



June 28, 2016  
Kleinfelder Project No.: 20170072.001A

Mr. Jerry Williams  
WV Department of Environmental Protection  
Division Air Quality  
601 57<sup>th</sup> Street, SE  
Charleston, WV 25304

**SUBJECT: Antero Water LLC – Clearwater Landfill  
West Virginia Department of Environmental Protection, Division of Air  
Quality, 45CSR13 Air Permit Application**

Dear Mr. Williams,

On behalf of Antero Treatment LLC, please find attached the 45CSR13 air permit application for the proposed Clearwater Landfill located in Doddridge County, West Virginia. Clearwater Landfill is a new source under DAQ Plant ID 017-00157. Enclosed is the original hard copy application plus two copies on CDs, including the permit application form and the required attachments. Per 45CSR22, a \$2,000 application fee is also enclosed which covers the base 45CSR13 \$1,000 application fee and the \$1,000 NSPS fee for engines.

A copy of the Air Quality Permit Notice for the advertisement is included as Attachment P. As the Notice is being submitted simultaneously with the application, the official affidavit of publication will be submitted to the Division of Air Quality separately once it is completed.

Please call if you have any questions or if I can be of further assistance. I can be reached at (719) 632-3593 or by email at [msteyskal@kleinfelder.com](mailto:msteyskal@kleinfelder.com).

Sincerely,

**KLEINFELDER**

A handwritten signature in cursive script that reads "Michele Steyskal".

Michele Steyskal  
Air Quality Specialist

Enclosure: Clearwater Landfill 45CSR13 Air Permit Application

# **Antero Treatment LLC**

## **Clearwater Landfill**

**NSR Permit Application  
West Virginia Department of Environmental Protection  
Division of Air Quality  
45CSR13**

**Doddridge County, West Virginia**

**June 2016**

**Prepared by:**



**1801 California Street, Suite 1100  
Denver, CO 80202  
(303) 237-6601  
Fax (303) 237-6602  
[www.kleinfelder.com](http://www.kleinfelder.com)**

## **Table of Contents**

Attachment A.	45CSR13 Application Form
Attachment B.	Discussion of Nearby Facilities
Attachment C.	Business Certificate
Attachment D.	Area and Topographic Maps
Attachment E.	Installation and Startup Schedule
Attachment F.	Regulatory Discussion
Attachment G.	Plot Plan
Attachment H.	Process Flow Diagram
Attachment I.	Process Description
Attachment J.	Material Safety Data Sheets
Attachment K.	Emission Units Table
Attachment L.	Emission Point Data Summary Sheet
Attachment M.	Fugitive Emissions Data Summary Sheet
Attachment N.	Emissions Unit Data Sheets
Attachment O.	Supporting Emissions Calculations
Attachment P.	Monitoring, Recordkeeping, Reporting, and Testing Plans
Attachment Q.	Public Notice
Attachment R.	Authority/Delegation of Authority



WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION  
**DIVISION OF AIR QUALITY**

601 57<sup>th</sup> Street, SE  
Charleston, WV 25304  
(304) 926-0475  
[www.dep.wv.gov/daq](http://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): Antero Treatment LLC		2. Federal Employer ID No. (FEIN): 3 0 0 8 8 2 8 7 9	
3. Name of facility (if different from above): Clearwater Landfill		4. The applicant is the: <input type="checkbox"/> OWNER <input type="checkbox"/> OPERATOR <input checked="" type="checkbox"/> BOTH	
5A. Applicant's mailing address: 1615 Wynkoop Street  Denver, CO 80202		5B. Facility's present physical address: 364 Gum Run Road  Pennsboro, WV 26415	
6. <b>West Virginia Business Registration.</b> Is the applicant a resident of the State of West Virginia? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO – If YES, provide a copy of the <b>Certificate of Incorporation/Organization/Limited Partnership</b> (one page) including any name change amendments or other Business Registration Certificate as <b>Attachment A</b> . – If NO, provide a copy of the <b>Certificate of Authority/Authority of L.L.C./Registration</b> (one page) including any name change amendments or other Business Certificate as <b>Attachment A</b> .			
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 <i>proposed site</i> ? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO – If YES, please explain:    Antero Treatment LLC owns the land for the proposed site  – If NO, you are not eligible for a permit for this source.			
9. Type of plant or facility (stationary source) to be <b>constructed, modified, relocated, administratively updated</b> or <b>temporarily permitted</b> (e.g., coal preparation plant, primary crusher, etc.): Non-municipal solid waste landfill specifically to handle salt waste from the Clearwater Treatment Facility		10. North American Industry Classification System (NAICS) code for the facility:  213112	
11A. DAQ Plant ID No. (for existing facilities only): 0 1 7 – 0 0 1 5 7		11B. List all current 45CSR13 and 45CSR30 (Title V) permit numbers associated with this process (for existing facilities only):	

*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 Greenwood, WV (north of US-50), head southeast on Sunnyside Road and follow for approximately 0.3 miles. After going across US-50, turn right onto Gum Run Road (50/36). Facility access road will be off of Gum Run Road. Entrance for Clearwater Landfill will be through the Clearwater Treatment Facility.

12.B. New site address (if applicable): 364 Gum Run Road Pennsboro, WV 26415	12C. Nearest city or town: Greenwood	12D. County: Doddridge
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12.E. UTM Northing (KM): 4346.105	12F. UTM Easting (KM): 508.045	12G. UTM Zone: 17
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13. Briefly describe the proposed change(s) at the facility:  
New construction

14A. Provide the date of anticipated installation or change: 11/15/2016 – If this is an <b>After-The-Fact</b> permit application, provide the date upon which the proposed change did happen:        /        /	14B. Date of anticipated Start-Up if a permit is granted: 7/1/2017
--	---

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](http://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:

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Bulk Liquid Transfer Operations  | <input checked="" type="checkbox"/> Haul Road Emissions | <input type="checkbox"/> Quarry  |
| <input type="checkbox"/> Chemical Processes   | <input type="checkbox"/> Hot Mix Asphalt Plant          | <input type="checkbox"/> Solid Materials Sizing, Handling and Storage Facilities |
| <input type="checkbox"/> Concrete Batch Plant   | <input type="checkbox"/> Incinerator                    | <input type="checkbox"/> Storage Tanks   |
| <input type="checkbox"/> Grey Iron and Steel Foundry  | <input type="checkbox"/> Indirect Heat Exchanger        |  |
| <input checked="" type="checkbox"/> General Emission Unit, specify Storage Piles, Material Transfer Points, Engines |   |  |

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

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

- |   |   |  |
|---|---|--|
| <input type="checkbox"/> Absorption Systems | <input type="checkbox"/> Baghouse                   | <input type="checkbox"/> Flare                 |
| <input type="checkbox"/> Adsorption Systems | <input type="checkbox"/> Condenser                  | <input type="checkbox"/> Mechanical Collector  |
| <input type="checkbox"/> Afterburner        | <input type="checkbox"/> Electrostatic Precipitator | <input type="checkbox"/> 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:

- |   |   |
|---|---|
| <input checked="" type="checkbox"/> Authority of Corporation or Other Business Entity | <input type="checkbox"/> Authority of Partnership         |
| <input type="checkbox"/> Authority of Governmental Agency                             | <input type="checkbox"/> 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.

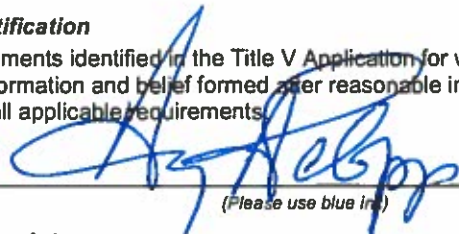
**Certification of Truth, Accuracy, and Completeness**

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 \_\_\_\_\_



(Please use blue ink)

DATE: \_\_\_\_\_

6/23/2016

(Please use blue ink)

35B. Printed name of signee:  
Al Schopp

35C. Title: Regional Senior Vice President and Chief Administrative Officer

35D. E-mail: [aschopp@anteroresources.com](mailto:aschopp@anteroresources.com)

36E. Phone: (303)357-7325

36F. FAX: 303-357-7315

36A. Printed name of contact person (if different from above): Barry Schatz

36B. Title: Senior Environmental and Regulatory Manager

36C. E-mail: [bschatz@anteroresources.com](mailto:bschatz@anteroresources.com)

36D. Phone: 303-357-7276

36E. FAX: 303-357-7315

**PLEASE CHECK ALL APPLICABLE ATTACHMENTS INCLUDED WITH THIS PERMIT APPLICATION:**

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



## **Discussion of Nearby Facilities**

**Clearwater Landfill –  
Closest Antero Resources Corporation Facilities**

1. Common Control: Only those facilities that are owned and managed by Antero were included in the aggregation discussion. This includes all facilities owned and operated by Antero Resources Corporation, Antero Midstream LLC, and Antero Treatment LLC.

2. SIC Code: The Clearwater Landfill will operate under SIC code 1389 (oil and gas field services). The closest facility owned by Antero Resources Corporation is a production facility located 1.4 miles northeast of the proposed landfill center. However, this production facility operates under the SIC code of 1311. The closest facility owned by Antero Midstream LLC is located 2.8 miles northeast of the proposed landfill center and does not operate under SIC code 1389. The closest facility owned by Antero Treatment LLC and operating under SIC code 1389 is the Antero Clearwater Facility. This facility is approximately 0.5 miles away.

3. Continuous or Adjacent: The land between the Clearwater Landfill and the Clearwater Facility is owned and managed by Antero Treatment LLC. Additionally, the Clearwater Landfill is a support facility for the Clearwater Facility.

Based on this three-pronged evaluation, the Clearwater Facility will aggregate emissions with the Clearwater Landfill.

**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*

**ANTERO TREATMENT LLC**

**Control Number: 9ABIM**

a limited liability company, organized under the laws of the State of Delaware has filed its "Application for Certificate of Authority" in my office according to the provisions of West Virginia Code §31B-10-1002. I hereby declare the organization to be registered as a foreign limited liability company from its effective date of September 17, 2015, until a certificate of cancellation is filed with our office.

Therefore, I hereby issue this

### **CERTIFICATE OF AUTHORITY OF A FOREIGN LIMITED LIABILITY COMPANY**

to the limited liability company authorizing it to transact business in West Virginia

*Given under my hand and the Great Seal of the State of West Virginia on this day of September 17, 2015*



*Natalie E. Tennant*

*Secretary of State*

FILED

SEP 09 2015

Submitted by:  
CT Corporation Rep-Terry Stamper  
Terry.Stamper@wolterskluwer.com  
304-776-1152

Natalie E. Tennant  
West Virginia Secretary of State  
1900 Kanawha Blvd. East  
Bldg. 1, Suite 157-K  
Charleston, WV 25305

IN THE OFFICE OF  
SECRETARY OF STATE



Penney Barker, Manager  
Business & Licensing Division  
Tel: (304)558-8000  
Fax: (304)558-8381  
Website: [www.wvsos.com](http://www.wvsos.com)  
E-mail: [business@wvsos.com](mailto:business@wvsos.com)

FILE ONE ORIGINAL  
(Two if you want a filed stamped  
copy returned to you.)

WEST VIRGINIA APPLICATION FOR  
CERTIFICATE OF AUTHORITY OF  
LIMITED LIABILITY COMPANY

Office Hours: Monday - Friday  
8:30 a.m. - 5:00 p.m. EST

FILING FEE: \$150

\* Fee Waived for Veteran-owned organization

Control # 9ABIM

\*\*\* The undersigned, having authority to transact business on behalf of a foreign (out-of-state) registered entity, agrees to \*\*\*  
comply with the requirements of West Virginia Code §31B-10-1002 to apply for Certificate of Authority.

1. The name of the limited liability company as registered in its home state is: Antero Treatment LLC

and the State or Country of organization is: Delaware

CHECK HERE to indicate you have obtained and submitted with this application a CERTIFICATE OF EXISTENCE (GOOD STANDING), dated during the current tax year, from your home state of original formation as required to process your application. The certificate may be obtained by contacting the Secretary of State's Office in the home state of original formation.

2. The business name to be used in West Virginia will be: [The name must contain one of the required terms such as "limited liability company" or abbreviations such as "LLC" or "PLLC." See instructions for complete list of acceptable terms and requirements for use of Trade Name.]  
 Home State name as listed in Section 1. above, if available in West Virginia (If name is not available, check DBA Name box below and follow special instructions in Section 2. attached.)  
 DBA Name \_\_\_\_\_ (See special instructions in Section 2. regarding the Letter of Resolution attached to this application. [Click here](#) to see a sample Letter of Resolution.)

3. The company will be a: [See instructions for limitations on professions which may form P.L.L.C. in WV. All members must have WV professional license. See (\*) note at the right.]  
 regular LLC  
 Professional LLC\* for the profession of: \_\_\_\_\_  
\* In most cases, a Letter of Authorization/Approval from the appropriate State Licensing Board is required to process the application. See attached instructions.

4. The address of the principal office of the company will be:  
Street: 1615 Wynkoop Street  
City: Denver State: CO Zip Code: 80202  
County: Denver  
Street: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Located in the County of (required):

The mailing address of the above location, if different, will be:

5. The address of the initial designated (physical) office of the company in West Virginia, if any, will be:  
Street: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_  
County: \_\_\_\_\_

Located in the County of:

RECEIVED  
SEP 09 2015

5. (Continued from previous page....)

The mailing address of the above location, if different, will be:

Street: \_\_\_\_\_
City: \_\_\_\_\_ State: \_\_\_\_\_ Zip Code: \_\_\_\_\_

6. Agent of Process: may be sent, if any, will be:

Name: CT Corporation System
Street: 5400 D Big Tyler Road
City: Charleston State: WV Zip Code: 25313

7. E-mail address where business correspondence may be received: jgiannaula@anteroresources.com

8. Website address of the business, if any (ex: yourdomainname.com): anteroresources.com

9. Do you own or operate more than one business in West Virginia?
a. How many businesses? b. Located in how many West Virginia counties?

10. The company is: an AT-WILL company, conducting business for an indefinite period.
a TERM company, conducting business for the term of years.

11. The company is: MEMBER-MANAGED [List the names and addresses of all members below.]
MANAGER-MANAGED [List the names and addresses of all managers below.]

List the name(s) and address(es) of the Member(s)/Manager(s) of the company (required; attach additional pages if necessary):

Table with 5 columns: Name, No. & Street Address, City, State, Zip Code. Row 1: Antero Midstream Partners LP, 1615 Wynkoop Street, Denver, CO, 80202

12. All or specified members of a limited liability company are liable in their capacity as members for all or specified debts, obligations or liabilities of the company (required):
No - All debts, obligations and liabilities are those of the company.
Yes - Those persons who are liable in their capacity as members for all debts, obligations or liability of the company have consented in writing to the adoption of the provision or to be bound by the provision.

13. The purpose(s) for which this limited liability company is formed is as follows:
[Describe the type(s) of business activity which will be conducted, for example, "real estate," "construction of residential and commercial buildings," "commercial painting," "professional practice of law" (see Section 2. for acceptable "professional" business activities). Purpose may conclude with words "...including the transaction of any or all lawful business for which corporations may be incorporated in West Virginia."]
Any lawful business or activity under the laws of this state.

14. Is the business a Scrap Metal Dealer?
Yes [If "Yes," you must complete the Scrap Metal Dealer Registration Form (Form SMD-1) and proceed to Section 15.]
No [Proceed to Section 15.]

15. Other provisions which may be set forth in the operating agreement or matters not inconsistent with law: [See instructions for further information; use extra pages if necessary.]

16. The number of pages attached and included in these Articles is: \_\_\_\_\_

17. The requested effective date is:  the date and time of filing in the Secretary of State's Office. [Requested date may not be earlier than filing nor later than 90 days after filing in our office]  the following date \_\_\_\_\_ and time \_\_\_\_\_

18. Is the organization a "veteran-owned" organization?

Effective JULY 1, 2015, to meet the requirements for a "veteran-owned" organization, the entity filing the registration must meet the following criteria per West Virginia Code §59-1-2a:

- 1. A "veteran" must be honorably discharged or under honorable conditions, and
2. A "veteran-owned business" means a business that meets one of the following criteria:
o Is at least fifty-one percent (51%) unconditionally owned by one or more veterans; or
o In the case of a publicly owned business, at least fifty-one percent (51%) of the stock is unconditionally owned by one or more veterans.

Yes (If "Yes," attach Form DD214)  CHECK BOX indicating you have attached Veteran Affairs Form DD214

No

You may obtain a copy of your Veterans Affairs Form DD214 by contacting: National Personnel Records Center, Military Personnel Records, 1 Archives Drive, St. Louis, MO 63138, Toll free: 1-86-NARA-NARA or 1-866-272-6272, Phone: 314-801-0800, www.archives.gov/veterans/military-service-records

Per WV Code 59-1-2(j) effective July 1, 2015, the registration fee is waived for entities that meet the requirements as a "veteran-owned" organization. See attached instructions to determine if the organization qualifies for this waiver. In addition, a "veteran-owned" entity will have four (4) consecutive years of Annual Report fees waived AFTER the organization's initial formation [see WV Code 59-1-2a(m)].

19. Contact and Signature Information\* (See below Important Legal Notice Regarding Signature):

a. Contact person to reach in case there is a problem with filing: Sean Roberts Phone: +1 (713) 758-3380

b. Print or type name of signer: Alvin A. Schopp Title/Capacity of signer: Chief Admin/Regional VP

c. Signature: [Handwritten Signature] Date: 8/26/2015

\*Important Legal Notice Regarding Signature: Per West Virginia Code §31B-2-209, Liability for false statement in filed record. If a record authorized or required to be filed under this chapter contains a false statement, one who suffers loss by reliance on the statement may recover damages for the loss from a person who signed the record or caused another to sign it on the person's behalf and knew the statement to be false at the time the record was signed.

Important Note: This form is a public document. Please do NOT provide any personal identifiable information on this form such as social security number, bank account numbers, credit card numbers, tax identification or driver's license numbers.

Reset Form

Print Form

# Delaware

PAGE 1

*The First State*

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "ANTERO TREATMENT LLC" IS DULY FORMED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE THIRTY-FIRST DAY OF AUGUST, A.D. 2015.


AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL TAXES HAVE NOT BEEN ASSESSED TO DATE.

