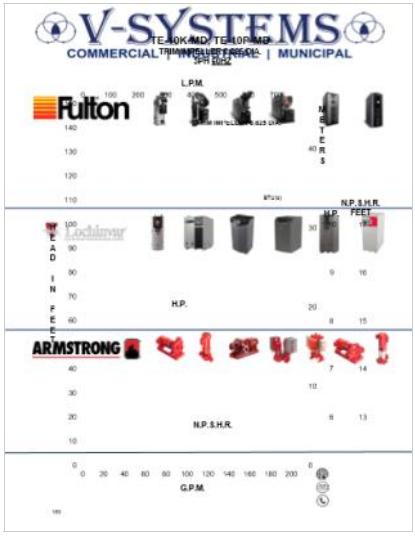
VERIFY REV LEVEL OF PAPER COPY WITH REV LEVEL ON PPC WEB SITE
10305 GALLON UPRIGHT TANK
VERT-10305




MARCH PUMPS
TE-10K-MD, TE-10P-MD
3PH 60HZ TRIM CURVES
L.P.M.
HEAD IN FEET
METERS
G.P.M.
--- IMPELLER COVER REMOVED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N.P.S.H.R.
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Products: Metal Hoses, Expansion Joints, Seismic Connectors, Equipment Legs, and Pipe Guides
Size: 1/2" to 24"

Products: Thermostatic Mixing Valves
Size: 1/2" to 6"

Products: Cooling Towers, Packaged Cooling Systems, Air Strippers, Degassifiers, Odor Control Screens
Performance: 10 to 2000 ton Cooling capacity

- 4 x 2 & 4 x 4
- Carryall 100, 300, 500, 700, 1500, & 1700 Series
- Packages & Accessories
- Electric, Diesel, and Gas
- New Used, Leasing
- Service & Parts

V-Systems Leasing Used Golf Cars, Carryall Cargo Vehicles, Utility Vehicles for [illegible] Events

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Warren Design & Build

PUMPS (Commercial)

Armstrong Pump Technology — LMP
Ashbrook Pump — MTH Pumps
Bannissa Pumps — Pioneer Pumps
Carter Pump — Pumps 2000
CRANE Pumps — SHIPCO Pumps
EBARA Pumps — Syncrofle
Kylon / G & L Pumps — Storcle / Flow Solutions
Hydrofle Pumps (Taco Group) — Tigerflow

BOILERS & WATER HEATERS

Fulton
Lochinvar
RECO USA

ELECTRICAL

Anchor Scientific — Dottelbrown
Bakkin Motors (ABB) — SSC Water Controls
CSI Controls — Tassen Dirty Schneider
Danfoss — TECO-Westinghouse
Nidec Motor Corporation — WEG Motors
Ohio Electric Control, Inc.

TANKS, BASINS, & SEPARATORS

American Wheatley — Niles Steel Tank
Containment Solutions — Spirotherm
Ellis of America — TOPP Industries
Highland Tank — Zimmels Company

VALVES

Apollo Valves — Milwaukee Valve
Flo-Tite — Ohio Valve Company
Hornetic Valves — Sure Flow Company
Walky Valve Co — Titan Flow Control
Wazee Controls

GAUGES

Trerice — Weiss Instruments

HYDRONICS

Gastrol Engineering — Turnbull
Pro Hydronic Specialties

FIRE PROTECTION

Armstrong — Rosenfield

PIPING

Energy Tank Force (Underground Piping Solutions)

WATER / WASTEWATER TREATMENT

Aqua/Phoenix Scientific / GTF — Easy Water
Aqua Turbo Systems — Eco Verde
Active Water Solutions — Equip Water
Concept Screen — Modular Water Systems
Custom Conveyor Corp — Neptune

OTHER

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UNIMA Sheets & Liners for Dump Trucks and Trailers

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Ohio Medical Products
Medical Gas Systems, Portable Suction, Flowmeters, Oxygen Masks, Alarms, Suction Regulators

Custom Machining & Design

Fabrication, and Robotics

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Pittsburgh, PA 15236
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sales@v-sys.com
412-826-9200

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Warren, OH 44485

(330) 394-4747, Ext. 1502

About Us	Facilities & Equipment	Bottom Line
Warren Design & Build is a multi-disciplinary [illegible] shop and engineering design services company. We specialize in emergency repairs of part and machines, as well as building custom machines. Our team is comprised of 10 machinists, 4 welders, 4 mechanical and electrical design engineers with in house PLC and computer systems programming capability.	Located in Warren Ohio, WD&B's 18,000 square foot corporate facility houses a variety of engineering, machining, assembly, and fabricating capabilities. Our large assembly area can handle everything from a single station to a full assembly line with all utilities available utilizing ceiling drops from electrical bus bar and pneumatic lines covering most of the floor space. Located in the Northeast Ohio Manufacturing Corridor we also have the availability to outsource many special processes that can be brought onboard on short notice to assist in peak design periods or on special projects.	With WD&B's unique position of having all Design, Machining, Paint, Mechanical and Electrical Assembly under one roof, our engineering team has the ability to assist in all aspects of the program build cycle to ensure design integrity and when necessary, capture all changes and updates as required by manufacturing, and/or requested by the customer, in a very economical time frame. With some of Northeast Ohio's most talented, experienced, and highly trained engineering and manufacturing staff we can help guide you with suggestions and input that will help maximize your project's efficiency, while often lowering costs.

201 Chambers Street
McKees Rocks, PA 15136

(412) 771-5160

About Us	Facilities & Equipment	Bottom Line
AJ Dupre, a subsidiary of Custom Machine and Design is a multi-disciplined machine shop and engineering design services company. We specialize in emergency repairs of part and machines, as well as building custom machines. Our team is comprised of 4 machinists, 1 welder and 1 mechanical design engineer. Additionally, we partner with our sister company, Warren Design & Build for many other	Located in McKees Rocks PA, AJ Dupre's 9,000 square foot facility houses a variety of engineering, machining, assembly, and fabricating capabilities. Our large assembly area can handle everything from a single station to a full assembly line with all utilities available utilizing ceiling drops from electrical bus bar and pneumatic lines covering most of the floor space. Located in the Greater Pittsburgh, we also have the availability to outsource many special processes that can be brought onboard on short notice to assist in peak design periods or on special projects.	With AJ Dupre's unique position of having all Design, Machining, Paint, Mechanical and Electrical Assembly under one roof, our engineering team has the ability to assist in all aspects of the program build cycle to ensure design integrity and when necessary, capture all changes and updates as required by manufacturing, and/or requested by the customer, in a very economical time frame. With some of Northeast Ohio's most talented, experienced, and highly trained engineering and machining staff we can help guide you with suggestions and input that will help maximize your project's efficiency, while often lowering costs.

Capabilities

- Emergency Repair: We fix all electro-mechanical devices. We have field tech service and in-house staff that will repair all forms of equipment.
- Water Jet: We have a water jet for cutting all types of material in almost any shape.
- Design Engineering: Senior mechanical designers. Each is ready to provide support from concept to build, installation and runoff of the solution to your manufacturing or operational bottleneck.
- Electrical Engineering: Electrical engineers ready to design electrical solutions, write control programming, and perform data analytics.
- Robotic Cell Design and Assembly: Project design & management of all needs and programming related to robot cells.
- Machining: We offer a wide variety of precision machining capabilities, including CNC turning and milling, general machining, grinding, and boring mill work. Our machining capabilities may be used for both short-run and sustained production work.
- Fabrication: We can meet all your prototyping and production needs with complete sheet metal and welding services that include quick delivery on small quantity prototypes, close tolerance fabrications and high-volume production runs.
- Assembly: We can meet your entire contract manufacturing needs with our diverse assembly capabilities and wide range of electrical, mechanical, and electro-mechanical assembly services, ranging from special, one-of-a-kind automation machinery to ongoing, low to medium volume production assembly. Our assembly capability includes turn-key production of build-to-print assembly work, including full management of key suppliers. WDB is capable of handling full production volumes.
- Painting: Using high-solids and water-based materials, our state-of-the-art paint shop can produce finishes from Class 1A to Mil-Spec, including textured finishes color matched to your specifications. Powder coated finishes also available.

ATTACHMENT N

Supporting Emission Calculations

1. OVERALL EMISSIONS CALCULATIONS ALL DEVICES

Plastic waste has significant variation in form and quantity. It seems the best way to describe it as a heterogeneous mixture of solids and semisolids. Literature review showed a References to the papers are given at the end of this section. They state a heterogeneous plastic waste composition based on the is repeated in Table 2. Municipal Solid Waste (MSW) data by Stepien, et.al,[2] given for comparison purposes.

Table 2. Range of Heterogeneous Properties of Plastics [1].

Plastic Waste Composition	Bayer Waste Range (wt, %)
C	50.5
H2	3
O2	21.1
N2	1.9
S	0.46
-Cl	1.2
Oxide	
Metal	
H2O	21.54
HHV (Btu/lb)	

Composition of the plastic waste and the pyrolysis output are shown in Table 3. Pyrolysis emissions are also shown for plastic waste by Durcharme[3] and MSW by Technotherm[4].

Table 3. Plastic Composition and Pyrolysis Output

Component Plastics	Plastics Composition (Wt, %)	Pyrolysis Component	Pyrolysis Syngas, (Wt, %)	Pyrolysis [3] Syngas, (Wt, %)	Pyrolysis [4] Syngas, (Wt, %)
O2	22.78	O2	1.54	2.64*	4.21
C	20.50	CO2	19.25	18.2	34.77
H2	20.50	CO	30.80	27.9	30.81
N2	2.85	CH4	2.16	1.8	21.49
CaO	1.59	H2	11.55	37.8	3.47
K2O	1.52	C14H30 (oil)	3.85		
S	2.85	C20H42 (tar)	3.85		
Na2O	4.58	N2	2.19		3.47
Cl	8.54	CaO	1.23		
MgO	2.39	K2O	1.93		
Fe2O3	1.48	Na2O	4.38		
H2O	2.03	HCl	6.58	0.03	
C2H4	8.39	H2O	4.38		
		MgO	1.84		
		Fe2O3	2.28		
		SO2	2.19		
Total	100		100		

**Rounding errors may apply.

Pyrolysis syngas and solids can vary about 10% or greater based on the input feed. An attempt was made to produce a syngas composition where some of the elements and compounds were near the middle and greater than the middle of the feed composition shown in Table 2. Molecules are shown as individual components instead of just the term "gases".

Once a syngas was established within the variances described, the next step was to combust those available components through the Engine, Vertifer and Thermal Oxidizer. Stoichiometric combustion equations are shown below:

2CO	+	O2	→	2CO2			
2CH4O	+	4O2	→	2CO2	+	4H2O	
2C10H8O	+	9O2	→	4CO2	+	4H2O	
C2H2	+	5/2	→	CO2	+	H2O	
2H2	+	O2	→	2H2O			

Emissions for all devices are shown in Figure 2 (see Miscellaneous 2, end of the TAB) and are shown as a composite.

Block Flow Diagram is the following attached.

The daily throughput for the pyrolysis process system shall be 70 U.S. tons per day and will operate twenty-four (24) hours a day, seven (7) days a week, for 310 days per year. This capacity is 80% availability for processing equipment. All equipment are sized for 70 tons per day, except "a" and "b" of Table 2 (Table 2 footer). All major chambers have the design life of twenty (20) years before replacement.

Throughput calculations are as follows:

Calculation 1: Throughput

Hourly Throughput (2,646.785 kg/hour) · (2.204 lb/kg) = 5,833.33 lb/hr

Annual Throughput:					
5,833.33 lb/hr x 24 hr/day x 310 days/year x 1 ton/2000 lb = 21,699.99 tons/year =	21,700	Tons/year			
Annual Throughput: 21,700 Tons/year					
lbs/hr x 24 hr/day x 310 days/yr / 2000 lbs/ton = tons/year annual output					

Table 2: Hourly, Daily and Annual Emissions Diagram (from model results Figure 2)

Gases Solids Components	lb/hour	lbs/day	lbs/year	tons/year
CO2	2,646.81	4,415.4	134,516.31	67,258.15
H2O	3,725.07	72,418.76	2,452,813.41	1,226,406.7
N2	24,861.83	596,683.5	20,209,209.21	10,104,604.6
Ar	293.31	646.28	15,516.18	7,758.1
CaO	3.25 x 10⁻⁴	9.10 x 10⁻⁴	1.72 x 10⁻³	2.66 x 10⁻³
KO	1.11 x 10⁻³	1.11 x 10⁻³	2.78 x 10⁻³	4.19 x 10⁻³
NaO	4.18 x 10⁻³	2.38 x 10⁻³	6.14 x 10⁻³	9.51 x 10⁻³
MgO	1.78 x 10⁻³	5.88 x 10⁻³	9.20 x 10⁻³	1.43 x 10⁻²
FeO	0.0136	0.0259	0.0614	0.0951
SiO2	4.87 x 10⁻³	1.07 x 10⁻²	2.58 x 10⁻³	3.99 x 10⁻³
FeO3	1.61 x 10⁻³	1.13 x 10⁻³	3.18 x 10⁻³	4.95 x 10⁻³
SO2	3.80 x 10⁻³	1.28 x 10⁻²	3.67 x 10⁻³	4.76 x 10⁻³
NO	3.00 x 10⁻²	6.61 x 10⁻²	2.69 x 10⁻²	4.12 x 10⁻²
NO2	4.00 x 10⁻²	8.82 x 10⁻²	3.68 x 10⁻²	5.68 x 10⁻²
TOTAL	31,427.06	69,265.24	1,662,365.77	257,666.69

SOLIDS OUTPUT

CaO	32.46	71.54	1,717.06	286.14
KO	71.06	112.53	2,700.67	450.40
NaO	116.64	255.75	6,137.88	991.57
MgO	48.74	107.41	2,577.91	399.58
FeO3	60.31	133.00	3,192.02	494.76
NaCl	286.22	617.69	14,822.53	2,297.49
Na2SO3	129.54	285.51	6,852.13	1,062.08
TOTAL	714.39	1,583.42	38,000.21	5,890.03

Calculation 2:

kg/hr x 2.204 lbs/kg = lb/hr

CALCULATION WORKSHEET PAGE 4 of 5

CLIENT/Empire Green Generation, LLC DATE 9/8/2023

SUBJECT/Empire Green Generation Plastics Pyrolysis Facility - Syngas Emissions from Pyrolysers

Pyrolyser Syngas Emissions

Component	mol %	Molecular weight (kg/kmol)	MW, 14.7psig lbm/ft³ (lbm/ft³)	wt%	normalized wt%	lb/hr	tpy	kJ/kg of component i	kJ/kg
Oxygen	0.18	32	0.08441	0.18	0.17	7.77	28.99	0	0
Carbon dioxide	20.00	44.01	0.11660	27.48	56.49	1186.19	4412.6	0	0
Carbon monoxide	10.60	28.01	0.073866	9.27	19.05	400.14	1488.5	10122	1928.69
Methane	18.40	16.04	0.042318	9.22	18.95	397.99	1480.5	55510	10523.0
Hydrogen	12.00	2	0.0053104	0.75	1.54	32.37	120.43	141790	2185.87
Nitrogen	2.00	28.013	0.07386	1.75	3.60	75.54	281.04	0	0
Overall	63.18	150.073	0.0652	48.65	100.00	2092	7783.1		14638.4

Syngas Specifics Results/Inputs

Gross Calorific Value 31,626 kJ/kg

13,567.54 Btu/lb

Gas Yield 38 % mass

Feed Input to Facility 70 tpd plastics

Gas Produced 26.2 tpd gas produced

Source: Provided by Technotherm. See Overall Emission Calculations.

Note: All Gases will be routed to the engine and/or RTO prior to release into the atmosphere.

Density Source: http://webbook.nist.gov/chemistry/fluid/

6. Conversion Factors:

35.34 ft3/m3

0.4536 kg/lb

1.00E+06 scf/MMscf

1.00E+06 Btu/MMBtu

60 min/hr

7440 hrs/yr (based on 310 days per yr as given by Technotherm)

2.326 kJ/kg per Btu/lb

2000 lb/ton

Calculations

a Calculate the estimated amount of syngas produced from the pyrolysers in tpd.

$FR_{Gas,tpd}$ = (mass%$_{syngas}$) / ($CF_{lb\text{-}ton/tons}$) * ($FR_{Feed,tpd}$)

= 36 ~~wtlb~~ / 100 ~~wtlb~~ 1 ~~lbton~~ / 2000 ~~lb~~ 70 tons / day = 25 tpd syngas

b Calculate the maximum hourly emission rate for the components $ER_{Max,HR}$.

Using O_2 as an example.

$ER_{Max,HR,O2}$ = (mass%$_{O2}$) / ($CF_{lb\text{-}ton,tpd\text{-}to\text{-}lb/hr}$) * ($FR_{Gas,tpd}$) * ($CF_{lb\text{-}ton}$) / ($CF_{hr\text{-}to\text{-}day}$)

= 0.37 ~~wtlb~~ / 100 ~~wtlb~~ 1 ~~lbton~~ / 2000 ~~lb~~ 25 ~~ton~~ / 1 ~~ton~~ 2000 lb / 24 hrs 1 ~~day~~ / 24 hrs = 7.77 lb/hr O_2

Calculations (continued)

CALCULATION WORKSHEET PAGE 5 of 5 .

