



**STATE OF CONNECTICUT
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR MANAGEMENT**

**NEW SOURCE REVIEW PERMIT
TO CONSTRUCT AND OPERATE
A STATIONARY SOURCE**

Issued pursuant to Title 22a of the Connecticut General Statutes and Section 22a-174-3a of the Regulations of Connecticut State Agencies.

Owner/Operator: Town of Manchester, Sanitation Division
Address: 41 Center Street, P.O. Box 191, Manchester, CT
Equipment Location: Manchester Landfill, 1 Landfill Way,
Manchester, CT
Equipment Description: Municipal Solid Waste Landfill w/ Gas Collection
and Odor Control System (Perennial Energy XLE
Enclosed Landfill Flare)

Town-Permit Numbers: 097-0114
Premises Number: 0225
Original Permit Issue Date: 10/26/2000
Modification Issue Date: January 16, 2009
Expiration Date: None

/s/ Anne Gobin for _____
Gina McCarthy
Commissioner

January 16, 2009 _____
Date

**PERMIT FOR MUNICIPAL SOLID WASTE LANDFILL
AND GAS COLLECTION AND ODOR CONTROL SYSTEM**

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This permit specifies necessary terms and conditions for the operation of this equipment to comply with state and federal air quality standards. The Permittee shall at all times comply with the terms and conditions stated herein.

PART I. General Description

The Town of Manchester, Sanitation Division (Town of Manchester) voluntarily installed a gas collection and odor control system (GCOCS) in 2001 for the control of odors from this landfill. Although the landfill is subject to 40 CFR Part 60 Subpart WWW - Standards of Performance for Municipal Solid Waste Landfills, the Town of Manchester was not required to install and operate this system to comply with Subpart WWW due to the non-methane organic compound (NMOC) generation rate being below 50 megagrams per year.

The GCOCS originally consisted of the following components: 1) 30 landfill gas (LFG) collection wells (24 around the landfill perimeter and 6 in the landfill interior), 2) lateral piping from the LFG collection wells to a main header, 3) leachate discharge piping and condensate collection sumps, air-pumps and discharge piping, 4) a combined leachate/condensate pumping station with discharge piping to the sanitary sewer, and 5) an enclosed flare (Perennial Energy extreme Low Emissions Burner System (XLE) Flare). Changes to the existing system could occur based on the systems age, existing conditions at the landfill and any proposed closure design that occurs in the future.

PART II. OPERATIONAL CONDITIONS AND DESIGN SPECIFICATIONS:

A. Operational Conditions

1. Fuel Type(s): Landfill Gas & Waste Propane
2. Maximum Fuel Consumption over any Consecutive Twelve (12) Month Period (MMft³): 298
3. Fuel Filter Performance Specifications:
 - a. Capture Efficiency (%): 100
 - b. Removal Efficiency (%): 99.5 (> or = to 3 micrometers)
 - c. Overall Efficiency (%): 99.5 (> or = to 3 micrometers)
4. Minimum Flare Allowable Combustion Temperature* (°F): 1,400
5. Minimum Flare Residence Time* (seconds): 0.6
6. Minimum Flare Destruction Efficiency*: 99% destruction of non-methane organic compounds (NMOC) or an NMOC outlet concentration of 20 parts per million by volume (ppmv), dry basis as hexane at 3% oxygen; 98%

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conversion of sulfur in the waste gas to sulfur oxides in the exhaust from the flare

* Parts II.A.4, II.A.5 and II.A.6 of this permit shall only apply when the LFG has a heat input value to the enclosed flare of 2.0 MMBtu/hr or greater.