5803812 8300

151238375



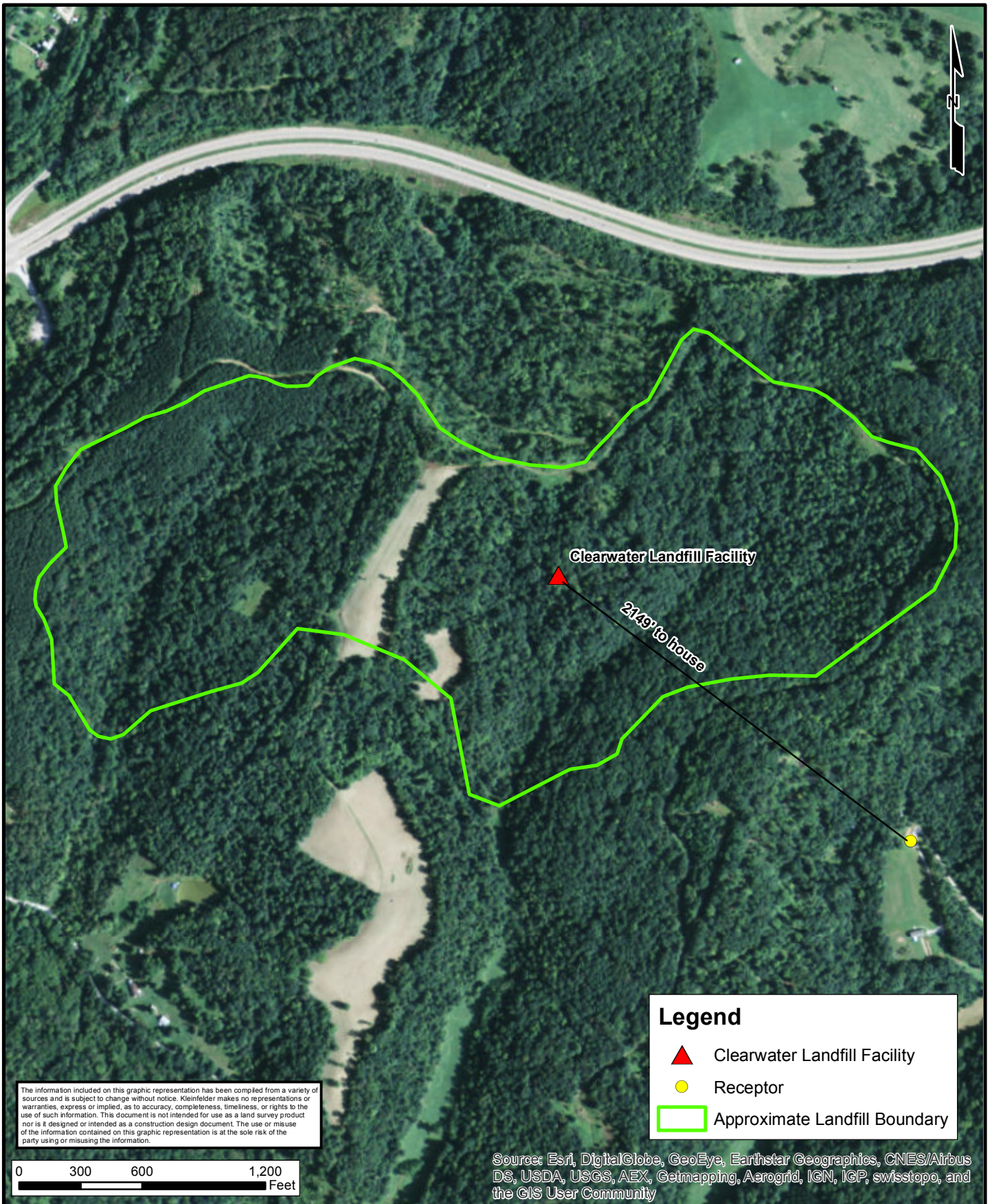
You may verify this certificate online  
at [corp.delaware.gov/authver.shtml](http://corp.delaware.gov/authver.shtml)

  
Jeffrey W. Bullock, Secretary of State  
AUTHENTICATION: 2690344

DATE: 08-31-15



**Attachment B.  
Area and Topographic Maps**



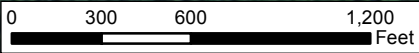
Clearwater Landfill Facility

2149' to house


**Legend**

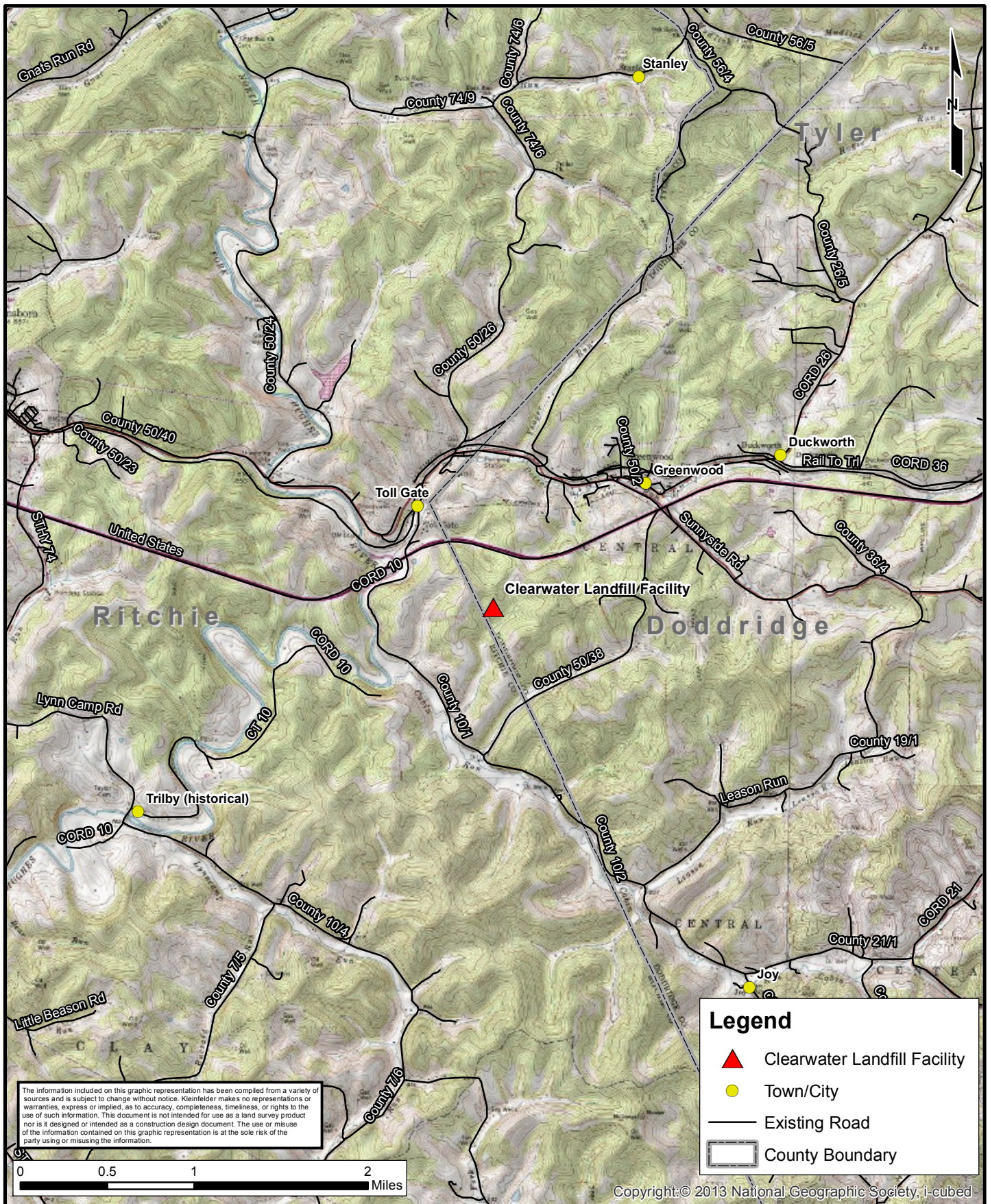
- ▲ Clearwater Landfill Facility
- Receptor
- Approximate Landfill Boundary

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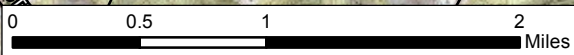


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

 <p><b>KLEINFELDER</b> Bright People. Right Solutions. www.kleinfelder.com</p>	PROJECT NO. 20170072	<b>Antero Treatment LLC</b>	Clearwater Landfill Facility Doddridge County, West Virginia	FIGURE
	DRAWN: 6/3/2016			
	DRAWN BY: A.Leonard			
	CHECKED BY: K.Meszaros			
FILE NAME: ClearwaterLandfill_Receptor.mxd				




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**Legend**

- ▲ Clearwater Landfill Facility
- Town/City
- Existing Road
- - - County Boundary

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	DRAWN: 6/3/2016			
	DRAWN BY: A.Leonard			
	CHECKED BY: K.Meszaros			
	FILE NAME: ClearwaterLandfill_Topo.mxd			

**Attachment C.  
Installation and Startup Schedule**

## **Clearwater Landfill – Installation and Startup Schedule**

The Clearwater Landfill will be a new facility located in Doddridge County, WV, approximately 1 mile southeast of Greenwood, WV. Ground clearing and other site preparation activities are anticipated to occur starting in November 15, 2016. Facility operations (first placement of waste) are scheduled to begin on or around July 2017.

**Attachment D.  
Regulatory Discussion**

## **Clearwater Landfill – Regulatory Discussion Federal Regulations**

### ***40 CFR Part 60 – Standards of Performance for New Stationary Sources***

- I. Subpart Cc – Emission Guidelines and Compliance Times for Municipal Solid Waste Landfills

Applicability: The Clearwater Landfill is not a municipal solid waste landfill per the definition in §60.31c. No gas will be entering or released from the facility since the facility will only handle soil and salts. Because the facility is not a municipal solid waste landfill, Subpart Cc does not apply.

- II. Subpart WWW – Standards of Performance for Municipal Solid Waste Landfills

Applicability: The Clearwater Landfill is not a municipal solid waste landfill per the definition in §60.751. No gas will be entering or released from the facility since the facility will only handle soil and salts. Because the facility is not a municipal solid waste landfill, Subpart WWW does not apply.

- III. Subpart IIII - Standards of Performance for Compression Ignition Internal Combustion Engines

Applicability: Subpart IIII applies to compression ignition engines that commence construction after July 11, 2005 and are manufactured after April 1, 2006 and are not fire pump engines (§60.4200(a)(2)(i)). Thus, Subpart IIII applies to the Clearwater Landfill since the backup generator engine and the light plant engines will be installed after July 2005 and manufactured after April 2006.

### ***40 CFR Part 61 – National Emission Standards for Hazardous Air Pollutants***

The majority of emissions from the Clearwater Landfill are particulate matter emissions from material handling, storage piles, and haul road truck traffic with only minimal amounts of pollutants regulated under §61.01(a) and (b). There are no stationary sources planned for the facility that are regulated under this Part. Therefore, no Subparts under 40 CFR Part 61 will apply to the Clearwater Landfill.

### ***40 CFR Part 63 – National Emission Standards for Hazardous Air Pollutants for Source Categories***

- I. Subpart AAAA – National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills

Applicability: Because the Clearwater Landfill is not a municipal solid waste landfill, Subpart AAAA will not apply as per §63.1935, only municipal solid waste landfills are applicable.

- II. Subpart ZZZZ - National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

Applicability: Subpart ZZZZ applies to stationary RICE at a major or area source of HAP emissions (§63.6585). Subpart ZZZZ applies to the Clearwater Landfill as the generator engine and the light plant engines are new RICE. These engines will meet Subpart ZZZZ by meeting 40 CFR Part 60, Subpart IIII as the Clearwater Landfill is an area source of HAP emissions (§63.6590(c)(1)).

## **West Virginia State Regulations**

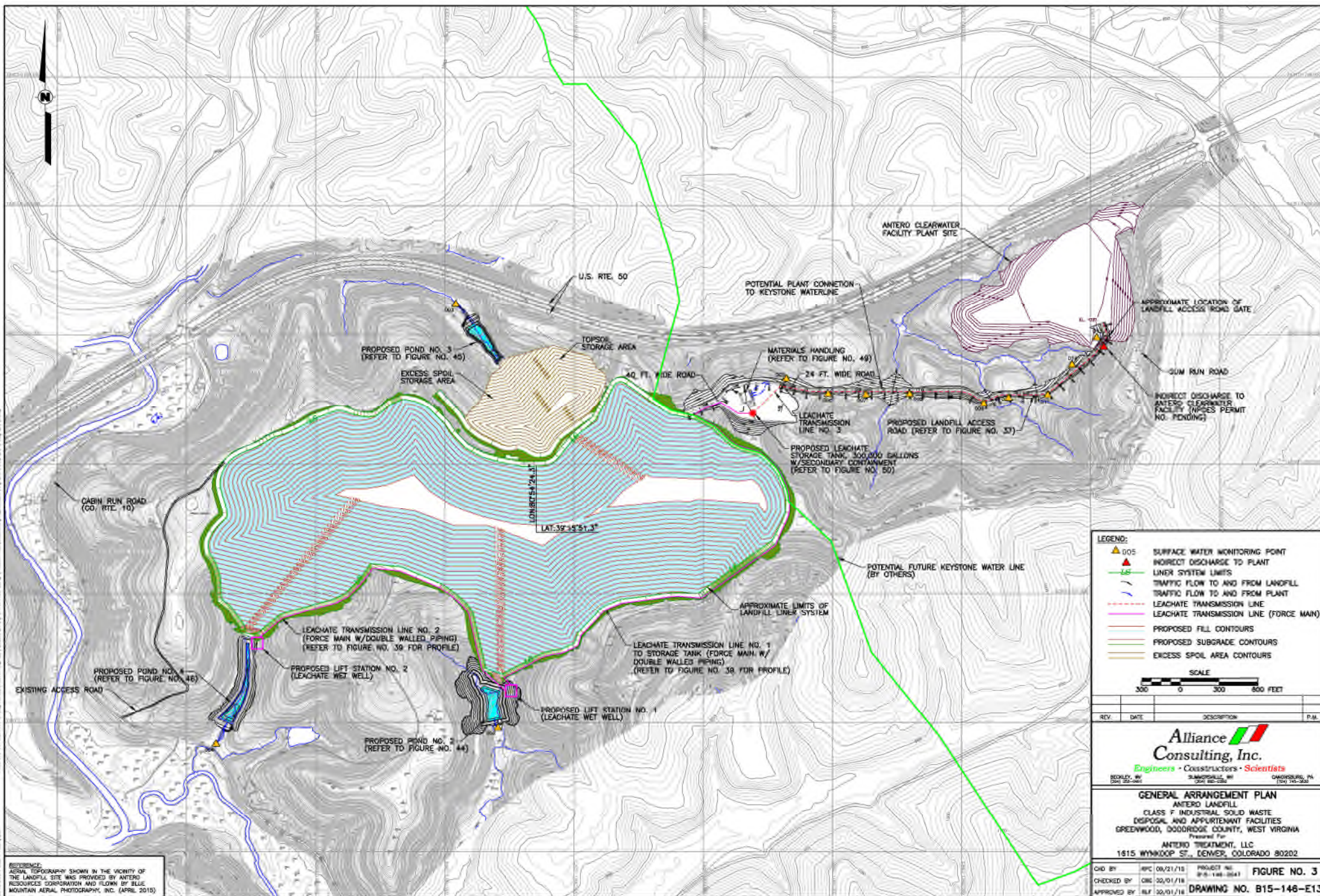
### ***Title 45 Legislative Rule – Division of Environmental Protection, Office of Air Quality***

The following Title 45 Legislative Rules will be applicable to the Clearwater Landfill:

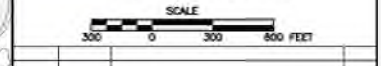
- I. *45CSR2A – Testing, Monitoring, Recordkeeping and Reporting Requirements Under 45CSR2*
- II. *45CSR4 – To Prevent and Control the Discharge of Air Pollutants into the Open Air Which Causes or Contributes to an Objectionable Odor or Odors*
- III. *45CSR8 – Ambient Air Quality Standards*
- IV. *45CSR11 – Prevention of Air Pollution Emergency Episodes*
- V. *45CSR13 – Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Administrative Updates, Temporary Permits, General Permits, and Procedures for Evaluation*
- VI. *45CSR16 – Standards of Performance for New Stationary Sources Pursuant to 40 CFR Part 60*
- VII. *45CSR22 – Air Quality Management Fee Program*
- VIII. *45CSR38 – Provisions for Determination of Compliance with Air Quality Management Rules*



**Attachment E.  
Plot Plan**



- LEGEND:**
- ▲ 005 SURFACE WATER MONITORING POINT
  - ▲ INDIRECT DISCHARGE TO PLANT
  - LINER SYSTEM LIMITS
  - TRAFFIC FLOW TO AND FROM LANDFILL
  - TRAFFIC FLOW TO AND FROM PLANT
  - LEACHATE TRANSMISSION LINE
  - LEACHATE TRANSMISSION LINE (FORCE MAIN)
  - PROPOSED FILL CONTOURS
  - PROPOSED SUBGRADE CONTOURS
  - EXCESS SPOIL AREA CONTOURS



REV.	DATE	DESCRIPTION	P.A.L.