CLIENT Empire Green Generation, LLC DATE 9/6/2023

SUBJECT Empire Green Generation Plastics Pyrolysis Facility - Syngas Emissions from Pyrolysers

3. Calculate the annual average emission rate for the components $ER_{Ann Avg}$

Using O_2 as an example:

$ER_{AnnAvgO2} = (ER_{MaxHr(O2)}) * (CF_{hr/yr}) / (CF_{lb/t})$

$= 7.77 \frac{lb}{hr} \cdot \frac{7{,}440\ hr}{1\ yr} \cdot \frac{1\ t}{2{,}000\ lb} = 28.90$ tpy O_2

4. Calculate the heat value of the syngas for each component in kJ/kg.

Using CO as an example:

$HV_{CO} = (HV_{CO kJ/kg}) * (mol\%) / (CF_{Decimal\ to\ mol\%})$

$= 10122 \frac{kJ}{kg} \cdot 19.1\ mol\% \cdot \frac{1\ Decimal}{100\ mol\%} = 1928.69$ kJ/kg CO

5. Calculate the gross calorific heat value of the syngas in Btu/lb.

$H_{syngas} = \Sigma(HV_{component\ kJ/kg}) / (CF_{kJ/kg\ Btu/lb})$

$= 31625.96 \frac{kJ}{kg} \cdot \frac{1\ Btu/lb}{2.326\ kJ/kg} = 13596.72$ Btu/lb

Empire Green Generation, LLC
Plastic Recycling Pyrolysis Facility
Generator Emissions Calculations

Inputs/Assumptions		
Number of Engines	4	
Control Device	(none)	
Gross Calorific Value	13,134.00	Btu/lb
Average Amount of Gas Produced	36	mass % gas
Amount of Plastics Processed	70	tpd plastics
Amount of Gas Produced per day	25.0	tpd of gas
Amount of Gas to Each Engine	520	lb/hr of gas
Fuel Consumption	6,849	Btu*1000/hr
Density	0.0844	lb/scf
Engine Rating	320	kW
Horse Power	429	HP
Annual Operating Hours	7,440	hours
Fuel Heat Value	1,112	Btu/scf
NOx Factor	1.09	g/HP-hr
CO Factor	2.18	g/HP-hr
VOC Factor	0.76	g/HP-hr
PM10 Factor	1.09E-02	lb/MMBtu
SO2 Factor	6.41E-04	lb/MMBtu
CO2 Factor	52.07	kg/MMBtu
N2O Factor	0.00520	kg/MMBtu
CH4 Factor	0.0006	kg/MMBtu

Pollutant	Per Engine lb/hr	Per Engine tpy	Total lb/hr	Total tpy
NOx	1.03	3.84	4.12	15.34
CO	2.06	7.67	8.25	30.69
VOC	0.72	2.68	2.89	10.74
PM	0.07	0.28	0.30	1.11
SO2	0.004	0.02	0.02	0.07
CO2	786.23	2,925	3,145	11,699
N2O	0.05	0.18	0.19	0.72
CH4	0.01	0.04	0.04	0.14
CO2e	790.20	2,940	3,161	11,759

Notes

1) All engine emissions will be subjected to the Regenerative Thermal Oxidiser (RTO) prior to emitting to atmosphere.

2) Engines will run on syngas only.

3) NO_x, CO and VOC factors are from 40 CFR 60 Subpart JJJJ, Table 1 and adjusted for syngas using a ratio of Heating Values. (per 40 CFR 60.4233(e))

4) PM and SO_2 factors are from AP-42, Table 3.2-2, 5th Edition, July, 2000 and adjusted for syngas.

5) Emission Factor for CO_2 is from 40 CFR 98, Table C-1 - Default CO2 Emissions Factors

6) Emission Factor for N_2O and CH_4 are from 40 CFR 98, Table C-2, Default CH4 and N2O Emission Factors.

7) NOx Emissions, lb/hr = Emission Factor, lb/MMBtu, x Fuel Consumption, Btu*1000/hr, / 1000 (MMBtu/Btu*1000)

8) CO_2 Emissions, lb/hr = Emission Factor, kg/MMBtu, x 2.2046 lb/kg, x Fuel Consumption, Btu*1000/hr, / 1000 (MMBtu/Btu*1000)

9) NOx Emissions, tons/yr = NOx Emissions, lb/hr, x 7,440 hrs/yr (310 days/yr), / 2,000 lb/ton

10) Fuel Consumption based on estimates provided by Technotherm. See Overall Emissions Calculations.

11) PM = PM, PM10, and PM2.5

12) CO2e calculated using the following: $(ER_{CO2} * 1) + (ER_{N2O} * 25) + (ER_{CH4} * 298)$

Empire Green Generation, LLC
Plastic Recycling Pyrolysis Facility
Generator Emissions Calculations

[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

[illegible]

I noticed that EPA had revised AP-42 for NG engines this past Oct. I would suggest reviewing the revised chapter and updating this table if necessary. https://www.epa.gov/system/files/documents/2024-10/c03s02_2024-update_0.pdf

CALCULATION WORK SHEET

PAGE 1 of 1

CLIENT Empire Pyrolysis		JOB NUMBER 212C-PB-0216.100	
SUBJECT Follansbee WV Unpaved Roads Particulate matter emissions			
SHEET DESCR Client provided information		DRAWING NUMBER Roadway Layout.pdf	
BY V. Murphy	CHECKED BY AMC/Brainerd		DATE 4/7/2023

Objective: Calculate the Particulate Matter emissions associated with vehicle traffic.

Inputs and Assumptions:

1. WVDEP Input data

	Class 6 Truck		Ford F250	
	PM	PM-10	PM	PM-10
k =	0.80	0.36	0.80	0.36
s =	4.8	4.8	4.8	4.8
p =	5	5	5	5
W =	11.4	11.4	3.5	3.5
w =	10	10	10	10
p =	140	140	140	140
VMT/trip =	0.07	0.07	0.29	0.29
trips/hr =	10.0	10.0	4	

2. Vehicle data:

no. Wheels =	10	4

3. AP-42 Fifth Edition - 13.2.2 Unpaved Roads

E = k * (s/12) * (S/30) * (W/3)^0.7 * (w/4)^0.5 * ((365 - p)/365)) = lb/VMT

4. WVDEP emissions lb/hr

E(lb/hr) = (lb/VMT)(VMT/trip)(trips/hr)

E(tpy) = (lb/VMT)(VMT/trip)(trips/hr)/(92,000 lb)

Calculations:

1. Calculate PM emission for Class 6 vehicle

E = k * (s/12) * (S/30) * (W/3)^0.7 * (w/4)^0.5 * ((365 - p)/365)) = lb/VMT

	Class 6 Truck		Ford F250	
	PM	PM-10	PM	PM-10
k =	0.80	0.36	0.80	0.36
s =	4.80	4.8	4.80	4.8
p =	5	5	5	5
W =	11.4	11.4	3.5	3.5
w =	10	10	10	10
p =	140	140	140	140
E (lb/VMT) =	0.78	0.35	0.34	0.15
E (lb/hr) =	0.36	0.23	0.29	0.18
E (tpy) =	0.0003	0.0001	0.0002	0.0001

201

Pet_PM-10 Unpaved roads cp.xlsx, Pet PM10

Attachment L
EMISSIONS UNIT DATA SHEET
CHEMICAL PROCESS

For chemical processes please fill out this sheet and all supplementary forms (see below) that apply. Please check all supplementary forms that have been completed.

Emergency Vent Summary Sheet
Leak Sources Data Sheet
Toxicology Data Sheet
Reactor Data Sheet
Distillation Column Data Sheet

1. Chemical process area name and equipment ID number (as shown in ***Equipment List Form***)
Plastic to syngas plant.

2. Standard Industrial Classification Codes (SICs) for process(es) ☐
162920

3. List raw materials and attach MSDSs
Plastic waste

4. List Products and Maximum Production and attach MSDSs

Description and CAS Number	Maximum Hourly (lb/hr)	Maximum Annual (ton/year)
Syngas	1091	9557160

5. Complete the ***Emergency Vent Summary Sheet*** for all emergency relief devices.

6. Complete the ***Leak Source Data Sheet*** and describe below or attach to application the leak detection or maintenance program to minimize fugitive emissions. Include detection instruments, calibration gases or methods, planned inspection frequency, and record-keeping, and similar pertinent information. If subject to a rule requirement (e.g. 40CFR60, Subpart VV), please list those here.

7. Clearly describe below or attach to application Accident Procedures to be followed in the event of an accidental spill or release.
In the case of an accidental release the plant will be immediately shut down the source and cause of the leak will be located and repaired.

8. **Waste Products** - Waste products status. (If source is subject to RCRA or 45CSR25, please contact the Hazardous Waste Section of WVDEP, DAQ at (304) 926-3647.)

8A. Types and amounts of wastes to be disposed.

8B. Method of disposal and location of waste disposal facilities. N/A
Carrier: Phone:

8C. Check here if approved USEPA/State Hazardous Waste Landfill will be used ☐

10. Maximum and Projected Typical Operating Schedule for process or project as a whole (circle appropriate units).

circle units:	(hrs/day) (hr/batch)	(days), (batches/day), (batches/week)	(days/yr), (weeks/year)
10A. Maximum			
10B. Typical	24 h		39 weeks per year

11. Complete a ***Reactor Data Sheet*** for each reactor in this chemical process.

12. Complete a ***Distillation Column Data Sheet*** for each distillation column in this chemical process.

13. **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

REPORTING TESTING

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 or 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 or air pollution control device.

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

INFORMATION REQUIRED FOR CHEMICAL PROCESSES

The notes listed below for chemical processes are intended to help the applicant submit a complete application to the DAQ; these notes are not intended to be all inclusive. The requirements for a complete application for a permit issued under 45CSR13 are designed to provided enough information for a permit reviewer to begin a technical review. Additional information beyond that identified may be required to complete the technical review of any individual application.

Process Description

Please keep these points in mind when completing your process description as part of this permit application.

1. Provide a general process overview. This brief, but complete, process description should include chemical or registered trademark names of chemical products, intermediates, and/or raw materials to be produced or consumed, and the ultimate use(s) of the product(s). A list of the various chemical compounds is helpful.
2. Describe each process step. Include the process chemistry and stoichiometrically balanced reaction equation or material/mass balance on all components.
3. Describe the methods and equipment used to receive, store, handle, and charge raw materials.
4. Describe the methods and equipment used to handle, store, or package final products and intermediates.
5. Provide process flow diagrams or equipment layout drawings which clearly show the process flow relationships among all pieces of process and control equipment. Identify all air emission discharge points. Discuss instrumentation and controls for the process.
6. Discuss the possibilities of process upsets, the duration and frequency of upsets, and consequences (including air emissions) of these upsets. Include a description of rupture discs, pressure relief valves, and secondary containment systems.
7. Discuss any fugitive emissions and the methods used to minimize them.
8. Include the following plans for the process if available:
   a. preventative maintenance and malfunction abatement plan (recommended for all control equipment).
   b. continuous emissions (in-stack) monitoring plan
   c. ambient monitoring plan
   d. emergency response plan

Regulatory Discussion

The following state and federal air pollution control regulations may be applicable to your chemical process. You should review these regulations carefully to determine if they apply to your process. Please summarize the results of your review in your permit application along with any other regulations you believe are applicable.

- Title 45 Legislative Rule Division of Environmental Protection, Office of Air Quality contains West Virginia's air pollution control regulations, including the following promulgated rules which may require emissions reductions or control technologies for your chemical process.
  a. 45CSR27 - Best Available Technology (BAT) for Toxic Air Pollutants (TAPs)
  b. 45CSR21 - VOC emissions controls for ozone maintenance in Kanawha, Cabell, Putnam, Wayne, and Wood counties.
  c. 45CSR13 (Table 45-13A) - plantwide emission thresholds for permitting for certain pollutants.
- Federal Guidelines for case-by-case MACT determinations under section 112(g) of the 1990 CAAA for individual and total HAPs greater than 10 and 25 tons per year, respectively.
- There are also subparts of the federal Standards of Performance for New Stationary Sources (NSPS), 40CFR60 60, and the National Emission Standards for Hazardous Air Pollutants (NESHAP) at 40CFR61 and 40CFR63, which apply to various chemical and nonchemical processes. These subparts are too numerous to list here, but these areas of the federal regulations should be consulted carefully to determine applicability to your process.

Emissions Summary and Calculations

Please keep these points in mind when submitting your emissions calculations as part of this permit application.

1. For each pollutant, provide the basis for the emissions estimate and for all emission reduction(s) or control efficiency(ies) claimed.
2. For all batch processes provide the following:
   a. Emissions of each pollutant in pound(s) per batch, from each process step
   b. Annual emissions based on number of batches requested per year
   c. The total time for each process step and the duration of the emissions during the process step
   d. Total batch time, total emissions per batch (or per day), and annual emissions based on the number of batches requested per year.

EMERGENCY VENT SUMMARY SHEET

List below all emergency relief devices, rupture discs, safety relief valves, and similar openings that will vent only under abnormal conditions.

Emission Point ID[1]	Equipment to Relief Vent (type, ID if available)[2]	Relief Vents (type) & Set Pressure (psig)	Name of Chemical(s) or Pollutants Controlled	Worst Case Emission per Release Event (lbs)
Pyrolyser A outlet	Pyrolyser A	Spring loaded explosion hatch set at 36psig	Syngas	29
Pyrolyser B outlet	Pyrolyser A	Spring loaded explosion hatch set at 36psig	Syngas	29

All routine vents (non-emergency) should be listed on the ***Emission Points Data Summary Sheet***.

[1] Indicate the emission point, if any, to which source equipment normally vents. Do not assign emission point ID numbers to each emergency relief vent or device.

[2] List all emergency relief devices next to the piece of equipment from which they control releases.

LEAK SOURCE DATA SHEET

Source Category	Pollutant	Number of Source Components[1]	Number of Components Monitored by Frequency[2]	Average Time to Repair (days)[3]	Estimated Annual Emission Rate (lb/yr)[4]
Pumps[5]	light liquid VOC[11]				
	heavy liquid VOC[7]				
	Non-VOC[9]				
Valves[10]	Gas VOC	186		1	10.7
	Light Liquid VOC				
	Heavy Liquid VOC				
	Non-VOC				
Safety Relief Valves[11]	Gas VOC	2		1	0.11
	Non VOC				
Open-ended Lines[12]	VOC	0			
	Non-VOC				
Sampling Connections[13]	VOC	25		1	1.44
	Non-VOC				
Compressors	VOC	3		2	0.17
	Non-VOC				
Flanges	VOC	440		1	25.3
	Non-VOC				
Other	VOC	220		1	12.69
	Non-VOC				

See notes on the following page.

Notes for Leak Source Data Sheet

1. For VOC sources include components on streams and equipment that contain greater than 10% w/w VOC, including feed streams, reaction/separation facilities, and product/by-product delivery lines. Do not include certain leakless equipment as defined below by category.

2. By monitoring frequency, give the number of sources routinely monitored for leaks, using a portable detection device that measures concentration in ppm. Do not include monitoring by visual or soap-bubble leak detection methods. "M/Q/S/A/O" means the time period between inspections as follows:

   Monthly/Quarterly, with Monthly follow-up of repaired leakers/Quarterly/Semi-annual/Annually/Other (specify time period)

   If source category is not monitored, a single zero in the space will suffice. For example, if 50 gas-service valves are monitored quarterly, with monthly follow-up of those repaired, 75 are monitored semi-annually, and 50 are checked bimonthly (alternate months), with not checked at any other frequency, you would put in the category "valves, gas service:" 0/50/0/75/0/50 (bimonthly).

3. Give the average number of days, after a leak is discovered, that an attempt will be made to repair the leak.

4. Note the method used: MB - material balance, EE - engineering estimate, EPA - emission factors established by EPA (cite document used), O - other method, such as in-house emission factor (specify).

5. Do not include in the equipment count sealless pumps (canned motor or diaphragm) or those with enclosed venting to a control device. (Emissions from vented equipment should be included in the estimates given in the Emission Points Data Sheet.)

6. Volatile organic compounds (VOC) means the term as defined in 40 CFR 51.100 (s).

7. A light liquid is defined as a fluid with vapor pressure equal to or greater than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if 20% w/w or more of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a light liquid.

8. A heavy liquid is defined as a fluid with a vapor pressure less than 0.04 psi (0.3 Kpa) at 20°C. For mixtures, if less than 20% w/w of the stream is composed of fluids with vapor pressures greater than 0.04 psi (0.3 Kpa) at 20 °C, then the fluid is defined as a heavy liquid.

9. LIST CO, H_2S, mineral acids, NO, NO_2, SO_2, etc. DO NOT LIST CO_2, H_2, H_2O, N_2, O_2, and Noble Gases.

10. Include all process valves whether in-line or on an open-ended line such as sample, drain and purge valves. Do not include safety-relief valves, or leakless valves such as check, diaphragm, and bellows seal valves.

11. Do not include a safety-relief valve if there is a rupture disk in place upstream of the valve, or if the valve vents to a control device.

12. Open-ended lines include purge, drain and vent lines. Do not include sampling connections, or lines sealed by plugs, caps, blinds or second valves.

