ECC
ENVIRONMENTAL COMMODITIES CORP.

Santosh Lakhan
Environmental Commodities Corporation
3305 Decatur Avenue
Kensington, MD 20895

December 15, 2016

Mr. Edward Andrews
West Virginia Department of Environmental Protection
Division of Air Quality
601 57th Street, SE
Charleston, WV 25304

Air Permit application for 19H-2 site on the Bailey Mine in Marshall County, WV

Dear Mr. Edwards,

I am enclosing our application for a permit to construct a mobile waste mine flare at the 19H-2 gob vent borehole site located at Burley Hill Road in Cameron, West Virginia. The purpose of this facility is to reduce the amount of methane being emitted into the atmosphere due to underground mining activity.

We estimate that this facility will have the capacity to reduce the equivalent of more than 50,000 tCO_2, which would have otherwise been emitted into the atmosphere.

If you have any questions regarding the facility or our application, please do not hesitate to contact us.

Yours sincerely,

Santosh Lakhan

Santosh Lakhan
202-701-8286
Santosh.Lakhan@EnvComCorp.com

Permit to Construct Application

Bailey Mine
Gas Flaring Project

ECC Windsor Inc.
3305 Decatur Avenue
Kensington, MD 20895

TABLE OF CONTENTS

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/daq

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

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

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

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

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

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

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

Section I. General

1. Name of applicant *(as registered with the WV Secretary of State's Office):*
ECC Windsor Inc

2. Federal Employer ID No. ***(FEIN):***
4 7 1 6 1 6 8 4 9

3. Name of facility *(if different from above):*

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

5A. Applicant's mailing address:
3305 Decatur Avenue, Kensington, MD 20895

5B. Facility's present physical address:
Facility location is on Burley Hill Road
Cameron, WV 26033

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

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

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

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

- If **YES,** please explain: Applicant has a license to operate on the site issued by the site owners, Consol Pennsylvania Coal Company, Conrhein Coal Company and CNX Coal Resources LP

- 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.): Construction of a waste mine methane enclosed flaring system

10. North American Industry Classification System **(NAICS)** code for the facility:
213113

11A. DAQ Plant ID No. (for existing facilities only):
N/A

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

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

12A.

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

From Cameron, WV, take US-250 North (Waynesburg Pike) for approximately 1.8 miles. Turn left onto Clouston Woods Road (64). After approximately 0.3 miles, turn left onto Burley Hill Road. The proposed site will be on the right after approximately 1.4 miles.

12.B. New site address (if applicable):	12C. Nearest city or town:	12D. County:
Burley Hill Road Cameron, WV 26033	Cameron, WV	Marshall County
12.E. UTM Northing (KM): 4412.83814 KM N	12F. UTM Easting (KM): 539.46515 KM E	12G. UTM Zone: 17S

13. Briefly describe the proposed change(s) at the facility:
Installation of an enclosed stack flare to abate greenhouse gas emissions at the Bailey Coal Mine

14A. Provide the date of anticipated installation or change: 04/10/2017 – 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: 04/10/2017

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 Year 52

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

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

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

Section II. Additional attachments and supporting documents.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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
☐ Adsorption Systems
☐ Afterburner
☐ Baghouse
☐ Condenser
☐ Electrostatic Precipitator
☒ Flare
☐ Mechanical Collector
☐ 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 Santosh Lakhan *(Please use blue ink)* DATE: 12/15/2016 *(Please use blue ink)*

35B. Printed name of signee: Santosh Lakhan		35C. Title: President
35D. E-mail: Santosh.Lakhan@envcomcorp.com	36E. Phone: 202-701-8286	36F. 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.

Attachment A – Business Certificate

State of West Virginia

Certificate

I, Natalie E. Tennant, Secretary of State,
of the State of West Virginia, hereby certify that

ECC Windsor Inc

has filed the appropriate registration documents in my office according to the provisions of the West Virginia Code and hereby declare the organization listed above as duly registered with the Secretary of State's Office.

Given under my hand and
the Great Seal of West Virginia
on this day of
August 19, 2014

Natalie E Tennant

Secretary of State

WEST VIRGINIA
STATE TAX DEPARTMENT
BUSINESS REGISTRATION CERTIFICATE

ISSUED TO:
ECC WINDSOR INC
3305 DECATUR AVE
KENSINGTON, MD 20895-2208

BUSINESS REGISTRATION ACCOUNT NUMBER: **2304-6164**

This certificate is issued on: **08/22/2014**

This certificate is issued by
the West Virginia State Tax Commissioner
in accordance with Chapter 11, Article 12, of the West Virginia Code

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

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

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

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

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

atL006 v.4
L1061362240

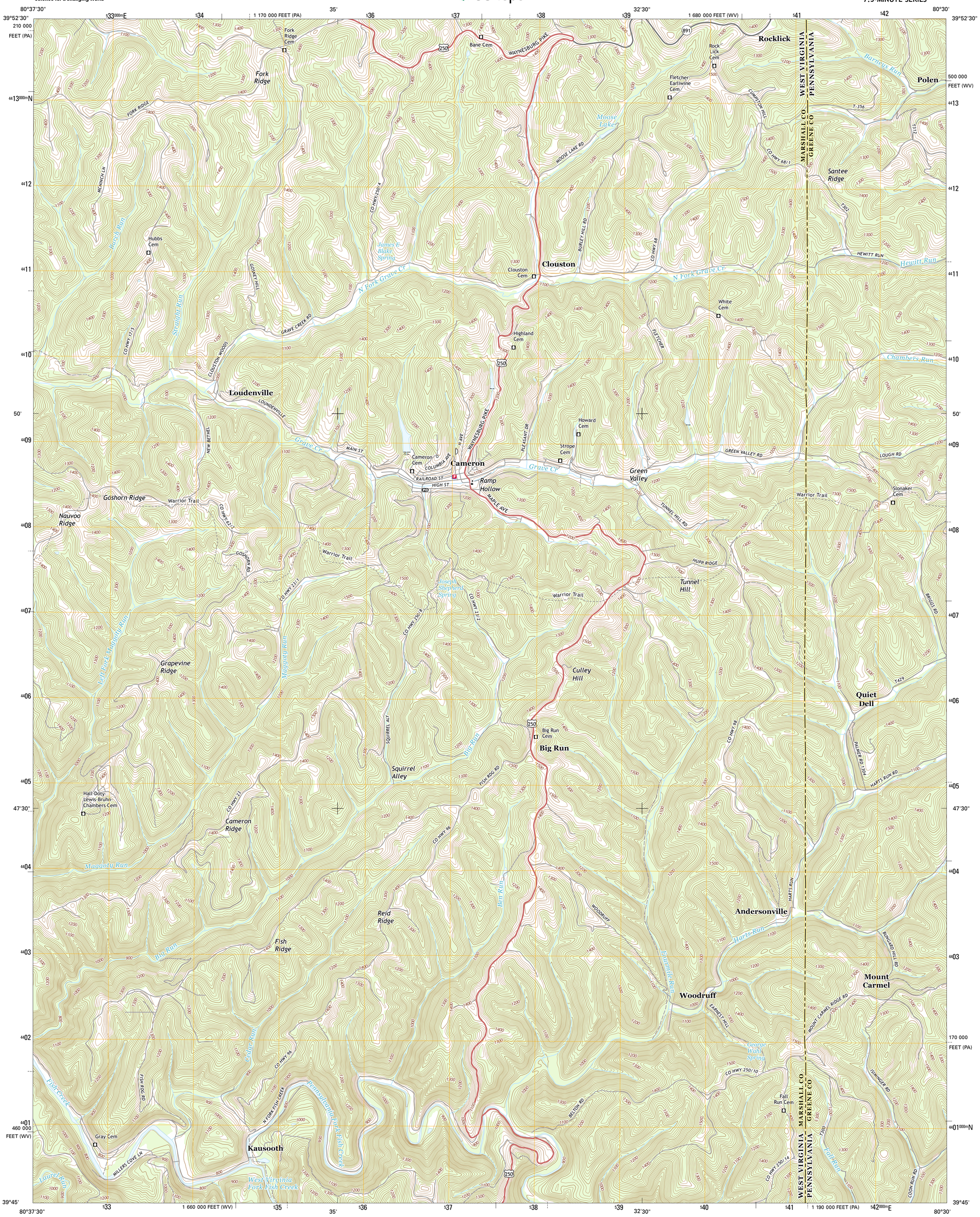
Attachment B – Maps

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

USGS science for a changing world

The National Map US Topo

CAMERON QUADRANGLE
WEST VIRGINIA-PENNSYLVANIA
7.5-MINUTE SERIES

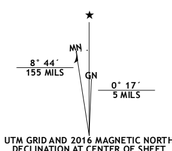


Produced by the United States Geological Survey

North American Datum of 1983 (NAD83)
World Geodetic System of 1984 (WGS84). Projection and 1 000-meter grid: Universal Transverse Mercator, Zone 17S
10 000-foot ticks: West Virginia Coordinate System of 1983 (north zone), Pennsylvania Coordinate System of 1983 (south zone)

This map is not a legal document. Boundaries may be generalized for this map scale. Private lands within government reservations may not be shown. Obtain permission before

Imagery	NAIP,	December 2015
Roads	U.S. Census Bureau,	2015 - 2016
Names	GNIS,	2016
Hydrography	National Hydrography Dataset,	2015
Contours	National Elevation Dataset,	2006
Boundaries	Multiple sources; see metadata file	1972 - 2016
Wetlands	FWS National Wetlands Inventory	1977 - 2014



UTM GRID AND 2016 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

U.S. National Grid
100,000-m Square ID
NE
Grid Zone Designation
17S

SCALE 1:24 000

1 0.5 0 KILOMETERS 1 2
1000 500 0 METERS 1000 2000
1 0.5 0 1
MILES
1000 0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000
FEET

CONTOUR INTERVAL 20 FEET
NORTH AMERICAN VERTICAL DATUM OF 1988

This map was produced to conform with the National Geospatial Program US Topo Product Standard, 2011.
A metadata file associated with this product is draft version 0.6.19