**Alliance Consulting, Inc.**  
*Engineers • Constructors • Scientists*

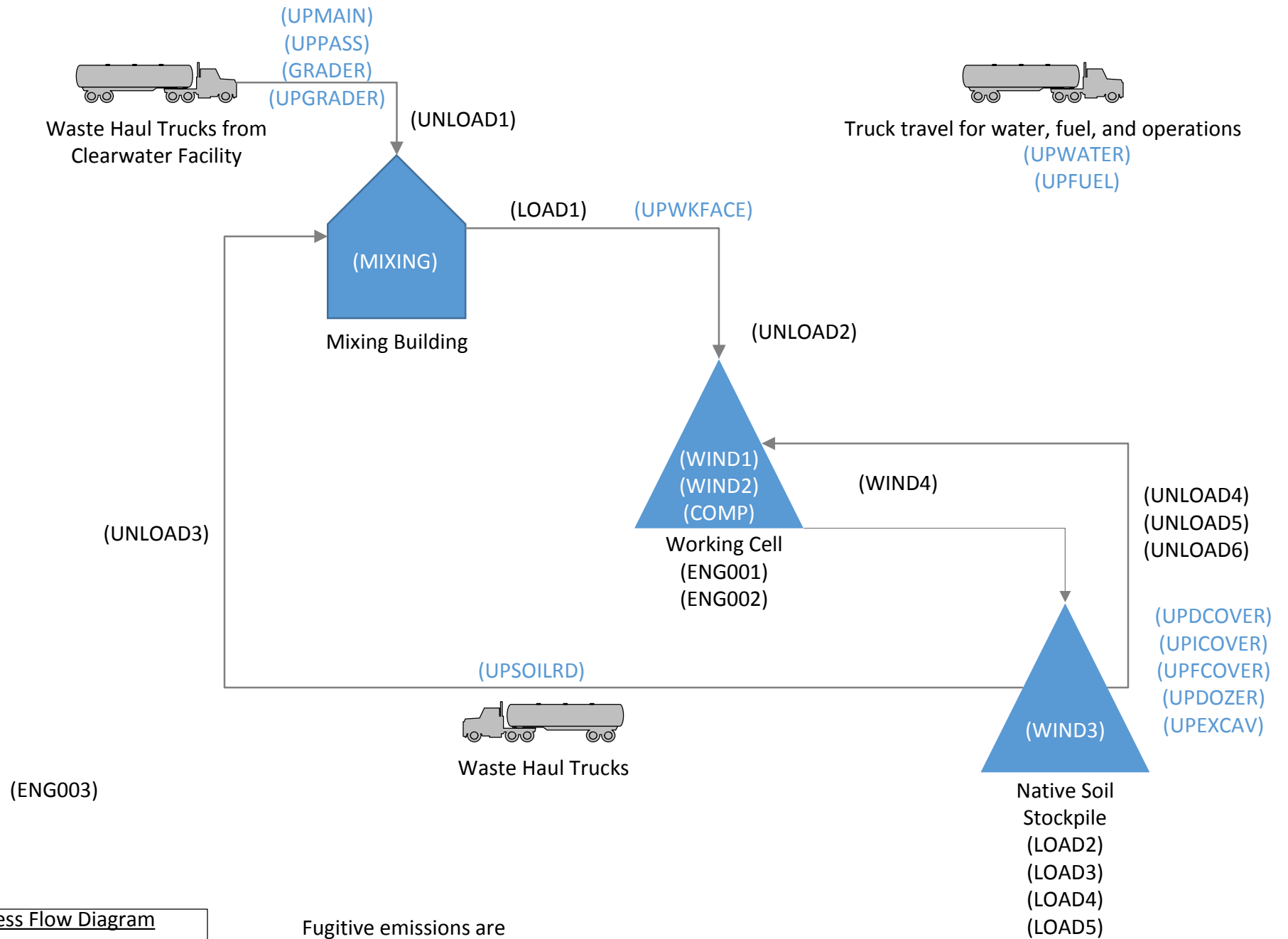
REDOYLE, WY 307 262-4671     
 SUMMITVILLE, WY 307 462-2284     
 DOWNSBURG, PA 717 742-2622

**GENERAL ARRANGEMENT PLAN**  
 ANTERO LANDFILL  
 CLASS F INDUSTRIAL SOLID WASTE  
 DISPOSAL AND APPURTENANT FACILITIES  
 GREENWOOD, DODDOROUGH COUNTY, WEST VIRGINIA  
 Prepared For  
 ANTERO TREATMENT, LLC  
 1815 WYNDHOOP ST., DENVER, COLORADO 80202

CWD BY: MPC 08/21/15      PROJECT NO: 8-8-146-2647      **FIGURE NO. 3**  
 CHECKED BY: OMS 10/01/15  
 APPROVED BY: RLF 10/01/15      **DRAWING NO. B15-146-E13**

**REFERENCE:**  
 AERIAL TOPOGRAPHY SHOWN IN THE VICINITY OF THE LANDFILL SITE WAS PROVIDED BY ANTERO RESOURCES CORPORATION AND FLOWN BY BLUE MOUNTAIN AERIAL PHOTOGRAPHY, INC. (APRIL 2015)

**Attachment F.  
Process Flow Diagram**



Process Flow Diagram  
 Antero Treatment LLC  
 Clearwater Landfill  
 Doddridge County, WV

Fugitive emissions are  
 in blue and non-  
 fugitive in black or  
 white

**Attachment G.  
Process Description**

## Process Description – Clearwater Landfill

Salt waste from the Clearwater Facility is hauled by haul trucks to the Clearwater Landfill (the Landfill) (UPMAIN). At the Landfill, the salt waste is unloaded (UNLOAD1) into the mixing building where it can be stored, mixed with native soil, and/or moved to the working cell. Soil will be unloaded (UNLOAD3) in the mixing building from the landfill stockpiles. The salt waste will consist of either sodium chloride (NaCl) or calcium chloride (CaCl), with the CaCl portion mixed with native soil prior to placing the waste in the working cell due to its high moisture content (MIXING). Although the mixing building plans to operate 24 hours per day and 365 days per year, the salt waste may be stored in the mixing building during periods of inclement weather because the salt waste (NaCl and CaCl) has a high affinity for moisture and needs to stay dry as possible as it already has a high moisture content itself. Salt waste (salt or salt mixed with soil) is loaded from the mixing building into trucks (LOAD1) and taken to the working cell by haul trucks (UPWKFACE). The emissions from material handling within the material building are controlled by 70% due to the building being a full enclosure. Any material handling that contains salt or a mix of salt and soil will not be watered for control due to the salt's affinity for moisture. The unpaved road from the Clearwater Facility to the Landfill will be watered for dust control. The unpaved road may be graded at times for maintenance (GRADER). The other temporary unpaved roads from the mixing building to the working cell and around the working areas will be watered up to the point that they enter the actual active working cell. It is estimated that two-thirds of the length of the temporary unpaved roads will be watered for dust control. Although some of the material handling will be mostly salt, all of the material handling emissions were calculated with the lower moisture content of soil so as to be conservative as some of the salt is mixed with soil.

Once the salt waste reaches the working cell, it is unloaded (UNLOAD2) where it is then spread and/or compacted in the daily cell by a dozer (COMP). Wind erosion of the active working cell will occur as well as inactive areas that are waiting for waste or to be seeded (WIND1 and WIND2). Weather permitting, geosynthetic rain covers, called Reinforced Landfill Covers (RLC), may be used in daily cover operations rather than daily cover soil. Additionally, during the nine non-winter months of the year, other areas that are exposed will be covered with a RLC so as to not create emissions from wind erosion. During the three winter months, the exposed acreage cannot be covered with the RLC due to the potential for snow cover. Although the snow cover will act as dust suppressant, it is not likely a continual cover; thus, for three months of the year there is additional exposed acreage that can create wind erosion emissions (WIND4). The working cells will be covered with the daily, intermediate, and final covers (UNLOAD4, UNLOAD5, UNLOAD6) as needed and then seeded as quickly as possible. The working cell will operate 12 hours per day and 365 days per year. For times of the year when there are less than 12 hours of daylight, portable light plants will be used that are powered by diesel engines (ENG001 and ENG002). None of the activities that occur at the active working cell will be watered for dust control due to the salt.

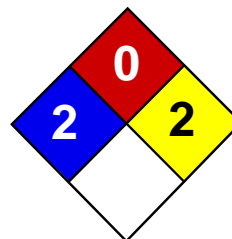
Native soil stockpiles or other active areas will be used as sources of native soil to be moved to the mixing building or working cell for cover soils. Soil may be loaded at the native soil areas to be moved (UPSOILRD) to the mixing building (LOAD2), or soil may be loaded for daily cover (LOAD3), intermediate cover (LOAD4), or final cover (LOAD5) and moved to the working cell (UPDCOVER, UPICOVER, UPFCOVER). Wind erosion of the native soil stockpiles will occur (WIND3). The native soil areas will not be watered because the soil used for mixing or cover cannot be wet when mixed or covering the salt.

Additional emissions from passenger vehicles, water trucks, and fuel trucks on the unpaved roads will occur. Travel from dozers and excavators or loaders will also create particulate matter emissions.

Lastly, a backup diesel generator will be located on site for use only when the grid power goes down to temporarily power the leachate tank pump. The generator will only be used to properly shut down operations and will not remain on until the grid power comes back on.

**Attachment H.**  
**Material Safety Data Sheets**





Health	2
Fire	0
Reactivity	1
Personal Protection	C

## Material Safety Data Sheet

### Calcium chloride, Anhydrous MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Calcium chloride, Anhydrous

**Catalog Codes:** SLC5011, SLC2221, SLC4012, SLC4798, SLC1006

**CAS#:** 10043-52-4

**RTECS:** EV9800000

**TSCA:** TSCA 8(b) inventory: Calcium chloride, Anhydrous

**CI#:** Not available.

**Synonym:**

**Chemical Name:** Calcium Chloride, Anhydrous

**Chemical Formula:** CaCl<sub>2</sub>

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Calcium chloride, Anhydrous	10043-52-4	100

**Toxicological Data on Ingredients:** Calcium chloride, Anhydrous: ORAL (LD50): Acute: 1000 mg/kg [Rat]. 1940 mg/kg [Mouse].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:**

Hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. The substance may be toxic to heart, cardiovascular system. Repeated or prolonged exposure to the substance can produce target organs damage.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water. Cover the irritated skin with an emollient. Remove contaminated clothing and shoes. Cold water may be used. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention.

**Serious Skin Contact:**

Wash with a disinfectant soap and cover the contaminated skin with an anti-bacterial cream. Seek immediate medical attention.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

**Serious Inhalation:** Not available.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. If large quantities of this material are swallowed, call a physician immediately. Loosen tight clothing such as a collar, tie, belt or waistband.

**Serious Ingestion:** Not available.

### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** Not available.

**Special Remarks on Explosion Hazards:** Furan-2-peroxycarboxylic acid + calcium chloride causes explosion at room temperature.

### Section 6: Accidental Release Measures

**Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

### Section 7: Handling and Storage

**Precautions:**

Keep locked up.. Do not ingest. Do not breathe dust. Wear suitable protective clothing. In case of insufficient ventilation, wear suitable respiratory equipment. If ingested, seek medical advice immediately and show the container or the label. Avoid contact with skin and eyes. Keep away from incompatibles such as moisture.

**Storage:**

Hygroscopic. Keep container tightly closed. Keep container in a cool, well-ventilated area. Do not store above 30°C (86°F).

## Section 8: Exposure Controls/Personal Protection

**Engineering Controls:**

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

**Personal Protection:** Safety glasses. Synthetic apron. Gloves (impervious).

**Personal Protection in Case of a Large Spill:**

Splash goggles. Full suit. Boots. Gloves. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:** Not available.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid. (Crystalline solid.)

**Odor:** Odorless.

**Taste:** Saline.

**Molecular Weight:** 110.99 g/mole

**Color:** Colorless. White. Off-white.

**pH (1% soln/water):** 9 [Basic.]

**Boiling Point:** 1670°C (3038°F)

**Melting Point:** 772°C (1421.6°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 2.15 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water, acetone.

**Solubility:**

Easily soluble in cold water, hot water, acetone. Freely soluble in alcohol. Soluble in Acetic Acid.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.

**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials, moisture.

**Incompatibility with various substances:** Reactive with moisture.

**Corrosivity:** Non-corrosive in presence of glass.

**Special Remarks on Reactivity:**

Hygroscopic. Reacts violently (violent boiling) with water, generating heat. Forms flammable gases and evolves hydrogen when reacted with zinc. Solutions attack some metals. Generates heat and violent polymerization occurs when mixed with methyl vinyl ether. Bromine trifluoride reacts violently with and attacks calcium chloride.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Absorbed through skin. Inhalation. Ingestion.

**Toxicity to Animals:** Acute oral toxicity (LD50): 1000 mg/kg [Rat].

**Chronic Effects on Humans:**

MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. May cause damage to the following organs: heart, cardiovascular system.

**Other Toxic Effects on Humans:**

Hazardous in case of skin contact (irritant), of ingestion, of inhalation. Slightly hazardous in case of skin contact (permeator).

**Special Remarks on Toxicity to Animals:**

Lowest Published Lethal Dose: LDL [Rabbit] - Route: Oral; Dose: 1384 mg/kg

**Special Remarks on Chronic Effects on Humans:**

May affect genetic material based on animal data. May cause cancer (tumorigenic) based on animal data.

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: May cause severe irritation and possible burns, especially if skin is wet. Contact with dry skin causes mild irritation. Contact of solid with moist/wet skin or skin contact with strong solutions may cause marked irritation or possible burns. Eyes: May cause severe irritation, possible transient corneal injury, and possible eye burns. Inhalation: May cause severe irritation of the upper respiratory tract with pain, inflammation and possible burns. Ingestion: May cause severe gastrointestinal (digestive) tract irritation with nausea, vomiting and possible burns. May affect cardiovascular system (cardiac disturbances, slow heart beat), behavior (seizures), metabolism, blood, and brain, respiration (rapid respiration). Chronic Potential Health Effects: effects may be delayed.

## Section 12: Ecological Information

**Ecotoxicity:** Ecotoxicity in water (LC50): 100 mg/l 96 hours [Fish].

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The products of degradation are less toxic than the product itself.

**Special Remarks on the Products of Biodegradation:** Not available.

## Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

**Section 14: Transport Information**

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

**Section 15: Other Regulatory Information**

**Federal and State Regulations:** TSCA 8(b) inventory: Calcium chloride, Anhydrous

**Other Regulations:** EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):** CLASS D-2B: Material causing other toxic effects (TOXIC).

**DSCL (EEC):**

R36- Irritating to eyes. S2- Keep out of the reach of children. S22- Do not breathe dust. S24- Avoid contact with skin.

**HMIS (U.S.A.):**

**Health Hazard:** 2

**Fire Hazard:** 0

**Reactivity:** 1

**Personal Protection:** C

**National Fire Protection Association (U.S.A.):**

**Health:** 2

**Flammability:** 0

**Reactivity:** 2

**Specific hazard:**

**Protective Equipment:**

Gloves (impervious). Synthetic apron. Wear appropriate respirator when ventilation is inadequate. Safety glasses.

**Section 16: Other Information**

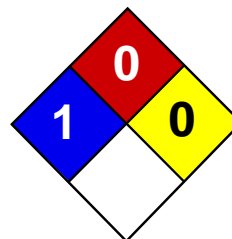
**References:** Not available.

**Other Special Considerations:** Not available.

**Created:** 10/09/2005 04:31 PM

**Last Updated:** 05/21/2013 12:00 PM

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Health	1
Fire	0
Reactivity	0
Personal Protection	E

## Material Safety Data Sheet

### Sodium chloride MSDS

#### Section 1: Chemical Product and Company Identification

**Product Name:** Sodium chloride

**Catalog Codes:** SLS3262, SLS1045, SLS3889, SLS1669, SLS3091

**CAS#:** 7647-14-5

**RTECS:** VZ4725000

**TSCA:** TSCA 8(b) inventory: Sodium chloride

**CI#:** Not applicable.

**Synonym:** Salt; Sea Salt

**Chemical Name:** Sodium chloride

**Chemical Formula:** NaCl

**Contact Information:**

**Sciencelab.com, Inc.**

14025 Smith Rd.

Houston, Texas 77396

US Sales: **1-800-901-7247**

International Sales: **1-281-441-4400**

Order Online: [ScienceLab.com](http://ScienceLab.com)

**CHEMTREC (24HR Emergency Telephone), call:**

1-800-424-9300

**International CHEMTREC, call:** 1-703-527-3887

**For non-emergency assistance, call:** 1-281-441-4400

#### Section 2: Composition and Information on Ingredients

**Composition:**

Name	CAS #	% by Weight
Sodium chloride	7647-14-5	100

**Toxicological Data on Ingredients:** Sodium chloride: ORAL (LD50): Acute: 3000 mg/kg [Rat.]. 4000 mg/kg [Mouse]. DERMAL (LD50): Acute: >10000 mg/kg [Rabbit]. DUST (LC50): Acute: >42000 mg/m 1 hours [Rat].

#### Section 3: Hazards Identification

**Potential Acute Health Effects:** Slightly hazardous in case of skin contact (irritant), of eye contact (irritant), of ingestion, of inhalation.

**Potential Chronic Health Effects:**

CARCINOGENIC EFFECTS: Not available. MUTAGENIC EFFECTS: Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast. TERATOGENIC EFFECTS: Not available. DEVELOPMENTAL TOXICITY: Not available. Repeated or prolonged exposure is not known to aggravate medical condition.

#### Section 4: First Aid Measures

**Eye Contact:**

Check for and remove any contact lenses. In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Cold water may be used. Get medical attention.

**Skin Contact:**

Wash with soap and water. Cover the irritated skin with an emollient. Get medical attention if irritation develops. Cold water may be used.

**Serious Skin Contact:** Not available.

**Inhalation:**

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if symptoms appear.

**Serious Inhalation:** Not available.

**Ingestion:**

Do NOT induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention if symptoms appear.

**Serious Ingestion:** Not available.

### Section 5: Fire and Explosion Data

**Flammability of the Product:** Non-flammable.

**Auto-Ignition Temperature:** Not applicable.

**Flash Points:** Not applicable.

**Flammable Limits:** Not applicable.

**Products of Combustion:** Not available.

**Fire Hazards in Presence of Various Substances:** Not applicable.

**Explosion Hazards in Presence of Various Substances:**

Risks of explosion of the product in presence of mechanical impact: Not available. Risks of explosion of the product in presence of static discharge: Not available.

**Fire Fighting Media and Instructions:** Not applicable.

**Special Remarks on Fire Hazards:** When heated to decomposition it emits toxic fumes.

**Special Remarks on Explosion Hazards:**

Electrolysis of sodium chloride in presence of nitrogenous compounds to produce chlorine may lead to formation of explosive nitrogen trichloride. Potentially explosive reaction with dichloromaleic anhydride + urea.

### Section 6: Accidental Release Measures

**Small Spill:**

Use appropriate tools to put the spilled solid in a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and dispose of according to local and regional authority requirements.

**Large Spill:**

Use a shovel to put the material into a convenient waste disposal container. Finish cleaning by spreading water on the contaminated surface and allow to evacuate through the sanitary system.

### Section 7: Handling and Storage

**Precautions:**

Keep locked up.. Do not ingest. Do not breathe dust. Avoid contact with eyes. Wear suitable protective clothing. If ingested, seek medical advice immediately and show the container or the label. Keep away from incompatibles such as oxidizing agents, acids.

**Storage:** Keep container tightly closed. Keep container in a cool, well-ventilated area. Hygroscopic

## Section 8: Exposure Controls/Personal Protection

### Engineering Controls:

Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, fume or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

### Personal Protection:

Splash goggles. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Gloves.

### Personal Protection in Case of a Large Spill:

Splash goggles. Full suit. Dust respirator. Boots. Gloves. A self contained breathing apparatus should be used to avoid inhalation of the product. Suggested protective clothing might not be sufficient; consult a specialist BEFORE handling this product.

**Exposure Limits:** Not available.

## Section 9: Physical and Chemical Properties

**Physical state and appearance:** Solid. (Solid crystalline powder.)

**Odor:** Slight.

**Taste:** Saline.

**Molecular Weight:** 58.44 g/mole

**Color:** White.

**pH (1% soln/water):** 7 [Neutral.]

**Boiling Point:** 1413°C (2575.4°F)

**Melting Point:** 801°C (1473.8°F)

**Critical Temperature:** Not available.

**Specific Gravity:** 2.165 (Water = 1)

**Vapor Pressure:** Not applicable.

**Vapor Density:** Not available.

**Volatility:** Not available.

**Odor Threshold:** Not available.

**Water/Oil Dist. Coeff.:** Not available.

**Ionicity (in Water):** Not available.

**Dispersion Properties:** See solubility in water.

### Solubility:

Easily soluble in cold water, hot water. Soluble in glycerol, and ammonia. Very slightly soluble in alcohol. Insoluble in Hydrochloric Acid.

## Section 10: Stability and Reactivity Data

**Stability:** The product is stable.



**Instability Temperature:** Not available.

**Conditions of Instability:** Incompatible materials, high temperatures.

**Incompatibility with various substances:** Reactive with oxidizing agents, metals, acids.

**Corrosivity:** Not considered to be corrosive for metals and glass.

**Special Remarks on Reactivity:**

Hygroscopic. Reacts with most nonnoble metals such as iron or steel, building materials (such as cement) Sodium chloride is rapidly attacked by bromine trifluoride. Violent reaction with lithium.