13. Do not include closed-purge sampling connections.

TOXICOLOGY DATA SHEET[1]

Descriptor Name/ Number	CAS	OSHA Limits[2] TWA	OSHA Limits[2] CL	Acute[3] TC_{50} - Animal LC_{50} - Animal LD_{50} - Animal		Chronic[4]		Irritation[5]	References
Propane/74-98-6		1000 ppm		>20000 ppm					SDS
Synthetic Natural Gas/ [illegible]	74-	500 ppm		324 g/m3 3 hrs					SDS

[1] Indicate by "ND" where no data exists, in company's knowledge.
[2] Time Weighted Average, Ceiling Limit, or other, with units.
[3] If inhalation data is not available, provide other data as available.
[4] Relying on animal or human studies, indicate if any data suggests: C = carcinogenicity, M = mutagenicity, T = teratogenicity, O = oncogenicity.
[5] Indicate if there are dermal or eye irritation effects and whether they are considered to be low, moderate, or severe.

REACTOR DATA SHEET

Provide the following information for each piece of equipment that is a potential or actual source of emissions as shown on the ***Equipment List Form*** and other parts of application.

Identification Number (as shown on ***Equipment List Form***):

1. Name and type of equipment (e.g. CSTR, plug flow, batch, etc.)

2. Type of operation Batch Continuous Semi-batch

3. Projected Actual Equipment Operating Schedule (complete appropriate lines):
   hr/day days/week weeks/year
   hrs/batch batches/day, weeks (Circle one) day, weeks/yr (Circle one)

4. Feed Data: Flow in = gal/h r, or gal/batch

Material Name & CAS No.	Charge Rate				Fill Time
	Pressure[a]	Normal	Max	Units	(min/batch, run)[b]

a. S = Solid, L = Liquid, G = gas or vapor
b. At feed conditions
c. Total time that equipment is filling per batch or run (start-up), for tank or vessel-type equipment.

5. Provide all **chemical reactions** that will be involved (if applicable), including the residence time and any side reactions that may occur as well as gases that may be generated during these reactions. Indicate if the reaction(s) are exothermic or endothermic.

☐

Phase: Specific Gravity: Vapor

☐

6. Maximum Temperature	7A. Maximum Pressure 7B. Max. Set Pressure for venting
°C °F	mmHg psig mmHg psig

8. Output Data Flow Out = gal/hr or gal/batch

Material Name and CAS No.	Phase	Specific Gravity	Vapor Pressure	Hourly or Batch Output Rate Normal	Maximum	Units

9. Complete the following emission data for equipment connected to a header exhaust system, giving emissions levels before entering header system (i.e. before control equipment).

Check here if not applicable

Emission Point ID (exhaust point of header system):

Material Name and CAS No.	Maximum Potential Emission Rate (lb/hr)	Method **

** MB - material balance; EE - Engineering Estimate; TM - Test Measurement (submit test data); O - other (Explain)

10. Provide the following information pertaining to each condenser that may be attached to this reactor. Attach additional pages as necessary if more than one condenser is used for this reactor. Complete the Condenser Air Pollution Control Device Sheet if necessary.

Check here if not applicable

10A. Cooling material

10B. Minimum and Maximum flowrate of cooling material (gal/hr)

10C. Inlet temperature of cooling material (°F)

10D. Outlet temperature of cooling material (°F)

10E. Pressure drop of gas to be condensed from inlet to outlet (psig)

10F. Inlet temperature of gas stream (°F)

10G. Outlet temperature of gas stream (°F)

10H. Number of passes

10I. Cooling surface area

11. Provide the following pertaining to auxiliary equipment that burns fuel (heaters, dryers, etc.):

Check here if not applicable

11A. Type of fuel and maximum fuel burn rate, per hour:

11B. Provide maximum percent sulfur (S), ash content of fuel, and the energy content using appropriate units:

%S % Ash BTU/lb, std. ft³/day, gal

☐ ☐ ☐ (circle one)

11C. Theoretical combustion air requirement in SCFD per unit of fuel (circle appropriate unit) @ 70°F and 14.7 PSIA:

SCFD/lb, SCFD, gal (circle one)

11D. Percent excess air: %

11E. Type, amount, and BTU rating of burners and all other firing equipment that are planned to be used:

11F. Total maximum design heat input: ×10⁶ BTU/hr.

12. **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

REPORTING	TESTING

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 OR 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 OR AIR POLLUTION CONTROL DEVICE.

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

NOTE: An **AIR POLLUTION CONTROL DEVICE SHEET** must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this reactor.

DISTILLATION COLUMN DATA SHEET

Identification Number (as assigned on **Equipment List Form**):

1. Name and type of equipment
2. Projected actual equipment operating schedule (complete appropriate lines):

hrs/day	days/week	weeks/year
hrs/batch	batches/day, batches/week (circle one)	days/yr, weeks/yr (circle one)

2. Number of stages (plates), excluding condenser
3. Number of feed plates and stage location
4. Specify details of any reheating, recycling, or stage conditioning along with the stage locations
5. Specify reflux ratio, R (where R is defined as the ratio of the reflux to the overhead product, given symbolically as R=L/D, where L = liquid down-column, D = distillation product)
6. Specify the fraction of feed which is vaporized, f (where f is the molar fraction of the feed that leaves the feed plate continuously as vapor).
7A. Type of condenser used: total partial multiple other
7B. For each condenser provide process operating details including all inlet and outlet temperatures, pressures, and compositions.
8. Feed Characteristics
   A. Molar composition
   B. Individual vapor pressure of each component
   C. Total feed stage pressure
   D. Total feed stage temperature
   E. Total mass flow rate of each stream into the system
9. Overhead Product
   A. Molar composition of components
   B. Vapor pressure of components
   C. Total mass flow rate of all streams leaving the system as overhead products
10. Bottom Product
   A. Molar composition of all components
   B. Total mass flow rate of all streams leaving the system as bottom products

11. General Information
   A. Distillation column diameter
   B. Distillation column height
   C. Type of plates
   D. Plate spacing
   E. Murphree plate efficiency
   F. Any other information necessary of describe the operation of this distillation column.
12. **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

REPORTING	TESTING

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 OR 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 OR AIR POLLUTION CONTROL DEVICE.

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

NOTE: An **AIR POLLUTION CONTROL DEVICE SHEET** must be completed for any air pollution device(s) (except emergency relief devices) used to control emissions from this distillation column.

ATTACHMENT O

Monitoring/Recordkeeping/Reporting/Testing Plans

ATTACHMENT O - MONITORING, RECORDING, REPORTING, AND TESTING PLANS

Plan Type	Emission Unit	Pollutant	Requirements	Frequency	Method of Measurement	Regulatory Reference
Recordkeeping	Regenerative Thermal Oxidizer (10E)	$PM/PM_{10}/PM_{2.5}$ VOC and criteria pollutants	Control of visible particulate emissions Temperature monitoring	Daily Continuous	Visual	40 CFR 63, Subpart JJJJ 40 CFR 60.18
Recordkeeping	Pyrolyzers (30E)	Syngas	Operate and maintain the source in a manner consistent with safety and good air pollution control practices to minimize emissions. Monitor for temperature.	Continuous during operations Weekly and monthly maintenance	Operate the control equipment in accordance with manufacturer's recommendations	N/A
Monitoring/ Recordkeeping	Scrubbers (42E)	$PM/PM_{10}/PM_{2.5}$ Solids	Pressure Drop monitoring	Hourly average Annual	The pressure drop across the system, PM production rate Catalyst Management Plan will monitor Catalyst Activity by pulling sample blocks and sending them to the laboratory for activity testing.	N/A

Daily Times

www.dailytimes.com

ATTACHMENT P

Kade Hill

Public Notice

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Empire Green Generation, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Modification of Permit R13-2835, for a Plastics Recycling Plant located on 801 Rosslyn Road, near Follansbee, in Brooke County, West Virginia. The latitude and longitude coordinates are: 40.336080 N, -80.605429 W.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be less than 24.6 tpy of CO, 39.9 tpy of NOx, 24.6 tpy of PM, 49.2 tpy of VOC, 24.6 tpy of SO_2, 2.0 tpy of HAPs and 28.57 tpy of SO_2.

Startup of operation is planned to begin on or about the 15th day of July 2023. 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:

DEPAirQuality
Permitting@WV.gov.

Any questions regarding this permit application should be directed to the DAQ at

(304) 926-0499
extension 41261

during normal business hours.

Dated this the 19th day of December, 2022

by Empire Green Generation, LLC
Kade Hill
Chief Technology Officer
1400 Main Street
Follansbee, WV 26037
AEP Dec 8, 2022

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that Empire Green Generation, LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Modification of Permit R13-3555 for a Plastics Recycling Plant located on 801 Koppers Road, near Follansbee, in Brooke County, West Virginia. The latitude and longitude coordinates are: 40.338898 N, -80.605429 W

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be less than 24.0 tons per year (tpy) of VOCs, 14.0 tpy of PM, 99.0 tpy of CO, 24.0 tpy of NO_x, 2.0 tpy of HAPs and 39.0 tpy of SO_2.

Startup of operation is planned to begin on or about the 15th day of July 2023. 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 (Day) day of (Month), (2023).

By: Empire Green Generation, LLC
Bernard Brown
Chief Technology Officer
1400 Main Street
Follansbee, WV 26037

201

AFFIDAVIT OF PUBLICATION

State of Florida, County of Orange, ss:

Keith Hill, being first duly sworn, deposes and says: That (s)he is a duly authorized signatory of Column Software, PBC, duly authorized agent of Wheeling Daily News, a newspaper printed and published in the City of Wheeling, County of Hancock, State of West Virginia, and that the affidavit on Page 1 of 1 with the full text of the contents notice set forth on the pages that follow, and the hours attached.

PUBLICATION DATES:
Dec. 8, 2023

NOTICE ID: [illegible]
PUBLISHER ID: [illegible]
NOTICE NAME: Green Gen Public Notice Modification
Publication Fee: $2.15

Signed

VERIFICATION

State of Florida
County of Orange

Subscribed in my presence and sworn to before me on this: 12/8/2023

Bernard R. Brown

Notary Public
Notarized online using audio-video communication

Green Gen Public Notice Modification - Page 1 of 1

ATTACHMENT Q

Business Confidential Claims

201

November 16, 2023

Mr. Edwards Andrews, P.E.
West Virginia Department of Environmental Protection
Division of air Quality
601 57th Street, SE
Charleston, WV 25304

RE: Empire Green Generation Confidential Business Information

Dear Mr. Andrews,

Please find enclosed Empire Green Generation's submittal of Confidential Business Information for the modification application for permit number R13-3555. This claim of confidentiality is due to trade secrets and intellectual property. A redacted version of this submittal has been sent to you via email.

Sincerely,

Bernard Brown
Chief Operating Officer

Encl.

1,400 Main Street, Follansbee, WV 26037
304-914-4624

Precautionary Notice — Claims of Confidentiality

The person submitting this information may assert that some or all of the information submitted is entitled to confidential treatment as provided by West Virginia Legislative Rule 45CSR31, entitled "Confidential Information." Information covered by such a claim will be disclosed by the Division of Air Quality (DAQ) only to the extent, and by means of the procedures, set forth in 45CSR31. Please contact the West Virginia Secretary of State's Office at 304/558-6000 or http://apps.sos.wv.gov/adlaw/csr/ to obtain a copy of 45CSR31 in order to ensure that all required procedures are followed.

Information concerning the "types and amounts of air pollutants discharged," as that term is defined in WVCSR §45-31-2.4, shall not be claimed as confidential.

Any claim of confidentiality shall be made in accordance with the requirements of 45CSR31 and must accompany the information at the time it is submitted to the DAQ. **If no claim of confidentiality is made at the time of submission or is not made in accordance with the requirements of 45CSR31, the DAQ may make the information available to the public without further notice.**

Included below are procedures, and an example form, to be followed in submitting information claimed as confidential. This information is intended to assist a person with claiming confidential information and to use means to relieve a person of his/her obligation to follow the provisions of 45CSR31 and to comply with such rule. The procedures are as follows:

1. Indicate clearly the items of information claimed confidential by marking each page with the term "Claimed Confidential," with the date of such claim of confidentiality. With the exception of documents of a size greater than 8½" x 14", information claimed confidential must be submitted on colored paper.

2. Include a cover document (See below) which justifies the claim of confidentiality in accordance with the specific criteria under WVCSR §45-31-4.1. A sample cover document is attached for your information and use. The cover document will be available for public disclosure and must include the following information:

   (a) The identity of the person making the submission of information claimed confidential;

   (b) The nature of the information;

   (c) The name, address in the State of West Virginia and telephone number of the designee who shall be contacted in accordance with 45CSR31;

   (d) Identification of each segment of information with in each page that is submitted as confidential and the justification for each segment claimed confidential, including the criteria under WVCSR §45-31-4.1;

   (e) The period of time for which confidential treatment is desired (e.g., until a certain date, until the occurrence of a specified event or permanently); and,

   (f) Signature of a responsible official or an authorized representative of such person.

3. At the same time as the information claimed confidential is submitted to the DAQ on colored paper, a complete set of the information, including the cover document previously required under paragraph 2, must be submitted with the information claimed to be confidential blacked or whited out and the words "Redacted Copy — Claim of Confidentiality" marked clearly on each such page, so that the information is suitable for public disclosure. In the case of drawings and blueprints, mark each page with the words Redacted Copy — Claim of Confidentiality," include the title or legend of the drawing, and black or white out the information claimed confidential. The redacted page may be 8½" x 11" in size.

4. In the case of a permit application or supplemental information to an application which contains confidential information, DAQ requires the "Redacted Copy – Claim of Confidentiality" pages and the cover document which justifies the claim of confidentiality to be submitted by e-mail as a PDF file to:
DEPAirQualityPermitting@wv.gov

   See instructions at: https://dep.wv.gov/daq/permitting/Pages/nsr-forms.aspx OR https://dep.wv.gov/daq/permitting/Pages/TitleVGuidanceandForms.aspx

5. "Claimed Confidential" pages **may not be e-mailed** and shall be submitted, as hardcopy, on colored paper and mailed to:

   WVDEP – DAQ – Permitting
   Attn: NSR *or* Title V Permitting Secretary *
   601 57th Street, SE
   Charleston, WV 25304

   * For a 45CSR13 application, send to NSR Permitting Secretary. For a 45CSR30 application, send to Title V Permitting Secretary. If this is a combined NSR/Title V Permit Application, send one copy to the NSR Permitting Secretary and one copy to the Title V Permitting Secretary.

April 8

Sample Cover Document
Confidential Information

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

Company Name	Empire Green Generation LLC	Responsible Official		Bernard Brown
Company Address	1400 Main Street Follansbee, WV	Confidential Information Designee in State of WV	Name	
			Title	
			Address	
Person/Title Submitting Confidential Information				
			Phone	
			Fax	

Frank Rosso
401 East Las Olas Blvd., Suite 1400, Fort Lauderdale, FL 33301
954-332-2423

Reason for Submittal of Confidential Information:

Identification of Confidential Information	Rationale for Confidential Claim	Confidential Treatment Time Period
	Provide justification that the criteria set forth in § 45CSR31-4.1.a - e have been met.	

Responsible Official Signature:	401 East Las Olas Blvd., Suite 1400, Fort Lauderdale, FL 33301 954-332-2423
Responsible Official Title:	Chief Operating Officer
Date Signed:	11/30/2023

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

Precedency Notice — Choice of Confidentiality WVDEP-DAQ Revised March 15, 2018

ATTACHMENT R

Authority Form

211

AUTHORITY OF LIMITED LIABILITY COMPANY (LLC)

TO: The West Virginia Department of Environmental Protection, Division of Air Quality

DATE: _____, 20

ATTN: Director

LLC's Federal Employer I.D. Number

The undersigned hereby files with the West Virginia Department of Environmental Protection, Division of Air Quality, a permit application and hereby certifies that the said name is a trade name which we are using in the conduct of an unincorporated business.

Further, we have agreed or certified as follows:

(1) The undersigned is a member and in that capacity may represent the interests of the LLC and may obligate and legally bind all current or future members and the LLC.

(2) The LLC is authorized to do business in the State of West Virginia.

(3) The name and business address of each member:

Member:
Address:

Telephone No.:

Member:
Address:

Telephone No.:

Member:
Address:

Telephone No.:

(4) If any other persons become members of the undersigned or our relations as such be altered in any way or if the business should become incorporated, the undersigned will notify you promptly.

Address:

MEMBER OF LLC (Signature)

Telephone No.:

Frank J Rosso
MEMBER OF LLC (Typed)

LIMITED LIABILITY COMPANY- $ NAME

212

Limited Liability.wpd
WVDEP-DAQ Revised 1/01

ATTACHMENT S

Title V Permit Revision Information
(Not Applicable)

Updated App Status? 2/26/2025

Wednesday, April 9, 2025 1:30 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

RE: Empire & Permit Status

1 message

Kathy Beckett <Kathy.beckett@steptoe-johnson.com> Wed, Feb 26, 2025 at 2:12 PM
To: "Andrews, Edward S" <edward.s.andrews@wv.gov>
Cc: Kathy Beckett <Kathy.Beckett@steptoe-johnson.com>

Dear Ed,

I have reached out to Empire Green and will let you know what I learn about a followup call.