QUADRANGLE LOCATION

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route / State Route

1	2	3
4		5
6	7	8

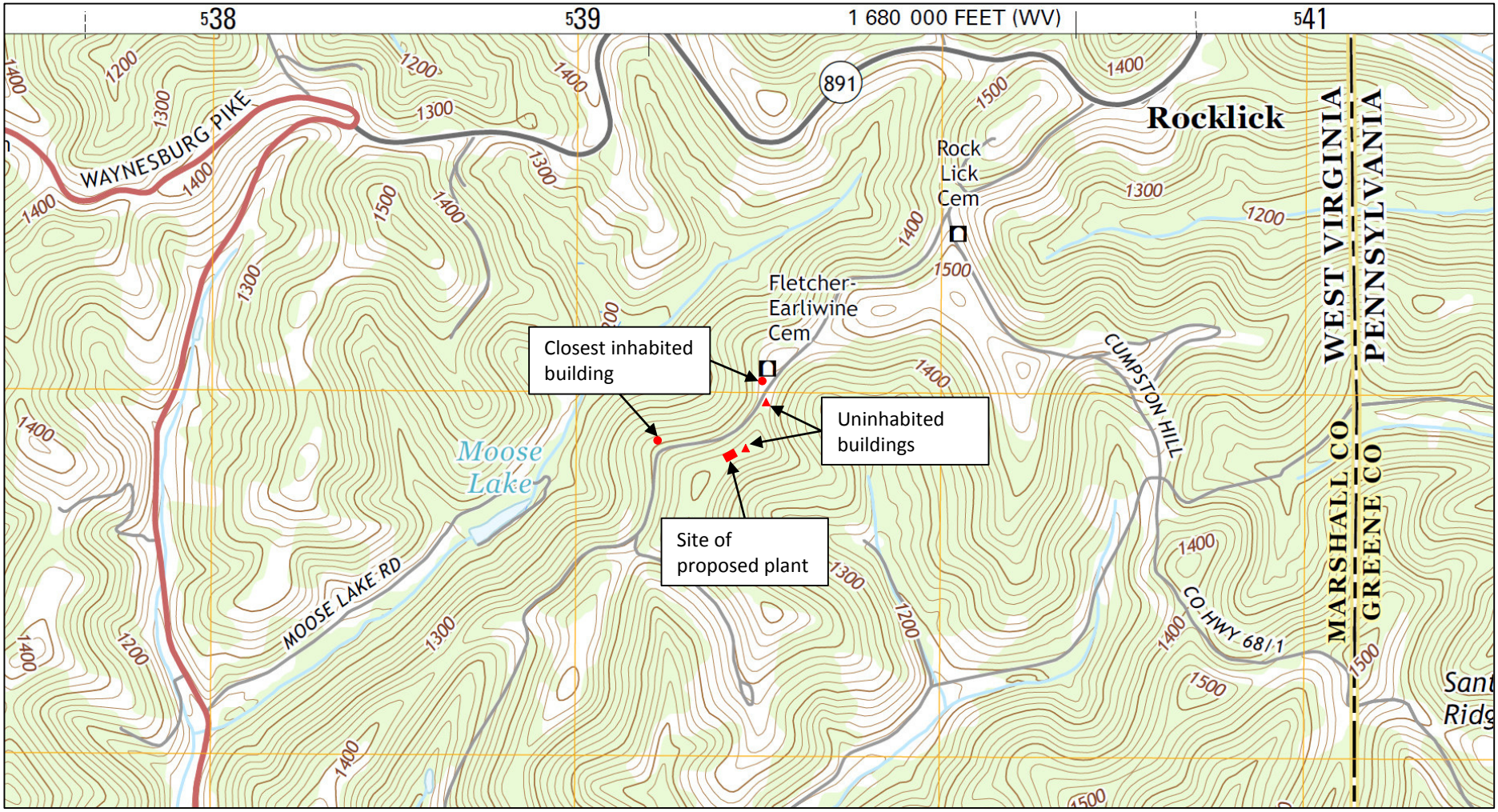
1 Moundsville
2 Majorsville
3 Wind Ridge
4 Glen Easton
5 New Freeport
6 Wileyville
7 Littleton
8 Hundred

ADJOINING QUADRANGLES

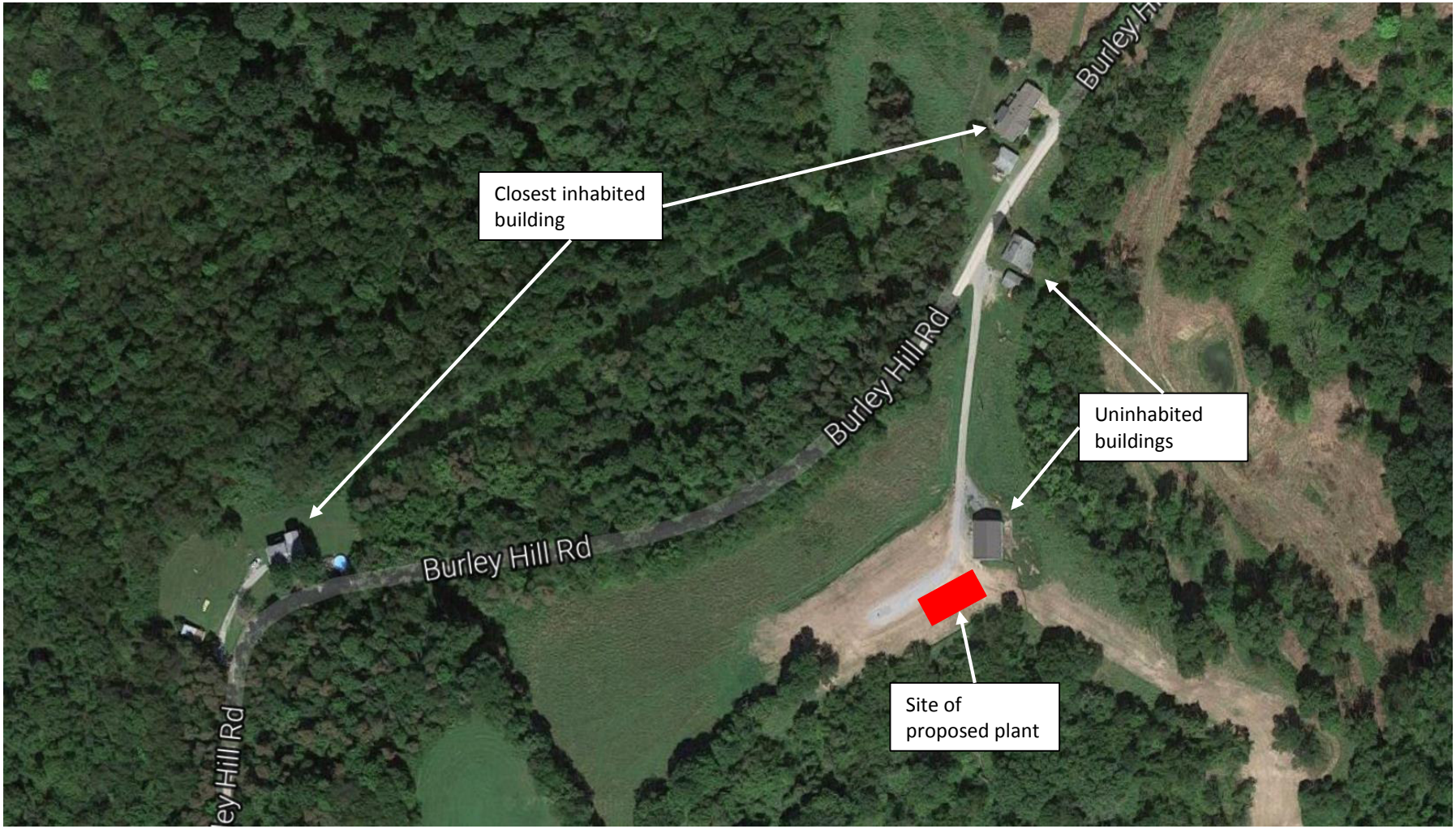
CAMERON, WV-PA
2016

NSN 7643016404047
NGA REF NO. USGSX24K6877

Proposed site of the 19H-2 gob well methane flaring system



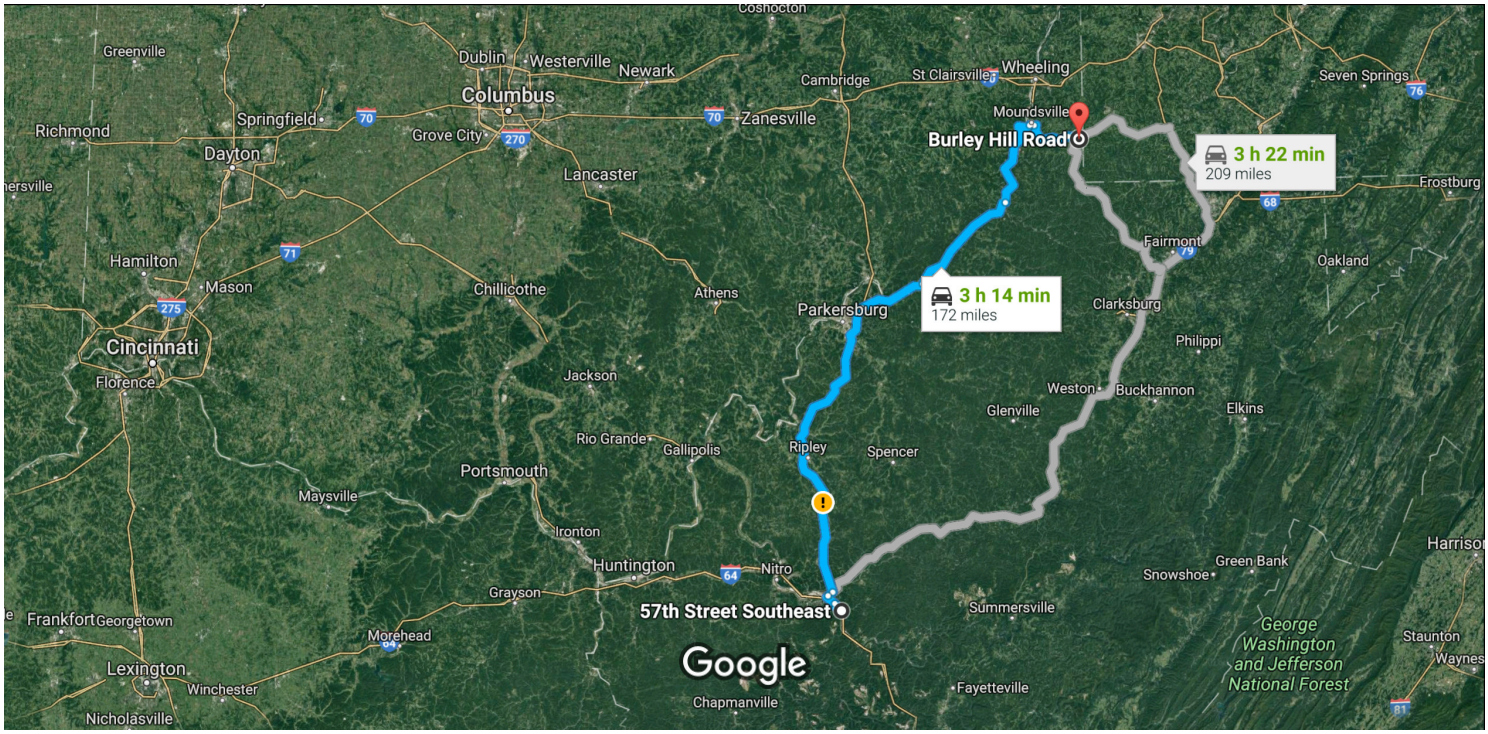
Proposed site of the 19H-2 gob well methane flaring system



Google Maps

57th Street Southeast to Burley Hill Road, Cameron, WV 26033

Drive 172 miles, 3 h 14 min



Imagery ©2016 Landsat, Map data ©2016 Google 20 mi

57th Street Southeast

Charleston, WV 25304

Get on I-64 W/I-77 N from Chesterfield Ave

7 min (2.6 mi)

1. Head northwest on Chesterfield Ave toward Lower Donnally Rd

1.5 mi

2. Turn right onto 39th St SE

0.3 mi

3. Turn left onto MacCorkle Ave SE

0.3 mi

4. Turn right onto 36th St SE

0.2 mi

5. Continue onto 36th St Southeast Bridge

0.2 mi

6. Use the right lane to take the ramp onto I-64 W/I-77 N

0.1 mi

Follow I-77 N to WV-2 N/Emerson Ave in Williams. Take exit 179 from I-77 N

1 h 10 min (81.7 mi)