**Special Remarks on Corrosivity:** Not available.

**Polymerization:** Will not occur.

## Section 11: Toxicological Information

**Routes of Entry:** Inhalation. Ingestion.

**Toxicity to Animals:**

WARNING: THE LC50 VALUES HEREUNDER ARE ESTIMATED ON THE BASIS OF A 4-HOUR EXPOSURE. Acute oral toxicity (LD50): 3000 mg/kg [Rat.]. Acute dermal toxicity (LD50): >10000 mg/kg [Rabbit]. Acute toxicity of the dust (LC50): >42000 mg/m<sup>3</sup> 1 hours [Rat].

**Chronic Effects on Humans: MUTAGENIC EFFECTS:** Mutagenic for mammalian somatic cells. Mutagenic for bacteria and/or yeast.

**Other Toxic Effects on Humans:** Slightly hazardous in case of skin contact (irritant), of ingestion, of inhalation.

**Special Remarks on Toxicity to Animals:** Lowest Published Lethal Dose (LDL) [Man] - Route: Oral; Dose: 1000 mg/kg

**Special Remarks on Chronic Effects on Humans:**

Causes adverse reproductive effects in humans (fetotoxicity, abortion, ) by intraplacental route. High intake of sodium chloride, whether from occupational exposure or in the diet, may increase risk of TOXEMIA OF PREGNANCY in susceptible women (Bishop, 1978). Hypertonic sodium chloride solutions have been used to induce abortion in late pregnancy by direct infusion into the uterus (Brown et al, 1972), but this route of administration is not relevant to occupational exposures. May cause adverse reproductive effects and birth defects in animals, particularly rats and mice (fetotoxicity, abortion, musculoskeletal abnormalities, and maternal effects (effects on ovaries, fallopian tubes) by oral, intraperitoneal, intraplacental, intrauterine, parenteral, and subcutaneous routes. While sodium chloride has been used as a negative control in some reproductive studies, it has also been used as an example that almost any chemical can cause birth defects in experimental animals if studied under the right conditions (Nishimura & Miyamoto, 1969). In experimental animals, sodium chloride has caused delayed effects on newborns, has been fetotoxic, and has caused birth defects and abortions in rats and mice (RTECS, 1997). May affect genetic material (mutagenic)

**Special Remarks on other Toxic Effects on Humans:**

Acute Potential Health Effects: Skin: May cause skin irritation. Eyes: Causes eye irritation. Ingestion: Ingestion of large quantities can irritate the stomach (as in overuse of salt tablets) with nausea and vomiting. May affect behavior (muscle spasticity/contraction, somnolence), sense organs, metabolism, and cardiovascular system. Continued exposure may produce dehydration, internal organ congestion, and coma. Inhalation: Material is irritating to mucous membranes and upper respiratory tract.

## Section 12: Ecological Information

**Ecotoxicity:** Not available.

**BOD5 and COD:** Not available.

**Products of Biodegradation:**

Possibly hazardous short term degradation products are not likely. However, long term degradation products may arise.

**Toxicity of the Products of Biodegradation:** The product itself and its products of degradation are not toxic.

**Special Remarks on the Products of Biodegradation:** Not available.

### Section 13: Disposal Considerations

**Waste Disposal:**

Waste must be disposed of in accordance with federal, state and local environmental control regulations.

### Section 14: Transport Information

**DOT Classification:** Not a DOT controlled material (United States).

**Identification:** Not applicable.

**Special Provisions for Transport:** Not applicable.

### Section 15: Other Regulatory Information

**Federal and State Regulations:** TSCA 8(b) inventory: Sodium chloride

**Other Regulations:** EINECS: This product is on the European Inventory of Existing Commercial Chemical Substances.

**Other Classifications:**

**WHMIS (Canada):** Not controlled under WHMIS (Canada).

**DSCL (EEC):**

R40- Possible risks of irreversible effects. S24/25- Avoid contact with skin and eyes.

**HMIS (U.S.A.):**

**Health Hazard:** 1

**Fire Hazard:** 0

**Reactivity:** 0

**Personal Protection:** E

**National Fire Protection Association (U.S.A.):**

**Health:** 1

**Flammability:** 0

**Reactivity:** 0

**Specific hazard:**

**Protective Equipment:**

Gloves. Lab coat. Dust respirator. Be sure to use an approved/certified respirator or equivalent. Splash goggles.

### Section 16: Other Information

**References:**

-Hawley, G.G.. The Condensed Chemical Dictionary, 11e ed., New York N.Y., Van Nostrand Reinold, 1987. -SAX, N.I. Dangerous Properties of Industrial Materials. Toronto, Van Nostrand Reinold, 6e ed. 1984. -The Sigma-Aldrich Library of Chemical Safety Data, Edition II.

**Other Special Considerations:** Not available.

**Created:** 10/11/2005 12:33 PM

**Last Updated:** 05/21/2013 12:00 PM

*The information above is believed to be accurate and represents the best information currently available to us. However, we make no warranty of merchantability or any other warranty, express or implied, with respect to such information, and we assume no liability resulting from its use. Users should make their own investigations to determine the suitability of the information for their particular purposes. In no event shall ScienceLab.com be liable for any claims, losses, or damages of any third party or for lost profits or any special, indirect, incidental, consequential or exemplary damages, howsoever arising, even if ScienceLab.com has been advised of the possibility of such damages.*

**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 <sup>1</sup>	Emission Point ID <sup>2</sup>	Emission Unit Description	Year Installed/ Modified	Design Capacity	Type <sup>3</sup> and Date of Change	Control Device <sup>4</sup>
UNLOAD1	1E	Salt Waste Unloading in Mixing Bld	2016	2100 tpd	New	None
LOAD1	2E	Waste Loading at Mixing Building	2016	2415 tpd	New	None
UNLOAD2	3E	Waste Unloading at Working Cell	2016	2415 tpd	New	None
LOAD2	4E	Soil Loading at Native Stock Piles	2016	315 tpd	New	None
UNLOAD3	5E	Soil Unloading at Mixing Building	2016	315 tpd	New	None
LOAD3	6E	Daily Soil Cover Loading at Stock Piles	2016	315 tpd	New	None
UNLOAD4	7E	Daily Soil Cover Unloading at Working Cell	2016	315 tpd	New	None
LOAD4	8E	Intermediate Soil Cover Loading at Stock Piles	2016	630 tpd	New	None
UNLOAD5	9E	Intermediate Soil Cover Unloading at Working Cell	2016	630 tpd	New	None
LOAD5	10E	Final Soil Cover Loading at Stock Piles	2016	630 tpd	New	None
UNLOAD6	11E	Final Soil Cover Unloading at Working Cell	2016	630 tpd	New	None
WIND1	12E	Daily Active Wind Erosion	2016	0.23 acres	New	None
WIND2	13E	Daily Inactive Wind Erosion	2016	1 acre	New	None
WIND3	14E	Stockpile Wind Erosion	2016	2 acres	New	None
WIND4	15E	Winter Wind Erosion	2016	8 acres	New	None
COMP	16E	Cover Soil Compaction	2016	NA	New	None
MIXING	17E	Mixing Salt and Soil	2016	2415 tpd	New	None
ENG001	18E	Light Plant Engine 1	2016	12.2 hp	New	None
ENG002	19E	Light Plant Engine 2	2016	12.2 hp	New	None
ENG003	20E	Backup Generator	2016	85 hp	New	None

<sup>1</sup> For Emission Units (or Sources) use the following numbering system: 1S, 2S, 3S,... or other appropriate designation.

<sup>2</sup> For Emission Points use the following numbering system: 1E, 2E, 3E, ... or other appropriate designation.

<sup>3</sup> New, modification, removal

<sup>4</sup> For Control Devices use the following numbering system: 1C, 2C, 3C,... or other appropriate designation.

**Attachment J.**  
**Emission Point 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 <sup>1</sup>	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 <sup>3</sup>  (Speciate VOCs & HAPS)	Maximum Potential Uncontrolled Emissions <sup>4</sup>		Maximum Potential Controlled Emissions <sup>5</sup>		Emission Form or Phase  (At exit conditions, Solid, Liquid or Gas/Vapor)	Est. Method Used <sup>6</sup>
		ID No.	Source	ID No.	Device Type	Short Term <sup>2</sup>	Max (hr/yr)		lb/hr	ton/yr	lb/hr	ton/yr		
1E	Material handling	UNLOAD1	Unload salt in mix blg		Fully enclosed blg	C	8760	PM PM10 PM2.5	0.026 0.012 0.0019	0.11 0.054 0.008	0.0078 0.0037 0.0006	0.034 0.016 0.0025	solid	EE
2E	Material handling	LOAD1	Load in mix blg		Fully enclosed blg	C	8760	PM PM10 PM2.5	0.060 0.028 0.0043	0.13 0.062 0.009	0.018 0.0085 0.0013	0.039 0.019 0.0028	solid	EE
3E	Material handling	UNLOAD2	Unload at working cell			C	4380	PM PM10 PM2.5	0.060 0.028 0.0043	0.13 0.062 0.009	0.060 0.028 0.0043	0.13 0.062 0.0094	solid	EE
4E	Material handling	LOAD2	Loading soil at stockpile			C	4380	PM PM10 PM2.5	0.0078 0.0037 0.0006	0.017 0.008 0.001	0.0078 0.0037 0.0006	0.017 0.008 0.0012	solid	EE
5E	Material handling	UNLOAD3	Unload soil in mix blg		Fully enclosed blg	C	4380	PM PM10 PM2.5	0.0078 0.0037 0.0006	0.017 0.008 0.001	0.0024 0.0011 0.0002	0.0051 0.0024 0.00037	solid	EE
6E	Material handling	LOAD3	Load soil at stockpile			C	4380	PM PM10 PM2.5	0.0078 0.0037 0.0006	0.017 0.008 0.001	0.0078 0.0037 0.0006	0.017 0.008 0.0012	solid	EE

7E	Material handling	UNLOAD4	Unload soil at working cell			C	4380	PM PM10 PM2.5	0.0078 0.0037 0.0006	0.017 0.008 0.001	0.0078 0.0037 0.0006	0.017 0.008 0.0012	solid	EE
8E	Material handling	LOAD4	Load soil at stockpile			C	4380	PM PM10 PM2.5	0.016 0.0074 0.0011	0.034 0.016 0.003	0.016 0.0074 0.0011	0.034 0.016 0.0025	solid	EE
9E	Material handling	UNLOAD5	Unload soil at working cell			C	4380	PM PM10 PM2.5	0.016 0.0074 0.0011	0.034 0.016 0.003	0.016 0.0074 0.0011	0.034 0.016 0.0025	solid	EE
10E	Material handling	LOAD5	Load soil at stockpile			C	4380	PM PM10 PM2.5	0.016 0.0074 0.0011	0.034 0.016 0.003	0.016 0.0074 0.0011	0.034 0.016 0.0025	solid	EE
11E	Material handling	UNLOAD6	Unload soil at working cell			C	4380	PM PM10 PM2.5	0.016 0.0074 0.0011	0.034 0.016 0.003	0.016 0.0074 0.0011	0.034 0.016 0.0025	solid	EE
12E	Wind erosion	WIND1	Wind erosion at working cell			C	8760	PM PM10 PM2.5	2.92 1.46 0.22	12.78 6.39 0.96	2.92 1.46 0.22	12.78 6.39 0.96	solid	EE
13E	Wind erosion	WIND2	Wind erosion at working cell			C	8760	PM PM10 PM2.5	0.60 0.30 0.045	2.65 1.32 0.20	0.60 0.30 0.045	2.65 1.32 0.20	solid	EE
14E	Wind erosion	WIND3	Wind erosion at stockpile			C	8760	PM PM10 PM2.5	0.84 0.40 0.060	3.66 1.73 0.26	0.84 0.40 0.060	3.66 1.73 0.26	solid	EE
15E	Wind erosion	WIND4	Winter Wind erosion			Winter only	2190	PM PM10 PM2.5	4.83 2.42 0.36	5.22 2.61 0.39	4.83 2.42 0.36	5.22 2.61 0.39	solid	EE
16E	Compaction	COMP	Compaction at the working cell			C	4380	PM PM10 PM2.5	2.53 1.90 0.047	5.54 4.15 0.10	2.53 1.90 0.047	5.54 4.15 0.10	solid	EE



17E	Mixing	MIXIN G	Mixing salt and soil in mix blg			C	8760	PM PM10 PM2.5	2.52 0.88 0.13	11.02 3.83 0.58	0.75 0.26 0.039	3.31 1.15 0.17	solid	EE
18E	Upward vertical	ENG001	Light Plant 1			Short term use daily	500	NOx CO VOC SO2 PM PM10 PM2.5 HAPs GHG	0.14 0.13 0.0075 0.020 0.0080 0.0080 0.0080 2.6e-4 11.07	.054 0.050 0.003 0.007 0.003 0.003 0.003 9.6e-5 4.15	0.14 0.13 0.0075 0.020 0.0080 0.0080 0.0080 2.6e-4 11.07	.054 0.050 0.0028 0.0073 0.0030 0.0030 0.0030 9.6e-5 4.15	Gas/vapor	EE
19E	Upward vertical	ENG002	Light Plant 2			Short term use daily	500	NOx CO VOC SO2 PM PM10 PM2.5 HAPs GHG	0.14 0.13 0.0075 0.020 0.0080 0.0080 0.0080 2.6e-4 11.07	.054 0.050 0.003 0.007 0.003 0.003 0.003 9.6e-5 4.15	0.14 0.13 0.0075 0.020 0.0080 0.0080 0.0080 2.6e-4 11.07	.054 0.050 0.0028 0.0073 0.0030 0.0030 0.0030 9.6e-5 4.15	Gas/vapor	EE
20E	Upward vertical	ENG003	Backup Genera tor			Emerg ency use	500	NOx CO VOC SO2 PM PM10 PM2.5 HAPs GHG	0.62 0.70 0.033 0.16 0.056 0.056 0.056 2.0e-3 88.12	0.16 0.17 0.008 0.039 0.014 0.014 0.014 5.1e-4 22.03	0.62 0.70 0.033 0.16 0.056 0.056 0.056 2.0e-3 88.12	0.16 0.17 0.008 0.039 0.014 0.014 0.014 5.1e-4 22.03	Gas/vapor	EE

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.

<sup>1</sup> 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<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. **DO NOT LIST** H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, 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<sup>3</sup>) at standard conditions (68 °F and 29.92 inches Hg) (see 45CSR7). If the pollutant is SO<sub>2</sub>, use units of ppmv (See 45CSR10).

**Attachment J**  
**EMISSION POINTS DATA SUMMARY SHEET**

Table 2: Release Parameter Data								
Emission Point ID No. <i>(Must match Emission Units Table)</i>	Inner Diameter (ft.)	Exit Gas			Emission Point Elevation (ft)		UTM Coordinates (km)	
		Temp. (°F)	Volumetric Flow <sup>1</sup> (acfm) <i>at operating conditions</i>	Velocity (fps)	Ground Level <i>(Height above mean sea level)</i>	Stack Height <sup>2</sup> <i>(Release height of emissions above ground level)</i>	Northing	Easting
1E – 2E, 5E	These point will occur at the height of the drop point from a loader to a truck (~10 ft) or to ground level for unloading in the mixing building			1070	NA	4346.395	508.609	
3E – 4E, 6E – 11E	These point will occur at the height of the drop point from a loader to a truck (~10 ft) or to ground level for unloading on the working face			Variable – depends on where working cell is	NA	Variable – depends on where working cell is		
12E – 15E	Wind erosion will occur on average about the midpoint height of the storage pile or a ground release for flat exposed areas.			Variable – depends on where working cell is	NA	Variable – depends on where working cell is		
16E	Will occur at ground release			Variable – depends on where working cell is	NA	Variable – depends on where working cell is		
17E	Will occur in the mixing building at ground level or slightly higher			1070	NA	4346.395	508.609	
18E – 19E	TBD	914	50	TBD	Variable – depends on where working cell is	TBD	Variable – depends on where working cell is	
20E	0.17	1120	448	329	1070	~5	4346.369	508.615

<sup>1</sup> Give at operating conditions. Include inerts.

<sup>2</sup> 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? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If YES, then complete the HAUL ROAD EMISSIONS UNIT DATA SHEET.
2.) Will there be Storage Piles? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> If YES, complete Table 1 of the NONMETALLIC MINERALS PROCESSING EMISSIONS UNIT DATA SHEET.
3.) Will there be Liquid Loading/Unloading Operations? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If YES, complete the BULK LIQUID TRANSFER OPERATIONS EMISSIONS UNIT DATA SHEET.
4.) Will there be emissions of air pollutants from Wastewater Treatment Evaporation? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 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.)? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> 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? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> If YES, complete the GENERAL EMISSIONS UNIT DATA SHEET.
7.) Will there be any other activities that generate fugitive emissions? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No (grading operations on haul roads) <input checked="" type="checkbox"/> 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 <sup>1</sup>	Maximum Potential Uncontrolled Emissions <sup>2</sup>		Maximum Potential Controlled Emissions <sup>3</sup>		Est. Method Used <sup>4</sup>
		lb/hr	ton/yr	lb/hr	ton/yr	
Haul Road/Road Dust Emissions Paved Haul Roads						
Unpaved Haul Roads	PM PM-10 PM-2.5	181.49 53.57 5.36	362.20 106.91 10.69	91.14 26.90 2.69	160.81 47.47 4.75	EE
Storage Pile Emissions	PM PM-10 PM-2.5	9.19 4.57 0.69	24.31 12.06 1.81	9.19 4.57 0.69	24.31 12.06 1.81	EE
Loading/Unloading Operations						
Wastewater Treatment Evaporation & Operations						
Equipment Leaks						
General Clean-up VOC Emissions						
Other	PM PM-10 PM-2.5	3.39 2.04 0.050	1.86 1.11 0.028	3.39 2.04 0.050	1.86 1.11 0.028	EE

<sup>1</sup> List all regulated air pollutants. Speciate VOCs, including all HAPs. Follow chemical name with Chemical Abstracts Service (CAS) number. LIST Acids, CO, CS<sub>2</sub>, VOCs, H<sub>2</sub>S, Inorganics, Lead, Organics, O<sub>3</sub>, NO, NO<sub>2</sub>, SO<sub>2</sub>, SO<sub>3</sub>, all applicable Greenhouse Gases (including CO<sub>2</sub> and methane), etc. DO NOT LIST H<sub>2</sub>, H<sub>2</sub>O, N<sub>2</sub>, O<sub>2</sub>, and Noble Gases.

<sup>2</sup> 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).

<sup>3</sup> 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).