Thank you,

Kathy

Kathy Beckett
Steptoe & Johnson PLLC
P.O. Box 1588, Charleston, WV 25326-1588
Overnight
Chase Tower, 17th Floor
707 Virginia Street, East, Charleston, WV 25301
O: 304-353-8172 F: 304-353-8183 C: 304-539-8119

Kathy.Beckett@Steptoe-Johnson.com
www.steptoe-johnson.com

STEPTOE & JOHNSON PLLC
ATTORNEYS AT LAW

Please consider the environment before printing this email

Steptoe & Johnson PLLC Note:
This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the intended recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Also, In accordance with I.R.S. Circular 230, we advise you that any tax advice in this email is not intended or written to be used, and cannot be used, by any recipient for the avoidance of penalties under federal tax laws. Thank you for your cooperation.

From: Andrews, Edward S <edward.s.andrews@wv.gov>
Sent: Wednesday, February 26, 2025 10:06 AM
To: Kathy Beckett <Kathy.beckett@steptoe-johnson.com>
Subject: Empire & Permit Status

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you trust edward.s.andrews@wv.gov.

Kathy,

Do you have time for a call either this morning or afternoon to discuss where Empire is at with regards to proposed changes to the sources of their feedstock?

Ed

--

Edward Andrews, P.E.

Engineer

WVDEP/Division of Air Quality

304-414-1244

601 57th Street, SE

Charleston, WV 25304

Steptoe & Johnson PLLC Note:
This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the intended recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

Steptoe & Johnson PLLC Note:
This e-mail and any attachments are confidential and may be protected by legal privilege. If you are not the intended recipient, be aware that any disclosure, copying, distribution or use of this e-mail or any attachment is prohibited. If you have received this e-mail in error, please notify us immediately by returning it to the sender and delete this copy from your system. Thank you for your cooperation.

Update - NHSM? 2/24/2025

Wednesday, April 9, 2025 1:33 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

Update - NHSM determination/application tune-up

1 message

Andrews, Edward S <edward.s.andrews@wv.gov> Mon, Feb 24, 2025 at 9:28 AM
To: Kathy Beckett <Kathy.beckett@steptoe-johnson.com>, Farley Wood <fwood@empirede.com>

Kathy and Farley,

I am hoping everything is going well.

I am planning to get both of you all a call later this week (e.g., Wednesday) and see if there are any additional questions that have come up.

Thanks
Ed

--
Edward Andrews, P.E.
Engineer
WVDEP/Division of Air Quality
304-414-1244
601 57th Street, SE
Charleston, WV 25304

Call invite 2/7/2025

Wednesday, April 9, 2025 1:29 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

RE: Availability for a call?

1 message

Kathy Beckett <Kathy.beckett@steptoe-johnson.com> Fri, Feb 7, 2025 at 9:51 AM
To: "Andrews, Edward S" <edward.s.andrews@wv.gov>

I will join your link and thank you.

Kathy Beckett
Steptoe & Johnson PLLC
P.O. Box 1588, Charleston, WV 25326-1588
Overnight
Chase Tower, 17th Floor
707 Virginia Street, East, Charleston, WV 25301
O: 304-353-8172 F: 304-353-8183 C: 304-539-8119

Kathy.Beckett@Steptoe-Johnson.com
www.steptoe-johnson.com

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From: Andrews, Edward S <edward.s.andrews@wv.gov>
Sent: Friday, February 7, 2025 9:50 AM
To: Kathy Beckett <Kathy.beckett@steptoe-johnson.com>
Subject: Re: Availability for a call?

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you trust edward.s.andrews@wv.gov.

Kathy,

You are welcome to call my desk number (304-414-1244) or join me on a Google Meet using this link or the invite I just sent to you.

Video call link: https://meet.google.com/wgz-uatq-rio
Or dial: (US) +1 650-457-1268 PIN: 893 387 565#
More phone numbers: https://tel.meet/wgz-uatq-rio?pin=8442326930135

Ed

On Thu, Feb 6, 2025 at 3:47 PM Kathy Beckett <Kathy.beckett@steptoe-johnson.com> wrote:

> Dear Ed,
>
> Thank you, we will review.
>
> Kathy
>
> **Kathy Beckett**
> Steptoe & Johnson PLLC
> P.O. Box 1588, Charleston, WV 25326-1588
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From: Andrews, Edward S <edward.s.andrews@wv.gov>
Sent: Thursday, February 6, 2025 3:45 PM
To: Kathy Beckett <Kathy.beckett@steptoe-johnson.com>
Subject: Re: Availability for a call?

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I had just found this site where NC EQ posted their actual determinations.

https://www.deq.nc.gov/about/divisions/air-quality/air-quality-permitting/non-hazardous-secondary-materials-nhsm-determinations

Templete presentation from ALL4

https://www.all4inc.com/our-videos/a-template-for-self-implementing-a-non-waste-determination-under-the-non-hazardous-secondary-materials-nhsm-rule/

I don't think I will find anything regarding plastic but NC has several that look like they are well researched out right.

Ed

On Thu, Feb 6, 2025 at 11:28 AM Kathy Beckett <Kathy.beckett@steptoe-johnson.com> wrote:

> I will hold that hour. Stay dry…..
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From: Andrews, Edward S <edward.s.andrews@wv.gov>
Sent: Thursday, February 6, 2025 11:26 AM
To: Kathy Beckett <Kathy.beckett@steptoe-johnson.com>
Subject: Re: Availability for a call?

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you trust edward.s.andrews@wv.gov.

I will give you a call tomorrow morning around 10,

Thanks

Ed

On Thu, Feb 6, 2025 at 9:59 AM Kathy Beckett <Kathy.beckett@steptoe-johnson.com> wrote:

> Dear Ed,
>
> I am available today from 2:15 on and am open on Friday. Thanks to you as well for all the hard work and shouldering the issues.

Kathy

Kathy Beckett
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Kathy,

Thank-you very much for making yesterday's meeting possible.

I have looked over the application and identified a few areas that might need to be addressed based on our discussion yesterday.

If possible I would like to talk to you about the Empire's NHSM determination. I am available anytime upto 2:30 PM today; anytime on Thursday except from 10 to 11; and all day on Friday.

Thanks,

Ed

--

Edward Andrews, P.E.

Engineer

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Virtual Mtg 2/7/2025

Wednesday, April 9, 2025 1:26 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

Accepted: Call Kathy Beckett Re: Empire

1 message

Kathy Beckett <Kathy.Beckett@steptoe-johnson.com> Fri, Feb 7, 2025 at 9:51 AM
To: Edward S Andrews <edward.s.andrews@wv.gov>

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invite.ics
2K

Re: After Mtg Call 2/6/2025

Wednesday, April 9, 2025 1:25 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

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Templete presentation from ALL4

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Thanks,

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Engineer

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Mtg Attendees 2/3/2025

Wednesday, April 9, 2025 1:24 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

Empire Diversified Meeting Tomorrow

1 message

Kathy Beckett <Kathy.Beckett@steptoe-johnson.com> Mon, Feb 3, 2025 at 1:19 PM
To: "Andrews, Edward S" <edward.s.andrews@wv.gov>
Cc: "bbrown@empirede.com" <bbrown@empirede.com>, "fwood@empirede.com" <fwood@empirede.com>, Samantha Phillips Beers <Samantha.Beers@steptoe-johnson.com>, Kathy Beckett <Kathy.Beckett@steptoe-johnson.com>

Dear Ed,

Only Farley Wood and I will be attending the meeting tomorrow at 1:30. Both Bernard and Samantha will need to join virtually. If you would like for me to set up a link for that meeting please let me know.

Kathy

Kathy Beckett
Steptoe & Johnson PLLC
P.O. Box 1588, Charleston, WV 25326-1588
Overnight
Chase Tower, 17th Floor
707 Virginia Street, East, Charleston, WV 25301
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RE: Feb Mtg 1/28/2025

Wednesday, April 9, 2025 1:23 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

RE: Meeting first week of February?

1 message

Kathy Beckett <Kathy.Beckett@steptoe-johnson.com> Tue, Jan 28, 2025 at 3:02 PM
To: "Andrews, Edward S" <edward.s.andrews@wv.gov>
Cc: "bbrown@empirede.com" <bbrown@empirede.com>, Kathy Beckett <Kathy.Beckett@steptoe-johnson.com>

Dear Ed,

Thank you for the reminder. Empire Diversified will not need a virtual link for this meeting. I do not have a list of attendees yet, but do not expect that to be more than four people and likely fewer.

Kathy

Kathy Beckett
Steptoe & Johnson PLLC
P.O. Box 1588, Charleston, WV 25326-1588
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From: Andrews, Edward S <edward.s.andrews@wv.gov>
Sent: Tuesday, January 28, 2025 1:48 PM
To: Kathy Beckett <Kathy.Beckett@steptoe-johnson.com>
Subject: Re: Meeting first week of February?

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you trust edward.s.andrews@wv.gov.

Kathy,

I'll need a list of individuals who plan to attend the meeting next Tuesday (2/4 - 1:30 PM to 3:00 pm).

Also, I need to know if this needs to be a hybrid (in-person/virtual) meeting or if other individuals need to call in. So that I can make the necessary arrangements.

Thanks

Ed

On Wed, Jan 22, 2025 at 4:54 PM Andrews, Edward S <edward.s.andrews@wv.gov> wrote:

> That date/time should work for us.
>
> I will need a list of attendees before the meeting.
>
> Ed
>
> On Wed, Jan 22, 2025 at 3:26 PM Kathy Beckett <Kathy.Beckett@steptoe-johnson.com> wrote:
>
> > Dear Ed,
> >
> > There is a preference for 2/4 at 1:30 – 3:00.

Thank you,

Kathy

Kathy Beckett
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From: Andrews, Edward S <edward.s.andrews@wv.gov>
Sent: Wednesday, January 22, 2025 10:16 AM
To: Kathy Beckett <Kathy.Beckett@steptoe-johnson.com>
Subject: Re: Meeting first week of February?

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Kathy,

Here are some proposed dates and times.

Tuesday, 2/11, 1:30 to 3 pm.

Tuesday 2/4, 1:30 to 3 pm.

Monday 2/10, 2:30 to 4 pm.

I am assuming this meeting might a little longer than a hour.

Please let me know, which date works best for you and Empire.

Thanks.

Ed

On Tue, Jan 21, 2025 at 6:26 PM Kathy Beckett <Kathy.Beckett@steptoe-johnson.com> wrote:

> Dear Ed,
>
> Empire Green would like to meet in early February in person. Is there a date or two you could offer?
>
> Thanks
>
> Kathy
>
> Kathy G. Beckett
>
> Steptoe & Johnson PLLC
>
> (304) 353-8172 desk
>
> (304) 539-8119 cell
>
> ---
>
> Steptoe & Johnson PLLC Note:
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Re: Jan Call 1/7/2025

Wednesday, April 9, 2025 1:22 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

Re: Empire Green Generation

1 message

Kathy Beckett <Kathy.Beckett@steptoe-johnson.com> Tue, Jan 7, 2025 at 4:55 PM
To: Edward S Andrews <edward.s.andrews@wv.gov>

Yes, may I call you? I'm not sure if my street will be clear but expect it to be. What number should I call?

Kathy G. Beckett
Steptoe & Johnson PLLC
(304) 353-8172 desk
(304) 539-8119 cell

On Jan 7, 2025, at 4:23 PM, Andrews, Edward S <edward.s.andrews@wv.gov> wrote:

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you trust edward.s.andrews@wv.gov.

How about 9 AM?

Ed

On Tue, Jan 7, 2025 at 4:21 PM Kathy Beckett <Kathy.Beckett@steptoe-johnson.com> wrote:

Yes, I am available. I'm open all day so you may choose a time that spits you.

Kathy G. Beckett
Steptoe & Johnson PLLC
(304) 353-8172 desk
(304) 539-8119 cell

On Jan 7, 2025, at 4:15 PM, Andrews, Edward S <edward.s.andrews@wv.gov> wrote:

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you trust edward.s.andrews@wv.gov.

Kathy,

I am following up with you on my suggestion for Empire Green Generation. Would you be available for a quick call tomorrow?

Thanks
Ed

Edward Andrews, P.E.
Engineer
WVDEP/Division of Air Quality
304-414-1244
601 57th Street, SE
Charleston, WV 25304

On Wed, Dec 11, 2024 at 8:51 AM Kathy Beckett <Kathy.beckett@steptoe-johnson.com> wrote:

I will pull these up. Thanks!

Kathy Beckett
Steptoe & Johnson PLLC
P.O. Box 1588, Charleston, WV 25326-1588
Overnight
Chase Tower, 17th Floor
707 Virginia Street, East, Charleston, WV 25301
O: 304-353-8172 F: 304-353-8183 C: 304-539-8119

Kathy.Beckett@Steptoe-Johnson.com
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<image001.png>

<image002.gif>

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useful this morning.

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Re: Call 12/10/2024

Wednesday, April 9, 2025 1:19 PM

Andrews, Edward S <edward.s.andrews@wv.gov>

RE: Empire Green Generation

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Kathy

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Other Plastic Pyrolysis Units 11/27/2024

Tuesday, January 21, 2025 7:55 AM

Andrews, Edward S <edward.s.andrews@wv.gov>

Other Plastic Pyrolysis Units -

1 message

Andrews, Edward S <edward.s.andrews@wv.gov> Wed, Nov 27, 2024 at 12:09 PM
To: Katie Wood <katie.wood@tetratech.com>, Farley Wood <fwood@empirede.com>, Bernard Brown <bbrown@empirede.com>, Kathy Beckett <Kathy.beckett@steptoe-johnson.com>, Samantha Beers <Samantha.beers@steptoe-johnson.com>
Cc: Joseph R Kessler <joseph.r.kessler@wv.gov>, "Boehm, Richard A" <richard.a.boehm@wv.gov>, "Crowder, Laura M" <laura.m.crowder@wv.gov>

I found three different pyrolysis units in Illinois. I have been able to figure out some basic info about two of them. The Channahon ILL (INEOS Joliet) is converting polystyrene back down to a styrene monomer. I am thinking this unit has been exempt from Illinois EPA permitting rules.

The BP Naperville Campus is converting plastic bottles and other polyethylene terephthalate products back into original constituents. The Illinois EPA permitted this unit as a "affected pilot plant".

The third is Plastic Advanced Recycling Corporation in Willowbrook, IL. At a high level, I think (maybe) this one is kind of similar to your proposed process. I will need to dig deep on this one after Thanksgiving.

https://www.plastic2x.com/parctechnology/

Also, Illinois passed a law excluding pyrolysis units located in either WIlls or Grady Counties from Illinois EPA permitting requirements.

https://www.ilga.gov/legislation/ilcs/ilcs4.asp?DocName=041500050HTit%2E+VI%2DD&ActID=1585&ChapterID=36&SeqStart=40000000&SeqEnd=41100000

Enjoy,
Ed

2 attachments

Construction Permit.pdf
713K

eP2FPresentation.pdf
889K

Constructio
n Permit

Bureau of Air Permit Section

File Organization Cover Sheet

Source Name:	BP Naperville Complex
ID No.:	043065AAG
Application No.:	20010010
Category:	03K Air Permit - Final
Item Date:	3/4/20
Keyword:	
Comment:	
Part:	of

IEPA - DIVISION OF RECORDS MANAGEMENT
RELEASABLE

JUN 25 2020

REVIEWER: RDH

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY
1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276 • (217) 782-3397
JB PRITZKER, GOVERNOR JOHN J. KIM, DIRECTOR

217/785-1705

CONSTRUCTION PERMIT

PERMITTEE

BP Naperville Campus
Attn: Junling Qiu
150 West Warrenville Road
Naperville, Illinois 60563

Application No.: 20010010 I.D. No.: 043065AAG
Applicant's Designation: Date Received: January 27, 2020
Subject: Pilot Plant for BP Infinia Technology
Date Issued: March 4, 2020
Location: 150 West Warrenville Road, Naperville, DuPage County

This Permit is hereby granted to the above-designated Permittee to CONSTRUCT emission source(s) and/or air pollution control equipment consisting of a pilot plant for BP Infinia Technology, as described in the above-referenced application. This Permit is subject to standard conditions attached hereto and the following special condition(s):

1. Introduction

   a. This permit addresses the construction of a pilot plant for BP Infinia Technology (the "affected pilot plant"). This proprietary solvent-based technology is being developed to enable the recycling of plastic bottles and other items made of polyethylene terephthalate by separating the material back into its original constituents. The plant would be designed to recover solvent for reuse in the process.

   b. For the purpose of this permit, this new pilot plant is referred to as the "affected pilot plant."

2. State Emission Standards

   a. The affected pilot plant is subject to 35 IAC 218.301, which provides that no person shall cause or allow the discharge of more than 3.6 kg/hour (8.0 lbs/hour) of organic material into the atmosphere from any emission unit. If no odor nuisance exists this limitation shall apply only to "photochemically reactive material," as defined by 35 IAC 211.4690.

