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New Jersey State Primer

**Permits and Incentive
Programs For Landfill
Gas to Energy Projects**



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PREFACE

EPA LANDFILL METHANE OUTREACH PROGRAM

The **EPA Landfill Methane Outreach Program (LMOP)**, a key component of the *U.S. Climate Change Action Plan*, promotes the use of landfill gas as an energy resource -- eliminating methane emissions while capturing their energy value. Recovery of energy from landfill gas provides local and global environmental and energy benefits, as well as economic benefits. Methane captured from landfills can be transformed into a cost-effective fuel source for electricity, heat, boiler and vehicular fuel, or sale to pipelines. The goals of the Outreach Program are to promote cost-effective projects at U.S. landfills and remove barriers to development. There are currently about 130 landfill methane recovery projects in the United States; EPA estimates that up to 750 landfills could install economically viable landfill energy projects by the year 2000.

EPA's Landfill Methane Outreach Program's

GOAL

To reduce methane emissions from landfills by:

- encouraging environmentally and economically beneficial landfill gas to energy development; and
- removing barriers to landfill gas-to-energy recovery development.

The Landfill Methane Outreach Program includes three important components: (1) the **State Ally**; (2) the Industry Ally; and (3) the Utility Ally programs. EPA establishes separate alliances with state agencies, utilities (including investor-owner, municipal and other public power utilities, and cooperatives), and members of the landfill gas development community (including developers, engineers, equipment vendors, and others) through a Memorandum of Understanding (MOU). By signing the MOU, each ally acknowledges a shared commitment to the promotion of landfill gas energy recovery at solid waste landfills, recognizes that the widespread use of landfill gas as an energy resource will reduce emissions of methane and other emissions, and commits to certain activities to enhance development of this resource.

The New Jersey State Ally contact is:

Mary Anne Goldman
Principal Environmental Engineer
Division of Solid and Hazardous Waste
Department of Environmental Protection
CN 414
Trenton, NJ 08625
609-984-6650

INTRODUCTION

Permits, incentive programs, and policies for landfill gas (LFG) -to-energy project development vary greatly from state to state. To guide LFG-to-energy project developers through the state permitting process and to help them to take advantage of state incentive programs, EPA's Landfill Methane Outreach Program (LMOP) developed individual state primers for those states that are participating in the State Ally Program. The **New Jersey State Primer** provides information on permits that may be required for LFG-to-energy projects and on incentive programs that either provide technical or financial assistance. While the main focus of the primer is on state permits and incentive programs, federal and local permits and federal incentive programs are also briefly discussed.

As a member of the LMOP State Ally program, New Jersey State identified all possible permits and incentive programs that could apply to landfill gas-to-energy projects developed in New Jersey. The LMOP program is also developing State Primers for other State Allies. For more information on other State Primers, contact:

EPA Landfill Methane Outreach Program
US EPA, 6202J
401 M St., SW
Washington, D.C. 20460
Phone: (202)233-9042
Fax: (202)233-9569

The following sections are included in the handbook:

- **State Landfill Gas Recovery Project Target.** This section describes the status of landfill gas recovery projects in the State of New Jersey and includes a target for the number of projects that will be in operation by the year 2000.
- **Federal, State, and Local Standards and Permits.** This section provides information on federal, state, and local permits that may be required to develop and operate a LFG-to-energy project. Both the federal and local sections provide brief descriptions of common standards that may apply to these projects. The state section, however, provides detailed information on specific state permits that are applicable to landfill gas recovery projects.
- **Federal and State Incentive Programs.** Similar to the section on standards and permits, this section provides information on both federal and state incentive programs that LFG-to-energy projects can qualify for, but with more detailed information provided on state programs.

The regulations, agencies, and policies described herein are subject to change. Changes are likely to occur whenever a state legislature meets or new directions are imposed on state and local governments by the federal government. Accordingly, LFG-to-energy project developers should verify and continuously monitor that status of laws and rules that might affect their plans or operation of their project. Developers are cautioned that the regulations described herein may only be a starting point on the path to obtaining all the necessary permits.

STATE LANDFILL GAS RECOVERY PROJECT TARGET

There are currently 8 planned and 8 operational LFG-to-energy projects in New Jersey. Another five landfills have the potential to support economically viable gas-to-energy projects. The potential for reducing methane emissions from these landfills is 0.55 million tons of carbon dioxide (CO₂) equivalent per year.

The New Jersey State Ally's goal is to have 10 projects on-line by the year 2000. These projects would reduce annual methane emissions by about 5.6 million tons of CO₂ equivalent per year. In addition, these projects would also avoid CO₂ emissions through conventional fuel displacement.

CANDIDATE LANDFILLS

LANDFILL NAME	LOCATION/COUNTY	STATUS
Burlington County SLF	Burlington	Open
Cumberland County SLF	Cumberland	Open
Edison Township SLF	Middlesex	Closed
Gloucester County SLF	Gloucester	Open
Linden City SLF	Union	Open

Hazardous waste/Superfund sites offer another potential avenue of LFG-to-energy development. The LMOP, however, is targeted at municipal solid waste landfills.

PART I: STANDARDS AND PERMITS

1. OVERVIEW OF FEDERAL STANDARDS AND PERMITS

The following section discusses federal regulations that may pertain to LFG-to-energy projects. LFG-to-energy projects can be subject to solid waste, air quality, and water quality regulations. The federal regulations are presented in general terms, because individual state/local governments generally develop their own regulations for carrying out the federal mandates. Specific requirements may therefore differ among states. Project developers will have to contact relevant federal agencies and, in some cases, state agencies for more detailed information and applications. The discussion of each key federal standard/permit contains three components:

- (1) **Importance** of the standard/permit to LFG-to-energy project developer
- (2) **Applicability** to LFG-to-energy projects
- (3) **Description** of each standard/permit

1.1 Resource Conservation and Recovery Act Subtitle D

Importance: Before a LFG-to-energy project can be developed, all Resource Conservation and Recovery Act (RCRA) Subtitle D requirements (i.e., requirements for non-hazardous waste management) must be satisfied.