7. Merge onto I-64 W/I-77 N

2.5 mi

8. Use the right 2 lanes to take the Interstate 77 N/Interstate 79 N exit toward Parkersburg

0.5 mi

9. Continue onto I-77 N

1.4 mi

10. Keep left at the fork to stay on I-77 N

76.9 mi

11. Take exit 179 for WV-2 N/WV-68 S/Emerson Ave toward Vienna

0.3 mi

Follow WV-2 N to OH-7 N/Ohio River Scenic Byway in Newport Township

20 min (16.6 mi)

12. Turn right onto WV-2 N/Emerson Ave (signs for St Marys/Airport)
    Continue to follow WV-2 N

15.9 mi

13. Turn left onto WV-807 N
    Entering Ohio

0.4 mi

14. Continue onto OH-807 N

0.4 mi

15. Turn left onto OH-7 N/Ohio River Scenic Byway

33 min (27.9 mi)

Follow WV-2 N and Fork Ridge Rd to US-250 S in 3

56 min (38.7 mi)

16. Slight right onto WV-7
    Entering West Virginia

0.7 mi

17. Continue straight

0.3 mi

18. Merge onto WV-2 N

24.1 mi

19. Turn right onto 12th St

1.1 mi

20. Continue onto Fork Ridge Rd

12.6 mi

Continue on US-250 S to Buzzard Ln

6 min (3.8 mi)

21. Turn right onto US-250 S

2.1 mi

22. Turn left onto WV-891 E

1.7 mi

Drive to Burley Hill Rd

3 min (0.9 mi)

23. Turn right onto Buzzard Ln

0.3 mi

24. Keep right to continue on Burley Hill Rd
    Destination will be on the left

0.6 mi

Burley Hill Road

Cameron, WV 26033

Attachment C – Installation and Start-up Schedule

Bailey Mine Gas Flaring

19H-2 Facility Installation

Attachment C – Installation and Start-up Schedule

Task	*Description*	*Estimated Date*
1. Finalize system design	Finalize the system design working with flare manufacturer and coal mine	11/25/2016
2. Place Purchase Order	Order the flare system from the manufacturer	12/02/2016
3. Manufacturer flare system	The flaring system will be manufactured offsite	12/02/2016 to 04/05/2017
4. Deliver and install system on site	Flaring system and all ancillary systems are delivered to site and are setup	04/05/2017 to 04/10/2017
5. Commissioning and Testing	Operational testing phase to assess performance of flare, control, communications and safety systems	04/10/2017 to 04/24/2017
6. Full Scale Operation	Operation at full scale levels	04/24/2017

Attachment D – Regulatory Discussion

Bailey Mine Gas Flaring Project

Attachment D – Regulatory Discussion

There are no federal or state regulations requiring the abatement or control of mine methane emissions. The installation of the pollution control enclosed flare is being undertaken on a purely voluntary basis.

Attachment E – Site Plots

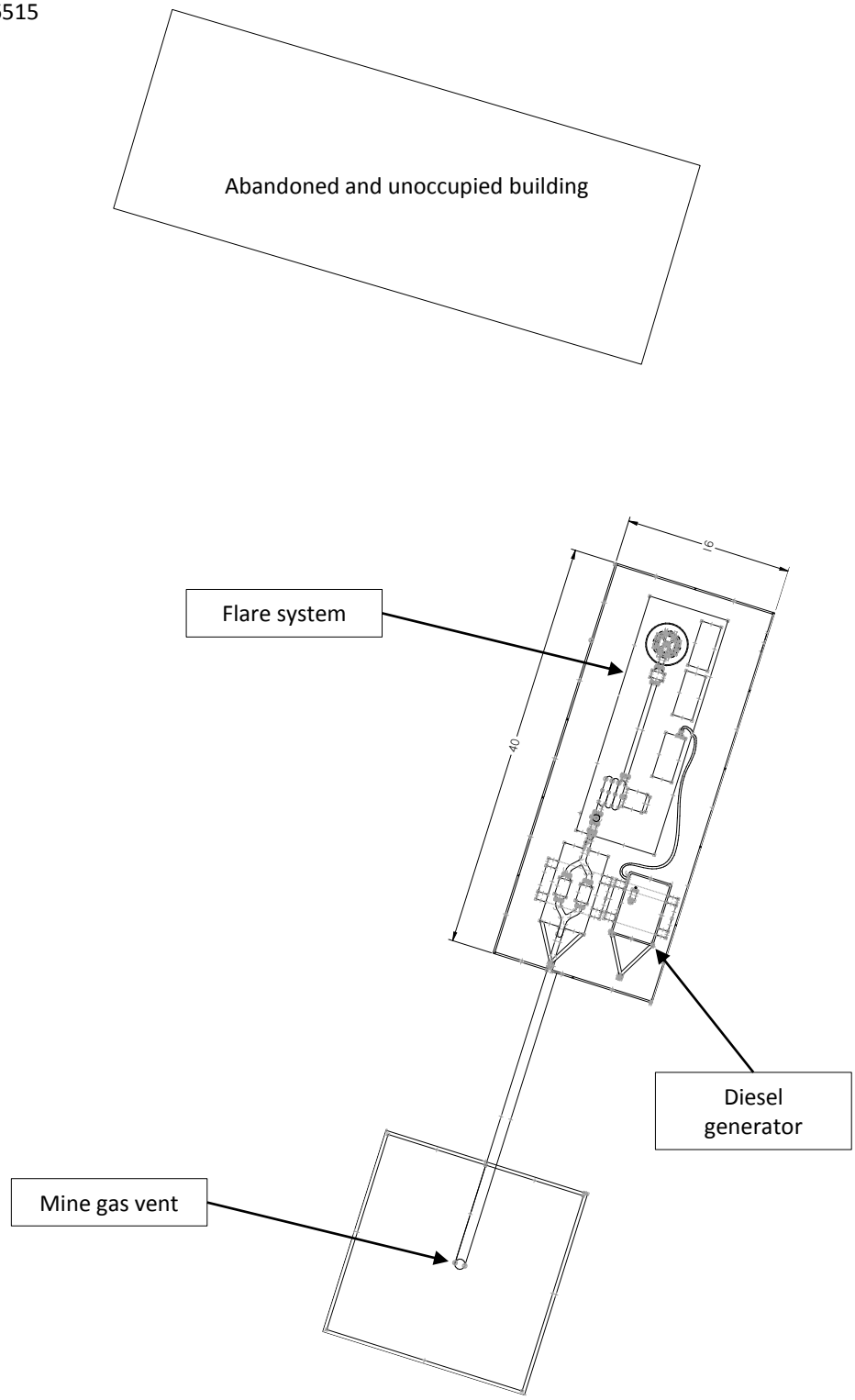
Attachment E

Plot of Bailey Mine Gob Gas Flaring Project – Site 19H-2

Scale: 1’ = 20”

Reference coordinates:

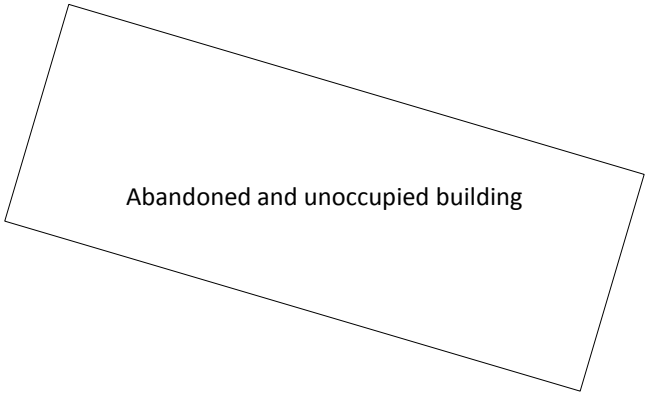
- UTM Northing (KM): 4412.83814
- UTM Easting (KM): 539.46515
- UTM Zone: 17S
- 1,400 feet above sea level

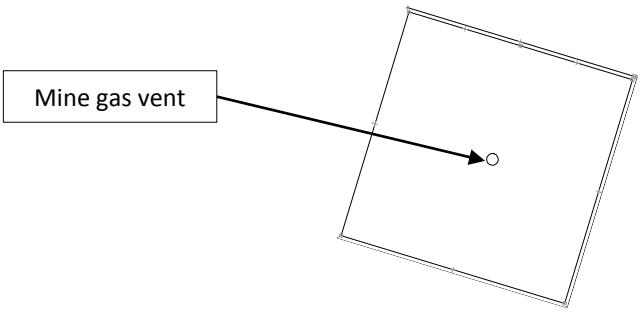


Attachment E
Current state of facility site – Site 19H-2

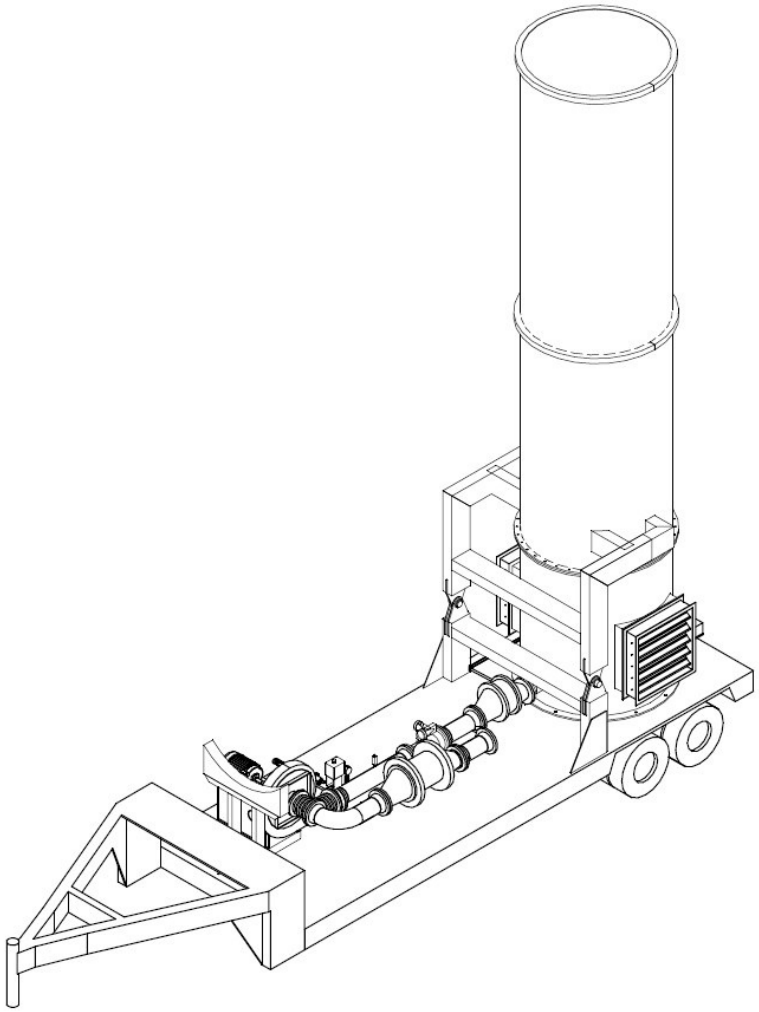
Scale: 1’ = 20”