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

**Attachment L.  
Emission Unit Data Sheets**

## CONVEYING AFFECTED SOURCE SHEET

Source Identification Number <sup>1</sup>	Date of Construction, Reconstruction, or Modification (Month/Year) <sup>2</sup>	Type of Material Handled <sup>3</sup>	Size of Material Handled <sup>4</sup>	Maximum Material Transfer Rate <sup>5</sup>		Average Moisture Content (%) <sup>6</sup>	Control Device <sup>7</sup>
				tons/hour	tons/year		
UNLOAD1	2016	salt		87.5	766,500	12	building
LOAD1	2016	Salt or salt/soil mix		201.3	881,475	12	building
UNLOAD2	2016	Salt or salt/soil mix		201.3	881,475	12	none
LOAD2	2016	Soil		26.3	114,975	12	none
UNLOAD3	2016	Soil		26.3	114,975	12	building
LOAD3	2016	Soil		26.3	114,975	12	none
UNLOAD4	2016	Soil		26.3	114,975	12	none
LOAD4	2016	Soil		52.5	229,950	12	none
UNLOAD5	2016	Soil		52.5	229,950	12	none
LOAD5	2016	Soil		52.5	229,950	12	none
UNLOAD6	2016	Soil		52.5	229,950	12	none
COMP	2016	Salt or salt/soil mix		NA	NA	12	none
MIXING	2016	Salt/soil mix		100.6	881,475	12	building

1. Enter the appropriate Source Identification Number for each conveyor using the following codes. For example, multiple belt conveyors should be designated BC-1, BC-2, BC-3 etc. Transfer points are considered emission points, not sources, and should not be included in the *Conveying Affected Source Sheet*. Transfer Point Identification Numbers shall be assigned in the *Emission Calculation Sheet*.

BC	Belt Conveyor	BE	Bucket Elevator	DL	Drag-link Conveyor
PS	Pneumatic System	SC	Screw Conveyor	VC	Vibrating Conveyor
OT	Other				

2. Enter the date that each crusher and screen was constructed, reconstructed, or modified.
3. Enter the type of material being handled - Raw Material (RM) Sized Material (SM) Refuse (R) Other (O)
4. Enter the nominal size of the material being conveyed (e.g. sized material- ¾" x 0). If more than one material is handled by the listed conveyor, list each material and enter the appropriate data for each material.
5. Enter the maximum material transfer rate for each conveyor in tons per hour and tons per year.
6. Enter the average percent moisture content of the conveyed material.
7. Enter the control device for the conveyor. PE - Partial Enclosure (example 3/4 hoop), FE - Full Enclosure, N - None



## STORAGE ACTIVITY AFFECTED SOURCE SHEET

Source Identification Number <sup>1</sup>	WIND1	WIND2	WIND3	WIND4		
Type of Material Stored <sup>2</sup>	Soil	Soil	Soil	Soil		
Average Moisture Content (%) <sup>3</sup>	12	12	12	12		
Maximum Yearly Storage Throughput (tons) <sup>4</sup>	NA	NA	Varies	NA		
Maximum Storage Capacity (tons) <sup>5</sup>	NA	NA	Varies	NA		
Maximum Base Area (ft <sup>2</sup> ) <sup>6</sup>	10019	43560	87120	348480		
Maximum Pile Height (ft) <sup>7</sup>	NA	NA	Varies	NA		
Method of Material Load-in <sup>8</sup>	NA	NA	FE	NA		
Load-in Control Device Identification Number <sup>9</sup>	NA	NA	None	NA		
Storage Control Device Identification Number <sup>9</sup>	NA	NA	none	NA		
Method of Material Load-out <sup>8</sup>	NA	NA	FE	NA		
Load-out Control Device Identification Number <sup>9</sup>	NA	NA	none	NA		

1. Enter the appropriate Source Identification Number for each storage activity using the following codes. For example, if the facility utilizes three storage bins, four open stockpiles and one storage building (full enclosure), the Source Identification Numbers should be BS-1, BS-2, and BS-3; OS-1, OS-2, OS-3, and OS-4; and SB-1, respectively.
 

BS	Bin or Storage Silo (full enclosure)	E3	Enclosure (three sided enclosure)
OS	Open Stockpile	SB	Storage Building (full enclosure)
SF	Stockpiles with wind fences	OT	Other
2. Describe the type of material stored or stockpiled. (e.g. sized material, raw material, refuse, etc).
3. Enter the average percent moisture content of the stored material.
4. Enter the maximum yearly storage throughput for each storage activity.
5. Enter the maximum storage capacity for each storage activity in tons (e.g. silo capacity, maximum stockpile size, etc.)
6. For stockpiles, enter the maximum stockpile base area.
7. For stockpiles, enter the maximum stockpile height.
8. Enter the method of load-in or load-out to/from stockpiles or bins using the following codes:
 

CS	Clamshell	SS	Stationary Conveyor/Stacker
FC	Fixed Height Chute from Bins	ST	Stacking Tube
FE	Front Endloader	TC	Telescoping Chute from Bins
MC	Mobile Conveyor/Stacker	TD	Truck Dump
UC	Under-pile or Under-Bin Reclaim Conveyor	PC	Pneumatic Conveyor/Stacker
RC	Rake or Bucket Reclaim Conveyor	OT	Other
9. Enter the appropriate Control Device Identification Number for each storage activity. Refer to Table A - *Control Device Listing and Control Device Identification Number Instructions* in the *Reference Document* for Control Device ID prefixes and numbering.

## ENGINE DATA SHEET

Source Identification Number <sup>1</sup>	ENG001	ENG002	ENG003				
Engine Manufacturer and Model	Mitsubishi L3E-W26ML	Mitsubishi L3E-W26ML	Generac RD050				
Manufacturer's Rated bhp/rpm	12.2/1800	12.2/1800	85/1800				
Source Status <sup>2</sup>	NS	NS	NS				
Date Installed/Modified/Removed (Month/Year) <sup>3</sup>	TBD/2017	TBD/2017	TBD/2017				
Engine Manufactured/Reconstruction Date <sup>4</sup>	TBD	TBD	TBD				
Is this a Certified Stationary Compression Ignition Engine according to 40CFR60 Subpart IIII? (Yes or No) <sup>5</sup>	Yes	Yes	Yes				
Is this a Certified Stationary Spark Ignition Engine according to 40CFR60 Subpart JJJJ? (Yes or No) <sup>6</sup>	N/A	N/A	N/A				
Engine, Fuel and Combustion Data	Engine Type <sup>7</sup>	Compression Ignition	Compression Ignition	Compression Ignition			
	APCD Type <sup>8</sup>	N/A	N/A	N/A			
	Fuel Type <sup>9</sup>	ULSD	ULSD	ULSD			
	H <sub>2</sub> S (gr/100 scf)	0	0	0			
	Operating bhp/rpm	12.2/1800	12.2/1800	85/1800			
	BSFC (Btu/bhp-hr)	N/A	N/A	N/A			
	Fuel throughput (gal/hr)	0.5	0.5	3.98			
	Fuel throughput (gal/yr)	375	375	1990			
	Operation (hrs/yr)	750	750	500			
Reference <sup>10</sup>	Potential Emissions <sup>11</sup>	lbs/hr	tons/yr	lbs/hr	tons/yr	lbs/hr	tons/yr
		NO <sub>x</sub>	0.14	0.054	0.14	0.054	0.62
	CO	0.13	0.050	0.13	0.050	0.70	0.17
	VOC	0.0075	0.0028	0.0075	0.0028	0.033	0.0082
	SO <sub>2</sub>	0.020	0.0073	0.020	0.0073	0.16	0.039
	PM <sub>10</sub>	0.0080	0.0030	0.0080	0.0030	0.056	0.014
	Formaldehyde	7.97e-5	2.99E-5	7.97e-5	2.99E-5	6.34e-4	1.59e-4

1. Enter the appropriate Source Identification Number for each reciprocating internal combustion compressor/generator engine located at the facility. Multiple compressor engines should be designated CE-1, CE-2, CE-3 etc. Emergency Generator engines should be designated EG-1, EG-2, EG-3 etc. If more than three (3) engines exist, please use additional sheets.

2. Enter the Source Status using the following codes:

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

3. Enter the date (or anticipated date) of the engine's installation (construction of source), modification or removal.
4. Enter the date that the engine was manufactured, modified or reconstructed.
5. Is the engine a certified stationary compression ignition internal combustion engine according to 40CFR60 Subpart IIII. If so, 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 according to 40CFR§60.4210 as appropriate.

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

6. Is the engine a certified stationary spark ignition internal combustion engine according to 40CFR60 Subpart JJJJ. If so, 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 according to 40CFR§60.4243a(2)(i) through (iii), as appropriate.

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

7. Enter the Engine Type designation(s) using the following codes:

LB2S	Lean Burn Two Stroke	RB4S	Rich Burn Four Stroke
LB4S	Lean Burn Four Stroke		

8. Enter the Air Pollution Control Device (APCD) type designation(s) using the following codes:

A/F	Air/Fuel Ratio	IR	Ignition Retard
HEIS	High Energy Ignition System	SIPC	Screw-in Precombustion Chambers
PSC	Prestratified Charge	LEC	Low Emission Combustion
NSCR	Rich Burn & Non-Selective Catalytic Reduction	SCR	Lean Burn & Selective Catalytic Reduction

9. Enter the Fuel Type using the following codes:

PQ	Pipeline Quality Natural Gas	RG	Raw Natural Gas
2FO	#2 Fuel Oil	LPG	Liquid Propane Gas

10. Enter the Potential Emissions Data Reference designation using the following codes. Attach all referenced data to this *Compressor/Generator Data Sheet(s)*.

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

11. Enter each engine's Potential to Emit (PTE) for the listed regulated pollutants in pounds per hour and tons per year. PTE shall be calculated at manufacturer's rated brake horsepower and may reflect reduction efficiencies of listed Air Pollution Control Devices. Emergency generator engines may use 500 hours of operation when calculating PTE. PTE data from this data sheet shall be incorporated in the *Emissions Summary Sheet*.



## Protector™ Series

### Diesel Generator Set

#### INCLUDES:

- Two Line LCD Multilingual Digital Evolution™ Controller (English/Spanish/French/Portuguese) with external viewing window for easy indication of generator status and breaker position.
- Isochronous Electronic Governor
- Sound Attenuated Aluminum Enclosure
- Smart Battery Charger
- UV/Ozone Resistant Hoses
- ±1% Voltage Regulation
- Integrated Base Tank Provides Up to 40 Hours of Run Time
- 5 Year Limited Warranty\*
- UL/CUL2200/UL 142 Listed
- Meets code requirements for External Vent and Fill

#### Standby Power Rating

- Model RD015 - 15 kW 60 Hz
- Model RD020 - 20 kW 60 Hz
- Model RD030 - 30 kW 60 Hz
- Model RD048 - 48 kW 60 Hz (single phase only)
- Model RD050 - 50 kW 60 Hz (three phase only)



QUIET-TEST™



\*Built in the USA using domestic and foreign parts

Meets EPA Emission Regulations  
CA/MA Emissions Compliant

\* 5 year warranty applicable to U.S. and Territories/Canada. International warranty is 3 year limited.

## FEATURES

- **INNOVATIVE DESIGN & PROTOTYPE TESTING** are key components of GENERAC'S success in "IMPROVING POWER BY DESIGN." But it doesn't stop there. Total commitment to component testing, reliability testing, environmental testing, destruction and life testing, plus testing to applicable CSA, NEMA, EGSA, and other standards, allows you to choose GENERAC POWER SYSTEMS with the confidence that these systems will provide superior performance.
- **TEST CRITERIA:**
  - ✓ PROTOTYPE TESTED
  - ✓ SYSTEM TORSIONAL TESTED
  - ✓ NEMA MG1-22 EVALUATION
  - ✓ MOTOR STARTING ABILITY
- **SOLID-STATE, FREQUENCY COMPENSATED VOLTAGE REGULATION.** This state-of-the-art power maximizing regulation system is standard on all Generac models. It provides optimized FAST RESPONSE to changing load conditions and MAXIMUM MOTOR STARTING CAPABILITY by electronically torque-matching the surge loads to the engine. Digital voltage regulation at ±1%.
- **SINGLE SOURCE SERVICE RESPONSE** from Generac's extensive dealer network provides parts and service know-how for the entire unit, from the engine to the smallest electronic component.
- **GENERAC TRANSFER SWITCHES.** Long life and reliability are synonymous with GENERAC POWER SYSTEMS. One reason for this confidence is that the GENERAC product line includes its own transfer systems and controls for total system compatibility.

**15 • 20 • 30 • 48 • 50 kW****application & engineering data****GENERATOR SPECIFICATIONS**

Type	Synchronous
Rotor Insulation Class	H (15 & 20 kW) or F (30, 48 & 50 kW)
Stator Insulation Class	H
Telephone Interference Factor (TIF)	<50
Alternator Output Leads 1-Phase	3 wire
Alternator Output Leads 3-Phase	6 wire
Bearings	Single Sealed Cartridge
Coupling	Direct, Flexible Disc
Excitation System	Direct

**VOLTAGE REGULATION**

Type	Electronic
Sensing	Single Phase
Regulation	± 1%
Features	Adjustable Voltage & Gain

**GOVERNOR SPECIFICATIONS**

Type	Electronic Isochronous
Steady State Regulation	± 0.25%

**ELECTRICAL SYSTEM**

Battery Charge Alternator	50 Amp (15 & 20 kW) or 70 Amp (30, 48 & 50 kW)
Smart Battery Charger	2 Amp
Recommended Battery (battery not included)	Group 27F, 700 CCA
System Voltage	12 Volts

**GENERATOR FEATURES**

<p>Revolving field heavy duty generator          Directly connected to the engine          Operating temperature rise 120°C above a 40°C ambient          Class H insulation is NEMA rated          Class F insulation is NEMA rated          All models fully prototype tested</p>
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**ENCLOSURE FEATURES**

Aluminum weather protective enclosure	Ensures protection against mother nature. Electrostatically applied textured epoxy paint for added durability.
Enclosed critical grade muffler	Quiet, critical grade muffler is mounted inside the unit to prevent injuries and maximize sound dampening.
Small, compact, attractive	Makes for an easy, eye appealing installation.
SAE	Sound attenuated enclosure ensures quiet operation.

(All ratings in accordance with BS5514, ISO3046, ISO8528, SAE J1349 and DIN6271)

## 15 • 20 • 30 • 48 • 50 kW

## application & engineering data

### ENGINE SPECIFICATIONS: 15 & 20 kW

Make	Generac
Model	In-line
Cylinders	4
Displacement (Liters)	2.28
Bore (in./mm)	3.46/88
Stroke (in./mm)	3.70/94
Compression Ratio	21.3:1
Intake Air System	Naturally Aspirated
Cylinder Head Type	Cast Iron OHV
Piston Type	Aluminum
EPA Emissions Compliance	Emergency Stationary

### ENGINE SPECIFICATIONS: 30 kW

Make	Generac
Model	In-line
Cylinders	4
Displacement (Liters)	2.4
Bore (in./mm)	3.54/90
Stroke (in./mm)	3.70/94
Compression Ratio	21.3:1
Intake Air System	Turbocharged
Cylinder Head Type	Cast Iron OHV
Piston Type	Aluminum
EPA Emissions Compliance	Emergency Stationary

### ENGINE SPECIFICATIONS: 48/50 kW

Make	Generac
Model	In-Line
Cylinders	4
Displacement (Liters)	3.4
Bore in/mm	3.86/98
Stroke in/mm	4.45/113
Compression Ratio	18.5:1
Intake Air System	Turbocharged/Aftercooled
Cylinder Head Type	Cast Iron OHV
Piston Type	Aluminum
EPA Emissions Compliance	Emergency Stationary

### WEIGHTS AND DIMENSIONS

	15 kW	20 kW	30 kW	48 kW	50 kW
Weight (lb/kg)	1380/626		1927/874	2197/997	
Dimensions (LxWxH) (in/cm)	81 x 31 x 50/205 x 78 x 128		95 x 35 x 57/242 x 89 x 145		

### ENGINE LUBRICATION SYSTEM

Oil Pump Type	Gear
Oil Filter Type	Full flow spin-on canister
Crankcase Capacity (quarts/liters)	6.87/6.5 - 15 & 20 kW
	6.8/6.4 - 30 kW
	7.4/7 - 48 & 50 kW

### ENGINE COOLING SYSTEM

Type	Pressurized radiator - 15 & 20 kW Closed recovery - 30, 48 & 50 kW
Water Pump	Pre-lubed, self-sealing
Fan Speed (rpm)	1800 - 15 & 20 kW
	2061 - 30 kW
	2029 - 48 & 50 kW
Fan Diameter (in./mm)	18.11/460 (15 & 20 kW) 22/559 (30, 48 & 50 kW)
Fan Mode	Pusher

### FUEL SYSTEM

Fuel Type	Ultra Low Sulfur Diesel Fuel
Fuel Pump Type	Mechanical Engine Driven Gear
Injector Type	Mechanical
Fuel Supply Line (mm/in)	7.94/0.31 (ID)
Fuel Return Line (mm/in)	7.94/0.31 (ID)
Fuel Specification	ASTM
Fuel Filtering (microns)	5 - 15, 20 & 30 kW
	10 - 48 & 50 kW

### TANK SPECIFICATIONS

Total Size (gallons/liters)	34/128.7 - 15 & 20 kW
	62/234.7 - 30, 48 & 50 kW
Usable Size (gallons/liters)	32/121.1 - 15 & 20 kW
	57/215.8 - 30, 48 & 50 kW
Run Time @ 1/2 Load (hrs)	41 - 15 kW
	31 - 20 kW
	38 - 30 kW
	25 - 48 & 50 kW
Listings	UL142

**15 • 20 • 30 • 48 • 50 kW****operating data****GENERATOR OUTPUT VOLTAGE/kW - 60 Hz**

		<b>kW (Standby)</b>	<b>Amp (Standby)</b>	<b>CB Size</b>
RD015	120/240 V, 1Ø, 1.0 pf	15	62	70
	120/208 V, 3Ø, 0.8 pf	15	52	60
	120/240 V, 3Ø, 0.8 pf	15	45	50
RD020	120/240 V, 1Ø, 1.0 pf	20	83	100
	120/208 V, 3Ø, 0.8 pf	20	69	80
	120/240 V, 3Ø, 0.8 pf	20	60	70
RD030	120/240 V, 1Ø, 1.0 pf	30	125	150
	120/208 V, 3Ø, 0.8 pf	30	104	125
	120/240 V, 3Ø, 0.8 pf	30	90	100
	277/480 V, 3Ø, 0.8 pf	30	45	50
RD048/ RD050	120/240 V, 1Ø, 1.0 pf	48	200	200
	120/208 V, 3Ø, 0.8 pf	50	173	200
	120/240 V, 3Ø, 0.8 pf	50	150	175
	277/480 V, 3Ø, 0.8 pf	50	75	90

**SURGE CAPACITY IN AMPS**

		<b>Voltage Dip @ &lt; .4 pf</b>	
		15%	30%
RD015	120/240 V, 1Ø	53	129
	120/208 V, 3Ø	37	90
	120/240 V, 3Ø	32	78
RD020	120/240 V, 1Ø	87	211
	120/208 V, 3Ø	59	143
	120/240 V, 3Ø	51	124
RD030	120/240 V, 1Ø	66	168
	120/208 V, 3Ø	59	144
	120/240 V, 3Ø	51	125
RD048/ RD050	120/240 V, 1Ø	69	189
	120/208 V, 3Ø	90	218
	120/240 V, 3Ø	78	189
	277/480 V, 3Ø	36	87

**ENGINE FUEL CONSUMPTION**

		gal/hr	L/hr
RD015	25% of rated load	0.51	1.93
	50% of rated load	0.79	2.99
	75% of rated load	1.14	4.31
	100% of rated load	1.48	5.58
RD020	25% of rated load	0.67	2.6
	50% of rated load	1.05	3.97
	75% of rated load	1.52	5.32
	100% of rated load	1.98	7.48
RD030	25% of rated load	0.92	3.5
	50% of rated load	1.45	5.5
	75% of rated load	1.96	7.4
	100% of rated load	2.74	10.4
RD048/ RD050	25% of rated load	1.35	5.11
	50% of rated load	2.15	8.14
	75% of rated load	3.06	11.58
	100% of rated load	3.98	15.07

STANDBY RATING: Standby ratings apply to installations served by a reliable utility source. The standby rating is applicable to varying loads for the duration of a power outage. There is no overload capability for this rating. Ratings are in accordance with ISO-3046-1. Design and specifications are subject to change without notice.