Applicability: Methane is explosive in certain concentrations and poses a hazard if it migrates beyond the landfill facility boundary. Landfill gas collection systems must meet RCRA Subtitle D standards for gas control.

Description: Since October 1979, federal regulations promulgated under Subtitle D of RCRA required controls on migration of landfill gas. In 1991, EPA updated landfill design and performance standards; the newer standards apply to municipal solid waste (MSW) landfills that were active on or after October 9, 1993. Specifically, the standards require monitoring of LFG and establish performance standards for combustible gas migration control. Monitoring requirements must be met at landfills not only during their operation, but also for a period of 30 years after closure.

Landfills affected by RCRA Subtitle D are required to control gas by establishing a program to periodically check for methane emissions and prevent offsite migration. Landfill owners and operators must ensure that the concentration of methane gas does not exceed:

- 25 percent of the lower explosive limit for methane in facilities' structures; and,
- the lower explosive limit for methane at the facility boundary.

Permitted limits on methane levels reflect the fact that methane is explosive within the range of 5 to 15 percent concentration in air. If methane emissions exceed permitted limits, corrective action (i.e., installation of a LFG collection system) must be taken. Subtitle D may provide an impetus for some landfills to install

energy recovery projects in cases where a gas collection system is required for compliance (see 40 CFR Part 258 for more information).

1.2 Clean Air Act (CAA)

The CAA regulates emissions of pollutants to ensure that air quality meets specified health and welfare standards. The CAA contains two provisions that may affect LFG-to-energy projects: New Source Performance Standards (NSPS) and New Source Review (NSR). Facilities that are planning to construct a new LFG-to-energy system or that plan to modify a landfill operation to incorporate a LFG-to-energy system must obtain an Authority to Construct (ATC) permit from the responsible air regulatory agency if emissions from the project exceed the major facility emission thresholds. The ATC permit specifies the NSPS and NSR requirements that the project must meet. Once construction is complete, the facility must obtain an operating permit that meets the requirements defined in Title V of the 1990 CAA Amendments. The general requirements of NSPS, NSR, and Title V for LFG-to-energy projects are discussed below.

1.2.1 NMOC Emissions: New Source Performance Standards (NSPS)

Importance: LFG-to-energy projects can be part of a compliance strategy to meet EPA's new emissions standards for landfill gas.

Applicability: Landfills meeting certain design capacity, age, and emissions criteria are required to collect LFG and to either flare it or use it for energy.

Description: EPA final regulations under Title I of the CAA Amendments require affected landfills to collect and control LFG. Specifically, the CAA targets reductions in the emissions of NMOCs found in LFG because they contribute to local smog formation. For landfills that received waste after November 8, 1987 ("existing landfills"), the standards are "Emissions Guidelines" (EG), and for landfills that began construction or accepted waste for the first time on or after May 30, 1991 ("new landfills"), the standards are "New Source Performance Standards" (NSPS). The final regulations can be found in the Federal Register, March 12, 1996, Vol. 61, No. 49, pgs. 9907-9944, or can be obtained from the National Technical Information Service (NTIS) at (703) 487- 4650. Ask for PB96 - 153465.

The basic requirements are the same for both existing and new landfills. Landfills that meet both of the following criteria must comply with the regulations.

- Capacity -- maximum design capacity greater than or equal to 2.5 million Mg (or 2.75 million tons).¹
- Emissions -- annual NMOC emission rate is greater than 50 metric tons.

Landfills with less than 2.5 million Mg are required to file a design capacity report.

1.2.2 Air Emissions: New Source Review (NSR) Permitting Process

Importance: New LFG-to-energy projects may be required to obtain construction permits under New Source Review (NSR). Depending on the area in which the project is located, obtaining these permits may be the most critical aspect of project approval.

Applicability: The combustion of LFG results in emissions of carbon monoxide and oxides of nitrogen. Requirements vary for control of these emissions depending on local air quality. The relevant standards for a particular area will be discussed in Section 2, State Standards and Permits. Applicability of these standards to LFG-to-energy projects will depend on the level of emissions resulting from the technology used in the project and the project's location (i.e., attainment or non-attainment area).

Description: CAA regulations require new stationary sources and modifications to existing sources of certain air emissions to undergo NSR before they can operate. The purpose of these regulations is to ensure that sources meet the applicable air quality standards for the area in which they are located. Because these regulations are complex, a landfill owner or operator may want to consult an attorney or expert familiar with NSR for more information about permit requirements in a particular area.

The existing CAA regulations for attainment and maintenance of ambient air quality standards regulate six criteria pollutants -- ozone, volatile organic compounds (VOCs), nitrogen oxides (NOx), carbon monoxide (CO), particulate matter (PM-10), sulfur dioxide (SOx); and lead. The CAA authorizes the EPA to set both health- and public welfare-based national ambient air quality standards (NAAQS) for each criteria pollutant. Areas that meet the NAAQS for a particular air pollutant are classified as being in "attainment" for that pollutant and those that do not are in "non-attainment." Because each state is required to develop an air quality implementation plan (called a State Implementation Plan or SIP) to attain and maintain compliance with the NAAQS in each Air Quality Control Region within the state, specific permit requirements will vary by state. (See 40 CFR 51.160-51.166 for more information.)

