



## **Northwest Clean Air Agency**

# **General Order of Approval GO 001 Dairy Manure Anaerobic Digester Systems with Engine-Generators**

**Effective August 28, 2012**

This General Order is applicable to any source applying for coverage within the jurisdiction of the Northwest Clean Air Agency (Island, Skagit, and Whatcom Counties).

Pursuant to the state of Washington Clean Air Act Chapter 70.94 Revised Code of Washington (RCW) and the Northwest Clean Air Agency (NWCAA) Regulation, NWCAA finds the following:

### **FINDINGS**

1. Any dairy manure anaerobic digester facility that includes at least one engine generator to produce electricity proposing to operate in one of the counties listed above may request coverage under this General Order.
2. A dairy manure anaerobic digester facility cannot obtain coverage under this Order if it is part of a new major stationary source or constitutes a major modification to a major stationary source. The addition of the dairy manure anaerobic digester facility to an existing source must not make the source subject to the Air Operating Permit (AOP) program or require a modification to an existing AOP.
3. The applicant must apply for coverage under this General Order. Please contact the Northwest Clean Air Agency at:

Northwest Clean Air Agency  
1600 South Second Street  
Mount Vernon, WA 98273-5202  
(360) 428-1617

Or on the internet at [www.nwcleanair.org](http://www.nwcleanair.org).

4. The proposed dairy manure anaerobic digester facility, if constructed and operated in accordance with the application and this General Order, will meet the requirements for Best Available Control Technology (BACT) for criteria pollutants and BACT for toxics (tBACT).
5. This General Order applies to the operation of a dairy manure anaerobic digestion system meeting the criteria of RCW 70.95.330 and associated digester-fueled engine-generators and digester gas flares meeting the size and siting requirements in Approval Condition 1.
6. Coverage under this General Order of Approval is effective thirty (30) days after receipt by NWCAA of an application for coverage under this General Order of Approval, unless NWCAA has notified the applicant in writing that the application is incomplete or the General Order does not apply to the proposed facility. If the application is incomplete, NWCAA shall notify the applicant of the information needed to complete the application. If the NWCAA determines that the General Order does not apply, the NWCAA shall notify the applicant of the reasons why the General Order does not apply.

7. This General Order and the availability of emission control techniques will be reviewed at least every five years after issuance of the Order. If changes are needed, the General Order will be revised and an updated General Order will be issued. Facilities that have been permitted for construction and operation under this General Order prior to issuance of an updated Order in the future remain covered by this General Order.

**THEREFORE, IT IS ORDERED** that a dairy manure anaerobic digester system that meets the specification and limitations contained in this General Order, and more specifically detailed in the Technical Support Document prepared July 2012 is approved for construction, installation, and operation, provided that the following conditions are met.

### **APPROVAL CONDITIONS**

#### 1. OPERATION AND EMISSION LIMITATIONS

- 1.1. Anaerobic digester operation and design must comply with the following requirements:
  - 1.1.1. The anaerobic digester must process at least fifty percent dairy cattle manure by volume.
  - 1.1.2. If the facility receives offsite waste, then the facility must maintain records onsite demonstrating compliance with RCW 70.95.330(3)(a) through (f).
- 1.2. Digester gas requirements
  - 1.2.1. Maximum design gas production must be between 20,000 and 400,000 cu. ft./day.
  - 1.2.2. Beginning after the initial start-up period as defined in Approval Condition 4.1.2.3, maximum digester gas hydrogen sulfide concentration must not exceed 550 ppm<sub>dv</sub> when tested in accordance with Approval Condition 4.1.2.
  - 1.2.3. Beginning after the initial start-up period as defined in Approval Condition 4.1.2.3, the 30-day rolling average digester gas hydrogen sulfide concentration must not exceed 350 ppm<sub>dv</sub> when tested in accordance with Approval Condition 4.1.2.
- 1.3. Engine-generator requirements
  - 1.3.1. Spark ignition reciprocating engines must be new engines, either lean or richburn design, that meet the following emission requirements :
    - 1.3.1.1. Nitrogen oxide emissions must not exceed 1 g/bhp-hr;
    - 1.3.1.2. Carbon monoxide emissions must not exceed 2.2 g/bhp-hr; and
    - 1.3.1.3. Volatile organic compound emissions must not exceed 2 g/bhp-hr.
  - 1.3.2. Except during periods of startup or shutdown of the engines, visible emissions from the engine generator shall not exceed five percent opacity for a period or periods aggregating more than three minutes in any one hour as measured by Washington Department of Ecology Method 9A. Startup and shutdown periods shall not exceed five minutes.
- 1.4. Flare requirements
  - 1.4.1. A flare must be installed capable of combusting at least the maximum design gas production rate expected to be produced by the digester.