B. Design Specifications

1. Maximum Fuel Firing Rate (scfm): 567
2. Maximum Gross Heat Input (MMBTU/hr): 17.0 (@ Estimated LFG Heat Content of 500 BTU/ft³)
3. Minimum Stack Height (ft): 30.6
4. Maximum Exhaust Gas Flow Rate (acfm): 35,256
5. Minimum Distance from Stack to Property Line (ft): 1,512

PART III. OPERATIONAL & MAINTENANCE REQUIREMENTS

- A.** The Permittee shall operate and maintain the enclosed flare and GCOCS in accordance with the manufacturer's specifications and written recommendations.
- B.** The Permittee shall operate the enclosed flare with no visible emissions as determined by Reference Method 22, Visual Determination of Fugitive Emissions from Material Sources and Smoke Emissions from Flares, except for periods not to exceed a total of five minutes during any two consecutive hours.
- C.** The Permittee shall operate the enclosed flare with a flame present at all times except as required during maintenance. The presence of a flare pilot flame shall be monitored by thermocouple or any other equivalent device to detect the presence of a flame.
- D.** The Permittee shall operate the enclosed flare only when the methane content of the LFG equals or exceeds 30% by volume (i.e. 300 Btu/scf) or the LFG flow equals or exceeds 300 scfm. In the event the enclosed flare is required to operate when the LFG does not meet the aforementioned values, the Permittee shall continue to operate the flare, as practicable, while the Permittee prepares and submits to the Commissioner an evaluation of the continued viability of the flare to reliably operate and maintain reasonably high destruction efficiencies at low gas flows and/or low methane concentrations.

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PART III. OPERATIONAL & MAINTENANCE REQUIREMENTS, continued

- E.** The Permittee shall promptly shutdown the GCOCS blower whenever the enclosed flare or other in place controls are inoperable. All valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour.
- F.** The Permittee shall train all flare operating personnel annually on the operation of the flare according to the manufacturer's operating procedures and trouble shooting techniques.
- G.** The Permittee shall ensure the GCOCS be operated and maintained only by personnel properly trained in its operation.
- H.** The Permittee shall not inject LFG condensate and/or landfill leachate into the enclosed flare.
- I.** The Permittee shall restrict the public from uncontrolled access to any location on the premises/landfill.
- J.** The Permittee shall maintain the integrity and collection efficiency of the LFG collection system. Such maintenance activities assuring the continued effectiveness of the LFG collection system shall be completed in a timely manner and shall include, but not be limited to, the following:
 - 1. repairing or replacing any damaged LFG well or other component of the LFG collection system on a schedule based on good engineering judgment for the control of odors from landfills. If a final landfill closure plan exists, the schedule shall be based in consideration of the final closure plan;
 - 2. modifying any LFG well or other component of the LFG collection system to assure its continued effectiveness on a schedule based on good engineering judgment for the control of odors from landfills. If a final landfill closure plan exists, the schedule shall be based in consideration of the final closure plan;
 - 3. providing reasonable safeguards to prevent damage to the LFG wells or other components of the LFG collection system;
 - 4. accounting for the collection and control of additional LFG and odorous compounds (e.g. hydrogen sulfide) generated as a result of any future landfill expansion

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PART III. OPERATIONAL & MAINTENANCE REQUIREMENTS, continued

- K.** The Permittee shall amend its Operations and Maintenance Plan to include such procedures as required assuring compliance with Part VI.A and Part V of this permit.
- L.** The Permittee shall include in the facility's amended Operations and Maintenance Plan procedures to mitigate nuisance odors from the landfill.
- M.** The Permittee shall submit an amended Operations and Maintenance Plan to the Commissioner for review and approval within ninety (90) days of the effective date of this modified permit.

PART IV. GCOCS & LANDFILL EMISSIONS

A. GCOCS Flare Emission Limits

The Permittee shall not allow emissions from this source to exceed the emission limits stated herein at any time.