The location of the LFG-to-energy project will dictate what kind of construction and operating permits are required. If the landfill is located in an area that is in attainment for a particular pollutant, the LFG-to-energy project must undergo Prevention of Significant Deterioration permitting. Nonattainment Area permitting is required for those landfills that are located in areas that do not meet the NAAQS for a particular air pollutant. Furthermore, the level of emissions from the project determines whether the project must undergo major NSR or minor NSR. The requirements of major NSR permitting are greater than those for minor NSR. The following provides more detail on new source permits:

Prevention of Significant Deterioration Permitting

Prevention of Significant Deterioration (PSD) review is used in attainment areas to determine whether a new or modified emissions source will cause significant deterioration of local air quality. The State air office can assist LFG project developers in determining whether a proposed project requires PSD approval.

Federal Standards and Permits

All areas are governed to some extent by PSD regulations because no location is in nonattainment for all criteria pollutants. Applicants must determine PSD applicability for each individual pollutant. For gas-fired sources, PSD major NSR is required if the new source will emit or has the potential to emit any criteria pollutant at a level greater than 250 tons per year.

For each pollutant for which the source is considered major, the PSD major NSR permitting process requires that the applicants determine the maximum degree of reduction achievable through the application of available control technologies. Specifically, major sources may have to undergo any or all of the following four PSD steps:

- Best Available Control Technology (BACT) analysis
- Monitoring of local air quality
- Source impact analysis/modeling
- Additional impact analysis/modeling (i.e., impact on vegetation, visibility, and Class I areas)²

Minor sources and modifications (i.e., below 250 tons per year) are exempt from this process, but these sources must still obtain construction and operating air permits (see CFR. 40 CFR 52.21 for more information on PSD).

Nonattainment Air Permitting

An area that does not meet the NAAQS for one or more of the six criteria pollutants is classified as being in "nonattainment" for that pollutant. Ozone is the most pervasive nonattainment pollutant, and the one most likely to affect LFG-to-energy projects. A proposed new emissions source or modification of an existing source located in a nonattainment area must undergo nonattainment major NSR if the new source or the modification is classified as major (i.e., if the new or modified source exceeds specified emissions thresholds). To obtain a nonattainment NSR permit for criteria pollutants, a project must meet two requirements:

- It must use technology that achieves the Lowest Achievable Emissions Rate (LAER) for the nonattainment pollutant.
- It must arrange for an emissions reduction at an existing combustion source that more than offsets the emissions from the new project.

Class I areas are specified under the Clean Air Act and include national parks. Projects situated within a certain distance from Class I areas are subject to more stringent criteria for emissions levels.

Potential Exemptions

EPA recently furnished a guidance document to state and regional permitting authorities that provides an exemption from major NSR permitting requirements for landfill projects that qualify as "pollution control projects." An existing landfill that plans to install a LFG-to-energy recovery project may qualify as a pollution control project as long as it reduces non-methane organic compounds (NMOC) at the site. Under the guidance, the permitting authority may exempt the project from major NSR, provided it meets all other requirements under the CAA and the state, including minor source requirements. In nonattainment areas, offsets will still be required, but need not exceed a 1:1 ratio. States have discretion to exercise the increased flexibility allowed by the guidance on a case-by-case basis.

1.2.3 Title V Operating Permit

Importance: Many LFG-to-energy projects must obtain operating permits that satisfy Title V of the 1990 CAA Amendments.

Applicability: Any LFG-to-energy plant that is a major source, as defined by the Title V regulation (40 CFR Part 70), must obtain an operating permit.

Description: Title V of the CAA requires that all major sources obtain new federally enforceable operating permits. Title V is modeled after a similar program established under the Federal Pollution Discharge System (NPDES). Each major source must submit an application for an operating permit that meets guidelines spelled out in individual state Title V programs. The operating permit describes the emission limits and operating conditions that a facility must satisfy, and specifies the reporting requirements that a facility must meet to show compliance with the air pollution regulations. A Title V operating permit is effective for 5 years, and must be renewed every 5 years.

1.3 National Pollutant Discharge Elimination System Permit (NPDES)

Importance: LFG-to-energy projects may need to obtain NPDES permits for discharging wastewater that is generated during the energy recovery process.

Applicability: LFG condensate forms when water and other vapors condense out of the gas stream due to temperature and pressure changes within the collection system. This wastewater must be removed from the collection system. In addition, LFG-to-energy projects may generate wastewater from system maintenance and cooling tower blowdown.

Description: NPDES permits regulate discharges of pollutants to surface waters. The authority to issue these permits is delegated to state governments by the EPA. The permits, which typically last five years, limit the quantity and concentration of pollutants that may be discharged. To ensure compliance with the limits, permits require wastewater treatment or impose other operation conditions. The state water offices or the EPA regional office can provide further information on these permits.

Federal Standards and Permits

The permits are required for three categories of sources and can be issued as individual or general permits. A LFG-to-energy project would be included in the "wastewater discharges to surface water from industrial facilities" category and would require an individual permit. An individual permit application for wastewater discharges typically requires information on water supply volumes; water utilization; wastewater flow; characteristics and disposal methods; planned improvements; storm water treatment; plant operation; materials and chemicals used; production; and other relevant information.

1.4 Clean Water Act, Section 401

Importance: LFG-to-energy projects may need CWA Section 401 certification for constructing pipelines that cross streams or wetlands.

Applicability: LFG recovery collection pipes or distribution pipes from the landfill to a nearby gas user may cross streams or wetlands. When construction or operation of such pipes causes any discharge of dredge into streams or wetlands, the project may require Section 401 certification.

Description: If the construction or operation of facilities results in any discharge into streams or wetlands, such construction is regulated under Section 401. This requirement may affect the construction of LFG-to-energy project facilities or pipelines to transport LFG.

The applicant must obtain a water quality certification from the State in which the discharge will originate. The certification should then be sent to the Corps of Engineers. The certification indicates that such discharge will comply with the applicable provisions of Sections 301, 302, 303, 306, and 307 of the Clean Water Act (CWA).