3. Nonapplicability Provisions

   a. This permit is issued based on this project not constituting a major modification subject to the federal rules for Prevention of Significant Deterioration (PSD), 40 CFR 52.21, or the state rules for Major Stationary Sources Construction and Modification (MSSCAM), 35 IAC Part 203. This is because the emissions of the

affected pilot plant will not be significant (See Condition 4). In addition, the operation of the affected pilot plant will not increase the utilization of the utility equipment at the plant, which has been operating with "surplus" electricity sent to the grid.

b. This permit is issued based on the source with the affected pilot plant continuing to be an area source for emissions of hazardous air pollutants (HAPs).

c. This permit is issued based on the affected pilot plant not being a "pollution control facility," as defined by Section 3.330 of the Illinois Environmental Protection Act. This is because the plant will be developed operated for research and development of process technology and not for storage or treatment of waste.

d. This permit is issued based on piping components and process equipment at the affected pilot plant not being subject to requirements of otherwise applicable federal New Source Performance Standards (NSPS), including 40 CFR 60 Subparts VVa, NNN and RRR, except for certain recordkeeping and reporting requirements of these rules that apply for components and process equipment that are not subject to substantive requirements. This is because the affected pilot plant has a total design capacity for production of chemicals that are potentially subject to these rules that is less than 1 gigagram/year (1,100 tons/year).

e. This permit is issued based on the affected pilot not including any new tanks for storage of organic liquids that are subject to the NSPS for Organic Liquid Storage Vessels for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984, 40 CFR 60 Subpart Kb. This is because the affected pilot plant will not include storage vessels with a capacity of 75 cubic meters or more.

f. This permit is issued based on the affected pilot plant not being subject to the control requirements of 35 IAC 218 Subpart TT, Other Emission Units. This is because the source does not meet the applicability criteria for VOM emissions in 35 IAC 218.980(a) or (b).

4. <u>Operational Requirements</u>

a. The annual usage of solvents by the affected pilot plant shall not exceed the following limits:

Type of Solvent	Limit (tons/calendar year)
VOM (including VOM HAPs)	9.5
Methanol	8.0
HAPs other than methanol	1.0

b. At all times, the Permittee shall, to the extent practicable, maintain and operate the affected pilot plant, including the VOM solvent recovery systems that are part of the plant, in a manner consistent with good air pollution control practice.

c. The consumption of VOM solvent by the affected pilot plant, determined as the difference between the amount of virgin VOM solvent delivered to the plant and the amount of VOM solvent in materials sent off-site for recycling or disposal, shall not exceed 9.0 tons/calendar year.

5. Emissions

a. The annual emissions of VOM, methanol and HAPs other than methanol of the affected pilot plant shall not exceed the following limits. Compliance with these limits shall be determined based from the usage of these materials, with adjustment allowed for the amounts of these pollutants in materials sent offsite and the amounts of these pollutants consumed by the chemical material that occur in the affected pilot plant.

Pollutant	Limit (tons/calendar year)
VOM (including VOM HAPs)	5.4
Methanol	4.4
HAPs other than methanol	1.0

b. This permit is issued based on the affected pilot plant having minimal emissions of particulate, including emissions from receiving and preliminary processing of feedstock, i.e., particulate emissions overall of no more than 1.1 tons/year.

6. Operational Monitoring for the Solvent Recovery System(s)

a. For the solvent recovery system(s) for VOM solvent in the affected plant, the Permittee shall maintain instrumentation for at least one operating parameter that is indicative of the operation and functioning of the system(s). If information from this instrumentation is not automatically recorded, the data measured by these systems shall be manually recorded on at least a daily basis when the affected pilot plant or a particular portion of the plant served by a recovery system is operated.

7. Recordkeeping

a. The Permittee shall maintain file(s) containing the following information for the affected pilot plant:

i. A process flow diagram for the plant that identifies the principle portions of the plant (e.g., the handling of feedstocks, the depolymerization process and the

purification of monomers) and the VOM solvent recovery systems and the portions of the plant that they serve.

ii. Information for each of the organic solvents used in the plant, including the identity (name or chemical type), whether the solvent is a VOM or contains HAPs, and if the solvent contains HAPs, the HAP content (percent by weight).

iii. A demonstration of compliance with 35 IAC 218.301 for the individual process emission units in the plant, which demonstration shall either show the emissions of organic material from the unit are not "photochemically reactive material," as defined by 35 IAC 211.4690, or show that maximum hourly organic material emission rate from the unit will not exceed 8.0 pounds/hour, with supporting documentation and calculations.

iv. A demonstration that the feedstock processed by the affected pilot plant is not a waste as defined by Section 3.535 of the Illinois Environmental Protection Act.

b. The Permittee shall maintain a log or other records for the affected pilot plant that includes information identifying periods when the plant or portions of the plant are operated.

c. The Permittee shall maintain a log or other records for the affected pilot plant that address the maintenance and repair of solvent recovery systems.

d. The Permittee shall maintain records for the usages of solvents by the affected pilot plant to address compliance with Condition 4(a) (tons/month and tons/year), with supporting data calculations.

e. The Permittee shall maintain records of the following items related to the emissions of pollutant(s) of the affected pilot plant to address compliance with Condition 5(a) if the annual usage of solvent(s) exceeds the respective limit for the pollutant in Condition 5(a). Otherwise, if the usage of the solvent is no more than the limit for the pollutant and the Permittee does not otherwise keep these records, the emissions of pollutant will be assumed to be the same as the usage of the respective solvent.

i. Records for amount of the pollutant in the shipments of waste solvent sent offsite, with the date of each shipment, the total weight of the shipment, and the weight of the pollutant in the shipment, with supporting documentation.

ii. Records for emissions of the pollutant, determined by subtracting the amount of the pollutant in waste shipments from the usage of the pollutant (tons/month and tons/calendar year), with supporting data calculations.

iii. If the annual emissions of the pollutant, as determined above, exceeds the applicable limit in Condition 5(a), a determination based on engineering analysis of the net amount of the pollutant that is consumed by the chemical reactions that are involved in processing the feedstock to the affected pilot plant (pound of pollutant consumed /pound of feedstock processed), with supporting documentation. Otherwise, if the Permittee does not keep these records, the emissions of the pollutant will be assumed to be usage of the pollutant less the amount of the pollutant in waste shipments.

iv. If the Permittee keeps the above records, records for the emissions of the pollutant (tons/month and tons/year), determined by subtracting the net amount of the pollutant consumed in the pilot plant, as calculated in accordance with the factor in Condition 7(e)(iii) from the emissions as determined pursuant to Condition 7(e)(ii), with supporting data calculations.

f. As solvent(s) that are HAPs or contain HAPs are used in the affected pilot plant, unless and until the Permittee notifies the Illinois EPA that the source has become a major source for HAPs, the Permittee shall keep records for the usage and emissions of HAPs by the source as reasonably necessary to show that the source continues to be an area source for HAP emissions.

8. <u>Notification and Reporting</u>

a. The Permittee shall notify the Illinois EPA within 30 days of the date that it first processes plastic in the affected pilot plant.

b. The Permittee shall promptly notify the Illinois EPA of deviations of the affected pilot plant with requirements of this permit. These reports shall contain the following information:

i. Identification of the emission unit(s) and/or operation involved.

ii. Description of the deviation, including date, time and duration.

iii. Probable cause of the deviation.

iv. Corrective actions or preventive measures taken.

c. The Permittee shall notify the Illinois EPA within 30 days of the date that it first begins to use the affected pilot plant for a technology other than the BP Infinia process or similar process(es).

9. Reporting Address

Notifications and reports required by this permit shall be sent to:

Illinois Environmental Protection Agency
Bureau of Air
Compliance Section (#40)
P.O. Box 19276
Springfield, Illinois 62794-9276

10. Other Requirements

a. This permit does not relieve the Permittee of the responsibility to comply with all Local, State and Federal Regulations which are part of the applicable Illinois State Implementation Plan, as well as all other applicable Federal, State and Local requirements.

b. In particular, this construction permit also does not provide approval(s) as permit(s) would be needed from the Illinois EPA Bureau of Water for construction or other activities at the source related to wastewater from the affected pilot plant.

c. This permit also does not excuse the Permittee from the obligation to undertake further actions at the source as may be needed to eliminate air pollution, including nuisance due to odors, such as implementation of additional work practices for handling of materials and processing of wastes.

11. Authorization to Operate

The Permittee may operate the affected pilot plant as addressed by this construction permit under this permit until the Clean Air Act Permit Program (CAAPP) permit for the source is revised to address the affected pilot plant. This condition supersedes Standard Condition 6.

If you have any questions on this permit, please contact Anwar Azeem at 217/785-1705.

Raymond E. Pilapil

Raymond E. Pilapil
Manager, Permit Section
Bureau of Air

REP:ASA:tan
PGA

STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY
DIVISION OF AIR POLLUTION CONTROL
P. O. BOX 19506
SPRINGFIELD, ILLINOIS 62794-9506

STANDARD CONDITIONS FOR CONSTRUCTION/DEVELOPMENT PERMITS ISSUED BY THE ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

July 1, 1985

The Illinois Environmental Protection Act (Illinois Revised Statutes, Chapter 111-1/2, Section 1039) authorizes the Environmental Protection Agency to impose conditions on permits which it issues.

The following conditions are applicable unless superseded by special condition(s).

1. Unless this permit has been extended or it has been voided by a newly issued permit, this permit will expire one year from the date of issuance, unless a continuous program of construction or development on this project has started by such time.

2. The construction or development covered by this permit shall be done in compliance with applicable provisions of the Illinois Environmental Protection Act, and Regulations adopted by the Illinois Pollution Control Board.

3. There shall be no deviations from the approved plans and specifications unless a written request for modification, along with plans and specifications as required, shall have been submitted to the Agency and a supplemental written permit issued.

4. The Permittee shall allow any duly authorized agent of the Agency upon the presentation of credentials, at reasonable times:

   a. to enter the Permittee's property where actual or potential effluent, emission or noise sources are located or where any activity is to be conducted pursuant to this permit,

   b. to have access to and copy any records required to be kept under the terms and conditions of this permit,

   c. to inspect, including during any hours of operation of equipment constructed or operated under this permit, such equipment and any equipment required to be kept, used, operated, calibrated and maintained under this permit,

   d. to obtain and remove samples of any discharge or emission of pollutants, and

   e. to enter and utilize any photographic, recording, testing, monitoring or other equipment for the purpose of preserving, testing, monitoring, or recording any activity, discharge, or emission authorized by this permit.

5. The issuance of this permit:

   a. shall not be considered as in any manner affecting the title of the premises upon which the permitted facilities are to be located,

   b. does not release the Permittee from any liability for damage to person or property caused by or resulting from the construction, maintenance, or operation of the proposed facilities,

   c. does not release the Permittee from compliance with the other applicable statues and regulations of the United States, of the State of Illinois, or with applicable local laws, ordinances and regulations,

   d. does not take into consideration or attest to the structural stability of any units or parts of the project, and

e. In no manner implies or suggests that the Agency (or its officers, agents or employees) assumes any liability, directly or indirectly, for any loss due to damage, installation, maintenance, or operation of the proposed equipment or facility.

6. a. Unless a joint construction/operation permit has been issued, a permit for operation shall be obtained from the Agency before the equipment covered by this permit is placed into operation.

b. For purposes of shakedown and testing, unless otherwise specified by a special permit condition, the equipment covered under this permit may be operated for a period not to exceed thirty (30) days.

7. The Agency may file a complaint with the Board for modification, suspension or revocation of a permit:

a. upon discovery that the permit application contained misrepresentations, misinformation or false statements or that all relevant facts were not disclosed, or

b. upon finding that any standard or special conditions have been violated, or

c. upon any violations of the Environmental Protection Act or any regulation effective thereunder as a result of the construction or development authorized by this permit.

eP2FPresentation

Waste Plastic to Fuel

Zero Pollution Conversion Technology

PLASTIC
ADVANCED
RECYCLING
CORP.

Confidential Information

1

Plastic Advanced Recycling Corp

Who We Are and What We Do

PARC is a leading pyrolysis technology company that achieved continuous production to convert waste plastics into high quality fuel through patented systems that are financially and environmentally beneficial.

- **Reduce** waste plastic streams and mitigate environmental pollution by efficiently converting all types of plastics, including PVC
- **Produce** high-quality, ready-to-use fuel for industrial furnace and can be refined into Gasoline and Diesel by refinery
- **Create** a sustainable solution to today's most daunting problems: environmental deterioration and energy shortage
- **Offer** green jobs that are beneficial to local economy

Hawaii, US

Naples, Italy

Confidential Information

Plastic Advanced Recycling Corp

Who We Are and What We Do

Industrial

Residential

- Generated: More than 13 million tons of plastic wastes in the US per year
- Recycled: Only 7% of those plastic wastes

Landfills

Incineration

PARC's Technology

- Environmental friendly method to dispose plastic wastes
- Alternative sources of energy
- New profit stream

Confidential Information

Plastic Advanced Recycling Corp

Company Overview

- Founded in 1994 and built first plant in Beijing in 1995
- PARC has devoted itself to improving and perfecting its waste-to-fuel technology for 20 years
- Currently have two operational plants in Jiangsu Province, China
  A new facility with two units are expected to be installed within 2015
- Independently own three US patents. Certified by ISO 9001

Facility in Nantong, China

Plastic Advanced Recycling Corp

Waste Plastic to Fuel

Advantages:

- Continuous operation with high efficiency and capacity

30 tons of waste plastic per day; 10,000 tons per year

- Automatic continuous feeding and discharging system
- New technology pyrolysis reactor
- No sorting is needed; able to process co-mingled plastics
- System is scaled to need
- Minimum emission
- High output ratio

Plastic Advanced Recycling Corp

Waste Plastic to Fuel

Process:

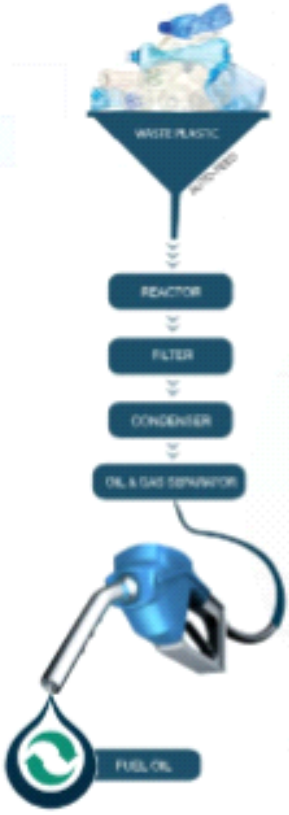
- Feedstock– Plastic packaging, agricultural film, food and beverage containers, etc.

➢ All types of plastic

➢ Single unit of equipment can process 30 tons of waste plastic a day, totaling 10,000 tons a year

➢ Types of plastic that have high oil yield: PP, PS, LDPE, HDPE

- Low-temp & pressure 800℉/500 ℃ pyrolysis reaction
- Reaction-- solid to liquid and gas
- Filtrated and condensed into mixed fuel
- (optional) Refine into diesel and gasoline



Plastic Advanced Recycling Corp

Waste Plastic to Fuel

Output:

- **Up to 60%** of the output is mixed fuel (depends on feedstock), which can be used in industrial boilers, generators, or can be further refined into diesel and gasoline by the refinery

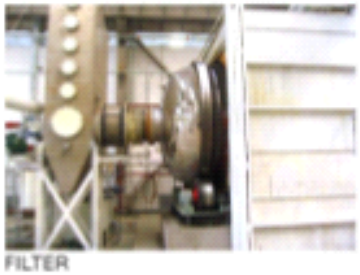
- **17%-32%** is solid residue, which can be used as a heating source similar to lean coal.
- **15%-18%** is combustible gas which is recycled back to the furnace as heat.

Plastic Advanced Recycling Corp

Value Proposition

- Reduce plastic waste pollution and tipping fees associated with plastic sourcing.
- Reduce GHG emissions related to incineration and oil extraction.
- Reduce dependency on foreign oil and exposure to volatile oil prices.
- Create additional revenue through mixed fuel sales.
- Create green jobs for local community.
- Create strong environmental stewardship with local community by better waste management practice.

DRYER


FILTER

CONDENSER

Thank You !

Plastic Advanced Recycling Corporation
Add: 7884 S Quincy St.
Willowbrook, IL 60527, U.S.
Tel: 1-630-655-6976
Fax: 1-630-654-0530
Email: info@plastic2x.com
www.plastic2x.com

Confidential Information

Additional Info Other Units 11/25/2024

Tuesday, January 21, 2025 7:53 AM

Andrews, Edward S <edward.s.andrews@wv.gov>

RE: Kore Infrastructure Permits

1 message

Kathy Beckett <Kathy.beckett@steptoe-johnson.com> Mon, Nov 25, 2024 at 10:08 AM
To: "Andrews, Edward S" <edward.s.andrews@wv.gov>

Thank you. Our education continues…..

Kathy Beckett
Steptoe & Johnson PLLC
P.O. Box 1588, Charleston, WV 25326-1588
Overnight
Chase Tower, 17th Floor
707 Virginia Street, East, Charleston, WV 25301
O: 304-353-8172 F: 304-353-8183 C: 304-539-8119

Kathy.Beckett@Steptoe-Johnson.com
www.steptoe-johnson.com

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From: Andrews, Edward S <edward.s.andrews@wv.gov>
Sent: Thursday, November 21, 2024 4:31 PM
To: Farley Wood <fwood@empirede.com>; Bernard Brown <bbrown@empirede.com>; Kathy Beckett <Kathy.beckett@steptoe-johnson.com>; Samantha Phillips Beers <Samantha.beers@steptoe-johnson.com>
Cc: Crowder, Laura M <laura.m.crowder@wv.gov>; Joseph R Kessler <joseph.r.kessler@wv.gov>; Boehm, Richard

A <richard.a.boehm@wv.gov>
Subject: Kore Infrastructure Permits

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you trust edward.s.andrews@wv.gov.