- 1.4.2. Except during periods of startup or shutdown of the flare, visible emissions from the flare shall not exceed five percent opacity for a period or periods aggregating more than three minutes in any one hour as measured by Washington Department of Ecology Method 9A. Startup and shutdown periods shall not exceed five minutes.
- 1.4.3. The flare shall be operational at all times when emissions may be vented to it. The flare shall be equipped with a thermocouple at the tip to monitor flame existence.
- 1.4.4. All digester gas must be routed to and burned in the flare anytime the engine is not operating.
- 1.5. The engine exhaust stack and flare height and location requirements
  - 1.5.1. All engine exhaust stacks and flares must be located at least 85 feet from the property line of the facility.
  - 1.5.2. All engine exhaust stacks and flares must exhaust vertically and be at least 6 feet higher than the height of any building within 20 feet of the stack or flare.
  - 1.5.3. All engine exhaust stacks must exhaust at least 32 feet above finished floor level.
2. RESTRICTIONS
  - 2.1. Non-dairy wastes:
    - 2.1.1. The source must minimize off-site odors detrimental to the use or enjoyment of off-site properties.
    - 2.1.2. Non-dairy waste must enter the digester within 36 hours of arriving at the facility.
    - 2.1.3. Non-dairy waste introduced to the anaerobic digester must be done in a manner that does not cause or contribute to an exceedance of an emission standard under section 1.2 of this Order.
3. REQUIRED PLANS
  - 3.1. The anaerobic digester, engine-generator set, and flare operational parameters and practices and manufacturer's operation and maintenance manuals must be included in a site specific Operations and Maintenance (O&M) manual for the anaerobic digester facility. The O&M manual shall be prepared by the digester system designer and must reflect the actual equipment installed. The O&M manual must be followed by the permittee, and shall be available for review by NWCAA upon request. Emissions that result from a failure to follow the O&M manual that would affect compliance with the conditions of this permit may be considered credible evidence that the source is not being properly operated and maintained. The O&M manual shall at a minimum include:
    - 3.1.1. Normal operating parameters for all digester, hydrogen sulfide control, engine generator and flare equipment, including manure/organic waste feed pumps and digestate handling equipment.
    - 3.1.2. Describe corrective actions to be taken when parameter monitoring indicates that an emission limit of this Order is exceeded or digester, bioreactor, or hydrogen sulfide control system conditions deviate from the operating conditions necessary for proper digester operation, operation of the engine or flare, or hydrogen sulfide reduction.

#### 4. MONITORING/RECORDKEEPING/REPORTING

4.1. The permittee must collect and retain for five years the following information:

4.1.1. Daily records of:

4.1.1.1. The amount and type of non-manure waste received at the facility

4.1.1.2. Quantity of digester gas produced in standard cu. ft./day

4.1.1.3. Quantity of digester gas combusted in the engine-generator, in standard cu. ft./day

4.1.1.4. The date, time, duration, and cause of any periods that the engine-generator is out of service, including downtime for maintenance.

4.1.2. Digester gas hydrogen sulfide content testing

4.1.2.1. Testing of the digester gas will be at a point immediately upstream of the engine and flare.

4.1.2.2. Testing will utilize gas detection tubes with a concentration range designed to accurately measure the concentration of hydrogen sulfide in the biogas at the time of measurement. A suitable hydrogen sulfide monitoring instrument of the same or greater sensitivity as the gas detection tubes may be used as an alternative.