Reference coordinates:
- UTM Northing (KM): 4412.83814
- UTM Easting (KM): 539.46515
- UTM Zone: 17S
- 1,400 feet above sea level





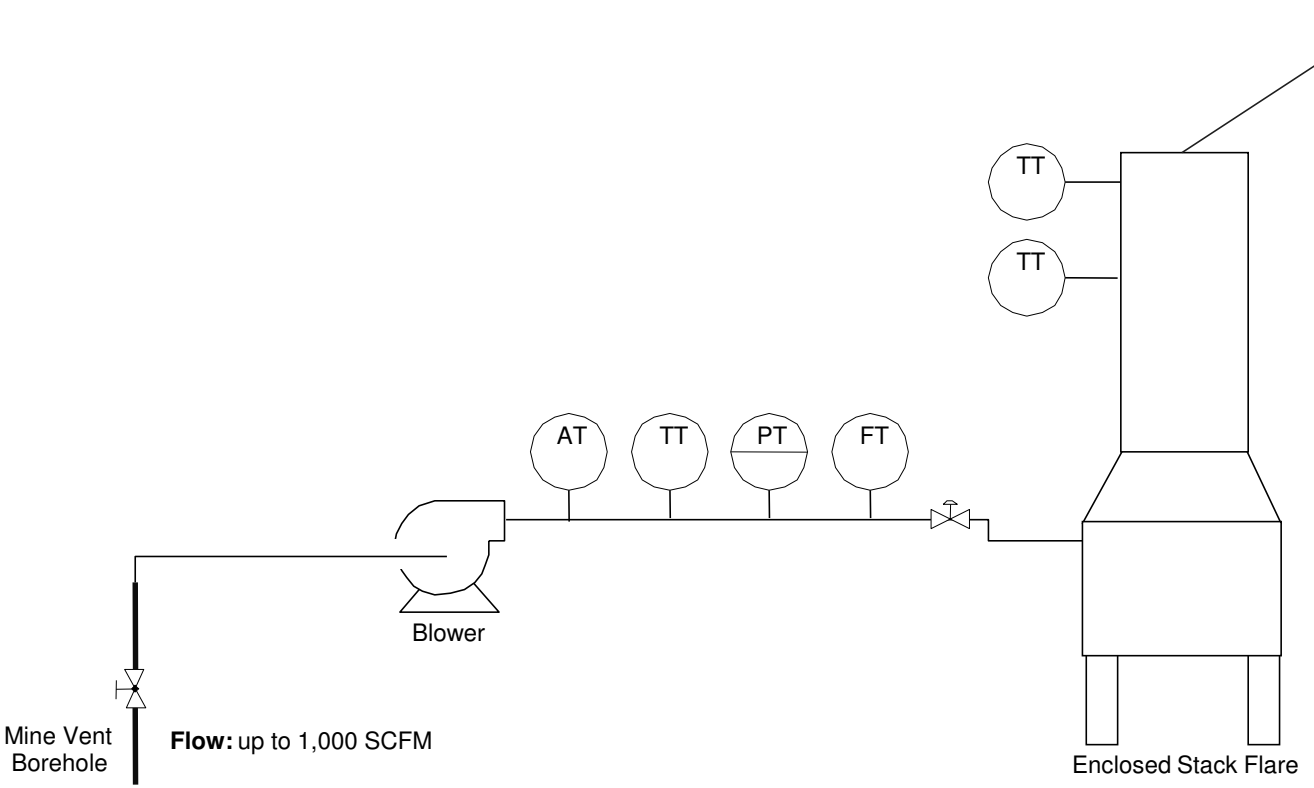
Attachment E
Flare system detail



Attachment F – Process Flow Diagram

ATTACHMENT F: PROCESS FLOW DIAGRAM

Bailey Gob Gas Flaring System



Component	Percentage
Methane	35.00 to 100.00%
Oxygen	0.00 to 1.10%
Ethane	0.00 to 0.26%
C3+	0.00 to 0.06%
Carbon Dioxide	0.00 to 4.00%
Nitrogen	0.00 to 59.00%

Pollutant	Hourly PTE (lb/hr)
PM	0.00
PM_{10}	0.00
VOCs	0.00
CO	Less than 3.64
NOx	Less than 2.73
SO_2	0.00
Pb	0.00
HAPs	0.00
TAPs	0.00
Other	Less than 15.23 (uncombusted methane from mine)

Bailey Mine Gas Flaring Project

Attachment F – Emission Points Data Summary Sheets

The enclosed flare stack is the only emission point at the plant.

Flare Stack Data Summary Sheet for Criteria Pollutants

POLLUTANT	HOURLY PTE (LB/HR)	YEARLY PTE (TON/YEAR) (HOURLY PTE MULTIPLIED BY 8760 HR/YR DIVIDED BY 2000 LB/TON)
PM	0.00	0.00
PM_{10}	0.00	0.00
VOCs	0.00	0.00
CO	Less than 3.64	Less than 15.96
NO_x	Less than 2.73	Less than 11.97
SO_2	0.00	0.00
Pb	0.00	0.00
HAPs (aggregate amount)	0.00	0.00
TAPs (individually)	0.00	0.00
Other	Less than 15.23 (uncombusted methane from mine)	Less than 66.70 (uncombusted methane from mine)

Attachment G – Process Description

Bailey Mine Gas Flaring Project – 19H-2 Location

Process Description

Process Step 1: Mine gas extraction

Mine gas will be extracted from an existing vent borehole at the Bailey Mine's 19H-2 vent site location by a blower driven by an electric motor. The blower will discharge the mine gas at 0.36 psi.

A 12" detonation arrester on the suction side of the blower separates the system from the mine's vent borehole preventing any possible flashback from reaching the mine.

Process Step 2: Mine gas measurement

The following measurements are taken of the mine gas:

- Pressure
- Temperature
- Flow rate
- Methane concentration

Process Step 3: Mine gas flaring

The mine gas is combusted in a John Zink (www.johnzink.com) flare. The flare's stack is enclosed creating a combustion chamber with a temperature greater than 1400°F. The combusting gas is retained in the combustion chamber at high temperature which results in the flare having a destruction efficiency greater than 98%. Additionally, the combustion chamber means that the flame is enclosed in the flare and is not visible.

Other: Power supply

In addition to the enclosed flaring system, ECC Windsor Inc will also position a portable trailer-mounted 12.5 kW diesel generator on site to power the flare's electrical systems. The diesel engine powering the generator will be a Tier 4 rated engine.

In the future, ECC Windsor Inc intends to connect the system onto the electrical power grid or generate electrical power using the waste mine methane gas from the borehole vent.

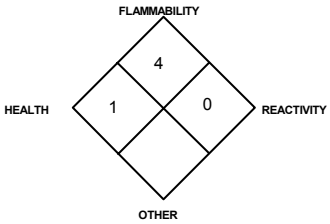
Attachment H – Material Safety Data Sheet

MATERIAL SAFETY DATA SHEET

Prepared to U.S. OSHA, CMA, ANSI and Canadian WHMIS Standards

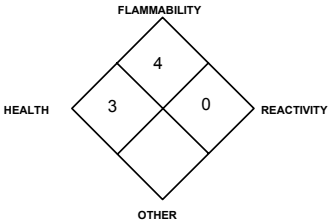
METHANE GAS

NFPA RATING



LIQUID METHANE

NFPA RATING



PART I *What is the material and what do I need to know in an emergency?*

1. PRODUCT IDENTIFICATION

CHEMICAL NAME; CLASS: **METHANE - CH_4, Gaseous**
METHANE - CH_4, Liquefied (Cryogenic)
Document Number: 001033

PRODUCT USE: Fuel and for general analytic/synthetic chemical uses.

SUPPLIER/MANUFACTURER'S NAME: AIRGAS INC.
ADDRESS: 259 N. Radnor-Chester Road
Suite 100
Radnor, PA 19087-5283

BUSINESS PHONE: 1-610-687-5253
EMERGENCY PHONE: 1-800-949-7937
International: 423-479-0293

DATE OF PREPARATION: May 12, 1996
REVISION DATE: January 3, 2001

2. COMPOSITION and INFORMATION ON INGREDIENTS

CHEMICAL NAME	CAS #	mole %	EXPOSURE LIMITS IN AIR					
			ACGIH		OSHA			
			TLV ppm	STEL ppm	PEL ppm	STEL ppm	IDLH ppm	OTHER
Methane	74-82-8	> 99%	There are no specific exposure limits for Methane. Methane is a simple asphyxiant (SA). Oxygen levels should be maintained above 19.5%.					
Maximum Impurities		< 1%	None of the trace impurities in this product contribute significantly to the hazards associated with the product. All hazard information pertinent to this product has been provided in this Material Safety Data Sheet, per the requirements of the OSHA Hazard Communication Standard (29 CFR 1910.1200) and State equivalent standards.					

NE = Not Established C = Ceiling Limit See Section 16 for Definitions of Terms Used

NOTE: All WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-1993 format.

3. HAZARD IDENTIFICATION

EMERGENCY OVERVIEW: Methane is an odorless, colorless gas, or a colorless, odorless liquid in its cryogenic form. Both the liquid and the gas pose a serious fire hazard when accidentally released. The liquid will rapidly boil to the gas at standard temperatures and pressures. As a gas, it will act as a simple asphyxiant and present a significant health hazard by displacing the oxygen in the atmosphere. The gas is lighter than air and may spread long distances. Distant ignition and flashback are possible. The liquefied gas can cause frostbite to any contaminated tissue. Flame or high temperature impinging on a localized area of the cylinder of Methane can cause the cylinder to rupture without activating the cylinder's relief devices. Provide adequate fire protection during emergency response situations. Allow the released gas to dissipate in the atmosphere.

SYMPTOMS OF OVEREXPOSURE BY ROUTE OF EXPOSURE: The most significant route of overexposure for this gas is by inhalation. The following paragraphs describe symptoms of exposure by route of exposure.

INHALATION: High concentrations of this gas can cause an oxygen-deficient environment. 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 overexposure, death may occur. The effects associated with various levels of oxygen are as follows:

CONCENTRATION	**SYMPTOMS OF EXPOSURE**
12-16% Oxygen:	Breathing and pulse rate increased, muscular coordination slightly disturbed.
10-14% Oxygen:	Emotional upset, abnormal fatigue, disturbed respiration.
6-10% Oxygen:	Nausea and vomiting, collapse or loss of consciousness.
Below 6%:	Convulsive movements, possible respiratory collapse, and death.

OTHER POTENTIAL HEALTH EFFECTS: Contact with cryogenic liquid or rapidly expanding gases (which are released under high pressure) may cause frostbite. Symptoms of frostbite include change in skin color to white or grayish-yellow. The pain after contact with the liquid can quickly subside.