SCAQMD permitted the pyrolysis unit to only process digested, dewatered sewage sludge biosolids. Also, SCAQMD used the provisions of Rule 441 to permit this facility.

https://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-441.pdf?sfvrsn=4

Subpart AAAA specifically excludes sewage sludge from the definition of "municipal solid waste or municipal-type waste"/

From what I can tell, the Kore's process is fairly comparable except that the process heater for the pyrolysis unit can only burn natural gas or treated syn gas.

Thanks,

Ed Andrews

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Availability 11/19/2024

Tuesday, January 21, 2025 7:59 AM

Andrews, Edward S <edward.s.andrews@wv.gov>

Re: Possible Dates/Times for a Call

1 message

Andrews, Edward S <edward.s.andrews@wv.gov> Tue, Nov 19, 2024 at 8:47 AM
To: Kathy Beckett <Kathy.Beckett@steptoe-johnson.com>

Joe had to back out on the Wednesday Afternoon Call.

We could still go over our discussion with R3.

Friday, 11/22, is not blocked off. 9-10 and the afternoon is open.

Ed

On Mon, Nov 18, 2024 at 10:29 AM Kathy Beckett <Kathy.Beckett@steptoe-johnson.com> wrote:

> Funny, I meant to reference Farley Wood but my old air agency brain kicked in…..
>
> **Kathy Beckett**
> Steptoe & Johnson PLLC
> P.O. Box 1588, Charleston, WV 25326-1588
> *Overnight*
> Chase Tower, 17th Floor
> 707 Virginia Street, East, Charleston, WV 25301
> O: 304-353-8172 F: 304-353-8183 C: 304-539-8119
>
> Kathy.Beckett@Steptoe-Johnson.com
> www.steptoe-johnson.com
>
> STEPTOE & JOHNSON PLLC ATTORNEYS AT LAW
>
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From: Kathy Beckett <Kathy.beckett@steptoe-johnson.com>
Sent: Monday, November 18, 2024 10:28 AM
To: Andrews, Edward S <edward.s.andrews@wv.gov>
Cc: Kathy Beckett <Kathy.Beckett@Steptoe-Johnson.com>
Subject: RE: Possible Dates/Times for a Call

Dear Ed,

Dale Farley and Bernard Brown have a preference for meeting on Wednesday. If that works for your team, let us know.

Thank you,

Kathy

Kathy Beckett
Steptoe & Johnson PLLC
P.O. Box 1588, Charleston, WV 25326-1588
Overnight
Chase Tower, 17th Floor
707 Virginia Street, East, Charleston, WV 25301
O: 304-353-8172 F: 304-353-8183 C: 304-539-8119

Kathy.Beckett@Steptoe-Johnson.com
www.steptoe-johnson.com

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From: Andrews, Edward S <edward.s.andrews@wv.gov>
Sent: Friday, November 15, 2024 4:21 PM
To: Kathy Beckett <Kathy.beckett@steptoe-johnson.com>
Subject: Possible Dates/Times for a Call

[EXTERNAL EMAIL] DO NOT CLICK links or attachments unless you trust edward.s.andrews@wv.gov.

Kathy

Here are a few dates & times for a future call with the agency to go over a path to move EGG's modification application forward.

Before Thanksgiving:

Wednesday (11/20) 3 to 4 pm.

Maybe Friday (11/22) 10 to 11 am or 1 to 2 pm (I have not been able to confirm this date with our folks.)

After Thanksgiving:

Tuesday (12/3) 2 to 3 pm. (Reserved)

Backup Option - Wednesday (12/4) afternoon - prefer 2 to 3 pm.

If you could let me know if any these would not work for EGG or your schedule, please let me know.

Thanks,

Ed

Edward Andrews, P.E.

Engineer

304-414-1244

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Response Lt for R3 11/4/2024

Tuesday, January 21, 2025 7:51 AM

Andrews, Edward S <edward.s.andrews@wv.gov>

Response to Letter from West Virginia, Division of Air Quality from October 23, 2024

1 message

R3 ECAD ADMIN <R3_ECAD_ADMIN@epa.gov> Mon, Nov 4, 2024 at 8:51 AM
To: "Crowder, Laura M" <Laura.M.Crowder@wv.gov>
Cc: "aearley@fairshake-els.org" <aearley@fairshake-els.org>, "frank.rocchio@oveadvocates.org" <frank.rocchio@oveadvocates.org>, "bbrown@empirede.com" <bbrown@empirede.com>, "fwood@empirede.com" <fwood@empirede.com>, "Joseph.r.kessler@wv.gov" <Joseph.r.kessler@wv.gov>, "edward.s.andrews@wv.gov" <edward.s.andrews@wv.gov>

Dear Ms. Crowder:

The attached is in response to your letter dated October 23, 2024 regarding West Virginia Division of Air Quality's previous request for a regulatory interpretation of Empire Green Generation LLC (Empire) proposal at their facility located in Follansbee, WV. Steve Ott will be following up with a meeting invitation to further discuss the status of EPA's regulatory interpretation.

Regards,

Eva Weinelt

Administrative Specialist

Enforcement and Compliance Assurance Division

US EPA Mid-Atlantic Region

Phone 215-814-2197

Email weinelt.eva@epa.gov

2 attachments

image001.jpg
6K

RE - WV Regulatory Interpretation Request.pdf
128K

RE - WV
Regulator...

RE - WV Regulator...

REGION 3

PHILADELPHIA, PA 19103

October 28, 2024

VIA ELECTRONIC MAIL
RETURN RECEIPT REQUESTED

Ms. Laura Crowder
Director
West Virginia, Division of Air Quality
601 57th Street SE
Charleston, WV 25304

Dear Ms. Crowder:

We received your letter dated October 23rd, 2024 regarding West Virginia Division of Air Quality's previous request for a regulatory interpretation of Empire Green Generation LLC (Empire) proposal to modify their existing permit to replace the use of medical waste with plastic as a feedstock in a pyrolytic conversion process at their facility located in Follansbee, WV.

As noted in your letter, Region 3 has been working to obtain sufficient information to develop an adequate and accurate response. Region 3 has sent Empire an Information Request Letter on August 1, 2024 and met with EPA's Office of Enforcement and Compliance Assurance (OECA) and Office of Air Quality Planning and Standards (OAQPS) several times to discuss the proposal.

While we acknowledge West Virginia DAQ is eager to complete the modification application, Region 3 believes that more information is needed for a complete response. Additionally, during the July 26, 2024 meeting between WVDAQ and Region 3, WVDAQ indicated that the permit application was incomplete and that the regulatory clock had not started yet and WVDAQ did not provide a deadline during the meeting or initial request for regulatory interpretation sent to Region 3's Air and Radiation Division on March 6, 2023.

Steve Ott of my staff will be following up with a meeting invitation to further discuss the status of EPA's regulatory interpretation.

Sincerely,

KAREN MELVIN

Digitally signed by KAREN MELVIN
Date: 2024.11.24 07:26:58 -05'00'

Karen Melvin, Director
Enforcement and Compliance Assurance Division

cc:
Penny Lassiter, EPA SPPD, lassiter.penny@epa.gov
Cristina Fernandez, EPA Region 3, Fernandez.Cristina@epa.gov
Marycate Opila, EPA Region 3, Opila.Marycate@epa.gov
Gwendolyn Supplee, EPA Region 3, Supplee.Gwendolyn@epa.gov
Diana Felix, EPA OAQPS, Felix.Diana@epa.gov
Andrew Earley, Fair Shake Environmental Legal Services, aearley@fairshake-els.org
Frank Rocchio, Ohio Valley Environmental Advocates, frank.rocchio@ovealdvocates.org
Bernard Brown, Empire Green Generation, bbrown@empirede.com
Farley Wood, Empire Green Generation, fwood@empirede.com
Joseph Kessler, WVDAQ, Joseph.r.kessler@wv.gov
Ed Andrews, WVDAQ,Edward.s.Andrews@wv.gov
Kristen Hall, EPA Region 3, hall.kristen@epa.gov
Steve Ott, EPA Region 3, ott.steven@epa.gov

Fair Shake lt to R3 10/30/2024

Tuesday, January 21, 2025 7:50 AM

Andrews, Edward S <edward.s.andrews@wv.gov>

Fwd: FW: Empire Green Generation in Follansbee, WV and WVDEP's Regulatory Interpretation Request

1 message

Kessler, Joseph R <joseph.r.kessler@wv.gov> Wed, Oct 30, 2024 at 9:59 AM
To: Edward S Andrews <edward.s.andrews@wv.gov>

---------- Forwarded message ---------
From: **Supplee, Gwendolyn** <Supplee.Gwendolyn@epa.gov>
Date: Wed, Oct 30, 2024 at 9:06 AM
Subject: FW: Empire Green Generation in Follansbee, WV and WVDEP's Regulatory Interpretation Request
To: Kessler, Joseph R <joseph.r.kessler@wv.gov>

Hi Joe –

FYI – you may have already received this from Laura, but sending just in case.

Thanks,

-gwen

Gwendolyn K. Supplee (She, her, hers)
Senior Permit Specialist/Life Scientist
U.S. Environmental Protection Agency, Region 3
Permits Branch (3AD10)
Air & Radiation Division
Phone 215-814-2763
Email supplee.gwendolyn@epa.gov

From: Andrew Earley <aearley@fairshake-els.org>
Sent: Wednesday, October 30, 2024 8:47 AM
To: Fernandez, Cristina (she/her/hers) <Fernandez.Cristina@epa.gov>
Cc: Megan Hunter <mhunter@earthjustice.org>; OVE Advocates <oveadvocates@gmail.com>; Lassiter, Penny <Lassiter.Penny@epa.gov>; Hall, Kristen <hall.kristen@epa.gov>; Opila, MaryCate <Opila.MaryCate@epa.gov>; Ott, Steven <Ott.Steven@epa.gov>; laura.m.crowder@wv.gov; Supplee, Gwendolyn <Supplee.Gwendolyn@epa.gov>
Subject: Empire Green Generation in Follansbee, WV and WVDEP's Regulatory Interpretation Request

Caution: This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

Ms. Fernandez:

Please see attached a letter addressing Empire Green Generation's proposed facility in Follansbee, WV, following our meeting on September 17, 2024. Thank you for your time and attention to this matter. Don't hesitate to reach out if we can be helpful.

Best,

Andrew Earley

WV Staff Attorney

Fair Shake Environmental Legal Services

232 Capitol Street, Ste. 14

Charleston, WV 25301

aearley@fairshake-els.org

www.fairshake-els.org

234-255-5397

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Letter to EPA re WVDEP Reg Int Req for Empire.pdf
352K

Letter to
EPA re W...

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Environmental Legal Services

EARTHJUSTICE
BECAUSE THE EARTH NEEDS A GOOD LAWYER

October 30, 2024

Cristina Fernandez
Director, Air and Radiation Division
Region 3, EPA
Fernandez.Cristina@epa.gov

Re: Empire Green Generation Follansbee, West Virginia, WVDEP Regulatory Interpretation Request

Ms. Fernandez:

Thank you for taking the time to meet with Ohio Valley Environmental Advocates and us on September 17, 2024, to discuss West Virginia's regulatory interpretation request regarding the applicability of Section 129 of the Clean Air Act ("CAA") to Empire Green Generation's proposed plastic pyrolysis and combustion facility in Follansbee, West Virginia ("Empire" or "EGG"). We appreciate that EPA offices are looking closely at this facility.

By all appearances, Empire proposes to build a plastic waste incinerator masquerading as a recycling facility to evade CAA Section 129 protections. EPA should look carefully at Empire's claim that it will be producing hydrochloric acid ("HCl") and char for sale, as well as its claims regarding the origins and handling of its plastic feedstock.

This letter provides additional information clarifying why the plastic Empire proposes to accept constitutes solid waste under EPA's Non-Hazardous Secondary Material ("NHSM") Rule. It also reiterates the concern raised on our call that the liquids and solids leaving Empire's pyrolysis trains for combustion in the vitrifiers should be evaluated to determine whether they are hazardous waste requiring additional permitting under RCRA.

I. Facility Background and WVDEP's Regulatory Interpretation Request

Empire has applied to WVDEP for a permit modification to build a facility that would accept plastic waste from other unidentified entities. Empire's application states

that it would feed the plastic into pyrolysis units—resulting in some amount of syngas, HCl, and char—and burn the resultant solids.

In March 2023, WVDEP submitted a regulatory interpretation request to Region 3 posing the following questions:

1. Should EGG's plastic feedstock be viewed as waste or non-waste?
2. If the plastic feedstock is determined to be fuel or ingredients in accordance with 40 CFR 241.3, then would the EGG pyrolysis trains be exempt from Section 129 of the CAA (e.g. subject to Subpart AAAA, CCCC, or Subpart EEEE)?
3. EGG plans to route the ash and char stream to the vitrifier (process heater) to be oxidized into products of combustion. Would the vitrifier be subject to Subpart CCCC or EEEE?
4. Would the vitrifiers be considered an "energy recovery unit" or a "commercial and industrial solid waste incineration unit" under Subpart CCCC?

As explained below, Empire's "plastic feedstock" meets the definition of a waste, triggering Section 129 requirements for the pyrolysis trains. In addition, EPA should evaluate whether the solids entering the vitrifiers are hazardous wastes triggering additional permitting requirements under RCRA.

II. Empire's "plastic feedstock" is waste

To determine whether the plastic Empire would receive constitutes a waste, we look to 40 CFR 241.3, which establishes the following criteria for a NHSM to be a non-waste when combusted: 1) the NHSM is maintained within the control of the generator *and* meets the legitimacy criteria in 40 CFR 241.3(d); or the discarded NHSM has undergone sufficient processing *and* meets the legitimacy criteria in 40 CFR 241.3(d).

The plastics Empire would combust are waste because they (1) are not managed within the control of the generator, and (2) are not sufficiently processed. In addition, the plastics do not meet the legitimacy criteria of the NHSM Rule.

A. The plastic Empire proposes to burn is not managed within the control of the generator

EPA regulations define "within control of the generator," to mean "the non-hazardous secondary material is generated and burned in combustion units at the generating facility; or that the such material is generated and burned in combustion units at different facilities, provided the facility combusting the non-hazardous secondary material is controlled by the generator; or both the generating facility and the

facility combusting the non-hazardous secondary material are under the control of the same person as defined in this section."[1]

Empire readily acknowledges that it would receive plastic waste from third parties.[2] Further, Empire states it is "in discussion with several entities regarding their waste plastic disposal needs, and willingness to participate in our waste recycling efforts."[3] Empire has not even determined where it will be getting its plastic, but it is clear it will be from third parties. Therefore, Empire cannot assert that the plastic it would burn will be under its control when generated, and Empire cannot meet the first prong of the NHSM Rule to obtain non-waste status for its plastic feedstock.

B. The plastic Empire proposes to burn has not been sufficiently processed.

Empire also cannot meet the second prong of the NHSM Rule because the plastic will not be sufficiently processed prior to entering the pyrolysis trains.[4] "Processing" means any operations that transform discarded NHSM into a non-waste fuel or non-waste ingredient product.[5] Processing "includes, but is not limited to, operations necessary to: remove or destroy contaminants; significantly improve the fuel characteristics of the material, e.g., sizing or drying the material in combination with other operations; chemically improve the as-fired energy content; or improve the ingredient characteristics."[6] Importantly, "processing" does not include "[m]inimal operations that result only in modifying the size of the material by shredding."[7]

In its self-determination, Empire does not address "processing;" however, Empire does address this question in its response to EPA's Section 114 request. When asked "[h]ow is the plastic processed prior to being delivered to EGG?" Empire responds, "processing consists of sizing and consolidation of waste stream."[8] As expressly stated in 40 CFR 241.2, operations that only result in modifying the size of the material do not

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[1] See 40 CFR 241.2(b).

[2] See Empire Green Generations Response to Request for Information under Section 114(a) of the Clean Air Act (July 31, 2024) ("Empire's Section 114 Response") at 7, available at https://dep.wv.gov/daq/permitting/Documents/EmpireGreenGeneration-Follesbee/Empire%20Green%20Gen%20Reply%20to%20USEPA%20114%20Ltr%20RFI%205-30-24.pdf.

[3] Id.

[4] See 40 CFR 241.3(b)(4).

[5] See 40 CFR 241.2.

[6] Id.

[7] Id.

[8] See Empire's Section 114 Response at 5.

constitute processing under the NHSM rule. Thus, when the plastic waste Empire receives enters the pyrolysis trains, it has not been "sufficiently processed" to be exempt from treatment as a solid waste under the NHSM Rule.[9]

C. Empire cannot show the plastic satisfies all three legitimacy criteria.

Because the discarded plastic Empire would burn is not under its control when it is generated, and that discarded plastic is not sufficiently processed prior to entering Empire's pyrolysis trains, the NHSM Rule exemption does not apply, and there is no need for EPA to assess whether the plastic meets the legitimacy criteria in 40 CFR 241.3(d). Nonetheless, it is evident that the plastics do not meet the legitimacy criteria.