1.5 Other Federal Permit Programs

The following are brief descriptions of how other federal permits could apply to LFG-to-energy project development.

- **RCRA Subtitle C** could apply to a LFG project if it produces hazardous waste. While some LFG projects can return condensate to the landfill, many dispose of it through the public sewage system after some form of on-site treatment. In some cases, the condensate may contain high enough concentrations of heavy metals and organic chemicals for it to be classified as a hazardous waste; thus triggering federal regulation.
- **The Historic Preservation Act of 1966** or the **Endangered Species Act** could apply if power lines or gas pipelines associated with a project infringe upon an historic site or an area that provides habitat for endangered species.

2.0 STATE STANDARDS AND PERMITS

This section provides information on permits required by the State of New Jersey for the development of a LFG-to-energy project.³ Information provided on each permit includes: how the permit is applicable to LFG-to-energy projects, the appropriate agency contact, a description of the permit, the statute/regulation, information required and suggestions for a successful application, the application and review process, and the review/approval period. For an overview of required permits, contact information, and length of the review period, see Tables 2.1 and 2.2.

The NJDEP gives qualifying LFG recovery projects special status in terms of permitting requirements. Streamlined permitting and technical assistance are standard for these ventures with consideration extended to non-traditional/innovative/alternative uses of LFG.

Summary of Permits

The principal permits required for LFG-to-energy projects in New Jersey are related to air quality, water quality, and solid waste issues and are regulated by the New Jersey Department of Environmental Protection (NJDEP). The paragraphs below summarize the permits required by NJDEP for a LFG-to-energy project. The criteria for LFG collection systems are provided in Table 2.3.

Air-Related: A Control Apparatus/Equipment Permit is required for emissions from equipment (combustion engines, turbines, etc.) used at LFG-to-energy facilities.

Water-Related: Most water-related permits will be project dependent. Developers planning to discharge to groundwater or surface waters must obtain a New Jersey Pollutant Discharge Elimination System (NJPDES) permit. A NJPDES Stormwater Permit may also be needed if the applicant intends to discharge stormwater to surface water. A Treatment Works Approval is required if a treatment system is planned to treat runoff, condensate, or wastewater. Furthermore, accessing water at the project site requires a Well Drilling Permit.

Solid Waste-Related: A solid waste permit is required for all construction and development on a landfill. If a LFG collection system is already in place, the approval would require a Landfill Disruption Permit. Installation of a collection system requires a Methane Venting Systems Approval.

In addition to the NJDEP, other departments regulate LFG-to-energy projects. For example, the Departments of Transportation and Community Affairs issue Construction/Safety Permits. The New Jersey Board of Public Utilities (BPU) does not have an actual permit application that would apply to LFG projects, but its Division of Energy may be involved in utility connections and energy sales contracts. Similarly, certain geographical areas of the State of New Jersey fall under the jurisdiction of the special commissions, such as the Hackensack Meadowlands Development Commission or the Pinelands Commission. Projects located in these areas will require separate approval. See Appendix for contact information for these agencies.

Permits issued by departments other than the NJDEP are not discussed in this handbook. Project developers should contact state and local agencies for a complete list of

The permits contained in this handbook were suggested by state permitting agencies.

applicable permits (see Section 3 for a discussion on potential local permit requirements).

Permitting Assistance

Two State offices assist project developers with the permitting process. They are the Office of Permit Information and Assistance (OPIA) -- run by the NJDEP -- and the Department of Commerce and Economic Development's Office of Business Advocacy (OBA). The primary purpose of these offices is to help project developers identify all permits required to develop project.

- The OPIA provides guidance to applicants on the environmental aspects of their projects. The OPIA provides developers with a permit identification form, which helps the OPIA to identify all necessary permits. The OPIA also coordinates the review of applications for complex, multifaceted projects (see Appendix for contact information).
- The OBA has instituted a "One Stop Permit Identification System" that helps project developers identify all required state agency permits within 15 working days of application submittal. This permit identification form also includes the DEP's OPIA permit identification form. Other agency permit forms that are included in the One Stop Permit Identification System include the Departments of Agriculture, Transportation, Community Affairs and Health. (See Appendix for contact information).

Additional information on environmental permits required by the NJDEP can be found in their handbook, called *Permits, Licenses, Approvals, & Certificates*. This handbook guides New Jersey residents and businesses in identifying and applying for environmental permits, licenses, certificates, or approvals which are administered by the NJDEP, as well as some by federal agencies. The handbook provides instructive guidance only and is not a substitute for administrative or statutory requirements of any law or regulation. The handbook can be obtained from the NJDEP.

TABLE 2.1. SUMMARY TABLE OF STATE STANDARDS/PERMITS

STANDARD/PERMIT	AGENCY/CONTACT	REVIEW PERIOD
AIR		
Control Apparatus/Equipment Permit	Bureau of New Source Review Department of Environmental Protection CN027 Trenton, NJ 08625 609-633-2753	30 days to 4.5 months (depending on project complexity).
WATER		
New Jersey Pollutant Discharge, Elimination System Permit (NJPDES) -- Surface Water and Ground Water	Division of Water Quality Environmental Regulation Department of Environmental Protection CN029 Trenton, NJ 08625 609-292-4860	6 months
NJPDES - Stormwater	Bureau of Stormwater Permitting Division of Water Quality Environmental Regulation Department of Environmental Protection CN029 Trenton, NJ 08625 609-292-4860	2-7 months
Treatment Works Approval	Bureau of Construction and Connection Division of Water Quality Department of Environmental Protection CN029 Trenton, NJ 08625 609-292-4860	90 days
Well Drilling Permit	Bureau of Water Allocation Water Supply Program Department of Environmental Protection CN426 Trenton, NJ 08625 609-984-6831	8-10 days by mail same day by walk-in
SOLID WASTE		
Landfill Disruption Permit	Division of Solid and Hazardous Waste Department of Environmental Protection CN 414 Trenton, NJ 08625 609-984-6650	1-2 months