HAZARDOUS MATERIAL INFORMATION SYSTEM

HEALTH	(BLUE)	1
FLAMMABILITY	(RED)	4
REACTIVITY	(YELLOW)	0
PROTECTIVE EQUIPMENT		B

EYES	RESPIRATORY	HANDS	BODY
	See Section 8		See Section 8

For routine industrial applications

See Section 16 for Definition of Ratings

HEALTH EFFECTS OR RISKS FROM EXPOSURE: An Explanation in **Lay Terms**. Overexposure to Methane may cause the following health effects:

ACUTE: The most significant hazard associated with this gas is inhalation of oxygen-deficient atmospheres. Symptoms of oxygen deficiency include respiratory difficulty, headache, dizziness, and nausea. At high concentrations, unconsciousness or death may occur. Contact with cryogenic liquid or rapidly expanding gases may cause frostbite.

CHRONIC: There are currently no known adverse health effects associated with chronic exposure to Methane.

TARGET ORGANS: Respiratory system.

PART II *What should I do if a hazardous situation occurs?*

4. FIRST-AID MEASURES

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO METHANE WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT. At a minimum, Self-Contained Breathing Apparatus and Fire-Retardant Personal Protective equipment should be worn. Adequate fire protection must be provided during rescue situations.

4. FIRST-AID MEASURES (Continued)

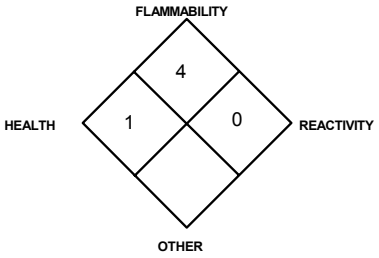
Remove victim(s) to fresh air as quickly as possible. Trained personnel should administer supplemental oxygen and/or cardio-pulmonary resuscitation, if necessary. Only trained personnel should administer supplemental oxygen.

In case of frostbite, place the frostbitten part in warm water. DO NOT USE HOT WATER. If warm water is not available, or is impractical to use, wrap the affected parts gently in blankets. Alternatively, if the fingers or hands are frostbitten, place the affected area in the armpit, Encourage victim to gently exercise the affected part while being warmed. Seek immediate medical attention. Victim(s) must be taken for medical attention. Rescuers should be taken for medical attention, if necessary. Take copy of label and MSDS to physician or other health professional with victim(s).

5. FIRE-FIGHTING MEASURES

METHANE GAS

NFPA RATING



FLASH POINT (Closed Cup):
-187°C (-306°F)

AUTOIGNITION TEMPERATURE:
537°C (999°F)

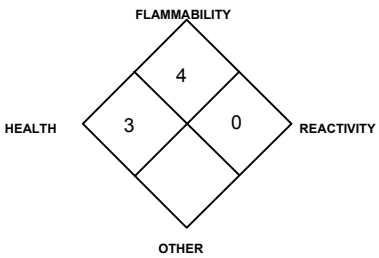
FLAMMABLE LIMITS (in air by volume, %):

Lower (LEL): 5.0%
Upper (UEL): 15.0%

See Section 16 for Definition of Ratings

LIQUID METHANE

NFPA RATING



FIRE EXTINGUISHING MATERIALS: Extinguish fires of this gas by shutting off the source of the gas. Use water spray to cool fire-exposed containers, structures, and equipment.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When involved in a fire, this gas will ignite and produce toxic gases including carbon monoxide and carbon dioxide. An extreme explosion hazard exists in areas in which the gas has been released, but the material has not yet ignited.

DANGER! Fires impinging (direct flame) on the outside surface of unprotected pressure storage vessels of Methane can be very dangerous and lead to container failure. The resulting fire and explosion can result in severe equipment damage and personnel injury or death over a large area around the vessel. For massive fires in large areas, use unmanned hose holder or monitor nozzles; if this is not possible, withdraw from area and allow fire to burn.

RESPONSE TO FIRE INVOLVING CRYOGEN: Cryogenic liquids can be particularly dangerous during fires because of their potential to rapidly freeze water. Careless use of water may cause heavy icing. Furthermore, relatively warm water greatly increases the evaporation rate of Methane. If large concentrations of Methane gas are present, the water vapor in the surrounding air will condense, creating a dense fog that may make it difficult to find fire exits or equipment. Liquid Methane, when exposed to the atmosphere, will produce a cloud of ice/fog in the air upon its release. A flammable mixture will exist within the vapor cloud and it is advisable that personnel keep well outside the area of visible moisture.

Explosion Sensitivity to Mechanical Impact: Not sensitive.
Explosion Sensitivity to Static Discharge: Static discharge may cause Methane to ignite explosively.

SPECIAL FIRE-FIGHTING PROCEDURES: Structural fire-fighters must wear Self-Contained Breathing Apparatus and full protective equipment. The best fire-fighting technique may be simply to let the burning gas escape from the pressurized cylinder, tank car, or pipeline. Stop the leak before extinguishing fire. If the fire is extinguished before the leak is sealed, the still-leaking gas could explosively re-ignite without warning and cause extensive damage, injury, or fatality. In this case, increase ventilation (in enclosed areas) to prevent flammable or explosive mixture formation. For large releases, consider evacuation. Refer to the North American Emergency Response Guidebook for additional information.

6. ACCIDENTAL RELEASE MEASURES

SPILL AND LEAK RESPONSE: Uncontrolled releases should be responded to by trained personnel using pre-planned procedures. Proper protective equipment should be used. In case of a release, clear the affected area, protect people, and respond with trained personnel. Adequate fire protection must be provided. Minimum Personal Protective Equipment should be **Level B: fire-retardant protective clothing, gloves resistant to tears, and Self-Contained Breathing Apparatus.**

Use only non-sparking tools and equipment. Locate and seal the source of the leaking gas. Protect personnel attempting the shut-off with water-spray. Allow the gas, which is lighter than air, to dissipate. Liquid Methane, when exposed to the atmosphere, will produce a cloud of ice/fog in the air upon its release. A flammable mixture will exist within the vapor cloud, and it is advisable that personnel keep well outside the area of visible moisture. If cryogenic liquid is released, keep area clear and allow the liquid to evaporate. The gas that is then formed should be allowed to dissipate.

Monitor the surrounding area for combustible gas levels and oxygen. The atmosphere must have at least 19.5 percent oxygen before personnel can be allowed in the area without Self-Contained Breathing Apparatus. Combustible gas concentration must be below 10% of the LEL (LEL = 5.0%) prior to entry. Attempt to close the main source valve prior to entering the area. If this does not stop the release (or if it is not possible to reach the valve), allow the gas to release in-place or remove it to a safe area and allow the gas to be released there.

RESPONSE TO CRYOGENIC RELEASE: Clear the affected area and allow the liquid to evaporate and the gas to dissipate. After the gas is formed, follow the instructions provided in the previous paragraphs. If the area must be entered by emergency personnel, SCBA, Kevlar gloves, and appropriate foot and leg protection must be worn.

THIS IS AN EXTREMELY FLAMMABLE GAS. Protection of all personnel and the area must be maintained.

PART III *How can I prevent hazardous situations from occurring?*

7. HANDLING and STORAGE

WORK PRACTICES AND HYGIENE PRACTICES: As with all chemicals, avoid getting Methane IN YOU. Do not eat or drink while handling chemicals. Be aware of any signs of dizziness or fatigue; exposures to fatal concentrations of Methane could occur without any significant warning symptoms.

STORAGE AND HANDLING PRACTICES: Cylinders should be stored in dry, well-ventilated areas away from sources of heat. Compressed gases can present significant safety hazards. Store containers away from heavily trafficked areas and emergency exits. Post “No Smoking or Open Flames” signs in storage or use areas.

SPECIAL PRECAUTIONS FOR HANDLING GAS CYLINDERS: Protect cylinders against physical damage. Store in cool, dry, well-ventilated area, away from sources of heat, ignition and direct sunlight. Do not allow area where cylinders are stored to exceed 52°C (125°F). Isolate from oxidizers such as oxygen, chlorine, or fluorine. Use a check valve or trap in the discharge line to prevent hazardous backflow. Post “No Smoking or Open Flame” signs in storage and use areas. Cylinders should be stored upright and be firmly secured to prevent falling or being knocked over. Cylinders can be stored in the open, but in such cases, should be protected against extremes of weather and from the dampness of the ground to prevent rusting. Never tamper with pressure relief devices in valves and cylinders. Electrical equipment should be non-sparking or explosion proof. The following rules are applicable to work situations in which cylinders are being used:

Before Use: Move cylinders with a suitable hand truck. Do not drag, slide, or roll cylinders. Do not drop cylinders or permit them to strike each other. Secure cylinders firmly. Leave the valve protection cap, if provided, in place until cylinder is ready for use.

During Use: Use designated CGA fittings and other support equipment. Do not use adapters. Do not heat cylinder by any means to increase the discharge rate of the product from the cylinder. Use check valve or trap in discharge line to prevent hazardous backflow into the cylinder. Do not use oils or grease on gas-handling fittings or equipment.

After Use: Close main cylinder valve. Replace valve protection cap, if provided. Mark empty cylinders “EMPTY”.

NOTE: Use only DOT or ASME code containers. Earth-ground and bond all lines and equipment associated with Methane. Close valve after each use and when empty. Cylinders must not be recharged except by or with the consent of owner. For additional information refer to the Compressed Gas Association Pamphlet P-1, *Safe Handling of Compressed Gases in Containers*. Additionally, refer to CGA Bulletin SB-2 “*Oxygen Deficient Atmospheres*”.

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT: Follow practices indicated in Section 6 (Accidental Release Measures). Make certain that application equipment is locked and tagged-out safely. Purge gas handling equipment with inert gas (e.g., nitrogen) before attempting repairs.

8. EXPOSURE CONTROLS - PERSONAL PROTECTION

VENTILATION AND ENGINEERING CONTROLS: Use with adequate ventilation. Local exhaust ventilation is preferred, because it prevents Methane dispersion into the work place by eliminating it at its source. If appropriate, install automatic monitoring equipment to detect the presence of potentially explosive air-gas mixtures and the level of oxygen. Monitoring devices should be installed near the ceiling.

RESPIRATORY PROTECTION: Maintain oxygen levels above 19.5% in the workplace. Use supplied air respiratory protection if oxygen levels are below 19.5% or during emergency response to a release of Methane. If respiratory protection is required, follow the requirements of the Federal OSHA Respiratory Protection Standard (29 CFR 1910.134) or equivalent State standards.

EYE PROTECTION: Splash goggles or safety glasses, for protection from rapidly expanding gases and splashes of liquid Methane.

HAND PROTECTION: Wear gloves resistant to tears when handling cylinders of Methane. Use low-temperature protective gloves when working with containers of liquid Methane.

BODY PROTECTION: Use body protection appropriate for task. Transfer of large quantities under pressure may require protective equipment appropriate to protect employees from splashes of liquefied product, as well as fire retardant items.

9. PHYSICAL and CHEMICAL PROPERTIES

VAPOR DENSITY: 0.6784 kg/m^3 (0.042 35 lb/ft^3)
SPECIFIC GRAVITY (air = 1): 0.555
SOLUBILITY IN WATER: Very slight.
EXPANSION RATIO: 626 (cryogenic liquid)
ODOR THRESHOLD: Not applicable. Odorless.
COEFFICIENT WATER/OIL DISTRIBUTION: Not applicable.
SPECIFIC VOLUME: 23.7
FREEZING POINT: -182.2°C (-296°F)
BOILING POINT @ 1 atm: -161°C (-258.7°F)
EVAPORATION RATE (n-BuAc): Not applicable.
VAPOR PRESSURE (psia): Not applicable.
pH: Not applicable.