**15 • 20 • 30 • 48 • 50 kW**

**operating data**

**ENGINE COOLING**

	15 kW	20 kW	30 kW	48/50 kW
Air flow (inlet air including alternator and combustion air in cfm/cmm)	2824/80	2824/80	3038/86	2824/80
System coolant capacity (gal/liters)	2.8/10.6	2.8/10.6	2.8/10.6	2.8/10.6
Heat rejection to coolant (BTU per hr/MJ per hr)	63,535/67	63,535/67	111,000/117.1	135,900/143.4
Maximum operation air temperature on radiator (°C/°F)	50/122			
Maximum ambient temperature (°C/°F)	50/122			

**COMBUSTION REQUIREMENTS**

Flow at rated power (cfm/cmm)	84.76/2.4	84.76/2.4	90/2.55	190/5.38
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**SOUND EMISSIONS**

Sound output in dB(A) at 23 ft (7 m) with generator in exercise mode*	65
Sound output in dB(A) at 23 ft (7 m) with generator operating at normal load*	70

\*Sound levels are taken from the front of the generator. Sound levels taken from other sides of the generator may be higher depending on installation parameters.

**EXHAUST**

Exhaust flow at rated output (cfm/cmm)	98.88/2.8	98.88/2.8	230/6.51	448/12.7
Exhaust temperature at rated output (°C/°F)	604.4/1120	604.4/1120	454.4/850	604.4/1120

**ENGINE PARAMETERS**

Rated Synchronous RPM	1800			
HP at rated kW	26.4	33.5	49	85

**POWER ADJUSTMENT FOR AMBIENT CONDITIONS**

Temperature Deration .....	3% for every 5 °C above 25 °C or 1.7% for every 5 °F above 77 °F
Altitude Deration (15, 30, 48 & 50 kW) .....	1% for every 100 m above 915 m or 3% for every 1000 ft above 3000 ft
Altitude Deration (20 kW) .....	1% for every 100 m above 305 m or 3% for every 1000 ft above 1000 ft

**CONTROLLER FEATURES**

2-Line Plain Text Multilingual LCD Display .....	Simple user interface for ease of operation.
Mode Buttons: Auto .....	Automatic Start on Utility failure. Programmable 7 day exerciser.
Manual .....	Start with starter control, unit stays on. If utility fails, transfer to load takes place.
Off .....	Stops unit. Power is removed. Control and charger still operate.
Ready to Run/Maintenance Messages .....	Standard
Engine Run Hours Indication .....	Standard
Programmable start delay between 2-1500 seconds .....	Standard (programmable by dealer only)
Utility Voltage Loss/Return to Utility Adjustable .....	From 140-171 V/190-216 V
Future Set Capable Exerciser/Exercise Set Error Warning .....	Standard
Run/Alarm/Maintenance Logs .....	50 Events Each
Engine Start Sequence .....	Cyclic cranking: 16 sec on, 7 rest (90 sec maximum duration).
Starter Lock-out .....	Starter cannot re-engage until 5 sec after engine has stopped.
Smart Battery Charger .....	Standard
Charger Fault/Missing AC Warning .....	Standard
Low Battery/Battery Problem Protection and Battery Condition Indication .....	Standard
Automatic Voltage Regulation with Over and Under Voltage Protection .....	Standard
Under-Frequency/Overload/Stepper Overcurrent Protection .....	Standard
Safety Fused/Fuse Problem Protection .....	Standard
Automatic Low Oil Pressure/High Oil Temperature Shutdown .....	Standard
Overcrank/Overspeed (@ 72 Hz)/RPM Sense Loss Shutdown .....	Standard
High Engine Temperature Shutdown .....	Standard
Internal Fault/Incorrect Wiring Protection .....	Standard
Common External Fault Capability .....	Standard
Field Upgradable Firmware .....	Standard



CERTIFIED BOOM REPAIR SERVICE, INC.

## Magnum Lighting Tower Model MLT 3060 Specifications

Engine	Mitsubishi L3E-W26ML4-stroke, diesel, liquid-cooled
Horsepower at 1800 RPM	12.2 standby/ 10.4 <i>prime</i>
Fuel Consumption (GPH)	0.5
Outlets	1-120VAC 20 amp <i>GFCI</i> duplex & 1- 240 VAC 30 amp twistlock
Generator	4-pole, 6KW brushless, self-regulated
Mast & Cord	30' maximum extension, coiled
Lights	4 - 1,000 watt metal halide hard wired
Ballast Type	Coil & core
Lumens	440000
Coverage	5 - 7 acres
Trailer Frame	tubular steel
Trailer Hitch	2" ball
Trailer Axle (lbs)	2200
Fuel Tank (gal)	30
Run Capacity (hrs)	60
Trailer Width (in)	48
Outrigger Width (in)	98
Unit Height (in)	68

Unit Length w/ Lights (in)	170
Unit Length w/o Lights (in)	150
Trailer Length (in)	115
Unit Weight (lbs)	1630

### Options

Engine Options	Kubota engine, Lower radiator hose heater, Spark arrest on muffler, Tethered fuel cap
Electrical Options	Gel cell battery, <i>Auto light controller</i> , Battery charger (2 amp trickle), Battery disconnect (lockable), Interior cabinet light
Floodlight Options	Metal halide lights - <i>quick disconnect</i> , <i>High pressure sodium</i> lights - hard wired, High pressure sodium lights - quick disconnect
Mast Options	<i>Galvanized / black</i> dual electric or manual <i>winches</i> , Drape cord mast wiring
Trailer Options	Combo 2" ball and 2.5" pintle ring hitch, 2.5" or 3" ring hitch, 2 5/16" ball hitch, 6 or 7 pole plug for trailer lights, Jack tube and sleeve, Level indicator, Spare tire and carrier, Air freight / sea container racking

## 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 (%)	10	10
p =	Number of days per year with precipitation >0.01 in.	157	157

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	UPMAIN		47.7		1.14	4	33,326		70
2	UPPASS		4		1.14	1	365		70
3	UPWKFACE		47.7		0.68	9	38,325		70
4	UPSOILRD		47.7		0.68	2	4,999		70
5	UPDCOVER		47.7		0.38	2	4,999		70
6	UPICOVER		47.7		0.38	3	9,998		70
7	UPFCOVER		47.7		0.76	3	9,998		70
8	UPWATER		22.4		1.89	1	365		70
9	UPFUEL		22.4		1.52	1	365		70
10	UPEXCAV		34		0.038	7	7,300		0
11	UPDOZER		15		0.076	15	54,750		0
12	UPGRADER		22.5		1.89	1	365		0
13	GRADER		22.5		1.89	1	365		0

**Source:** AP-42 Fifth Edition – 13.2.2 Unpaved Roads

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

Where:

		PM	PM-10
k =	Particle size multiplier	0.80	0.36
s =	Silt content of road surface material (%)	10	10
S =	Mean vehicle speed (mph)		
W =	Mean vehicle weight (tons)	see calcs	see calcs
w =	Mean number of wheels per vehicle		
p =	Number of days per year with precipitation >0.01 in.	157	157

For lb/hr:  $[\text{lb} \div \text{VMT}] \times [\text{VMT} \div \text{trip}] \times [\text{Trips} \div \text{Hour}] = \text{lb/hr}$

For TPY:  $[\text{lb} \div \text{VMT}] \times [\text{VMT} \div \text{trip}] \times [\text{Trips} \div \text{Hour}] \times [\text{Ton} \div 2000 \text{ lb}] = \text{Tons/year}$

### 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	38.79	161.60	11.64	48.48	11.45	47.70	3.43	14.31
2	3.18	0.58	0.95	0.17	0.94	0.17	0.28	0.051
3	52.37	111.50	27.93	59.47	15.46	32.91	8.24	17.55
4	11.64	14.54	6.21	7.76	3.43	4.29	1.83	2.29

5	6.47	8.08	3.45	4.31	1.91	2.38	1.02	1.27
6	9.70	16.16	5.17	8.62	2.86	4.77	1.53	2.54
7	19.40	32.32	10.34	17.24	5.72	9.54	3.05	5.09
8	11.51	2.10	3.45	0.63	3.40	0.62	1.02	0.19
9	9.21	1.68	2.76	0.50	2.72	0.50	0.82	0.15
10	1.94	1.01	1.94	1.01	0.57	0.30	0.57	0.30
11	5.76	10.52	5.76	10.52	1.70	3.10	1.70	3.10
12	11.53	2.10	11.53	2.10	3.40	0.62	3.40	0.62
13	3.39	1.86	3.39	1.86	2.04	1.11	2.04	1.11
TOTALS	184.8	364.06	94.53	162.67	55.60	108.02	28.94	48.58

**Attachment N.  
Supporting Emissions Calculations**

## Emissions Summary Total

Company:	Antero Treatment LLC
Facility Name:	Clearwater Landfill
Facility Location:	Doddridge County, WV

### UNCONTROLLED POTENTIAL EMISSION SUMMARY

Source	PM			PM <sub>10</sub>			PM <sub>2.5</sub>			NO <sub>x</sub>			CO		
	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy
<b><i>Non-Fugitive Emissions</i></b>															
Total Material Handling	0.24	3.20	0.58	0.114	1.51	0.28	0.017	0.23	0.042	----	----	----	----	----	----
Wind Erosion	9.19	220.62	24.31	4.57	109.77	12.06	0.69	16.48	1.81	----	----	----	----	----	----
Other Operations	5.04	90.73	16.56	2.77	43.77	7.99	0.18	3.71	0.68	----	----	----	----	----	----
Diesel Engines	0.072	0.11	0.020	0.072	0.11	0.020	0.072	0.11	0.020	0.91	1.44	0.26	0.96	1.50	0.27
<b><i>Fugitive Emissions</i></b>															
Other Operations	3.39	10.18	1.86	2.04	6.11	1.11	0.050	0.15	0.028	----	----	----	----	----	----
Road Travel to Landfill	41.97	888.66	162.18	12.39	262.30	47.87	1.24	26.23	4.79	----	----	----	----	----	----
Road Travel within Landfill	120.28	1,021.30	186.39	35.50	301.45	55.01	3.55	30.14	5.50	----	----	----	----	----	----
Travel from Equipment within Landfill	19.23	74.70	13.63	5.68	22.05	4.02	0.57	2.20	0.40	----	----	----	----	----	----
<b>Non-Fugitive Facility PTE =</b>	<b>14.55</b>	<b>314.65</b>	<b>41.47</b>	<b>7.53</b>	<b>155.16</b>	<b>20.34</b>	<b>0.95</b>	<b>20.53</b>	<b>2.55</b>	<b>0.91</b>	<b>1.44</b>	<b>0.26</b>	<b>0.96</b>	<b>1.50</b>	<b>0.27</b>
<b>Fugitive Facility PTE =</b>	<b>184.88</b>	<b>1,994.84</b>	<b>364.06</b>	<b>55.60</b>	<b>591.90</b>	<b>108.02</b>	<b>5.41</b>	<b>58.73</b>	<b>10.72</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total Facility PTE =</b>	<b>199.43</b>	<b>2,309.49</b>	<b>405.53</b>	<b>63.13</b>	<b>747.06</b>	<b>128.36</b>	<b>6.36</b>	<b>79.26</b>	<b>13.27</b>	<b>0.91</b>	<b>1.44</b>	<b>0.26</b>	<b>0.96</b>	<b>1.50</b>	<b>0.27</b>

### CONTROLLED POTENTIAL EMISSION SUMMARY

Source	PM			PM <sub>10</sub>			PM <sub>2.5</sub>			NO <sub>x</sub>			CO		
	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy	lb/hr	lb/day	tpy
<b><i>Non-Fugitive Emissions</i></b>															
Total Material Handling	0.174	2.19	0.40	0.083	1.03	0.19	0.0125	0.16	0.029	----	----	----	----	----	----
Wind Erosion	9.19	220.62	24.31	4.57	109.77	12.06	0.69	16.48	1.81	----	----	----	----	----	----
Other Operations	3.28	48.46	8.84	2.16	29.07	5.30	0.086	1.50	0.27	----	----	----	----	----	----
Diesel Engines	0.072	0.11	0.020	0.072	0.11	0.020	0.072	0.11	0.020	0.91	1.44	0.26	0.96	1.50	0.27
<b><i>Fugitive Emissions</i></b>															
Other Operations	3.39	10.18	1.86	2.04	6.11	1.11	0.050	0.15	0.028	----	----	----	----	----	----
Road Travel to Landfill	12.59	266.60	48.65	3.72	78.69	14.36	0.37	7.87	1.44	----	----	----	----	----	----
Road Travel within Landfill	59.32	539.86	98.52	17.51	159.35	29.08	1.75	15.93	2.91	----	----	----	----	----	----
Travel from Equipment within Landfill	19.23	74.70	13.63	5.68	22.05	4.02	0.57	2.20	0.40	----	----	----	----	----	----
<b>Non-Fugitive Facility PTE =</b>	<b>12.72</b>	<b>271.38</b>	<b>33.58</b>	<b>6.89</b>	<b>139.98</b>	<b>17.57</b>	<b>0.86</b>	<b>18.25</b>	<b>2.13</b>	<b>0.91</b>	<b>1.44</b>	<b>0.26</b>	<b>0.96</b>	<b>1.50</b>	<b>0.27</b>
<b>Fugitive Facility PTE =</b>	<b>94.53</b>	<b>891.34</b>	<b>162.67</b>	<b>28.94</b>	<b>266.19</b>	<b>48.58</b>	<b>2.74</b>	<b>26.16</b>	<b>4.77</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Total Facility PTE =</b>	<b>107.25</b>	<b>1,162.71</b>	<b>196.24</b>	<b>35.82</b>	<b>406.17</b>	<b>66.15</b>	<b>3.60</b>	<b>44.41</b>	<b>6.91</b>	<b>0.91</b>	<b>1.44</b>	<b>0.26</b>	<b>0.96</b>	<b>1.50</b>	<b>0.27</b>

## Unpaved Road Emissions

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Fugitive Road Dust Emissions

AP-42 Section 13.2.2 Unpaved Haul Roads, Final Section, November 2006.

Emission Factor Equation:  $E = [k(s/12)^a(W/3)^b] \cdot [(365-P)/365]$

Equation 13.2.2-1a and 13.2.2-2

where:

E = particulate emission factor (pounds per vehicle mile traveled, lb/VMT)

k, a, b = dimensionless constants

s = surface material silt content (%)

W = mean vehicle weight of the vehicles traveling the road (tons)

P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period

**Operating Parameters:**

Source ID	Vehicle Description	Description of Haul	Tons per Day Hauled	Unloaded Vehicle Weight (Tons)	Loaded Vehicle Weight (Tons)
UPMAIN	40 ton Artic Truck	Hauls waste from Water Treatment Facility to Landfill mixing building	2100	36.2	59.2
UPPASS	Passenger Vehicles	Passenger vehicles for employees entering and exiting the Landfill	---	4.0	4.0
UPWKFACE	40 ton Artic Truck	Hauls waste from mixing building to working face of landfill	2415	36.2	59.2
UPSOILRD	40 ton Artic Truck	Hauls native soil from working areas of landfill to mixing building	315	36.2	59.2
UPDCOVER	40 ton Artic Truck	Hauls borrow/stockpile soil to working face for daily cover	315	36.2	59.2
UPICOVER	40 ton Artic Truck	Hauls borrow/stockpile soil to working face for intermediate cover	630	36.2	59.2
UPFCOVER	40 ton Artic Truck	Hauls borrow/stockpile soil to working face for final cover	630	36.2	59.2
UPWATER	Water Trucks	Water trucks for watering roads or storage piles, etc	---	12.0	32.9
UPFUEL	Fuel Trucks	Fuel trucks to deliver fuel for the dozers, loaders, etc	---	12.0	29.8

**Emission Factor Parameters:**

Description	Variable	Value	Unit	Notes
Mean Silt Content of Unpaved Roads	s	10	%	G40-C permit guidance - AP-42 13.2.2-1 for quarries
Average Weight of Trucks to Mixing Building	W	47.7	tons	Based on typical trucks and amount hauled
Average Weight of Artic Truck to Working Face	W	47.7	tons	Based on typical trucks and amount hauled
Average Weight of Artic Truck with native soil	W	47.7	tons	Based on typical trucks and amount hauled
Average Weight of Passenger Vehicles	W	4.0	tons	Based on typical passenger trucks
Average Weight of a Water or Fuel Truck	W	22.4	tons	Based on typical trucks and 5000 gallons
Mean Days > 0.01-in precipitation	P	157	days	G40-C permit guidance - Table B, Zone 1
Control Efficiency	CE	70	%	G40-C permit guidance for watering unpaved roads

Particle Size Multipliers for Unpaved Road Equation Table 13.2.2-2	Variable	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
		k	4.9	1.5
a		0.7	0.9	0.9
b		0.45	0.45	0.45

**Emission Factors:**

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Mixing Building Trucks Emission Factor (lb/VMT)	E	8.53	2.52	0.25
Artic With Waste Emission Factor (lb/VMT)	E	8.53	2.52	0.25
Artic with Soil Emission Factor (lb/VMT)	E	8.53	2.52	0.25
Passenger Emission Factor (lb/VMT)	E	2.80	0.83	0.083
Water or Fuel Truck Emission Factor (lb/VMT)	E	6.08	1.79	0.18



## Unpaved Road Emissions

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Fugitive Road Dust Emissions