4.1.2.3. Initial start-up of the digester must not exceed six months in duration. This one-time initial start-up period begins when manure or other feedstocks are first introduced to the digester. During this initial start-up period the operator must measure and record the following information:

4.1.2.3.1. Daily hydrogen sulfide measurements, in ppm<sub>dv</sub>;

4.1.2.3.2. The method used to measure hydrogen sulfide; and

4.1.2.3.3. Digester gas production in standard cubic feet per day.

4.1.2.4. After the initial start-up period, digester gas testing will occur at seven calendar day intervals, provided that the source demonstrates that the digester has operated within the hydrogen sulfide limits established in this Order daily for 90 consecutive days. If an exceedance of the hydrogen sulfide limit occurs, then the source shall monitor the biogas for hydrogen sulfide on a daily basis until 90 consecutive days of compliance are demonstrated. The source may then test the biogas for hydrogen sulfide at seven day intervals.

4.2. Engine emissions testing

4.2.1. Spark ignition engines that have not been certified by EPA for use on digester gas and meeting the emission limitations in Approval Condition 1.2 must be tested annually as required in 40 CFR 60.4243 using the methods and calculation procedures prescribed in 40 CFR 60.4244.

4.3. Reporting

4.3.1. The permittee shall notify NWCAA within seven calendar days, by letter, of the date of initial start-up of the anaerobic digester facility.

4.3.2. The permittee shall notify NWCAA within seven calendar days of any digester gas hydrogen sulfide measurement above the limitation in Condition 1.2.2, the probable cause of such deviations, and any corrective actions or preventive measures taken.

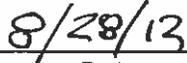
4.3.3. All records and monitoring information must be available at the facility and accessible for review and copying by NWCAA staff on request during normal business hours.

5. GENERAL CONDITIONS

- 5.1. Access to the source for the purpose of determining compliance with the terms of this General Order of Approval by the permitting authority staff must be permitted during normal business hours. Failure to allow such access is grounds for revocation of coverage under this General Order or an enforcement action under the Washington State Clean Air Act.
- 5.2. Legible copies of this General Order of Approval and the O&M manual(s) must be kept on-site and available to employees in direct operation of the facility and must be available for review upon request by staff from the permitting authority.
- 5.3. Operation of the digester facility must be conducted in compliance with all data and specifications submitted as part of the General Order application and in accordance with the O&M manual requirements.
- 5.4. The permittee is required to comply with applicable rules and regulations pertaining to air quality, and conditions of operation imposed upon issuance of this order. Any violation of applicable state and/or federal air quality rules and regulations or of the terms of this approval is subject to the sanctions provided in Chapter 70.94 RCW. Authorization under this Order may be modified, suspended, or revoked in whole or part for cause including, but not limited to, the following:
- 5.4.1. Violation of any term or condition of this authorization.
- 5.4.2. Obtaining this authorization by misrepresentation or failure to fully disclose all relevant facts.
- 5.4.3. Receipt of this General Order requires the permittee to register the applicable source emission unit(s) with NWCAA. Upon request, the permittee must submit an inventory of emissions from the applicable source emission unit(s) and pay all applicable registration fees.
- 5.4.4. The provisions of this General Order of Approval are severable and if any provision of this authorization, or application of any provisions of this authorization to any circumstance is held invalid, the application of such provision to their circumstances, and the remainder of this authorization shall not be affected thereby.

**APPROVED BY:**

  
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Mark Buford, P.E.  
Assistant Director  
Northwest Clean Air Agency

  
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Date

### **YOUR RIGHT TO APPEAL**

You have a right to appeal this Order to the Pollution Control Hearing Board (PCHB) within 30 days of the date of receipt of this Order. "Date of receipt" is defined in RCW 43.21B.001(2).

To appeal you must do the following within 30 days of the date of receipt of this Order:

- File your appeal and a copy of this Order with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of your appeal and this Order on NWCAA in paper form—by mail or in person. (See addresses below). E-mail is not accepted.

### **ADDRESS AND LOCATION INFORMATION**

| <b>Street Addresses</b>   | <b>Mailing Addresses</b>  |
|---|---|
| <b>Pollution Control Hearings Board</b><br>1111 Israel Road SW, Suite 301<br>Tumwater, WA 98501 | <b>Pollution Control Hearings Board</b><br>P.O. Box 40903<br>Olympia, WA 98504-0903 |

For additional information, visit the Environmental Hearings Office website at <http://www.eho.wa.gov>.