TABLE 2.2. PERMIT APPROVAL TIMELINE

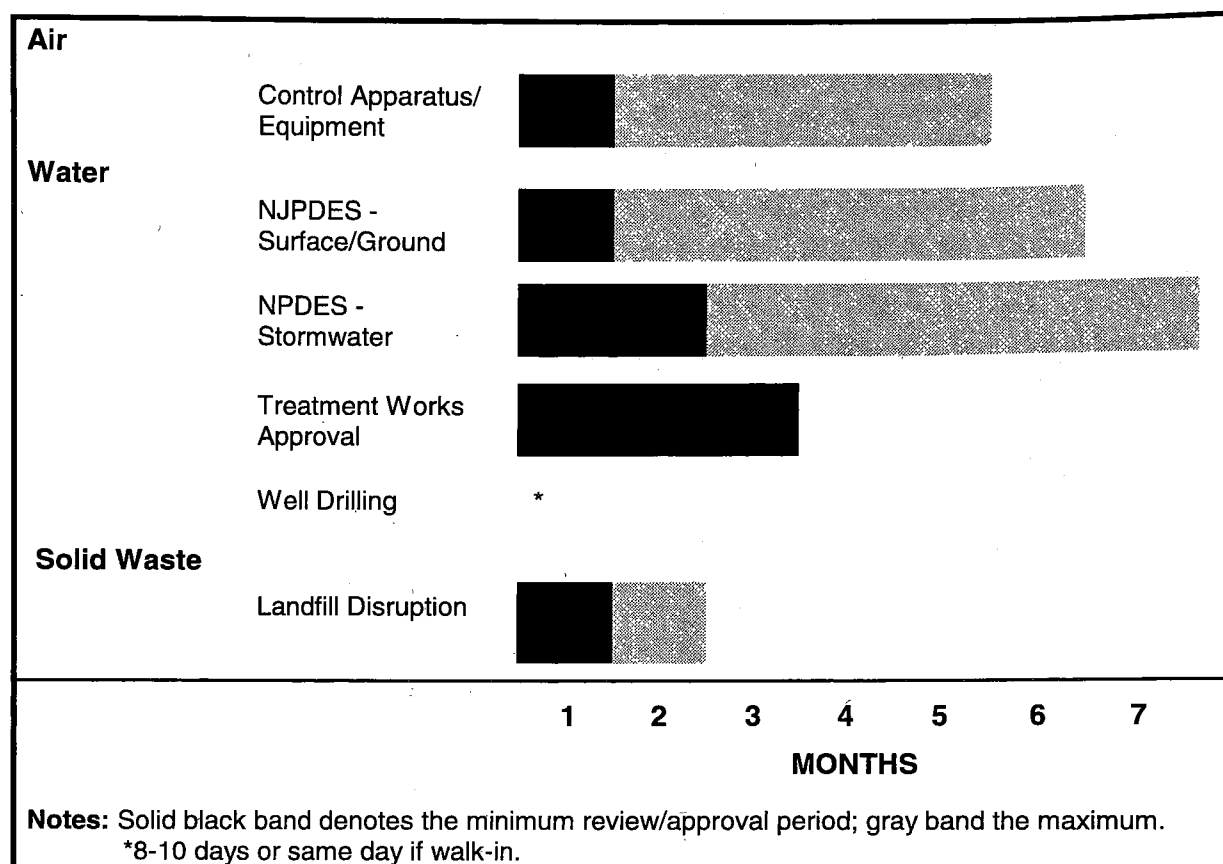


TABLE 2.3. SUMMARY OF LANDFILL GAS SYSTEMS CRITERIA

TYPE OF PROJECT	SPECIFIC CRITERIA
Landfill Gas Collection and Venting System	<p>The following criteria set forth the NJDEP's policies and regulatory interpretations of N.J.A.C. 7:26-2A.7(f) governing gas collection and venting systems.</p> <ul style="list-style-type: none"> Buildings at sanitary landfill sites where all waste is deposited in lined cells that will prohibit gas migration need not comply with the requirements set forth in N.J.A.C. 7:26-2A.7(f)14. Buildings constructed on top of landfilled areas shall utilize the open space (crawl space) between the final ground surface elevation and the building floor as an area for the installation and operation of an active methane gas venting system in lieu of the requirements set forth in 7:26-2A.7(f)14. The requirements established in sections 14vi and vii will be complied with at all times. active methane gas venting system shall be capable of preventing the accumulation of gas at or greater than 25 percent of the lower explosive limit in the crawl space.

TYPE OF PROJECT	SPECIFIC CRITERIA
Landfill Gas Collection and Venting System, continued	<ul style="list-style-type: none"> • Calculations supporting the basis for the layout of passive or active gas venting systems shall be provided. In addition, the amount of landfill gas condensate generated as a function of time shall also be computed. Disposal methods for gas condensate must be described. • The gas collection system shall be connected to the leachate collection system to control odors. • The Division of Solid and Hazardous Waste will not approve of a perimeter system as a sole means to control malodorous emissions. Odors shall be controlled by more effective means such as suppressants or an interior venting system. • The Division of Solid and Hazardous Waste waived the requirement for the development of energy recovery systems. • All gas venting systems require air quality permits in accordance with the regulations of the Bureau of Air Pollution Control -- N.J.A.C. 7:27. This permitting process has its own requirements for gas analysis. • A draft Operation and Maintenance Manual shall be prepared and included in the application. The O&M manual shall include: <ul style="list-style-type: none"> complete operation instructions and maintenance procedures for all equipment in the system - a complete monthly maintenance and monitoring program details of an extensive preventative maintenance program tailored to prevent system failure or downtime test procedures and methods of verification to confirm that the system is functioning prior to occupancy development of calibration procedures to ensure that the system gives an automatic warning at 1% methane by volume in air and sounds and alarm at 2% methane by volume in air. emergency procedures for evacuation of the building(s) in the event that an alarm is triggered.