**VMT Calculations:**

Number of Trips	Hourly <sup>2</sup>	Daily <sup>1</sup>	Annual <sup>1</sup>	
Mixing Building Trucks	4	91	33,326	trucks
Artic Trucks to Working Face from Building	9	105	38,325	trucks
Artic Trucks to Mixing Building from Landfill	2	14	4,999	trucks
Passenger Vehicles to Mixing Building	1	1	365	vehicles
Artic Trucks for Daily Cover	2	14	4,999	trucks
Artic Trucks for Intermediate Cover	3	27	9,998	trucks
Artic Trucks for Final Cover	3	27	9,998	trucks
Water Trucks	1	1	365	trucks
Fuel Trucks	1	1	365	trucks
Distances	Average		Control <sup>3</sup>	
One Way Distance from Treatment Facility to Landfill	3,000	feet	All watered	
Average One Way Distance from Building to Working Face	1,800	feet	2/3 watered	
Average One Way Distance from Soil Piles to Building	1,800	feet	2/3 watered	
Average One Way Distance for Daily and Intermediate Cover	1,000	feet	2/3 watered	
Average One Way Distance for Final Cover	2,000	feet	2/3 watered	
Average One Way Distance for Water Trucks	5,000	feet	All watered	
Average One Way Distance for Fuel Trucks	4,000	feet	All watered	
VMT Calculations	Hourly <sup>2</sup>	Daily <sup>1</sup>	Annual <sup>1</sup>	
VMT for Mixing Building Trucks	4.55	103.75	37,871	miles
VMT for Artic Trucks to Working Face from Building	6.14	71.59	26,131	miles
VMT for Artic Trucks to Mixing Building from Landfill	1.36	9.34	3,408	miles
VMT for Passenger Vehicles to Mixing Building	1.14	1.14	415	miles
VMT for Artic Trucks for Daily Cover	0.76	5.19	1,894	miles
VMT for Artic Trucks for Intermediate Cover	1.14	10.38	3,787	miles
VMT for Artic Trucks for Final Cover	2.27	20.75	7,574	miles
VMT for Water Trucks	1.89	1.89	691	miles
VMT for Fuel Trucks	1.52	1.52	553	miles

**Emissions:**

PM	Uncontrolled			Controlled		
	(lb/hr) <sup>2</sup>	(lb/day) <sup>1</sup>	(ton/yr) <sup>1</sup>	(lb/hr) <sup>2</sup>	(lb/day) <sup>1</sup>	(ton/yr) <sup>1</sup>
Source ID						
UPMAIN	38.79	885.48	161.60	11.64	265.64	48.48
UPPASS	3.18	3.18	0.58	0.95	0.95	0.17
UPWKFACE	52.37	610.98	111.50	27.93	325.86	59.47
UPSILRD	11.64	79.69	14.54	6.21	42.50	7.76
UPDCOVER	6.47	44.27	8.08	3.45	23.61	4.31
UPICOVER	9.70	88.55	16.16	5.17	47.23	8.62
UPFCOVER	19.40	177.10	32.32	10.34	94.45	17.24
UPWATER	11.51	11.51	2.10	3.45	3.45	0.63
UPFUEL	9.21	9.21	1.68	2.76	2.76	0.50

PM <sub>10</sub>	Uncontrolled			Controlled		
	(lb/hr) <sup>2</sup>	(lb/day) <sup>1</sup>	(ton/yr) <sup>1</sup>	(lb/hr) <sup>2</sup>	(lb/day) <sup>1</sup>	(ton/yr) <sup>1</sup>
Source ID						
UPMAIN	11.45	261.36	47.70	3.43	78.41	14.31
UPPASS	0.94	0.94	0.17	0.28	0.28	0.051
UPWKFACE	15.46	180.34	32.91	8.24	96.18	17.55
UPSILRD	3.43	23.52	4.29	1.83	12.55	2.29
UPDCOVER	1.91	13.07	2.38	1.02	6.97	1.27
UPICOVER	2.86	26.14	4.77	1.53	13.94	2.54
UPFCOVER	5.72	52.27	9.54	3.05	27.88	5.09
UPWATER	3.40	3.40	0.62	1.02	1.02	0.19
UPFUEL	2.72	2.72	0.50	0.82	0.82	0.15

PM <sub>2.5</sub>	Uncontrolled			Controlled		
	(lb/hr) <sup>2</sup>	(lb/day) <sup>1</sup>	(ton/yr) <sup>1</sup>	(lb/hr) <sup>2</sup>	(lb/day) <sup>1</sup>	(ton/yr) <sup>1</sup>
Source ID						
UPMAIN	1.14	26.14	4.77	0.34	7.84	1.43
UPPASS	0.094	0.094	0.017	0.028	0.028	0.0051
UPWKFACE	1.55	18.03	3.29	0.82	9.62	1.76
UPSILRD	0.34	2.35	0.43	0.18	1.25	0.23
UPDCOVER	0.19	1.31	0.24	0.10	0.70	0.13
UPICOVER	0.29	2.61	0.48	0.15	1.39	0.25
UPFCOVER	0.57	5.23	0.95	0.31	2.79	0.51
UPWATER	0.34	0.34	0.062	0.10	0.10	0.019
UPFUEL	0.27	0.27	0.050	0.082	0.082	0.015

**Notes:**

- Daily and Annual calculations are based on the landfill operating 365 days per year with average road distances.
- Hourly emissions in some cases will not occur every hour, but is the maximum that could occur in an hour. Hourly emissions are based on 24 hour per day operations for mixing building and 12 hour per day operations for the working face.
- Due to the working cell not being able to be watered because of the salt, the last 1/3 of the temporary roads to the cell will not be watered.

## Unpaved Road Emissions - Equipment Traffic

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Fugitive Road Dust Emissions

AP-42 Section 13.2.2 Unpaved Haul Roads, Final Section, November 2006.

Emission Factor Equation:  $E = [k(s/12)^a(W/3)^b] \cdot [(365-P)/365]$  Equation 13.2.2-1a and 13.2.2-2

where:

E = particulate emission factor (pounds per vehicle mile traveled, lb/VMT)

k, a, b = dimensionless constants

s = surface material silt content (%)

W = mean vehicle weight of the vehicles traveling the road (tons)

P = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period

### Operating Parameters:

Source ID	Vehicle Description	Description of Activity	Unloaded Vehicle Weight (Tons)	Loaded Vehicle Weight (Tons)
UPEXCAV	Loader/Excavator	Travel around the landfill of loaders or excavators to load the haul trucks	34.0	34.0
UPDOZER	Dozers	Travel of dozers around the landfill for spreading and compacting waste	15.0	15.0
UPGRADER	Graders	Travel of graders around the landfill	22.5	22.5

### Emission Factor Parameters:

Description	Variable	Value	Unit	Notes
Mean Silt Content of Unpaved Roads	s	10	%	G40-C permit guidance - AP-42 13.2.2-1 for quarries
Average Weight of Loaders/Excavators	W	34.0	tons	Based on weight of typical equipment
Average Weight of Dozers	W	15.0	tons	Based on weight of typical equipment
Average Weight of Graders	W	22.5	tons	Based on weight of typical equipment
Mean Days > 0.01-in precipitation	P	157	days	G40-C permit guidance - Table B, Zone 1
Control Efficiency	CE	0	%	No watering will occur at the working face

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Particle Size Multipliers for Unpaved Road Equation Table 13.2.2-2	k	4.9	1.5	0.15
	a	0.7	0.9	0.9
	b	0.45	0.45	0.45

### Emission Factors:

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Loader/Excavator Emission Factor (lb/VMT)	E	7.33	2.16	0.22
Dozer Emission Factor (lb/VMT)	E	5.07	1.50	0.15
Grader Emission Factor (lb/VMT)	E	6.09	1.80	0.18

### VMT Calculations:

Number of Trips	Hourly <sup>1</sup>	Daily <sup>2</sup>	Annual <sup>3</sup>	
Loaders/Excavators	7	20	7,300	vehicles
Dozers	15	150	54,750	vehicles
Graders	1	1	365	vehicles
<b>Distances</b>	<b>Average</b>			
Average One Way Distance Travel of Loader/Excavator	100	feet		
Average One Way Distance Travel of Dozer	200	feet		
Average One Way Distance Travel of Grader	5,000	feet		
<b>VMT Calculations</b>	<b>Hourly<sup>1</sup></b>	<b>Daily<sup>2</sup></b>	<b>Annual<sup>3</sup></b>	
VMT for Loader/Excavator	0.27	0.76	277	miles
VMT for Dozers	1.14	11.36	4,148	miles
VMT for Graders	1.89	1.89	691	miles

### Emissions:

PM	Uncontrolled			Controlled		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
Source ID						
UPEXCAV	1.94	5.55	1.01	1.94	5.55	1.01
UPDOZER	5.76	57.62	10.52	5.76	57.62	10.52
UPGRADER	11.53	11.53	2.10	11.53	11.53	2.10

PM <sub>10</sub>	Uncontrolled			Controlled		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
Source ID						
UPEXCAV	0.57	1.64	0.30	0.57	1.64	0.30
UPDOZER	1.70	17.01	3.10	1.70	17.01	3.10
UPGRADER	3.40	3.40	0.62	3.40	3.40	0.62

PM <sub>2.5</sub>	Uncontrolled			Controlled		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
Source ID						
UPEXCAV	0.057	0.16	0.030	0.057	0.164	0.0299
UPDOZER	0.17	1.70	0.31	0.170	1.70	0.310
UPGRADER	0.34	0.34	0.062	0.34	0.34	0.062

### Notes:

- Number of trips per hour are based on the number of hours that the equipment is anticipated to operate and rounded up: 3 hours for loaders/excavators and graders and 10 hours for dozers.
- Daily calculations are based on the average number of trips per day for each vehicle type.
- Annual calculations are based on the landfill operating 365 days per year with average travel distances.

## Material Handling Emissions

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Material Handling - Transfer Points

AP-42 Section 13.2.4 Aggregate Handling and Storage Piles, Final Section, November 2006.

**Emission Factor Equation:**  $E = k(0.0032)^U \left[ \frac{U}{5} \right]^{-2} \left[ \frac{M}{2} \right]^{1.4}$  Equation 13.2.4.3-1

where:

E = emission factor (pounds emission per ton of material (lb/ton))

k = dimensionless constant for particle size multiplier

U = mean wind speed in miles per hour (mph)

M = material moisture content (%)

Note: Although some of the material handled is salt, which has a higher moisture content than soil, the lower moisture content of soil is used in all of the calculations to be conservative as some of the salt is mixed with soil.

**Operating Parameters:**

Source ID	Source Description	Material Handled per Hour (tons/hr)	Material Handled per Day (tons/day)	Material Handled per Year (tons/year)
UNLOAD1	Salt Waste Unloaded in Mixing Building	87.5	2,100	766,500
LOAD1	Waste Loaded in Mixing Building	201.3	2,415	881,475
UNLOAD2	Waste Unloaded at Working Cell	201.3	2,415	881,475
LOAD2	Native Soil Loaded at Active Area or Stockpile	26.3	315	114,975
UNLOAD3	Native Soil Unloaded at Mixing Building	26.3	315	114,975
LOAD3	Loading daily cover soil at borrow area or stockpiles	26.3	315	114,975
UNLOAD4	Unloading daily cover soil at working cell	26.3	315	114,975
LOAD4	Loading intermediate cover soil at borrow area or stockpiles	52.5	630	229,950
UNLOAD5	Unloading intermediate cover soil at working cell	52.5	630	229,950
LOAD5	Loading final cover soil at borrow area or stockpiles	52.5	630	229,950
UNLOAD6	Unloading final cover soil at working cell	52.5	630	229,950

**Emission Factor Parameters:**

Description	Variable	Value	Unit	Notes
Mean wind speed	U	7	mph	G40-C permit guidance for transfer points
Material moisture content <sup>1</sup>	M	12	%	AP-42 Table 13.2.4-1 for cover at MSW landfills
Control factor for building	CE	70	%	G40-C permit guidance for unloading in a full enclosure
Control factor for watering	CE	0	%	Working face will not be watered due to moisture in salt waste

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>	
Particle Size Multipliers from AP-42 Section 13.2.4.3	k	0.74	0.35	0.053

**Emission Factors:**

	PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Emission Factor (lb/ton) E	0.00030	0.00014	0.000021

**Uncontrolled Emissions**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
UNLOAD1	0.026	0.63	0.11	0.012	0.30	0.054	0.0019	0.045	0.0082
LOAD1	0.060	0.72	0.13	0.028	0.34	0.062	0.0043	0.052	0.0094
UNLOAD2	0.060	0.72	0.13	0.028	0.34	0.062	0.0043	0.052	0.0094
LOAD2	0.0078	0.094	0.017	0.0037	0.044	0.0081	0.00056	0.0067	0.0012
UNLOAD3	0.0078	0.094	0.017	0.0037	0.044	0.0081	0.00056	0.0067	0.0012
LOAD3	0.0078	0.094	0.017	0.0037	0.044	0.0081	0.00056	0.0067	0.0012
UNLOAD4	0.0078	0.094	0.017	0.0037	0.044	0.0081	0.00056	0.0067	0.0012
LOAD4	0.016	0.19	0.034	0.0074	0.089	0.016	0.0011	0.013	0.0025
UNLOAD5	0.016	0.19	0.034	0.0074	0.089	0.016	0.0011	0.013	0.0025
LOAD5	0.016	0.19	0.034	0.0074	0.089	0.016	0.0011	0.013	0.0025
UNLOAD6	0.016	0.19	0.034	0.0074	0.089	0.016	0.0011	0.013	0.0025
<b>TOTAL:</b>	<b>0.24</b>	<b>3.20</b>	<b>0.58</b>	<b>0.11</b>	<b>1.51</b>	<b>0.28</b>	<b>0.017</b>	<b>0.23</b>	<b>0.042</b>

**Controlled Emissions<sup>2</sup>**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
UNLOAD1	0.0078	0.19	0.034	0.0037	0.089	0.016	0.00056	0.013	0.0025
LOAD1	0.018	0.22	0.039	0.0085	0.10	0.019	0.0013	0.015	0.0028
UNLOAD2	0.060	0.72	0.13	0.028	0.34	0.062	0.0043	0.052	0.0094
LOAD2	0.0078	0.094	0.017	0.0037	0.044	0.0081	0.00056	0.0067	0.0012
UNLOAD3	0.0024	0.028	0.0051	0.0011	0.013	0.0024	0.00017	0.0020	0.00037
LOAD3	0.0078	0.094	0.017	0.0037	0.044	0.0081	0.00056	0.0067	0.0012
UNLOAD4	0.0078	0.094	0.017	0.0037	0.044	0.0081	0.00056	0.0067	0.0012
LOAD4	0.016	0.19	0.034	0.0074	0.089	0.016	0.0011	0.013	0.0025
UNLOAD5	0.016	0.19	0.034	0.0074	0.089	0.016	0.0011	0.013	0.0025
LOAD5	0.016	0.19	0.034	0.0074	0.089	0.016	0.0011	0.013	0.0025
UNLOAD6	0.016	0.19	0.034	0.0074	0.089	0.016	0.0011	0.013	0.0025
<b>TOTAL:</b>	<b>0.17</b>	<b>2.19</b>	<b>0.40</b>	<b>0.083</b>	<b>1.03</b>	<b>0.19</b>	<b>0.012</b>	<b>0.16</b>	<b>0.029</b>

**Notes:**

- Moisture of the salt material is higher than the native soil. Soil moisture content used as a conservative value.
- Unloading (UNLOAD1 and UNLOAD3) and loading (LOAD1) in the building will be controlled based on the control efficiency for a full enclosure.

# Wind Erosion

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Wind Erosion

## Stockpiles

EPA-450/3-88-008, "Control of Open Fugitive Dust Sources"

**Emission Factor Equation:**  $E = 1.7 * (s/1.5)^{1.5} * ((365-p)/235)^{0.5} * (f/15)$  Equation 4-9  
 where:  
 E = PM emission factor (pounds emission per acre per day (lbs/acre-day))  
 s = silt content in percent  
 p = number of "wet" days with at least 0.254 mm (0.01 in) of precipitation during the averaging period  
 f = percentage of time the wind speed exceeds 12 mph at mean pile height

**Emission Factor Parameters:**

Description	Variable	Value	Unit	Notes
Silt Content	s	7.5	%	EPA-450/3-88-008, Table 4-1 mean value for overburden
Number of wet days	p	157	days	G40-C permit guidance - Table B, Zone 1
Percent time wind speed > 12 mph	f	20	%	G40-C permit guidance

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Particle Size Multipliers based on ratios from AP-42 Section 13.2.4.3	k	1	0.47	0.072

**Emission Factors:**

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Emission Factor (lb/acre-day)	E	10.03	4.74	0.72

**Operating Parameters:**

Source ID	Source Description	Acres
WIND3	Average daily acreage in outside stockpiles or borrow areas	2

**Notes:**

- Storage piles located in the mixing building will not have any emissions from wind erosion as they are located inside.
- Only 2 acres would be active or exposed at a time as the other stockpile or borrow areas will be seeded.