APPEARANCE AND COLOR: Colorless, odorless gas, or colorless, odorless, cryogenic liquid.
HOW TO DETECT THIS SUBSTANCE (warning properties): There are no distinct warning properties. In terms of leak detection, fittings and joints can be painted with a soap solution to detect leaks, which will be indicated by a bubble formation.
NOTE: This gas is lighter than air and must not be allowed to accumulate in elevated locations.

10. STABILITY and REACTIVITY

STABILITY: Stable.

DECOMPOSITION PRODUCTS: When ignited in the presence of oxygen, this gas will burn to produce carbon monoxide, carbon dioxide.

MATERIALS WITH WHICH SUBSTANCE IS INCOMPATIBLE: Strong oxidizers (e.g., chlorine, bromine pentafluoride, oxygen, oxygen difluoride, and nitrogen trifluoride).

HAZARDOUS POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Contact with incompatible materials and exposure to heat, sparks, and other sources of ignition. Cylinders exposed to high temperatures or direct flame can rupture or burst.

PART IV *Is there any other useful information about this material?*

11. TOXICOLOGICAL INFORMATION

TOXICITY DATA: There are no specific toxicology data for Methane. Methane is a simple asphyxiant, which acts to displace oxygen in the environment.

SUSPECTED CANCER AGENT: Methane is not found on the following lists: FEDERAL OSHA Z LIST, NTP, IARC, CAL/OSHA, and therefore, is neither considered to be nor suspected to be a cancer-causing agent by these agencies.

IRRITANCY OF PRODUCT: Methane is not irritating; however, contact with rapidly expanding gases can cause frostbite to exposed tissue.

SENSITIZATION TO THE PRODUCT: Methane does not cause sensitization with prolonged or repeated contact.

11. TOXICOLOGICAL INFORMATION (Continued)

REPRODUCTIVE TOXICITY INFORMATION: Listed below is information concerning the effects of Methane on the human reproductive system.

Mutagenicity: No mutagenicity effects have been described for Methane.
Embryotoxicity: No embryotoxic effects have been described for Methane.
Teratogenicity: No teratogenicity effects have been described for Methane.
Reproductive Toxicity: No reproductive toxicity effects have been described for Methane.

A mutagen is a chemical which causes permanent changes to genetic material (DNA) such that the changes will propagate through generational lines. An embryotoxin is a chemical which causes damage to a developing embryo (i.e., within the first eight weeks of pregnancy in humans), but the damage does not propagate across generational lines. A teratogen is a chemical which causes damage to a developing fetus, but the damage does not propagate across generational lines. A reproductive toxin is any substance which interferes in any way with the reproductive process.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: Acute or chronic respiratory conditions may be aggravated by overexposure to the components of Methane.

RECOMMENDATIONS TO PHYSICIANS: Administer oxygen if necessary. Treat symptoms and eliminate exposure.

BIOLOGICAL EXPOSURE INDICES (BEIs): Currently, Biological Exposure Indices (BEIs) are not applicable for Methane.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL STABILITY: Methane occurs naturally in the atmosphere. This gas will be dissipated rapidly in well-ventilated areas.
EFFECT OF MATERIAL ON PLANTS or ANIMALS: Any adverse effect on animals would be related to oxygen-deficient environments. No adverse effect is anticipated to occur to plant-life, except for frost produced in the presence of rapidly expanding gases.
EFFECT OF CHEMICAL ON AQUATIC LIFE: No evidence is currently available on the effects of Methane on aquatic life.

13. DISPOSAL CONSIDERATIONS

PREPARING WASTES FOR DISPOSAL: Product removed from the cylinder must be disposed of in accordance with appropriate Federal, State, and local regulations. Return cylinders with residual product to Airgas. Do not dispose locally.

14. TRANSPORTATION INFORMATION

THIS MATERIAL IS HAZARDOUS AS DEFINED BY 49 CFR 172.101 BY THE U.S. DEPARTMENT OF TRANSPORTATION.

For Methane Gas:

PROPER SHIPPING NAME:	Methane, compressed
HAZARD CLASS NUMBER and DESCRIPTION:	2.1 (Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1971
PACKING GROUP:	Not Applicable
DOT LABEL(S) REQUIRED:	Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 115

For Liquefied Methane:

PROPER SHIPPING NAME:	Methane, refrigerated liquid
HAZARD CLASS NUMBER and DESCRIPTION:	2.1 (Flammable Gas)
UN IDENTIFICATION NUMBER:	UN 1972
PACKING GROUP:	Not Applicable
DOT LABEL(S) REQUIRED:	Flammable Gas

NORTH AMERICAN EMERGENCY RESPONSE GUIDEBOOK NUMBER (2000): 115

MARINE POLLUTANT: Methane is not classified by the DOT as a Marine Pollutant (as defined by 49 CFR 172.101, Appendix B).

15. REGULATORY INFORMATION

U.S. SARA REPORTING REQUIREMENTS: Methane is not subject to the reporting requirements of Sections 302, 304, and 313 of Title III of the Superfund Amendments and Reauthorization Act.

U.S. SARA THRESHOLD PLANNING QUANTITY: Not applicable.

U.S. CERCLA REPORTABLE QUANTITY (RQ): Not applicable.

CANADIAN DSL/NDSL INVENTORY STATUS: Methane is on the DSL Inventory.

U.S. TSCA INVENTORY STATUS: Methane is listed on the TSCA Inventory.

OTHER U.S. FEDERAL REGULATIONS: Methane is subject to the reporting requirements of Section 112(r) of the Clean Air Act. The Threshold Quantity for this gas is 10,000 lb. Depending on specific operations involving the use of Isobutylene, the regulations of the Process Safety Management of Highly Hazardous Chemicals may be applicable (29 CFR 1910.119). Under this regulation Methane is not listed in Appendix A; however, any process that involves a flammable gas on-site, in one location, in quantities of 10,000 lb (4,553 kg) or greater is covered under this regulation unless it is used as a fuel.

U.S. STATE REGULATORY INFORMATION: Methane is covered under specific State regulations, as denoted below:

Alaska - Designated Toxic and Hazardous Substances: Methane.
California - Permissible Exposure Limits for Chemical Contaminants: Methane.
Florida - Substance List: No.
Illinois - Toxic Substance List: Methane.
Kansas - Section 302/313 List: No.
Massachusetts - Substance List: Methane.
Michigan - Critical Materials Register: No.
Minnesota - List of Hazardous Substances: Methane.
Missouri - Employer Information/Toxic Substance List: Methane.
New Jersey - Right to Know Hazardous Substance List: Methane.
North Dakota - List of Hazardous Chemicals, Reportable Quantities: No.
Pennsylvania - Hazardous Substance List: Methane.
Rhode Island - Hazardous Substance List: Methane.
Texas - Hazardous Substance List: No.
West Virginia - Hazardous Substance List: No.
Wisconsin - Toxic and Hazardous Substances: No.

CALIFORNIA SAFE DRINKING WATER AND TOXIC ENFORCEMENT ACT (PROPOSITION 65): Methane is not on the California Proposition 65 lists.

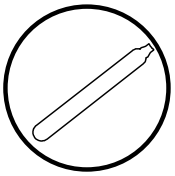
LABELING:

DANGER: FLAMMABLE HIGH PRESSURE GAS.
CAN FORM EXPLOSIVE MIXTURES WITH AIR.

Keep away from heat, flames, and sparks.
Store and use width adequate ventilation.
Use equipment rated for cylinder pressure.
Close valve after each use and when empty.
Use in accordance with the Material Safety Data Sheet.

DO NOT REMOVE THIS PRODUCT LABEL

CANADIAN WHMIS SYMBOLS: **Class A:** Compressed Gas
Class B1: Flammable Gas



16. OTHER INFORMATION

PREPARED BY: **Airgas - SAFECOR**

The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. AIRGAS, Inc. assumes no responsibility for injury to the vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Additionally, AIRGAS, Inc. assumes no responsibility for injury to vendee or third persons proximately caused by abnormal use of the material even if reasonable safety procedures are followed. Furthermore, vendee assumes the risk in his use of the material.

DEFINITIONS OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these which are commonly used include the following:

CAS #: This is the Chemical Abstract Service Number which uniquely identifies each constituent. It is used for computer-related searching.

EXPOSURE LIMITS IN AIR:

ACGIH - American Conference of Governmental Industrial Hygienists, a professional association which establishes exposure limits. **TLV -** Threshold Limit Value - an airborne concentration of a substance which represents conditions under which it is generally believed that nearly all workers may be repeatedly exposed without adverse effect. The duration must be considered, including the 8-hour Time Weighted Average **(TWA)**, the 15-minute Short Term Exposure Limit, and the instantaneous Ceiling Level **(C)**. Skin absorption effects must also be considered.

OSHA - U.S. Occupational Safety and Health Administration. **PEL -** Permissible Exposure Limit - This exposure value means exactly the same as a TLV, except that it is enforceable by OSHA. The OSHA Permissible Exposure Limits are based in the 1989 PELs and the June, 1993 Air Contaminants Rule (Federal Register: 58: 35338-35351 and 58: 40191). Both the current PELs and the vacated PELs are indicated. The phrase, "Vacated 1989 PEL," is placed next to the PEL which was vacated by Court Order.

IDLH - Immediately Dangerous to Life and Health **-** This level represents a concentration from which one can escape within 30-minutes without suffering escape-preventing or permanent injury. **The DFG - MAK** is the Republic of Germany's Maximum Exposure Level, similar to the U.S. PEL. **NIOSH** is the National Institute of Occupational Safety and Health, which is the research arm of the U.S. **O**ccupational **S**afety and **H**ealth **A**dministration (**OSHA**). NIOSH issues exposure guidelines called **R**ecommended **E**xposure **L**evels (**REL**s). When no exposure guidelines are established, an entry of **NE** is made for reference.

HAZARD RATINGS:

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: Health Hazard: **0** (minimal acute or chronic exposure hazard); **1** (slight acute or chronic exposure hazard); **2** (moderate acute or significant chronic exposure hazard); **3** (severe acute exposure hazard; onetime overexposure can result in permanent injury and may be fatal); **4** (extreme acute exposure hazard; onetime overexposure can be fatal). Flammability Hazard: **0** (minimal hazard); **1** (materials that require substantial pre-heating before burning); **2** (combustible liquid or solids; liquids with a flash point of 38-93°C [100-200°F]); **3** (Class IB and IC flammable liquids with flash points below 38°C [100°F]); **4** (Class IA flammable liquids with flash points below 23°C [73°F] and boiling points below 38°C [100°F]. Reactivity Hazard: **0** (normally stable); 1 (material that can become unstable at elevated temperatures or which can react slightly with water); **2** (materials that are unstable but do not detonate or which can react violently with water); **3** (materials that can detonate when initiated or which can react explosively with water); **4** (materials that can detonate at normal temperatures or pressures).

NATIONAL FIRE PROTECTION ASSOCIATION: Health Hazard: **0** (material that on exposure under fire conditions would offer no hazard beyond that of ordinary combustible materials); **1** (materials that on exposure under fire conditions could cause irritation or minor residual injury); **2** (materials that on intense or continued exposure under fire conditions could cause temporary incapacitation or possible residual injury); **3** (materials that can on short exposure could cause serious temporary or residual injury); **4** (materials that under very short exposure causes death or major residual injury).