The remainder of Section 2 contains information about each of the permits required by NJDEP for LFG-to-Energy projects development. The information is organized in tables and each table contains the following information about the subject permit:

Applicability to LFG Projects
 Agency Contact
 Description
 Statute/Regulation
 Information Required/Suggestions
 Application Process
 Review Process
 Review/Approval Period
 Fee

CONTROL APPARATUS/EQUIPMENT PERMIT <i>(Permit to Construct/Install/Alter and Certificate to Operate)</i>	
Applicability to LFG Projects	The construction, expansion, or modification of gas recovery systems at a landfill are subject to air quality permit regulations. Emissions from equipment used at LFG-to-energy facilities, such as internal combustion engines, are also subject to state air regulations. However, LFG-to-energy projects may be exempt from some air permits because they emit less than the <i>de minimis</i> regulated level.
Agency Contact	Bureau of New Source Review, Department of Environmental Protection, CN 027, Trenton, NJ 08625 609-633-2753
Description	<p>Equipment that emits, or controls the emission of, substances into the air are required to obtain a Control Apparatus/Equipment Permit. Installation of or modification to a LFG extraction system and/or energy conversion system requires a Permit to Construct. Operation of a LFG extraction system and energy conversion system requires a Certificate to Operate.</p> <p>Air pollution control permits are classified into five levels according to their complexity and time required to process them. The size of the operation or the quantity of air contaminants emitted by the operation will determine the permit level and, thus, what additional information is required.</p>
Statute/Regulation	<p>Air Pollution Control Act <i>Statute:</i> N.J.S.A. 26:2C-9.2 <i>Admin. Code:</i> 7:27-8.1 et seq.</p>
Information required/suggestions	<p>It is important to submit a complete application because failure to submit a complete application will not only delay the review but can result in denial of the application. A complete application should contain:</p> <ul style="list-style-type: none"> • Basic application forms (VEM-003, VEM-004, DEQ-069) or specialized application forms • Supplemental information, if required • Application fee (see NJAC 7:27-8.11) • Authorized signature (see NJAC 7:27-8.24)
Application Process	Applicants should contact the Bureau of New Source Review for information on application requirements and procedures for each type of permit. The Bureau of New Source Review offers a Air Pollution Control Permit Check List to help the applicant determine whether an application is needed and, if so, help the applicant prepare an application which is complete for the Department to begin a technical review. The NJDEP also recommends a pre-application conference to clarify the Department's requirements.
Review Process	If the application is complete, the NJDEP begins its technical review.
Review/Approval Period	30 days to 4.5 months, depending on project complexity.
Fee	Application fee; permit fee. Contact the Bureau of New Source Review.

NEW JERSEY POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT

Applicability to LFG Projects	Some LFG-to-energy projects treat condensate, which forms as water and other vapors condense out of the gas steam due to temperature and pressure changes within the gas collection system. Also, energy recovery projects may generate wastewater from system maintenance and cooling tower blowdown. Such wastewater streams are typically combined with landfill leachate streams for treatment and may be discharged to surface waters or ground waters.
Agency Contact	Division of Water Quality, Environmental Regulation, Department of Environmental Protection, CN 029, Trenton, NJ 08625 609-292-4860
Description	The discharge of pollutants into the state's surface waters and ground waters is regulated through NJPDES permits. These permits typically place limits on the quantity and concentration of pollutants that may be discharged. Projects that discharge to surface waters of the State or to a domestic treatment works (DTW) without an approved pretreatment program must apply for a NJPDES Discharge to Surface Water (DSW) permit. Projects that discharge or propose to discharge pollutants, such as contact/non-contact cooling water and stormwater runoff, to or via conveyances which will or may result in the introduction of pollutants into the ground waters of the state are required to obtain a NJPDES Discharge to Ground Water (DGW) permit.
Statute/ Regulation	New Jersey Water Pollution Control Act of 1977 <i>Statute:</i> N.J.S.A. 58:10A-1 et seq. <i>Admin. Code:</i> N.J.A.C. 7:14-12.1 et seq.
Information Required/ Suggestions	New discharges or expansions at existing municipal facilities must first receive a Discharge Allocation Certificate.
Application Process	The NJDEP issues these permits under authority delegated by the U.S. Environmental Protection Agency. For both permits, submit a CP-1 Application plus supplement sheet NJPDES-WQM-1 and a technical addendum, which covers the activities presently conducted or planned. Contact the Division of Water Quality for additional information on required forms.
Review Process	The Division of Water Quality, NJDEP reviews applications.
Review/Approval Period	30 days to 6 months for Surface Water Discharge Permits and Ground Water Discharge Permits
Fees	Contact the Division of Water Quality for information on fees.

NEW JERSEY POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT <i>(Industrial Stormwater Permit)</i>	
Applicability to LFG Projects	Stormwater runoff from LFG-to-energy facilities may be discharged to surface waters
Agency Contact	Bureau of Stormwater Permitting, Division of Water Quality, Environmental Regulation, Department of Environmental Protection, CN 029, Trenton, NJ 08625 609-292-4860
Description	Industrial facilities that presently discharge or plan to discharge stormwater associated with industrial activity (as defined by EPA) to surface water must obtain a NJPDES permit. Project developers can apply for a general permit or an individual permit. In addition, stormwater discharge from construction activities that will disturb five acres or more will also need to obtain coverage under a separate general permit. The construction stormwater general permit is obtained through the local Soil Conservation District Office.
Statute/Regulation	New Jersey Water Pollution Control Act of 1977 <i>Statute:</i> N.J.S.A. 58:10A-1 et seq. <i>Admin. Code:</i> N.J.A.C. 7:14-1 et seq.
Information Required/Suggestions	Contact the Bureau of Stormwater Permitting, NJDEP for specific information.
Application Process	Applications should be submitted to the Bureau of Stormwater Permitting, Division of Water Quality, Environmental Regulation, NJDEP.
Review Process	Applications are reviewed by the NJDEP. The NJDEP posts a 30 day public notice.
Review/Approval Period	General Permit - 2 months Individual Permit - 7 months
Fees	General Permit - \$500 per year Individual Permit - \$2,300 per year