For NHSM used as a fuel in a combustion unit, the legitimacy criteria requires that the NHSM (1) "be managed as a valuable commodity," (2) "have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy," *and* (3) "contain contaminants or groups of contaminants at levels comparable in concentration to or lower than those in traditional fuel(s) that the combustion unit is designed to burn."[10] For NHSM used as an ingredient in a combustion unit, the legitimacy criteria requires that the NHSM (1) "be managed as a valuable commodity," (2) "provide a useful contribution to the production or manufacturing process," (3) "be used to produce a valuable product or intermediate," *and* (4) "result in products that contain contaminants at levels that are comparable in concentration to or lower than those found in traditional products that are manufactured without the [NHSM]."[11] The NHSM must meet all criteria to obtain the exemption.

The plastics Empire proposes to combust do not contain levels of contaminants comparable to or lower than the traditional fuel the unit is designed to burn. Clear guidance exists on how to determine whether a fuel is comparable.[12] An applicant should provide the total concentrations of each contaminant after processing but before

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[9] In its response to EPA's Section 114 request, Empire claims the pyrolysis is "processing" as defined in 40 CFR 241.2. *See* Empire's Section 114 Response at 5. This assertion ignores that pyrolysis units are subject to regulation under Section 129 of the Clean Air Act as combustion units. *See e.g.* 40 CFR 60.2977. Thus, even if Empire's pyrolysis unit constitutes the "processing" necessary for the facility to obtain the NHSM Rule exemption, that very "processing" would itself require a Section 129 permit.

[10] 40 CFR 241.3(d)(1).

[11] 40 CFR 241.3(d)(2).

[12] *See* EPA Non-Hazardous Secondary Material (NHSM) Regulations 40 CFR Part 241: Guide for Waste/Non-Waste Determinations (May 2021), available at https://www.epa.gov/sites/default/files/2021-05/documents/nhsm_guide_5_26_2021.pdf (hereinafter "Guidance")

combustion.[11] Empire has not done this. Instead, Empire states the syngas it will produce is "derived from the same base material as the traditional fuel" and makes the baseless assertion that its product is "comparable or lower than traditional fuel for contaminants."[12]

In fact, Empire's mixed waste stream can be expected to contain additives and contaminants higher than a traditional fuel. Plastics are made by combining fossil fuels with synthetic chemicals—more than 4,200 of these chemicals are known chemicals of concern, meaning they are persistent, bioaccumulative, mobile, and/or toxic, and can be released into air during incineration.[13] Empire's operations as described suggest a high potential for the release of hydrogen chloride, cadmium, PFAS and other plasticizers, chlorinated and brominated flame retardants, benzene, formaldehyde, mercury, arsenic, dioxins, and brominated dioxins (to name a few).[14] Exposure to this pollution is known to increase the risk of cancer, birth defects, reproductive system damage, developmental issues, cardiovascular problems, respiratory impairment, hormonal irregularities, and neurological problems.[15]

Thus, Empire cannot meet the legitimacy criterion requiring its feedstock to "contain contaminants or groups of contaminants at levels comparable in concentration to or lower than those in traditional fuel."

In addition, Empire has not demonstrated, or even believably alleged, that the plastics will "provide a useful contribution to the production or manufacturing process" or "be used to produce a valuable product or intermediate." EPA should look closely at Empire's proposal, which seems to be for a solid waste incinerator that would result in some HCl and char—both of questionable market value—and syngas that Empire would use solely to power its incinerator. From all appearances, Empire

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[11] Id.

[12] Empire's Section 114 Response at 5.

[13] Wagner, M., & Monclús, L. (2024). *State-of-the-science on plastic chemicals: identifying and addressing chemicals and polymers of concern in plastic* at 3, 15. FlashChem, *available at* https://flashchem-project.org/

[14] *See* Empire's Section 114 Response at 9; *see also* Environmental Protection Agency. (2023). Rulemaking Docket: Significant New Use Rules on Certain Chemical Substances. Regulations.gov. https://www.regulations.gov/docket/EPA-HQ-OPPT-2023-0245; *see also* Singla, V. (2022). Issue brief: Recycling Lies. https://www.rmds.org/sites/default/files/chemical-recycling-greenwashing-incineration-fb.pdf at 6.

[15] Landrigan, P. J., et al. (2023). The Minderoo-Monaco Commission on plastics and Human Health. Annals of Global Health, 89(1), 23. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10055115/

proposes to run a plastic waste incinerator, but asks EPA to avoid Section 129 application by pointing to waste products that have no genuine market or value.

Accordingly, the plastic Empire would burn cannot meet the legitimacy criteria in the NHSM Rule.

III. The Solids and Liquids Exiting the Pyrolysis Process, that Empire Proposes to Burn, Are Likely Hazardous Wastes

Thus far, this letter has focused on why the plastics Empire would feed into the pyrolysis trains are "waste" triggering Section 129 requirements. In addition, the solids leaving the pyrolysis trains, that Empire generates and then proposes to burn, should be evaluated to assess whether they are hazardous wastes requiring RCRA pre-construction permits. As explained above, plastics contain numerous chemicals of concern that are hazardous to human health and the environment. [14] At least some of these chemicals are likely to be present in the solids resulting from the pyrolysis process.[15] Thus, there is serious concern that Empire is proposing to build a hazardous waste incinerator, and EPA should ensure Empire adheres to all relevant RCRA requirements, including pre-construction permitting.

Conclusion

We appreciate EPA's close attention to WVDEP's regulatory interpretation request. As explained above, Empire is proposing to build a waste incinerator. We ask that EPA respond accordingly and issue a determination finding that the plastic Empire receives constitutes waste, thus the facility must be regulated under Section 129 of the CAA. Given the nature of the facility's feedstock, we further ask that EPA evaluate whether Empire will be generating and incinerating hazardous waste and employ all appropriate regulations for the protection of the community's health and safety.

Sincerely,

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[14] *See* Wagner, M., & Mansilla, L. (2024) *supra* note 17 at 38, 40, 43.

[15] *See* Strigle, V. (2022) *supra* note 15 at 5 (explaining that one "chemical recycling" facility alone, Agilyx, generated nearly 500,000 pounds of hazardous waste in 2019 alone. "This waste consisted primarily of benzene, along with other toxics such as lead, admium, and chromium.").

Megan M. Hunter, Esq.
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Andrew Earley, Esq.
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232 Capitol Street, Ste. 14
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aearley@fairshake-els.org
234-233-5397
Counsel for Ohio Valley Environmental Advocates

CC: Kristen Hall, Chief, Air Section, Compliance and Enforcement, USEPA Region 3, hall.kristen@epa.gov
Penny Lassiter, Director of Sector Policies and Programs Division, USEPA, Lassiter.Penny@epa.gov
Laura Crowder, Director, Division of Air Quality, WVDEP, laura.m.crowder@wv.gov
Marycate Opila, Acting Associate Director, Branch Chief, Permits Branch, USEPA Region 3, Opila.Marycate@epa.gov
Gwendolyn Supplee, Permitting Support, USEPA Region 3, Supplee.Gwendolyn@epa.gov
Steven Ott, Air Inspector, USEPA Region 3, Ott.Steven@epa.gov
Frank A. Rocchio III, President, Ohio Valley Environmental Advocates, Inc., ovaadvocates@gmail.com

Letter to R3 Re: RIR 10/23/2024

Tuesday, January 21, 2025 7:48 AM

Andrews, Edward S <edward.s.andrews@wv.gov>

WV Regulatory Interpretation Request re Empire Green Generation

1 message

Crowder, Laura M <laura.m.crowder@wv.gov> Wed, Oct 23, 2024 at 12:18 PM
To: Lassiter.Penny@epa.gov, "Hall, Kristen" <hall.kristen@epa.gov>
Cc: "Fernandez, Cristina" <Fernandez.Cristina@epa.gov>, "Opila, MaryCate" <Opila.MaryCate@epa.gov>, "supplee.gwendolyn@epa.gov" <supplee.gwendolyn@epa.gov>, Felix.Diana@epa.gov, ott.steven@epa.gov, "aearley@fairshake-els.org" <aearley@fairshake-els.org>, "frank.rocchio@oveadvocates.org" <frank.rocchio@oveadvocates.org>, "Bernard Brown, REP" <bbrown@empirede.com>, "Farley R. Wood, P.E." <fwood@empirede.com>, Joseph R Kessler <Joseph.R.Kessler@wv.gov>, "Andrews, Edward S" <edward.s.andrews@wv.gov>

Ms. Lassiter and Ms. Hall,

Attached please find a letter detailing WV DAQ's request that the US EPA finalize the Regulatory Information Request which was sent to EPA in early March, 2024, regarding Empire Green Generation.

Thank you for consideration of this matter and please direct any further questions regarding the specifics of this request to Mr. Ed Andrews (the reviewing engineer) at (304) 926-0499 x41244 or Mr. Joe Kessler, NSR Program Manager, at (304) 926-0499 x41271.

Sincerely,

Laura M. Crowder
Director
WV Division of Air Quality
601 57th Street, SE
Charleston, WV 25304
Phone: 304-414-1253
Email: Laura.M.Crowder@wv.gov

WV EPA Reg Interpretation Req re Empire Green Generation 2024-10-23.pdf
392K

WV EPA
Reg Inter...

west virginia department of environmental protection

Division of Air Quality
601 57th Street SE
Charleston, WV, 25304
304-926-0499

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

October 23, 2024

Kristin Hall, Chief, Air Section,
USEPA Region III, Enforcement & Compliance Division

Penny Lassiter, Director of Sector Policies and Programs Division
(SPPD) USEPA

RE: **Regulatory Interpretation Request**
Empire Green Generation LLC
Facility ID: 009-00141
Permit No. R13-3555A
Follansbee, WV

Dear Ms. Hall and Ms. Lassiter:

On December 5, 2023, the West Virginia Division of Air Quality (WVDAQ) received a permit application (R13-3555A) from Empire Green Generation (EGG) proposing to modify their existing permit to replace the use of medical waste with plastic as a feedstock in a pyrolytic conversion process. On March 6, 2024, the WVDAQ sent a letter to Christina Fernandez, Director, USEPA, Region III Air and Radiation Division, requesting a regulatory interpretation regarding whether all streams that exit the pyrolysis process need to be evaluated under 40 CFR 241 to determine applicability under 40 CFR 60, Subpart CCCC (see the previously submitted letter and other relevant documents for full details on the request and the process in question). Since that letter was sent, there have been multiple interactions between the WVDAQ, USEPA, and EGG as detailed in the following list:

4/30/2024 - USEPA Region III requested a 40 CFR 241 Determination concerning the definition of relevant material as waste/non-waste;

5/3/2024 - EGG provided the WVDAQ information concerning the 40 CFR 241 Determination.

5/7/2024 - WVDAQ forwarded EGG's 40 CFR 241 Determination to USEPA Region III;

6/26/2024 - Virtual Meeting regarding EGG's Regulatory Request between WVDAQ and USEPA Region III;

7/3/2024 - USEPA Region III requests the contact information of EGG's Responsible Official;

7/3/2024 - DAQ provided the contact information of EGG's Responsible Official to USEPA Region III;

7/11/2024 - USEPA Region III provided the WVDAQ a draft list of questions for a Section 114(a) Request for Information (RFI) USEPA was intending to submit to EGG;

7/18/2024 - WVDAQ provided USEPA Region III a list of comments/suggestions regarding the draft list of questions;

8/1/2024 - USEPA Region III sent EGG a Section 114(a) RFI;

8/30/2024 - EGG provides a response to USEPA Region III's Section 114(a) RFI; and

9/17/2024 - EPA hosted a virtual Listening Session with interested parties concerning the proposed modification.

As can be seen from the list above, WVDAQ and EGG have been diligent and timely in responding to all requests from USEPA concerning the regulatory request first made in early March of 2024. The WVDAQ now believes USEPA has all relevant information to make a determination as requested in the March letter and strongly requests that USEPA conclude its review of this matter and finalize the determination as soon as possible. The WVDAQ believes that further delay could, with respect to R13-3555A, result in both an unfair burden to the applicant and an impediment to the WVDAQ in carrying out its policy mandate - as given under WV State Code [§22-5-1] - to provide "…for the timely processing of permit applications…" Thank you for consideration of this matter and please direct any further questions regarding the specifics of this request to Mr. Ed Andrews (the reviewing engineer) at (304) 926-0499 x41244 or Mr. Joe Kessler, NSR Program Manager, at (304) 926-0499 x41271.

Sincerely,

Laura M. Crowder

Laura M. Crowder
Director

cc: Cristina Fernandez, Director, EPA Region III, Air and Radiation Division
Fernandez.Cristina@epa.gov
MaryCate Opila, Acting Associate Director, Branch Chief, Permits Branch, USEPA Region III, Opila.Marycate@epa.gov
Gwendolyn Supplee, Permitting Support, USEPA Region III
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Bernard Brown, Chief Operating Officer, Empire Green Generation, LLC
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Farley Wood, P.E., Vice-President of Engineering, Empire Green Generation, LLC
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Joseph Kessler, NSR Program Manager, WVDAQ
Joseph.r.kessler@wv.gov
Ed Andrews, Engineer, WVDAQ
Edward.s.Andrews@wv.gov

Response to 114 Request 8/30/2024

Tuesday, January 21, 2025 7:45 AM

Andrews, Edward S <edward.s.andrews@wv.gov>

Fwd: Empire Green Generation Section 114 Request

1 message

Crowder, Laura M <laura.m.crowder@wv.gov> Fri, Aug 30, 2024 at 1:22 PM
To: Beverly D McKeone <beverly.d.mckeone@wv.gov>, "Andrews, Edward S" <edward.s.andrews@wv.gov>

---------- Forwarded message ---------
From: **Bernard Brown, REP** <bbrown@empirede.com>
Date: Fri, Aug 30, 2024 at 11:53 AM
Subject: RE: Empire Green Generation Section 114 Request
To: Matlin, Martin <Matlin.Martin@epa.gov>
CC: jesse.d.adkins@wv.gov <jesse.d.adkins@wv.gov>, laura.m.crowder@wv.gov <laura.m.crowder@wv.gov>, Ott, Steven <Ott.Steven@epa.gov>, Hall, Kristen <hall.kristen@epa.gov>, Farley R. Wood, P.E. <fwood@empirede.com>

Mr. Matlin and Mr. Ott,

Please find our attached response. If you have any questions regarding our response, please feel to contact myself or Farley Wood.

Sincerely,

EMPIRE Diversified Energy

Bernard Brown, REP
Chief Operating Officer

Main Office: (304) 935-5851
Mobile: 916-544-1900
Call Me On Teams!

bbrown@empirede.com
www.empirediversifiedenergy.com

From: Matlin, Martin <Matlin.Martin@epa.gov>
Sent: Thursday, August 1, 2024 10:58 AM

To: Bernard Brown, REP <bbrown@empirede.com>
Cc: jesse.d.adkins@wv.gov; laura.m.crowder@wv.gov; Ott, Steven <Ott.Steven@epa.gov>; Hall, Kristen <hall.kristen@epa.gov>; Farley R. Wood, P.E. <fwood@empirede.com>
Subject: RE: Empire Green Generation Section 114 Request

Thank you for the confirmation, Mr. Brown.

****

Martin Matlin, Acting Section Chief

Air Section (3ED21)

U.S. EPA Region III

Four Penn Center – 1600 John F. Kennedy Blvd.

(215) 814-5789

From: Bernard Brown, REP <bbrown@empirede.com>
Sent: Thursday, August 01, 2024 1:56 PM
To: Matlin, Martin <Matlin.Martin@epa.gov>
Cc: jesse.d.adkins@wv.gov; laura.m.crowder@wv.gov; Ott, Steven <Ott.Steven@epa.gov>; Hall, Kristen <hall.kristen@epa.gov>; Farley R. Wood, P.E. <fwood@empirede.com>
Subject: RE: Empire Green Generation Section 114 Request

Caution: This email originated from outside EPA, please exercise additional caution when deciding whether to open attachments or click on provided links.

We are in receipt of this document and will respond accordingly.

Respectfully,

EMPIRE Diversified Energy

Bernard Brown, REP
Chief Operating Officer

Main Office: (304) 935-5851
Mobile: 916-544-1900
Call Me On Teams!

bbrown@empirede.com
www.empirediversifiedenergy.com

From: Matlin, Martin <Matlin.Martin@epa.gov>
Sent: Thursday, August 1, 2024 10:51 AM
To: Bernard Brown, REP <bbrown@empirede.com>
Cc: jesse.d.adkins@wv.gov; laura.m.crowder@wv.gov; Ott, Steven <Ott.Steven@epa.gov>; Hall, Kristen <hall.kristen@epa.gov>
Subject: Empire Green Generation Section 114 Request

You don't often get email from matlin.martin@epa.gov. Learn why this is important

Dear Mr. Brown,

In the attached document, EPA is requesting information under Section 114 of the Clean Air Act. The response is due electronically no later than **September 2, 2024**. Detailed submission instructions can be found in the attached document. Should you have any questions please reach out to Steve Ott, Enforcement and Compliance Assurance Division, at (215) 814-2267 or ott.steven@epa.gov.

Thank you,

Martin Matlin

****

Martin Matlin, Acting Section Chief

Air Section (3ED21)

U.S. EPA Region III

Four Penn Center – 1600 John F. Kennedy Blvd.

(215) 814-5789

External Email. Please make sure you trust this sender before clicking on any links or opening attachments. Learn why this is important

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Empire Green Gen Rely to USEPA 114 Ltr RFI 8-30-24.pdf
3094K

Empire
Green Ge...