<u>Criteria Pollutants</u>	<u>lb/hr</u>	<u>TPY</u>
TSP	0.95	4.2
PM-10	0.95	4.2
SOx	3.40	14.9
NOx	0.94	4.1
VOC as NMOC		
(≥2.0 MMBTU/hr heat input to flare)	0.054	--
(<2.0 MMBTU/hr heat input to flare)	1.04	--
(Total)	--	4.6
CO	1.33	5.8

B. Total Landfill NMOC Production (Before GCOCS)

<u>Criteria Pollutants</u>	<u>TPY</u>	<u>Mg</u>
VOC as NMOC	24.2	22.0

C. Hazardous Air Pollutants

The emissions from the enclosed flare shall not exceed the Maximum Allowable Stack Concentration for any hazardous air pollutant listed in RCSA Section 22a-174-29. [State-Only Requirement]

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PART IV. GCOCS & LANDFILL EMISSIONS, continued

- D. Demonstrations of compliance with the emission limits in Part IV of this permit may be met by calculating the emission rates using emission factors and data from the sources noted below:
1. Initial Compliance Demonstration Test Data
 2. Manufacturer's Emissions Data
 3. AP-42, Fifth Edition, Section 13.5
 4. VOC emissions are based on a 99% VOC destruction efficiency of enclosed flare and an assumed VOC gas collection rate of 50%.
 5. SOx emissions are based on a 98% overall oxidation of sulfur compounds contained in the waste gas and 98% overall oxidation of reduced sulfur to oxides of sulfur
 6. Mg = Megagrams; 50 Mg = 55.11 tons

PART V. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS

A. MONITORING REQUIREMENTS

1. The Permittee shall monitor gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except under the following conditions:
 - a. A fire or increased well temperature. (The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire);
 - b. Use of a geomembrane or synthetic cover. (The owner or operator shall develop acceptable pressure limits in their O&M plan);
 - c. A decommissioned well. (A well may experience a static positive pressure after shut down to accommodate for declining flows).

If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure.

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PART V. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS, continued

If measured levels are due to declining flows, LFG quality, or GCOCS condition, then the well shall be decommissioned or the installation of a replacement well or header pipe will be performed on a schedule based on good engineering judgment for the control of odors from landfills. The Permittee shall notify the Commissioner in writing, within 30 days of the initial reading of a measured level due to the factors above. If a final landfill closure plan exists, the schedule shall be based in consideration of the final closure plan.

- 2. The Permittee shall monitor LFG temperature, N₂ levels and O₂ levels at each wellhead to ensure LFG temperature is less than 55°C and N₂ levels are below 20% or O₂ levels are below 5%. Should the LFG temperature, N₂ level or O₂ level equal or exceed the limits above, action shall be initiated to correct the exceedance within 5 calendar days. If correction of the exceedance cannot be achieved within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance.

If measured levels are due to declining flows, LFG quality, or GCOCS condition, then the well shall be decommissioned or the installation of a replacement well or header pipe will be performed on a schedule based on good engineering judgment for the control of odors from landfills. The Permittee shall notify the Commissioner in writing, within 30 days of the initial reading of a measured level due to the factors above. If a final landfill closure plan exists, the schedule shall be based in consideration of the final closure plan.

- 3. The Permittee shall monitor landfill surface methane concentrations quarterly for all active portions of the landfill. Inactive portions of the landfill shall be monitored annually if initial methane concentration monitoring of the inactive areas indicates all corresponding methane levels are below 100 ppmv, above background.

The monitoring of landfill surface methane concentrations shall be conducted around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. A surface monitoring design plan shall be developed and kept on site that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing.

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PART V. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS, continued

All locations exceeding 500 ppmv above background in any round of methane monitoring shall be increased to monthly monitoring. For such locations, the Permittee shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis. Should the methane concentration at such location fall below 500 ppmv during subsequent monitoring, the frequency of monitoring shall revert to quarterly to coincide with the monitoring schedule for the remainder of the landfill.

If measured levels are due to declining flows, LFG quality, or GCOCS condition, then the well shall be decommissioned or the installation of a replacement well or header pipe will be performed on a schedule based on good engineering judgment for the control of odors from landfills. The Permittee shall notify the Commissioner in writing, within 10 days of the initial reading of a measured level due to the factors above. If a final landfill closure plan exists, the schedule shall be based in consideration of the final closure plan.