TREATMENT WORKS APPROVAL	
Applicability to LFG Projects	Some LFG-to-energy projects discharge condensate, which forms as water and other vapors condense out of the gas steam due to temperature and pressure changes within the gas collection system, directly into the municipal sanitary sewer system to be treated at a wastewater treatment plant. Also, energy recovery projects may discharge wastewater, which is generated from system maintenance and cooling tower blowdown, into the sanitary sewer system or to groundwater. The discharge can be treated on site.
Agency Contact	Bureau of Construction and Connection, Division of Water Quality, Department of Environmental Protection, CN 029, Trenton, NJ 08625 609-292-4429
Description	Treatment Works approval is required to build, install, modify, or operate any treatment works system. Treatment works is defined as any method or system for preventing, abating, reducing, storing, treating, separating, or disposing of pollutants including stormwater runoff, or industrial waste in combined or separate stormwater or sanitary sewers systems. For most industrial treatment works, the treatment works approval will be issued in the form of a General Industrial Treatments Works Approval (GITWA).
Statute/Regulation	New Jersey Water Pollution Control Act of 1977 <i>Statute:</i> N.J.S.A. 58:10A-1 et seq. <i>Admin. Code:</i> N.J.A.C. 7:14-12.1 et seq.
Information Required/Suggestions	Items needed prior to application submittal: <ul style="list-style-type: none"> • cost estimate of sewerage facilities • professional engineers report of construction specifications • USGS Quad map (see Appendix for contact information)
Application Process	A complete application should contain: <ul style="list-style-type: none"> • 2 copies of Standard Application Form CP-1 • 2 copies of WQM-003 • Estimate of construction cost of sewerage facilities • Certified mail return receipts of notice to: Municipal Planning Board; Municipal Environmental Commission; and Municipal Clerk • 2 copies of the Engineer's Report, signed and sealed • 2 copies of Form WQM-006 for discharges to a POTW • 2 sets of sewerage construction specifications, signed and sealed by a NJ licensed Professional Engineer • 2 sets of final plans and profiles, signed and sealed • Resolutions from appropriate municipalities and sewage authorities • Copy of appropriate USGS Quad map with project site delineated • Signed and sealed "Professional Engineer Certification Form"
Review Process	Applications are reviewed by the NJDEP
Review/Approval Period	Permit covered by 90-day Review Law (P.S. 1975, c. 232)
Fees	Contact the Bureau of Construction and Connection for fee information.

WELL DRILLING PERMIT	
Applicability to LFG Projects	Some LFG-to-energy projects may need to drill a well to access water when town water is not available. The water may be used in some project applications such as in treatment of discharge, for operation of steam turbine engines, as a source of potable water, or for safety.
Agency Contact	Bureau of Water Allocation, Water Supply Program, Department of Environmental Protection, CN 426, Trenton, NJ 08625 Tel: (609) 984-6831
Description	All water well drilling, boring, coring, or excavating is regulated through this permit. For permit approval, construction of a well must be performed under the immediate supervision of a New Jersey licensed well driller. The permit is valid for one year from the date of issuance. All abandoned wells must be sealed.
Statute/Regulation	Subsurface and Percolating Waters <i>Statute Number:</i> N.J.S.A. 58:4A-4.1 et seq. <i>Admin. Code:</i> N.J.A.C. 7:9-9.1 et seq.
Information Required/ Suggestions	Applicants must obtain the services of a NJ licensed well driller of the proper class who is responsible for obtaining the permit to drill the well.
Application Process	Contact the Bureau of Water Allocation for the appropriate application forms and checklist of submission requirements. Applicants can either mail in their application or "walk in" on Tuesday and Thursday mornings.
Review Process	The NJDEP reviews and approves applications.
Review/Approval Period	By Mail: 8-10 days Walk In: issued same day
Fees	Contact the Bureau of Water Allocation for fee information.

LANDFILL DISRUPTION PERMIT	
Applicability to LFG Projects	Installation of the LFG collection system will disrupt landfilled solid waste. Similarly, the construction of a LFG-to-energy project may also disrupt landfilled solid waste.
Agency Contact	Division of Solid and Hazardous Waste, Department of Environmental Protection, CN 414, Trenton, NJ 08625 609-984-6650
Description	Prior approval is required for any construction or excavation activity on or in a closed or existing solid waste land disposal area.
Statute/Regulation	Solid Waste Management Act <i>Statute:</i> N.J.S.A. 13:1E et seq. <i>Admin. Code:</i> N.J.A.C. 7:26-2A.8J et seq.
Information Required/Suggestion	Arrange a pre-application meeting to discuss proposed landfill gas project.
Application Process	Applications should be submitted to the Division of Solid and Hazardous Waste. Submit: Standard Application Form CP-1 and Supplement, all requirements set forth in the applicable facility design checklist, engineering design of proposed solid waste facility, and fees.
Review Process	Applications are reviewed by the Division of Solid and Hazardous Waste, NJDEP.
Review/Approval Period	1 - 2 months
Fees	Contact the Division of Solid and Hazardous Waste for fee information.