NATIONAL FIRE PROTECTION ASSOCIATION (Continued): Flammability Hazard and Reactivity Hazard: Refer to definitions for "Hazardous Materials Identification System".

FLAMMABILITY LIMITS IN AIR:

Much of the information related to fire and explosion is derived from the National Fire Protection Association (**NFPA**). Flash Point - Minimum temperature at which a liquid gives off sufficient vapors to form an ignitable mixture with air. Autoignition Temperature: The minimum temperature required to initiate combustion in air with no other source of ignition. LEL - the lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source. UEL - the highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source.

TOXICOLOGICAL INFORMATION:

Possible health hazards as derived from human data, animal studies, or from the results of studies with similar compounds are presented. Definitions of some terms used in this section are: **LD_{50}** - Lethal Dose (solids & liquids) which kills 50% of the exposed animals; **LC_{50}** - Lethal Concentration (gases) which kills 50% of the exposed animals; **ppm** concentration expressed in parts of material per million parts of air or water; **mg/m^3** concentration expressed in weight of substance per volume of air; **mg/kg** quantity of material, by weight, administered to a test subject, based on their body weight in kg. Data from several sources are used to evaluate the cancer-causing potential of the material. The sources are: **IARC** - the International Agency for Research on Cancer; **NTP** - the National Toxicology Program, **RTECS** - the Registry of Toxic Effects of Chemical Substances, **OSHA** and **CAL/OSHA**. IARC and NTP rate chemicals on a scale of decreasing potential to cause human cancer with rankings from 1 to 4. Subrankings (2A, 2B, etc.) are also used. Other measures of toxicity include **TDLo**, the lowest dose to cause a symptom and **TCLo** the lowest concentration to cause a symptom; **TDo**, **LDLo**, and **LDo**, or **TC**, **TCo**, **LCLo**, and **LCo**, the lowest dose (or concentration) to cause lethal or toxic effects. **BEI** - Biological Exposure Indices, represent the levels of determinants which are most likely to be observed in specimens collected from a healthy worker who has been exposed to chemicals to the same extent as a worker with inhalation exposure to the TLV. Ecological Information: EC is the effect concentration in water.

REGULATORY INFORMATION:

This section explains the impact of various laws and regulations on the material. **EPA** is the U.S. Environmental Protection Agency. **WHMIS** is the Canadian Workplace Hazardous Materials Information System. **DOT** and **TC** are the U.S. Department of Transportation and the Transport Canada, respectively. Superfund Amendments and Reauthorization Act **(SARA)**; the Canadian Domestic/Non-Domestic Substances List **(DSL/NDSL)**; the U.S. Toxic Substance Control Act **(TSCA)**; Marine Pollutant status according to the **DOT**; the Comprehensive Environmental Response, Compensation, and Liability Act **(CERCLA or Superfund)**; and various state regulations.

Attachment I – Emission Units Table

Attachment I

Emission Units Table

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

Emission Unit ID[1]	Emission Point ID[2]	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type[3] and Date of Change	Control Device[4]
1S	1E	Enclosed stack flare mounted on a trailer	New	15.3 MMBTU/hr 1000 scfm for flow capacity	New	1C

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

Attachment J – Emission Points Data Summary Sheet

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 1: Emissions Data															
Emission Point ID No. *(Must match Emission Units Table & Plot Plan)*	Emission Point Type[1]	Emission Unit Vented Through This Point *(Must match Emission Units Table & Plot Plan)*		Air Pollution Control Device *(Must match Emission Units Table & Plot Plan)*		Vent Time for Emission Unit *(chemical processes only)*		All Regulated Pollutants - Chemical Name/CAS[3] *(Speciate VOCs & HAPS)*	Maximum Potential Uncontrolled Emissions [4]		Maximum Potential Controlled Emissions [5]		Emission Form or Phase *(At exit conditions, Solid, Liquid or Gas/Vapor)*	Est. Method Used [6]	Emission Concentration [7] (ppmv or mg/m^4)
		ID No.	Source	ID No.	Device Type	Short Term[2]	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr			
1E	Upward vertical stack	1S	Waste mine gas	1C	Flare	C	8,760	NO	0.0	0.0	2.7	12.0	Gas	MB	42.3 ppmv
								CO	0.0	0.0	3.6	16.0	Gas	MB	92.7 ppmv
								CO_2	0.0	0.0	2,044.5	8,955.0	Gas	MB	33,100.4 ppmv
								Methane (CH_4)	761.4	3,334.9	15.2	66.7	Gas	MB	676.4 ppmv

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

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

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

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

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

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

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

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

Attachment J
EMISSION POINTS DATA SUMMARY SHEET

Table 2: Release Parameter Data								
Emission Point ID No. *(Must match Emission Units Table)*	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow [1] (acfm) *at operating conditions*	Velocity (fps)	Ground Level *(Height above mean sea level)*	Stack Height [2] *(Release height of emissions above ground level)*	Northing	Easting
1E	6.0	1,400 to 1,800	38,605.4	22.8	1,400 ft	30.0	4412.83814 KM N Zone: 17S	539.46515 KM E Zone 17S

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

Attachment K – Fugitive Emissions Data Summary Sheet

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 uncaptured process emissions are not typically considered to be fugitive, and must be accounted for on the appropriate EMISSIONS UNIT DATA SHEET and on the EMISSION POINTS DATA SUMMARY SHEET.

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

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

FUGITIVE EMISSIONS SUMMARY	All Regulated Pollutants - Chemical Name/CAS [1]	Maximum Potential Uncontrolled Emissions [2]		Maximum Potential Controlled Emissions [3]		Est. Method Used [4]
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads						
Unpaved Haul Roads						
Storage Pile Emissions						
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks		Does not apply		Does not apply		
General Clean-up VOC Emissions						
Other						

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

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

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

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

Attachment L & M – Emission Unit Data Sheet

Attachment M
Air Pollution Control Device Sheet
(FLARE SYSTEM)

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

Equipment Information

1. Manufacturer: John Zink

   Model No. ZTOF Flare System

2. Method:
   - ☐ Elevated flare
   - ☐ Ground flare
   - ☒ Other

   Describe: Trailer mounted enclosed stack flare system

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:
   - 1,000 scf/min
   - 60,000 scf/hr

6. Dimensions of stack:
   - Diameter 6 ft.
   - Height 30 ft.

7. Estimated combustion efficiency:
   (Waste gas destruction efficiency)
   - Estimated: 99 %
   - Minimum guaranteed: 98 %

8. Fuel used in burners:
   - ☐ Natural Gas
   - ☐ Fuel Oil, Number
   - ☒ Other, Specify:

9. Number of burners:
   Rating: 15.3 MM BTU/hr

10. Will preheat be used? ☐ Yes ☒ No

11. Describe method of controlling flame:
    Automatic air damper modulates to maintain proper temperature and mixing ratio

12. Flare height: 30 ft

13. Flare tip inside diameter: 0.5 ft

14. Natural gas flow rate to flare pilot flame per pilot light:
    - 0.367 scf/min
    - 22 scf/hr

15. Number of pilot lights:
    Total 56,584 BTU/hr

16. Will automatic re-ignition be used?
    ☒ Yes ☐ No

17. If automatic re-ignition will be used, describe the method:
    Upon loss of flame, the main valve will close, isolating the flow of waste mine gas to the main burner. The pilot valve will also close to completely isolate the flow of gas to the combustion chamber. If the appropriate "start" conditions are detected, the start sequence will re-initiate by first opening the pilot valve and re-lighting the pilot burner, then slowly opening the main valve to re-establish the main burner flame.

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: 8,760

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 Grains of H_2S/100 ft^3	Quantity (LB/hr, ft^3/hr, etc)	Source of Material
Waste mine gas	0	Max 1,000 scfm	Mine gas well

30. Estimate total combustible to flare: 746 LB/hr or ACF/hr
(Maximum mass flow rate of waste gas) 1,000 scfm

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

32. Give composition of carrier gases:
Apart from waste mine methane (composition 30% to 100%) the remaining gases are components of air.

33. Temperature of emission stream: 68 °F Heating value of emission stream: 1,012 BTU/ft^3 Mean molecular weight of emission stream: MW = 16.05 lb/lb-mole	34. Identify and describe all auxiliary fuels to be burned. None BTU/scf BTU/scf BTU/scf BTU/scf
35. Temperature of flare gas: °F	36. Flare gas flow rate: scf/min
37. Flare gas heat content: BTU/ft^3	38. Flare gas exit velocity: scf/min

39. Maximum rate during emergency for one major piece of equipment or process unit: 1,000 scf/min

40. Maximum rate during emergency for one major piece of equipment or process unit: 303,600 BTU/min

41. Describe any air pollution control device inlet and outlet gas conditioning processes (e.g., gas cooling, gas reheating, gas humidification):
Flare uses an enclosed combustion stack to ensure greater than 98% destruction efficiency. Flue gases are retained in the combustion stack at high temperature to complete combustion of methane.

42. Describe the collection material disposal system:
Only gas emitted from flare

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

44. **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:
The input waste mine methane flow will be monitored continuously. The following parameters will be monitored: Pressure, Temperature, Flow rate and Methane concentration In addition, the flare combustion chamber temperature will be monitored continuously.	Data will be continuously recorded and stored on-site. Further the operating data will be uploaded to an off-site data storage facility. All data will be stored electronically and will be available for auditing for a period of no less than 8 years.
REPORTING:	TESTING:
The project will report emissions and project performance to the California Air Resources Board, as per the State of California's Assembly Bill 32, on an annual basis.	All instrumentation will be tested and calibrated at a minimum on an annual basis and more frequently if recommended by the manufacturer. In addition, the composition of the flare's inlet gas stream will be analyzed annually by an certified laboratory using a gas chromatograph.