Upon completion of eight rounds of quarterly monitoring, the Permittee may request for a change in the frequency of monitoring. The reasonableness of such request shall be established by the following: site-specific landfill surface methane measurements during the first two years of quarterly monitoring, trends in methane concentrations during the two year period, monthly wellhead pressure measurements, and other test data or the correlation of test data the Permittee believes pertinent. Such request shall also incorporate the monitoring of locations of "elevated" methane concentrations at a greater frequency. Elevated can be interpreted as greater than 200 ppmv methane above background.

The Permittee shall not be required to conduct periodic methane landfill surface monitoring when the landfill is snow covered and required cover maintenance can be delayed by safety concerns due to weather conditions.

4. The Permittee shall install, operate and routinely calibrate a device or devices, in accordance with manufacturer's recommendations, to continuously measure and monitor the volumetric flow of waste gas into this flare.
5. The Permittee shall install and operate a device or devices to measure and monitor the number of hours of flare operation during each calendar month.

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PART V. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS, continued

B. RECORD KEEPING REQUIREMENTS

1. The Permittee shall keep records of monthly and consecutive 12 month flare fuel consumption. The consecutive 12 month fuel consumption shall be determined by adding (for each fuel) the current month's fuel usage to that of the previous 11 months. The Permittee shall make these calculations within 30 days of the end of the previous month.
2. The Permittee shall record the number of hours of flare operation during each calendar month. Such records shall include the date of the recording period and the number of flare operating hours during each recording period.
3. The Permittee shall calculate and record the monthly and consecutive 12 month criteria pollutant emissions in units of tons. The consecutive 12 month emissions shall be determined by adding (for each pollutant) the current month's emissions to that of the previous 11 months. Such records shall include a sample calculation for each pollutant. The Permittee shall make these calculations within 30 days of the end of the previous month.
4. The Permittee shall record the date and length of operation where the flare operated with a heat input less than 2.0 MMBTU/hr. Such records shall include the calculation and basis used to determine the heat input rate on a monthly average.
5. The Permittee shall maintain records of all GCOCS maintenance and calibration operations listed in Part V.A of this permit as detailed in the facility's amended Operations and Maintenance Plan.
6. The Permittee shall maintain a complete record of all testing conducted pursuant to Part VI of this permit as well as any periodic testing required in the facility's amended Operations and Maintenance Plan.
7. The Permittee shall retain any records required under this permit for a period of no less than five (5) calendar years. All records shall be made available to the Commissioner or his agent upon request.

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PART V. MONITORING, REPORTING AND RECORD KEEPING REQUIREMENTS, continued

C. REPORTING REQUIREMENTS

The Permittee shall submit a report annually to the CTDEP Compliance Assurance and Coordination Unit of the Bureau of Air Management detailing all exceedances of operational conditions monitored pursuant to Part V.A.1 through Part V.A.3 of this permit. Such report shall include the remedial action taken by the Permittee. The report shall be submitted no later than May 1 of each calendar year.

PART VI. SOURCE TEST AND COMPLIANCE DEMONSTRATION REQUIREMENTS

A. Source Testing (Final Closure/Final Grade)

The Permittee shall conduct source testing, for the following pollutants, within 180 days of completion of the expansion of the well field and after final landfill closure or landfill reaches final grade, into the area outside of the zone of influence of the LFG collection system as tested in June of 2001 and for which a compliance demonstration has already been made. Stack testing shall be performed in accordance with the latest Emission Test Guidelines available on the DEP website:

http://www.ct.gov/dep/cwp/view.asp?a=2684&q=322076&depNav_GID=1619

- SOx VOC (as NMOC) HAPS¹
 Other: Site Specific Testing as required in Part VI.A.1 and VI.A.2 below