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Green Ge...

REGION 3
PHILADELPHIA, PA 19103

July 31, 2024

VIA ELECTRONIC MAIL
RETURN RECEIPT REQUESTED

Bernard Brown
Chief Technology Officer
Empire Green Generation, LLC
801 Koppers Rd
Follansbee, WV 26037
bbrown@empirede.com

Request for Information under § 114(a) of the Clean Air Act, 42 U.S.C. § 7414(a)

Dear Mr. Brown:

The United States Environmental Protection Agency (EPA), Region 3 hereby requires Empire Green Generation, LLC (Empire Green Generation or the Facility), located at 801 Koppers Rd, Follansbee, WV to provide certain information as part of an EPA investigation to determine the Facility's compliance with applicable standards and requirements under the federal Clean Air Act, 42 U.S.C. §7401 et seq., (CAA or the Act).

Pursuant to Section 114(a) of the CAA, 42 U.S.C. §7414(a), the Administrator of EPA is authorized to require any person who owns and/or operates an emission source to establish and maintain records, make reports, and provide such information as he/she may reasonably require for the purposes of determining whether such person is in violation of any provision of the Act. In order for EPA to determine whether a violation has occurred, you are hereby required, pursuant to Section 114(a) of the CAA, to provide responses to the following questions and requests for information regarding your facility. Therefore, you are hereby required to respond to questions and requests for information in Appendix B (see Appendix A for instructions and definitions). All information submitted in response to this request must be certified as true, correct, accurate, and complete by an individual with sufficient knowledge and authority to make such representations on behalf of Empire Green Generation. On the last page of your response(s) to this questionnaire, please include the certification contained in Appendix C.

The EPA issues this Request for Information under Section 114(a) of the CAA, 42 U.S.C. § 7414(a). Under Section 114(a), Part A – Air Quality and Emission Limitations, 42 U.S.C. §§ 7414 – Recordkeeping, Inspection, Monitoring, and Entry, the Administrator of the EPA may require any person who is subject

to the CAA to perform tests and provide information necessary to determine whether the person is acting or has acted in compliance with the CAA and the regulations promulgated thereunder. The Administrator has delegated this authority to the undersigned Division Director, of the Enforcement and Compliance Assurance Division, in EPA Region 3.

In order for the EPA to determine whether a violation has occurred, you are hereby required, pursuant to Section 114(a) of the CAA, to provide responses to the questions and requests for information in Appendix B to this letter. Failure to provide the required information may result in the issuance of an Order requiring compliance with the requirements, or the initiation of a civil action pursuant to Section 113(b) of the Act, 42 U.S.C. §7413(b). In addition, Section 113(c)(2) of the Act provides that any person who knowingly makes any false statement, representation, or certification in, or omits material information from any document required pursuant to this Act shall upon conviction be punished by a fine pursuant to Title 18 of the United States Code, or by imprisonment for not more than two years, or both. The information you provide may be used by EPA in administrative, civil, and criminal proceedings.

EPA requires Empire Green Generation to submit the requested information electronically no later than **thirty (30) calendar days** from the date of your receipt of this letter. You may submit your response using one of the following options: A) via email to ott.steven@epa.gov or B) by requesting a link from ott.steven@epa.gov for a secure EPA file transfer site where you may upload your response. Please note, the EPA cannot receive compressed files (.zip) via email. If you wish to submit compressed files, please select option B above. If you prefer not to send documents that you have claimed as confidential business information (CBI) to the EPA by email, please send them as electronic files through the EPA's secure file transfer site (option B). Prior to submitting your response, please send an email to ott.steven@epa.gov indicating which option you have selected to submit your response to this request.

Failure to provide all the requested information, and in the format requested, may result in additional inquiries, and may result in the initiation of a civil action pursuant to Section 205(b) of the CAA, 42 U.S.C. § 7524(b). It is important that your responses be clear, accurate, organized, and complete. We will regard any submitted information that is misleading, false, incomplete, or submitted without regard to its accuracy as a violation of the CAA and/or criminal statutes.

You must submit all requested information under an authorized signature with the following certification (provided in Appendix C):

"I certify under penalty of law that I have examined and am familiar with the information in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 113(c)(2) of the Clean Air Act, 42 U.S.C. § 7413(c)(2), and 18 U.S.C. §§ 1001 and 1341."

Finally, you are entitled to assert a business confidentiality claim covering all or part of the information you provide in response to this Request for Information, in accordance with the procedures described in the Confidentiality of Business Information ("CBI") regulations, 40 C.F.R. Part 2, Subpart B. However, no CBI claim may be made with respect to emissions data as defined at 40 C.F.R. § 2.301(a)(2). You must specify the page, paragraph, and sentence when identifying the information subject to your CBI claim. Appendix D of this Request for Information specifies the assertion and substantiation requirements for business confidentiality claims. The EPA may, without further notice, provide the public with any information not subject to a CBI claim.

Please submit the requested information electronically within **30 calendar days of your receipt of this letter**. You may do so via email to Steve Ott, Enforcement and Compliance Assurance Division, U.S. Environmental Protection Agency Region 3, at ott.steven@epa.gov. Please note that the EPA email server will allow attachments up to 20 MB. Alternatively, you may want to provide documents in response to this Request for Information by way of a secure file sharing site. Please let us know how you want to proceed.

This request is not subject to the Paperwork Reduction Act, 44 U.S.C. § 3501 et seq., because it seeks the collection of information from specific individuals or entities as part of an administrative action or investigation.

If you have any questions regarding this information request, please contact Steve Ott, of the Enforcement and Compliance Assurance Division at (215) 814-2267 or ott.steven@epa.gov. Additionally, please visit the small business resources information sheet for assistance and information at https://www.epa.gov/compliance/small-business-resources-information-sheet.

Sincerely,

KAREN MELVIN

Digitally signed by KAREN MELVIN
Date: 2024.08.07 13:05:26 -04'00'

Karen Melvin
Director
Enforcement and Compliance Assurance Division

Enclosures:

Appendix A: Instructions and Definitions
Appendix B: Request for Information
Appendix C: Statement of Certification
Appendix D: Confidential Business Information

cc: Jesse Adkins, WVDEP, jesse.d.adkins@wv.gov
Laura Crowder, WVDEP, laura.m.crowder@wv.gov

Appendix A

INSTRUCTIONS AND DEFINITIONS

A. **Instructions**

1. Please provide a separate narrative response to each question and subpart of a question set forth in this Information Request. Please provide the requested non-narrative information in spreadsheet format, preferably in Excel.
2. Indicate on each document produced in response to this Information Request, or in some other reasonable manner, the number of the question to which it corresponds.
3. Provide as much information possible to completely answer each question. This includes all supporting documentation, such as performance test reports, inspection records, memorandums, facility records, etc. Failure to completely respond to any questions may increase the time necessary to determine compliance with all applicable regulations.
4. For each document provided in response to these questions, provide an accurate and legible copy, which can be used to determine completeness of this request. For any information submitted electronically, clearly label to which question(s) the data is responsive.
5. When a response is provided in the form of a number, specify the units of measure of the number in a precise manner.
6. Where documents or information necessary for a response are neither in your possession nor available to you, indicate in your response why such documents or information is not available or in your possession and identify any source that either possesses or is likely to possess such information.

B. **Definitions**

1. All terms used in the Information Request will have their ordinary meaning unless such terms are defined in the Act, 42 U.S.C Section 7410 or 40 C.F.R. Part 60, Part 61, or Part 63. The terms "Facility" and "EGGI" shall mean the Empire Green Generation, LLC facility, located at 801 Koppers Rd, Follansbee, WV.
2. EPA Region 3 includes the states of Maryland, Pennsylvania, Virginia, West Virginia, Delaware, and the District of Columbia.
3. Except for in question 4, processing shall maintain its ordinary meaning.

Appendix B

REQUEST FOR INFORMATION

1. Provide a plot plan or map of facility.

2. Provide a process diagram and corresponding description of the facility.

3. Identify what type(s) of materials EGG intends to process, and:
    a. If plastic will be material processed, identify the percentage of each plastic type intended to be processed (i.e., HDPE, PVC, ABS, PET, etc).
    b. What is the anticipated amount of plastic processed daily?
    c. What is the maximum possible daily capacity of material? Provide calculations.
    d. What are the caloric values of each plastic type being processed?
    e. How is the plastic processed prior to being delivered to EGG?
    f. Does EGG plan to process medical waste as permitted by the WVDEP under Permit R13-3555?

4. Does EGG consider pyrolysis to be "processing" as defined in 40 CFR 241.2? Provide supporting evidence.

5. For each pyrolysis unit provide the following:
    a. Make/model of the pyrolysis unit.
    b. Will there be batch processing or continuous processing of plastics?

6. What is the oxygen content inside of the pyrolysis unit during normal operations? Please use either ppm or percentage of air.
    a. How will the oxygen content be controlled?
    b. How will the oxygen content be monitored?
    c. How will oxygen be purged during start-up operations?

7. Provide calculations for the conversion of plastic (tons) to hydrochloric acid (gallons, tons, and concentration).
    a. Describe how, and where in the process, the hydrochloric acid will be seperated from other gases in the process.
    b. Will water be added to the produced hydrochloric acid to change the final volume or concentration?
    c. If water is added, will it be sourced from well/municipal water or derived from the pyrolysis/combustion process?
    d. Will a scrubber be used to remove any residual acid forming gas, prior to the generator sets? If so provide make, model, capacity, and what type of scrubbing media material will be used.

8. How will the generated hydrochloric acid be stored and offloaded (drums, truck, or rail)
    a. Provide details regarding truck/rail transfers, if applicable, and how emissions will be controlled?
    b. Does EGG currently have a buyer(s) for the produced hydrochloric acid?
        i. What are the specifications required by the buyer(s) such as %Hydrochloric Acid, purity?
        ii. How will EGG determine if the buyer specification is met or not, please identify the analytic method(s) and type of instruments to be used?
        iii. Who is/are the buyer(s)?
        iv. What will EGG do with any off-spec HCL?

9. For each product of pyrolysis (oils, solids, tars, and synges) provide a safety data sheet.
    a. What is the expected chlorine content, by weight and percentage, found in solid and liquid streams.
    b. Provide calculations for the conversion of plastic (tons) to each product, include expected yield of oil, solids, tars, and synges.

10. For any synges storage onsite provide:
    a. Volume of storage vessel(s)
    b. Type of storage vessel i.e. floating roof tank, totes, etc.
    c. Pressure the gas will be stored at.
    d. If stored as pressurized gas, where does the pressure relief device for the storage vessel vent to?

11. Provide waste determination(s) from each company/entity in which EGG intends to obtain plastics to process.
    a. If EGG and its recycling partners are mutually held by a parent company/entity, describe the relation.

12. Pursuant to 40 CFR part 241 provide a non-hazardous secondary materials determination for all plastics intended to be processed.

13. Pursuant to 40 CFR part 241 provide a non-hazardous secondary materials determination for all products of pyrolysis prior to gas cleanup.

14. Pursuant to 40 CFR part 241 provide a non-hazardous secondary materials determination for all products of pyrolysis prior to gas cleanup.

15. For each generator set, provide the following information in an excel sheet:
    a. Make/model
    b. Make/model of the engine.
    c. Serial No of each engine.
    d. Type of engines.
    e. Fuel type of each engine.
    f. Power output rating of the engine.
    g. Make/model and capacity of electric generators.
    h. Will generated electricity be used onsite or sold to the local electrical grid?

16. For each vitrifier (process heater), provide the following:
    a. Internal and external dimensions in feet/inches
    b. Describe the process by which the vitrifier will be used and how the generated heat will interact with the process material.
    c. Make/Model/Heat Input Rating of the burners for each vitrifier, also please specify heat input rating by type of fuel.
    d. Please note or identify any other streams entering the vitrifier?
    e. What streams are leaving the vitrifier? Please describe the make-up of these streams and where any of these streams are considered and/or to as a waste.

17. For the dryer, provide the following:
    a. Source of the heat energy for the dryer.
    b. Make/model/fuel type/heat input capacity of burner(s) if equipped.

18. For the gas cleaning trains, please provide the following:
    a. Please describe how the different streams (tars, oils, hydrochloric acid, solids (char), and synthetic gas) are going to be separated using the gas cleaning trains/equipment.
    b. Please identify the type(s) of equipment going to be used in the gas cleaning trains.
    c. Please identify the operating conditions needed to perform the desired separations.
    d. Please identify any additional inlet streams that are necessary to perform the desired separations.
    e. Please identify all outlet streams to include any wastewater.

Appendix C

STATEMENT OF CERTIFICATION

This Certification is for signature by the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or another executive with authority to perform similar policy or decision-making functions of the corporation.

Empire Green Generation is submitting the enclosed documents in response to the U.S. Environmental Protection Agency's ("EPA") request for information, issued pursuant to Section 114(a) of the Clean Air Act, to determine whether the facility is in compliance with the Clean Air Act.

I certify that I am fully authorized by Empire Green Generation to provide the above information on its behalf to EPA.

I certify under penalty of law that I have personally examined and am familiar with the statements and information submitted in the enclosed documents, including all attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are, to the best of my knowledge and belief, true, correct, accurate and complete. I am aware that there are significant penalties for knowingly submitting false statements and information, including the possibility of fines or imprisonment pursuant to Section 113(c)(2) of the Clean Air Act, 42 U.S.C. § 7413(c)(2), and 18 U.S.C. §§ 1001 and 1341.

Date: _____

Name (Printed): _____

Signature: _____

Title: _____

Appendix D

CONFIDENTIAL BUSINESS INFORMATION

You may assert a business confidentiality claim covering all or part of the information you provide in response to this information request for any business information entitled to confidential treatment under section 114(c) of the Clean Air Act (the Act), 42 U.S.C. § 7414(c), and 40 C.F.R. Part 2, Subpart B (which governs treatment of CBI under both the CAA and RCRA). Under section 114(c) of the Act, you are entitled to confidential treatment of information that would divulge methods or processes entitled to protection as trade secrets. Under 40 C.F.R. Part 2, Subpart B, business confidentiality means "the concept of trade secrecy and other related legal concepts which give (or may give) a business the right to preserve the confidentiality of business information and to limit its use or disclosure by others in order that the business may obtain or retain business advantages it derives from its rights in the information." 40 C.F.R. § 2.201(e).

Information covered by a claim of business confidentiality will be disclosed by the EPA only to the extent, and by means of the procedures, set forth in section 114(c) of the Act and 40 C.F.R. §§ 2.201-2.311. **If you fail to furnish a business confidentiality claim with your response to this information request, the EPA will construe your failure as a waiver of that claim, and the information may be made available to the public without further notice to you.** See 40 C.F.R. § 2.203(c).

Pursuant to Section 114 of the Act and 40 C.F.R. § 2.301(h), the EPA possesses the authority to disclose to any authorized representative of the United States information which might otherwise be entitled to confidential treatment. In order to assist in its review and analysis, and in accordance with the requirements of 40 C.F.R. § 2.301(h)(2), the EPA may disclose information provided in response to this and other information requests to any person under contract or subcontract to the United States government to perform work in support of EPA in connection with the Act or regulations which implement the Act. In accordance with the requirements of 40 C.F.R. § 2.301(h)(3), the EPA may also disclose such information to State and/or local governmental agencies which have duties or responsibilities under the Act, or under regulations which implement the Act.

To assert a business confidentiality claim, you must place on (or attach to) all information you desire to assert as business confidential either a cover sheet, stamped or typed legend, or other suitable form of notice employing language such as "trade secret," "proprietary," or "company confidential" at the time you submit your response to this information request.

Please be specific by page (including Bates Stamp, if applicable), paragraph, and sentence when identifying the information subject to your claim. Where your claim, as originally made or as modified by your response to this letter, does not include all information on a page, please attach a copy of each such page with brackets around the text that you claim to be CBI. Please note that if a page, document, group, or class of documents claimed by you to be CBI contains a significant amount of information which our Office of Regional Counsel determines is not CBI, your CBI claim regarding that page, document, group, or class of documents may be denied. You should indicate if you desire confidential treatment only until a certain date or until the occurrence of a certain event. All confidentiality claims

are subject to EPA verification. If the EPA reviews your CBI claim(s) then the EPA may send notice to your business and ask you to submit additional information to substantiate the CBI claim(s). *See* 40 C.F.R. § 2.204(e).

The criteria the EPA will use in determining whether material you claim as business confidential is entitled to confidential treatment are set forth at 40 C.F.R. § 2.208(a)-(d), as well as the U.S. Supreme Court's decision in *Food Marketing Institute v. Argus Leader Media* (*Argus*), 139 S. Ct. 2356 (2019), which evaluated the definition of "confidential" as used in Exemption 4 of the Freedom of Information Act, 5 U.S.C. § 552. In the *Argus* decision, the Court held that at least where "[1] commercial or financial information is both customarily and actually treated as private by its owner and [2] provided to the government under an assurance of privacy, the information is 'confidential' within the meaning of Exemption 4." *Argus*, 139 S. Ct. at 2366.

Emission data, as defined at 40 C.F.R. § 2.301(a)(2), is expressly not entitled to confidential treatment under 40 C.F.R. Part 2, Subpart B. *See* 42 U.S.C. § 7414(c); 40 C.F.R. § 2.301(e).