**Uncontrolled Emissions**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
WIND3	0.84	20.06	3.66	0.40	9.49	1.73	0.060	1.44	0.26

**Controlled Emissions**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
WIND3	0.84	20.06	3.66	0.40	9.49	1.73	0.06	1.44	0.26

# Wind Erosion

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Wind Erosion

## Exposed Areas

### AP-42 13.2.5 Industrial Wind Erosion, November 2006

**Emission Factor Equation:**  $E = k \cdot N \cdot P$  Equation 13.2.5-2

where:  
 E = PM emission factor (grams/square meter/year)  
 k = particle size multiplier  
 N = Number of disturbances per year  
 P = Erosion potential corresponding to the fastest mile between disturbances (g/m<sup>2</sup>)

**Erosion Potential Equation:**  $P = 58 \cdot (u^* - u_{t10})^2 + 25 \cdot (u^* - u_{t10})$  and  $P = 0$  for  $u^* \leq u_{t10}$  Equation 13.2.5-3

where:  
 P = erosion potential (g/m<sup>2</sup>)  
 u\* = friction velocity (m/s) - 0.053 \* u<sub>10</sub>  
 u<sub>t10</sub> = threshold friction velocity (m/s)  
 u<sub>10</sub> = fastest mile anemometer for period between disturbances (m/s)

### Emission Factor Parameters:

Description	Variable	Value	Unit	Notes
Number of disturbances for WIND1	N1	2,190	disturb/year	Assume area would be disturbed six times per day
Number of disturbances for WIND2	N2	104	disturb/year	Assume area would be disturbed twice per week
Number of disturbances for WIND4	N4	26	disturb/year	Assume area would be disturbed twice per week for 90 days
Friction velocity	u*	1.18	m/s	Equation 13.2.5-4
Threshold friction velocity for overburden	u <sub>t10</sub>	1.02	m/s	AP-42 Table 13.2.5-2
Highest gust wind speed	u <sub>10</sub>	22	m/s	May 2015 - April 2016 NWS data from Parkersburg

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Particle Size Multipliers, AP-42 Section 13.2.5.3	k	1	0.50	0.075

Erosion Potential, Equation 13.2.5-3	P	5.69	g/m <sup>2</sup>
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### Emission Factors:

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
WIND1 Emission Factor (g/m <sup>2</sup> -year)	E	12,458.63	6,229.32	934.40
WIND1 Emission Factor (lb/acre-day)	E	304.53	152.26	22.84
WIND2 Emission Factor (g/m <sup>2</sup> -year)	E	593.27	296.63	44.50
WIND2 Emission Factor (lb/acre-day)	E	14.50	7.25	1.09
WIND4 Emission Factor (g/m <sup>2</sup> -year)	E	146.29	73.14	10.97
WIND4 Emission Factor (lb/acre-day)	E	14.50	7.25	1.09

### Operating Parameters:

Source ID	Source Description	Acres
WIND1	Average daily active acreage at working face	0.23
WIND2	Average daily exposed, but inactive, acreage at working face	1
WIND4	Exposed winter areas that cannot be tarped	8

### Uncontrolled Emissions

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
WIND1	2.92	70.04	12.78	1.46	35.02	6.39	0.22	5.25	0.96
WIND2	0.60	14.50	2.65	0.30	7.25	1.32	0.045	1.09	0.20
WIND4	4.83	116.01	5.22	2.42	58.01	2.61	0.363	8.70	0.39

### Controlled Emissions

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
WIND1	2.92	70.04	12.78	1.46	35.02	6.39	0.22	5.25	0.96
WIND2	0.60	14.50	2.65	0.30	7.25	1.32	0.045	1.09	0.20
WIND4	4.83	116.01	5.22	2.42	58.01	2.61	0.363	8.70	0.39

## Other Operation Emissions

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Other Non-Fugitive Sources

### Cover Soil Compaction

AP-42 Section 11.9 Western Surface Coal Mining, July 1998

Emission Factor Equation:  $E1=5.7*(s^{1.2})/(M^{1.3})$  Table 11.9-1 Bulldozing Overburden  
 $E2=1.0*(s^{1.5})/(M^{1.4})$   
 where:  
 E1 = Total particulate emission factor (pounds per hour, lb/hr)  
 E2 = PM15 emission factor (pounds per hour, lb/hr)  
 s = material silt content (%)  
 M = material moisture content (%)

**Operating Parameters:**

Source ID	Vehicle Description	Description of Activity	Hours Per Day
COMP	Dozers	Compaction of waste and/or cover soil	12

**Emission Factor Parameters:**

Description	Variable	Value	Unit	Notes
Silt Content	s	7.5	%	Consistent with silt for wind erosion
Material moisture content	M	12	%	Consistent with moisture for transfer points
Control Efficiency	CE	0	%	Working face will not be watered due to moisture in salt waste

		PM <sub>10</sub>	PM <sub>2.5</sub>
Particle Size Multipliers, Table 11.9-1	*E1	0.75	---
	*E2	---	0.105

**Emission Factors:**

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Compaction Emission Factor (lb/hr)	E	2.53	1.90	0.047

**Uncontrolled Emissions**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
COMP	2.53	30.35	5.54	1.90	22.76	4.15	0.047	0.56	0.10

**Controlled Emissions**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
COMP	2.53	30.35	5.54	1.90	22.76	4.15	0.047	0.56	0.10

## Other Operation Emissions

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Other Non-Fugitive Sources

### Grading

AP-42 Section 11.9 Western Surface Coal Mining, July 1998

Emission Factor Equation:  $E1=0.040*(S^{2.5})$  Table 11.9-1 Grading  
 $E2=0.051*(S^{2.0})$

where:

E1 = Total particulate emission factor (pounds per vehicle miles traveled, lb/VMT)

E2 = PM15 emission factor (pounds per vehicle miles traveled, lb/VMT)

S = mean grader speed (mph)

**Operating Parameters:**

Source ID	Vehicle Description	Description of Activity	Hours Per Day	Feet per day
GRADER	Graders	Grading for road maintenance	3	10,000

**Emission Factor Parameters:**

Description	Variable	Value	Unit	Notes
Mean Vehicle Speed	S	7.1	mph	AP-42 Table 11.9-3
Control Efficiency	CE	0	%	Working face will not be watered due to moisture in salt waste

		PM <sub>10</sub>	PM <sub>2.5</sub>
Particle Size Multipliers, Table 11.9-1	*E1	0.60	---
	*E2	---	0.031

**Emission Factors:**

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Grading Emission Factor (lb/VMT)	E	5.37	3.22	0.080

**Uncontrolled Emissions**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
GRADER	3.39	10.18	1.86	2.04	6.11	1.11	0.050	0.15	0.028

**Controlled Emissions**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
GRADER	3.39	10.18	1.86	2.04	6.11	1.11	0.050	0.15	0.028

### Mixing Waste and Soil

AP-42 Section 11.19 Crushed Stone Processing and Pulverized Mineral Processing, August 2004

**Operating Parameters:**

Source ID	Description of Activity	Tons per day	Hours Per Day
MIXING	Mixing native soil with salt waste	2,415	24

**Emission Factor Parameters:**

Description	Variable	Value	Unit	Notes
Control factor for building	CE	70	%	G40-C permit guidance for activity in a full enclosure

**Emission Factors:**

		PM	PM <sub>10</sub>	PM <sub>2.5</sub>
Screening Emission Factor (lb/ton)	E	0.025	0.0087	0.0013

Notes: 1. No emission factor for mixing was available, so screening was used as a similar activity estimate  
 2. PM<sub>2.5</sub> factor was derived assuming the same ratio of PM<sub>2.5</sub>/PM<sub>10</sub> as material handling (0.15)

**Uncontrolled Emissions**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
MIXING	2.52	60.38	11.02	0.88	21.01	3.83	0.13	3.15	0.58

**Controlled Emissions**

Source ID	PM Emissions			PM <sub>10</sub> Emissions			PM <sub>2.5</sub> Emissions		
	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)	(lb/hr)	(lb/day)	(ton/yr)
MIXING	0.75	18.11	3.31	0.26	6.30	1.15	0.039	0.95	0.17

## Diesel Engine Emissions - Light Plants

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Light Plant

### Source Information

Emission Source ID	ENG001 - ENG002
Engine Make/Model	Mitsubishi L3E-W26ML
Service Type	Light Plant
Number of Engines	2
Emissions Level	Tier 4 <sup>3</sup>
Power (hp) <sup>1</sup>	12.2
Fuel Consumption (gal/hr) <sup>1</sup>	0.5
Fuel Consumption (gal/yr) <sup>2</sup>	375
Heat Rating (MMBtu/hr) <sup>2</sup>	0.068
Fuel Heating Value (Btu/gal)	135,000
Annual Operating Hours	750

1. Values retrieved from manufacturer specification sheet.
2. Calculated per engine.
3. For engines of this horsepower, there are no Tier 3 emission factors, so Tier 4 was assumed.

### Potential to Emit

Criteria Pollutants	Emission Factors		Per Engine		Total Engines		Emission Factor Source
	g/hp-hr	lb/MMBtu	Emissions		Emissions		
			lb/hr	tpy	lb/hr	tpy	
NOx <sup>4</sup>	5.3	---	0.14	0.054	0.29	0.11	Tier 4 emission levels
CO <sup>4</sup>	4.9	---	0.13	0.050	0.26	0.099	Tier 4 emission levels
VOC <sup>4</sup>	0.3	---	0.0075	0.0028	0.015	0.0056	Tier 4 emission levels
PM <sup>4</sup>	0.3	---	0.0080	0.0030	0.016	0.0060	Tier 4 emission levels
SO <sub>2</sub> <sup>5</sup>	---	0.29	0.020	0.0073	0.039	0.015	AP-42 Table 3.3-1
Hazardous Air Pollutants	Emission Factors <sup>5</sup>		Emissions		Emissions		Emission Factor Source
	g/hp-hr	lb/MMBtu	Emissions		Emissions		
			lb/hr	tpy	lb/hr	tpy	
1,3-Butadiene	---	3.91E-05	2.64E-06	9.90E-07	5.28E-06	1.98E-06	AP-42 Table 3.3-2
Acetaldehyde	---	7.67E-04	5.18E-05	1.94E-05	1.04E-04	3.88E-05	AP-42 Table 3.3-2
Acrolein	---	9.25E-05	6.24E-06	2.34E-06	1.25E-05	4.68E-06	AP-42 Table 3.3-2
Benzene	---	9.33E-04	6.30E-05	2.36E-05	1.26E-04	4.72E-05	AP-42 Table 3.3-2
Formaldehyde	---	1.18E-03	7.97E-05	2.99E-05	1.59E-04	5.97E-05	AP-42 Table 3.3-2
Naphthalene	---	8.48E-05	5.72E-06	2.15E-06	1.14E-05	4.29E-06	AP-42 Table 3.3-2
Toluene	---	4.09E-04	2.76E-05	1.04E-05	5.52E-05	2.07E-05	AP-42 Table 3.3-2
Xylenes	---	2.85E-04	1.92E-05	7.21E-06	3.85E-05	1.44E-05	AP-42 Table 3.3-2
<b>Total HAPs</b>	---	---	<b>2.56E-04</b>	<b>9.59E-05</b>	<b>5.12E-04</b>	<b>1.92E-04</b>	
Greenhouse Gases	Emission Factors		Emissions		Emissions		Emission Factor Source
	g/hp-hr	kg/MMBtu	Emissions		Emissions		
			lb/hr	tpy	lb/hr	tpy	
CO <sub>2</sub>	---	73.96	11.03	4.14	22.07	8.27	40 CFR Part 98 Subpart C Table C-1
CH <sub>4</sub>	---	0.003	0.00045	0.00017	0.00090	0.00034	40 CFR Part 98 Subpart C Table C-2
N <sub>2</sub> O	---	0.0006	0.000090	0.000034	0.00018	0.000067	40 CFR Part 98 Subpart C Table C-2
CO <sub>2</sub> e	---	---	11.07	4.15	22.14	8.30	40 CFR Part 98 Subpart A Table A-1

4. Emissions from NOx, CO, VOC, and PM are based on EPA Tier 4 emission standards for nonroad diesel fueled engines with a horsepower rating between 11 HP to 25 HP. It is assumed that 95% of the NMHC+NOx emissions are NOx, and 5% are VOC.

5. SO<sub>2</sub> and HAP emission factors retrieved from AP-42 Section 3.3-2.



## Diesel Engine Emissions - Emergency Generator

<b>Company Name:</b>	Antero Treatment LLC
<b>Facility Name:</b>	Clearwater Landfill
<b>Facility Location:</b>	Doddridge County, WV
<b>Source Description:</b>	Emergency Generator

### Source Information

Emission Source ID	ENG003
Engine Make/Model	Generac 48/50 kW
Service Type	Emergency Generator
Number of Engines	1
Emissions Level	Tier 3
Power (hp) <sup>1</sup>	85
Fuel Consumption (gal/hr) <sup>1</sup>	3.98
Fuel Consumption (gal/yr) <sup>2</sup>	1,990
Heat Rating (MMBtu/hr) <sup>2</sup>	0.54
Fuel Heating Value (Btu/gal)	135,000
Annual Operating Hours	500

1. Values retrieved from manufacturer specification sheet.

2. Calculated per engine.

### Potential to Emit

Criteria Pollutants	Emission Factors		Per Engine		Total Engines		Emission Factor Source
			Emissions		Emissions		
	g/hp-hr	lb/MMBtu	lb/hr	tpy	lb/hr	tpy	
NO <sub>x</sub> <sup>3</sup>	3.3	---	0.62	0.16	0.62	0.16	Tier 3 emission levels
CO <sup>3</sup>	3.7	---	0.70	0.17	0.70	0.17	Tier 3 emission levels
VOC <sup>3</sup>	0.2	---	0.033	0.0082	0.033	0.0082	Tier 3 emission levels
PM <sup>4</sup>	0.3	---	0.056	0.014	0.056	0.014	Tier 3 emission levels
SO <sub>2</sub> <sup>4</sup>	---	0.29	0.16	0.039	0.16	0.039	AP-42 Table 3.3-1
Hazardous Air Pollutants	Emission Factors <sup>4</sup>		Emissions		Emissions		Emission Factor Source
	g/hp-hr	lb/MMBtu	lb/hr	tpy	lb/hr	tpy	
1,3-Butadiene	---	3.91E-05	2.10E-05	5.25E-06	2.10E-05	5.25E-06	AP-42 Table 3.3-2
Acetaldehyde	---	7.67E-04	4.12E-04	1.03E-04	4.12E-04	1.03E-04	AP-42 Table 3.3-2
Acrolein	---	9.25E-05	4.97E-05	1.24E-05	4.97E-05	1.24E-05	AP-42 Table 3.3-2
Benzene	---	9.33E-04	5.01E-04	1.25E-04	5.01E-04	1.25E-04	AP-42 Table 3.3-2
Formaldehyde	---	1.18E-03	6.34E-04	1.59E-04	6.34E-04	1.59E-04	AP-42 Table 3.3-2
Naphthalene	---	8.48E-05	4.56E-05	1.14E-05	4.56E-05	1.14E-05	AP-42 Table 3.3-2
Toluene	---	4.09E-04	2.20E-04	5.49E-05	2.20E-04	5.49E-05	AP-42 Table 3.3-2
Xylenes	---	2.85E-04	1.53E-04	3.83E-05	1.53E-04	3.83E-05	AP-42 Table 3.3-2
<b>Total HAPs</b>	---	---	<b>2.04E-03</b>	<b>5.09E-04</b>	<b>2.04E-03</b>	<b>5.09E-04</b>	
Greenhouse Gases	Emission Factors		Emissions		Emissions		Emission Factor Source
	g/hp-hr	kg/MMBtu	lb/hr	tpy	lb/hr	tpy	
CO <sub>2</sub>	---	73.96	87.82	21.96	87.82	21.96	40 CFR Part 98 Subpart C Table C-1
CH <sub>4</sub>	---	0.003	0.0036	0.00089	0.0036	0.00089	40 CFR Part 98 Subpart C Table C-2
N <sub>2</sub> O	---	0.0006	0.00071	0.000178	0.00071	0.000178	40 CFR Part 98 Subpart C Table C-2
CO <sub>2</sub> e	---	---	88.12	22.03	88.12	22.03	40 CFR Part 98 Subpart A Table A-1

3. Emissions from NO<sub>x</sub>, CO, VOC, and PM are based on EPA Tier 3 emission standards for nonroad diesel fueled engines with a horsepower rating between 75 HP to 100 HP. It is assumed that 95% of the NMHC+NO<sub>x</sub> emissions are NO<sub>x</sub>, and 5% are VOC.

4. SO<sub>2</sub> and HAP emission factors retrieved from AP-42 Section 3.3-2 since the engine is less than 600 HP.

**Attachment O.**  
**Monitoring, Recordkeeping, Reporting, and Testing Plans**

# Monitoring, Recordkeeping, Reporting, and Testing Plans

The following is a summary of the methods to comply with the requirements of West Virginia Division of Air Quality (WVDAQ) 45CSR13 rules and regulations for the Clearwater Landfill.

## 1. Summary of Key Operational Throughput Limits

- a. Maximum salt waste to landfill: 766,500 tons per year

## 2. Operational Requirements

- a. Generator engine and light plant engines will meet Tier III emission standards and will be fueled by diesel only.
- b. During the nine non-winter months of the year, exposed, but inactive areas, of the landfill will be covered with Reinforced Landfill Covers for dust control.
- c. The road from the Clearwater Treatment Facility to the Clearwater Landfill will be watered as needed for dust control.
- d. The temporary roads leading to the working face will be watered for dust control up to the point where they lead into the working cell.

## 3. Recordkeeping

- a. Records will be kept in company records (on or off-site) for a minimum of 5 years.
- b. Records will be kept of inspections, observations, preventive maintenance, watering, and shutdowns at the facility.
- c. The daily and rolling twelve-month total amount of truck trips will be recorded.
- d. The daily and rolling twelve-month total amount of waste entering the facility will be recorded.

## 4. Notifications and Reports

- a. Notify WVDAQ within 30 calendar days of commencement of construction.
- b. Notify WVDAQ within 30 calendar days of startup.
- c. Upon startup, file a Certificate to Operate (CTO) application and pay fees to WVDAQ for the period from startup to the following June 30 and then annually renew the CTO and pay fees. Maintain CTO on-site.
- d. If operations are suspended for 60 days or more, notify WVDAQ within 2 weeks after the 60<sup>th</sup> day.

**Attachment P.  
Public Notice**

**AIR QUALITY PERMIT NOTICE**  
**Notice of Application – Clearwater Landfill**

Notice is given that Antero Treatment LLC has applied to the West Virginia Department of Environmental Protection, Division of Air Quality, for a 45CSR13 Construction Permit for a non-municipal waste landfill located south of US-50 near Greenwood, in Doddridge County, West Virginia. The latitude and longitude coordinates are: 39.26425N, 80.90675W.

The applicant estimates the potential to discharge the following Regulated Air Pollutants will be:

<b>Pollutant</b>	<b>Emission Rate (tons per year)</b>
<u><i>Non-Fugitive Sources</i></u>	
Total PM (PM)	33.58
Particulate Matter less than 10 $\mu\text{m}$ (PM <sub>10</sub> )	17.57
Particulate Matter less than 2.5 $\mu\text{m}$ (PM <sub>2.5</sub> )	2.13
Nitrogen Oxides (NO <sub>x</sub> )	0.26
Carbon Monoxide (CO)	0.27
<u><i>Fugitive Sources</i></u>	
Total PM (PM)	162.67
Particulate Matter less than 10 $\mu\text{m}$ (PM <sub>10</sub> )	48.58
Particulate Matter less than 2.5 $\mu\text{m}$ (PM <sub>2.5</sub> )	4.77

Startup of operation is planned to begin on or about July 2017, with construction starting in November 2016. Written comments will be received by the West Virginia Department of Environmental Protection, Division of Air Quality, 601 57<sup>th</sup> 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 1250, during normal business hours.

Dated this the 28th day of June 2016.

By: Antero Resources Corporation  
Barry Schatz  
Senior Environmental and Regulatory Manager  
1615 Wynkoop Street  
Denver, CO 80202

**Attachment R.  
Authority/Delegation of Authority**

**Attachment R  
AUTHORITY OF CORPORATION  
OR OTHER BUSINESS ENTITY (DOMESTIC OR FOREIGN)**

TO: The West Virginia Department of Environmental Protection,  
Division of Air Quality

DATE: June 13, 2016

ATTN.: Director

Corporation's / other business entity's Federal Employer I.D. Number 30-0882879

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 is used in the conduct of an incorporated business or other business entity.

Further, the corporation or the business entity certifies as follows:

(1) Barry Schatz (is/are) the authorized representative(s) and in that capacity may represent the interest of the corporation or the business entity and may obligate and legally bind the corporation or the business entity.

(2) The corporation or the business entity is authorized to do business in the State of West Virginia.

(3) If the corporation or the business entity changes its authorized representative(s), the corporation or the business entity shall notify the Director of the West Virginia Department of Environmental Protection, Division of Air Quality, immediately upon such change.

  
Al Schopp, Regional Senior Vice President and Chief Administrative Officer

\_\_\_\_\_  
President or Other Authorized Officer  
(Vice President, Secretary, Treasurer or other official in charge of a principal business function of the corporation or the business entity)

(If not the President, then the corporation or the business entity must submit certified minutes or bylaws stating legal authority of other authorized officer to bind the corporation or the business entity).

\_\_\_\_\_  
Secretary

Antero Treatment LLC  
\_\_\_\_\_  
Name of Corporation or business entity