¹ HAP measurements and MASC compliance demonstrations shall include the following HAPs common to MSW landfills: acetone, acrylonitrile, benzene, bromodichloromethane, butane, carbon disulfide, carbon tetrachloride, carbonyl sulfide, chlorobenzene, chlorodifluoromethane, chloroethane, chloroform, chloromethane, dichlorobenzenes, dichlorodifluoromethane, 1,1-dichloroethane, 1,2-dichloroethane, 1,1-dichloroethene, trans 1,2-dichloroethene, dichlorofluoromethane, dichloromethane, dimethylsulfide, ethane, ethanol, ethyl mercaptan, ethylbenzene, ethylene dibromide, fluorotrichloromethane, hexane, hydrogen sulfide, mercury, methyl ethyl ketone, methyl iso-butyl ketone, methyl mercaptan, pentane, propane, 2-propanol, propylene dichloride, 1,1,2,2-tetrachloroethane, tetrachloroethylene, toluene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, trichloroethylene, vinyl chloride, vinylidene chloride, and xylenes

The following site-specific testing and compliance demonstrations shall also be required:

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PART VI. SOURCE TEST AND COMPLIANCE DEMONSTRATION REQUIREMENTS, continued

1. LFG Re-Characterization

- a. Re-characterization of LFG with respect to total reduced sulfur, NMOC, methane, oxygen, nitrogen, and hazardous air pollutants (HAPs) common to municipal solid waste (MSW) landfills
- b. Re-assessment of total LFG production rate and re-measurement of GCOCS LFG collection rate (scfm)
- c. The Permittee shall ensure at least 90% of the wells in the GCOCS network are fully operational 24 hours prior to the initiation of LFG characterization. The Permittee shall demonstrate compliance with annual emission limitations set forth in Part IV of this permit for SO_x and VOC (as NMOC), and MASC compliance for HAPs based upon the re-characterization of the LFG and the demonstrated destruction efficiency of 99% for VOCs and 98% conversion of reduced sulfur to SO_x.

2. Gas Collection System Capture Efficiency

The Permittee shall re-assess the capture efficiency of the LFG collection system employing the modeled total LFG production determination and the re-measured LFG collection rate.

B. Source Testing (New Well Installation)

The Permittee shall submit a test protocol to the CTDEP stack test group 30 days prior to the installation of any LFG well(s) outside of the zone of influence of the current LFG network for the purposes of demonstrating continued compliance with RCSA §22a-174-29. The zone of influence shall be considered to be no more than 150 feet from the nearest wellhead in the current LFG network. Stack testing shall be performed in accordance with the latest Emission Test Guidelines available on the DEP website:

http://www.ct.gov/dep/cwp/view.asp?a=2684&q=322076&depNav_GID=1619

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PART VII. SPECIAL REQUIREMENTS

- A.** The Permittee shall operate this source and premises at all times in a manner so as not to violate or significantly contribute to the violation of any applicable state requirements for the control of fugitive particulate matter emissions and take reasonable precautions to prevent particulate matter from becoming airborne, as set forth in RCSA §22a-174-18(c).
- B.** The Permittee shall operate this facility at all times in a manner so as not to violate or contribute significantly to the violation of any applicable state noise control regulations, as set forth in Sections 22a-69-1 through 22a-69-7.4 of the RCSA.
- C.** The Permittee shall comply with state odor regulations, as set forth in Section 22a-174-23 of the Regulations.
- D.** The Permittee shall comply with all applicable sections of the following New Source Performance Standard(s) at all times.

Title 40 CFR Part 60, Subpart WWW

Copies of the Code of Federal Regulations (CFR) are available online at the U.S. Government Printing Office website.

- E.** The Permittee shall be required to complete the LFG collection system by installation of the additional interior wells within 12 months of any of the following:
 - 1. NMOC emission rate from the landfill should equal or exceed 50 Mg/year pursuant to 40 CFR 60.752(b);
 - 2. landfill closure (i.e. disposal of solid waste ends);or
 - 3. final permitted landfill design capacity is reached.
- F.** The modification, replacement, repair, or retiring of any LFG well(s) shall not constitute a modification of this permit.
- G.** The Permittee shall install final cover over the landfill as stipulated in the O&M Plan and any applicable landfill waste permit. This shall be completed within 8 months of the final closure or reaching of final design capacity, whichever is earliest, or other schedule approved by the Commissioner.