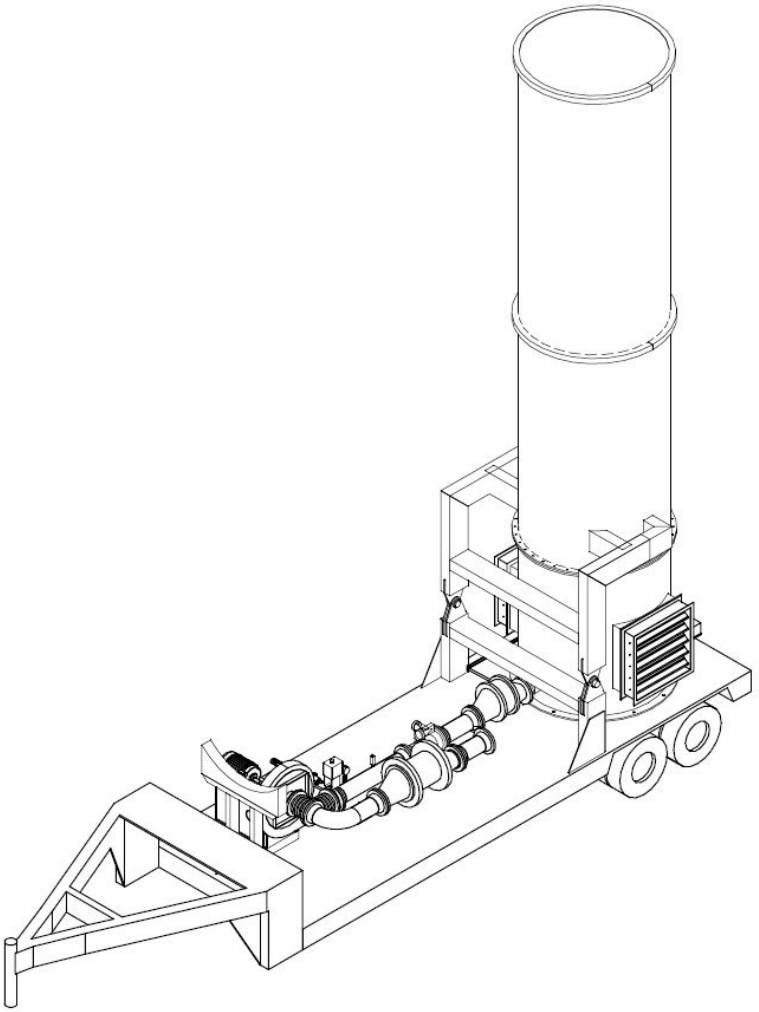
MONITORING:	Please list and describe the process parameters and ranges that are proposed to be monitored in order to demonstrate compliance with the operation of this process equipment or air control device.
RECORDKEEPING:	Please describe the proposed recordkeeping that will accompany the monitoring.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

45. Manufacturer's Guaranteed Capture Efficiency for each air pollutant.
The well will be connected directly to inlet of the flare blower. Therefore 100% capture of mine gas is expected.

46. Manufacturer's Guaranteed Control Efficiency for each air pollutant.
Guaranteed methane destruction efficiency of methane: 98%

47. Describe all operating ranges and maintenance procedures required by Manufacturer to maintain warranty.
Maximum flow: 280 scfm at 100% methane up to 1,000 scfm at 28% methane
Methane concentration range: 28 - 100%
Temperature range: 1,400 - 1,800 deg F
Maintenance: Quarterly inspection of flare burner tips

Attachment M
Flare system detail



Attachment N – Supporting Emissions Calculations

ATTACHMENT N - Supporting Calculations

Expected Process Gas Performance		
Operating Temperature	1600˚F	1800˚F
CO_2 Volume %	7.0	8.1
H_2O Volume %	8.2	9.2
N_2 Volume %	72.6	71.8
O_2 Volume %	12.2	10.9

Expected Emission Range - (Design Flow with Natural Gas)		
Operating Temperature	1400˚F - 1800˚F	
Overall Destruction Efficiency	98 - 99%	
Emissions rate, NOx	0.15	lb/MMBTU
Emissions rate, CO	0.20	lb/MMBTU

Operating Characteristics		
Input gas flow rate	300	scf/min
CH4 concentration	100%	
HHV of CH4	1,012	BTU/scf
Density of methane	0.0423	lb/scf
Period	525,600	min/year
Energy flow rate	159,572	MMBtu/year

Potential to Emit		
Overall Destruction Efficiency	98%	
Emissions rate, NO_x	23,936	lb/year
Emissions rate, CO	31,914	lb/year
Emission rate, CO_2	17,909,919	lb/hr

Emissions rate, NO_x	2.73	lb/hr
Emissions rate, CO	3.64	lb/hr
Emission rate, CO_2	2,044.51	lb/hr

Uncombusted methane		
Emission rate, uncombusted methane	6.00	scf/min
Emission rate, uncombusted methane	0.25	lb/min
Emission rate, uncombusted methane	15.23	lb/hr

Coversion to ton/year		
Emissions rate, NOx	11.97	ton/yr
Emissions rate, CO	15.96	ton/yr
Emission rate, CO2	8,954.96	ton/yr
Emission rate, uncombusted methane	66.70	ton/yr

Flow calculation		
Flue Gas Flow rate at standard	9,015	scfm
Flue gas flow rate at process temp and pressure	38,605.43	acfm

PPMV Calculations		
Molecular weight of NO	46.05	lb/lb-mol
Molecular weight of CO	28.01	lb/lb-mol
Molecular weight of CO2	44.01	lb/lb-mol
Molecular weight of CH4	16.04	lb/lb-mol

ppmV of NO	42.3	ppmV
ppmV of CO	92.7	ppmV
ppmV of CO2	33,100.4	ppmV
ppmV of CH4	676.4	ppmV

Exit velocity		
Flare diameter	6	ft
Flare exhaust area	28.27	sq ft
Flare exhaust velocity	1,365.39	ft/min
Flare exhaust velocity	22.76	ft/second

Expected Flare Emission Range – (Design Flow)[1]

Operating Temperature	1600°F	1800°F
Overall Destruction Efficiency[2]	98%	99%
NOx, lb / MMBTU[3]	0.08	0.10
CO, lb / MMBTU[4]	0.20	0.15

Expected Emission Range – (Design Flow with Natural Gas)[1]

Operating Temperature	1400°F - 1800°F
Overall Destruction Efficiency[2]	98 - 99%
NOx, lb / MMBTU[3]	0.15
CO, lb / MMBTU[4]	0.20

(1) Expected emission rates at lower operating temperatures are available upon request.
(2) Typical sulphur containing compounds are expected to have greater than 98% oxidation efficiency.
(3) Excludes NOx from fixed nitrogen.
(4) Excludes CO contribution present in the gas.

NOTE: Expected emissions are based on field tests of operating units and the higher heating value (HHV) of the gas. Destruction efficiency, NOx, and CO emissions shown are valid for combustion of landfill gas only. Expected emissions are not guaranteed unless expressly stated in this proposal.

Mass Emissions (mass per time)
are calculated based on measured concentration, molecular weight and volumetric flow:

$$\frac{lb}{hr} = \left[\frac{[conc]ppmV}{1{,}000{,}000}\right] x \frac{MW}{385.4\ ft^3/lb\ mol} xVolFlowx60$$

- lb/hr is mass emissions in pounds per hour
- [conc]ppmV is measured concentration, measured in parts per million, volume
- MW is molecular weight in pounds per pound-mole (lb/lb-mol)
- VolFlow is Volumetric flow, measured in dry, standard cubic feet per minute (dscfm)
- 60 signifies 60 minutes per hour
- 385.4 is the number of cubic feet in a pound-mole of gas at standard temperature and pressure

Attachment O – Monitoring / Record keeping / Reporting / Testing Plan

Bailey Mine Gas Flaring Project – 19H-2 Location

Appendix O – Monitoring / Recordkeeping / Reporting / Testing Plans

The project will comply with the monitoring, recordkeeping, reporting and testing requirements laid out in the State of California's Assembly Bill 32, the Global Warming Solutions Act of 2006 and the California Air Resources Board's Mine Methane Capture protocol.

Monitoring Plan:

The gas flowing to the flare and the flare operation will be monitored continuously. The following parameters will be continuously measured and recorded:

Parameter	Instrument	Expected Range
Inlet gas pressure	Pressure Transmitter	0.36 psi
Inlet gas temperature	Thermocouple	50 to 80 deg F
Inlet gas flow rate	Differential pressure, orifice plate flow meter	300 to 1,000 scfm
Inlet methane concentration	Ultrasonic or infrared methane monitor	35% to 100%
Flare combustion chamber temperature	Thermocouple	1,400 to 1,800 deg F
Flare combustion chamber temperature – redundant	Thermocouple	1,400 to 1,800 deg F

All instrumentation will be calibrated at a minimum annually or more frequently if required by the manufacturers. Instrumentation will have a maximum reading error of 5%. West Virginia has extreme cold, heat, and humidity. The instruments must be sufficiently robust to operate continuously throughout the year. This will be accomplished with a weatherized cabinet.

Recordkeeping Plan:

Records from the systems operations will be stored on-site and regularly uploaded to an offsite data storage facility. This equates to approximately 250,000 data points annually.

All data will be stored electronically and will be auditable for a period of no less than 8 years.

Reporting:

As the project is voluntary, there are no reporting requirements. The project will however report emissions and project performance to the California Air Resources Board, as per the State of California's Assembly Bill 32, on an annual basis. To this end, the project performance, data, project emissions, and emission reductions will be verified by an independent third-party environmental auditor. The verification report will be made public by the California Air Resources Board.

Testing:

All instrumentation will be tested and calibrated at a minimum on an annual basis and more frequently if recommended by the manufacturer. In addition, the composition of the flare's inlet gas stream will be analyzed annually by a certified laboratory using a gas chromatograph.

Attachment P – Public Notice

AIR QUALITY PERMIT NOTICE
Notice of Application

Notice is given that ECC Windsor Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for a Waste Mine Methane Enclosed Flaring System located at the Bailey Mine gob vent borehole location on Burley Hill Road, Cameron, in Marshall County, West Virginia. The latitude and longitude coordinates are: 39.864663, -80.538571.

The proposed plant is a voluntary installation of a pollution control device aimed at reducing greenhouse gas emissions. Waste mine methane emissions from the Bailey Mine will be destroyed in a fully enclosed stack flare so that flame will not be visible. The applicant estimates the increased potential to discharge the following Regulated Air Pollutants will be: CO at less than 16.0 tons/year, CO_2 at less than 8,955.0 tons/year and NO_x at less than 12.0 tons/year.

Startup of operation is planned to begin on or about the 10th day of April, 2016. 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.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 2nd day of December, 2016.

By: ECC Windsor Inc.
Santosh Lakhan
President
3305 Decatur Avenue
Kensington, MD 20895

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ADNo: 235996 Customer Number: L30420
Customer Name: Company: ENVIRONMENTAL COMMOD
Address: 3305 DECATUR AVE ATTN: SANTOSH LAKHAN
City/St/Zip: KENSINGTON ,MD 20895
Phone: (202) 701-8286 Solicitor: LE
Category: 10 Class: 1000 Rate: L-0 Start: 12-9-2016 Stop: 12-9-2016
Lines: 73 Inches: 7.10 Words: 247

Credit Card: Expire:
Order Number:
Cost: 38.77 Extra Charges: 2.00 Adjustments: .00
Payments: .00 Discount: .00
Balance: 40.77

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Notice is given that ECC Windsor Inc. has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a Construction Permit for a Waste Mine Methane Enclosed Flaring System located at the Bailey Mine gob vent borehole location on Burley Hill Road, Cameron, in Marshall County, West Virginia. The latitude and longitude coordinates are: 39.864663, -80.538571.

The proposed plant is a voluntary installation of a pollution control device aimed at reducing greenhouse gas emissions. Waste mine methane emissions from the Bailey Mine will be destroyed in a fully enclosed stack flare so that flame will not be visible. The applicant estimates the increased potential to discharge the following Regulated Air Pollutants will be: CO at less than 16.0 tons/year, CO2 at less than 8,955.0 tons/year and NOx at less than 12.0 tons/year.

Startup of operation is planned to begin on or about the 10th day of April, 2016. 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.

Any questions regarding this permit application should be directed to the DAQ at (304) 926-0499, extension 1227, during normal business hours.

Dated this the 2nd day of December, 2016.

By: ECC Windsor Inc.
Santosh Lakhan
President
3305 Decatur Avenue

Kensington, MD 20895
Int. Dec. 9, 2016
N.R. Dec. 9, 2016

Application Fee