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PART VII. SPECIAL REQUIREMENTS, continued

The Permittee shall amend its O&M plan to incorporate operational conditions to assure acceptable wellhead pressure limitations are maintained within the landfill area should the Permittee be required by the Commissioner to also install a geomembrane or synthetic cover as a component of final cover for the landfill area. In addition, the Permittee shall submit in writing to the Commissioner for review and approval the amended operational conditions incorporated into the plan assuring the proper wellhead pressure is maintained. Final cover for the landfill shall be a minimum be an 18 inch barrier layer (1×10^{-5} cm/sec earthen material) overlain by a minimum of a 6" thick erosion layer or other design approved by the Commissioner.

PART VIII. ADDITIONAL TERMS AND CONDITIONS

- A. This permit does not relieve the Permittee of the responsibility to conduct, maintain and operate the regulated activity in compliance with all applicable requirements of any federal, municipal or other state agency. Nothing in this permit shall relieve the Permittee of other obligations under applicable federal, state and local law.
- B. Any representative of the DEP may enter the Permittee's site in accordance with constitutional limitations at all reasonable times without prior notice, for the purposes of inspecting, monitoring and enforcing the terms and conditions of this permit and applicable state law.
- C. This permit may be revoked, suspended, modified or transferred in accordance with applicable law. The required recommendations are such that the applicable recommendations shall not be given until the allowable recommendations are given in order to maintain it.
- D. This permit is subject to and in no way derogates from any present or future property rights or other rights or powers of the State of Connecticut and conveys no property rights in real estate or material, nor any exclusive privileges, and is further subject to any and all public and private rights and to any federal, state or local laws or regulations pertinent to the facility or regulated activity affected thereby. This permit shall neither create nor affect any rights of persons or municipalities who are not parties to this permit.
- E. Any document, including any notice, which is required to be submitted to the commissioner under this permit shall be signed by a duly authorized representative of the Permittee and by the person who is responsible for actually preparing such document, each of whom shall certify in writing as follows: "I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that

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PART VIII. ADDITIONAL TERMS AND CONDITIONS, continued

based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that any false statement made in the submitted information may be punishable as a criminal offense under section 22a-175 of the Connecticut General Statutes, under section 53a-157b of the Connecticut General Statutes, and in accordance with any applicable statute."

- F.** Nothing in this permit shall affect the commissioner's authority to institute any proceeding or take any other action to prevent or abate violations of law, prevent or abate pollution, recover costs and natural resource damages, and to impose penalties for violations of law, including but not limited to violations of this or any other permit issued to the Permittee by the commissioner.
- G.** Within 15 days of the date the Permittee becomes aware of a change in any information submitted to the commissioner under this permit, or that any such information was inaccurate or misleading or that any relevant information was omitted, the Permittee shall submit the correct or omitted information to the commissioner.
- H.** The date of submission to the commissioner of any document required by this permit shall be the date such document is received by the commissioner. The date of any notice by the commissioner under this permit, including but not limited to notice of approval or disapproval of any document or other action, shall be the date such notice is personally delivered or the date three days after it is mailed by the commissioner, whichever is earlier. Except as otherwise specified in this permit, the word "day" means calendar day. Any document or action which is required by this permit to be submitted or performed by a date which falls on a Saturday, Sunday or legal holiday shall be submitted or performed by the next business day thereafter.
- I.** Any document required to be submitted to the commissioner under this permit shall, unless otherwise specified in writing by the commissioner, be directed to: Office of Director; Engineering & Enforcement Division; Bureau of Air Management; Department of Environmental Protection; 79 Elm Street, 5th Floor; Hartford, Connecticut 06106-5127.

FIRM NAME: Town of Manchester, Sanitation Division
EQUIPMENT LOCATION: Manchester Landfill, 1 Landfill Way, Manchester, CT
EQUIPMENT DESCRIPTION (MODEL, I.D. #): Gas Collection System and Enclosed
Flare (Perennial Energy extreme Low Emissions System Burner Flare)