3. OVERVIEW OF LOCAL STANDARDS AND PERMITS

Within the framework of federal and state regulation, local governments will have some jurisdiction over LFG-to-energy development in nearly all cases. Typically, local permits address issues that affect the surrounding community. These permits generally fall under the categories of construction, environment and health, land use, and water quality/use. Local governments are also responsible for administering some permits for federal and state regulations in addition to their own. For example, many local governments are responsible for ensuring compliance with federal air quality regulations. It should be noted, however, that some local standards and regulations are more strict than state or federal regulations.

Steps to Successful Local Permits Approval:

The following 6 steps will assist LFG-to-energy project developers achieve successful local permits approval:

- Step 1.** Determine which local authorities have jurisdiction over the project site.
- Step 2.** Contact local, city, and/or county planning and public works departments to obtain information about applicable permits and to discuss your plans. Meeting with agency staff to discuss the LFG project and required permits often helps to expedite the permitting process.
- Step 3.** Obtain essential information regarding each permit, including:
 - what information is required
 - the permitting process that should be followed
 - time frames (including submittal, hearing, and decision dates)
- Step 4.** Obtain copies of the regulations to compare and verify what is required in the permit applications. If they differ, contact the appropriate permitting agency.
- Step 5.** Submit a complete application. Incomplete applications typically result in processing delays.
- Step 6.** Attend meetings or hearing where the application will be discussed to respond to any questions that are raised. If questions are not responded to, delays could result.

Typical Local Permits

The table below provides typical local permits and approvals required for LFG-to-energy projects:

TABLE 3.1. LOCAL PERMITS AND STANDARDS

PERMIT	DESCRIPTION
Building Permit	Most county/local governments require building permits for construction, which entail compliance with several types of building codes, such as plumbing and electrical. A typical building permit application may require detailed final plans for structures, including electrical and plumbing plans, floor layout, sewage facilities, stormwater drainage plan, size and shape of lot and buildings, setback of buildings from property lines and drain field, access, size and shape of foundation walls, air vents, window access, and heating or cooling plants (if included in the design).
Zoning/Land Use	Most communities have a zoning and land use plan that identifies where different types of development are allowed (i.e., residential, commercial, and industrial). The local zoning board determines whether a particular project meets local land use criteria, and can grant variances if conditions warrant. A landfill gas project may require an industrial zoning classification.
Stormwater Management	Some local public works departments require a permit for discharges during construction and operation of a LFG-to-energy project. Good facility design that maintains the pre-development runoff characteristics of the site will typically enable the project to meet permitting requirements easily.
Solid Waste Disposal	A LFG-to-energy project may generate solid wastes, such as packaging material, cleaning solvents, and equipment fluids. If the landfill is closed, disposal of these solid wastes may be subject to review by a local authority.
Wastewater	The primary types of wastewater likely to be generated by a LFG-to-energy project include maintenance wastewater and cooling tower blowdown. The city engineer's office should be contacted to provide information about available wastewater handling capacity, and any unique condensate treatment requirements or permits for landfills.
Fire Hazards and Precautions	The mix of gases in landfill gas has a moderate to high explosion potential; methane is explosive in concentrations of 5 to 15 percent in air. Because methane has the potential to migrate from the landfill to on-site or off-site structures, it poses a significant public safety hazard. EPA requires that methane concentrations be less than 5 percent at a landfill property line, and less than 1.5 percent in a facility's structures. County regulations may call for as strict or stricter standards to be observed at the landfill.
Noise	Most local zoning ordinances stipulate the maximum allowable decibel levels from noise sources. These levels vary depending on the location of the site. For example, LFG energy recovery projects located near residential areas will likely have to comply with stricter noise level standards than projects located in non-populated areas.

PART II: INCENTIVE PROGRAMS

1. OVERVIEW OF FEDERAL INCENTIVE PROGRAMS

There are three federal incentive programs that may apply to LFG-to-energy projects: the Section 29 Tax Credit, the Renewable Energy Production Incentive (REPI), and the Qualifying Facilities (QF) Certification. Each program is described below.

1.1 Section 29 Tax Credit

Developers of LFG-to-energy projects who sell LFG to an unrelated third party may qualify for a tax credit under Section 29 of the Internal Revenue Service (IRS) tax code. In order to take advantage of the credits, project developers may bring in an outside party when developing power projects. The Section 29 tax credit was established in 1979 to encourage development of unconventional gas resources, such as landfill gas. Section 29 tax credits are available through 2007 to LFG projects that have a gas sales agreement in place by December 31, 1996 and are placed in service by June 30, 1998. The credit has been extended several times by the U.S. Congress, but there is no guarantee that these extensions will continue. The credit is worth \$3.00 per barrel of oil-equivalent (on a MMBtu basis) and is adjusted annually for inflation; currently, it is worth \$0.979 per MMBtu -- about 1.2 ¢/kWh for a typical landfill gas electricity project.

1.2 Renewable Energy Production Incentive (REPI)

The Renewable Energy Production Incentive (REPI), mandated under the Energy Policy Act of 1992, may provide a cash subsidy of up to \$0.015 per kWh to owners and operators of qualified renewable energy sources, such as landfills, that began operation between October 1993 and September 2003.⁴ The Department of Energy (DOE) will make incentive payments for 10 fiscal years, beginning with the fiscal year in which application for payment for electricity generated by the facility is first made and the facility is determined by DOE to be eligible for receipt of an incentive payment. The period for payment under this program ends in fiscal year 2013.

For further information, contact:

U.S. Department of Energy
Efficiency and Renewable Energy
Forrestal Building, Mail Station EE-10
1000 Independence Avenue, S.W.
Washington, DC 20585
Phone: (202) 586-4564

1.3 Qualifying Facilities Certification

Landfill gas-to-energy projects that generate electricity will benefit from Qualifying Facilities (QF) certification, which is granted through the Federal Energy Regulatory Commission (FERC). The following describes the benefits of QF status and the steps for applying for such status.

The Public Utility Regulatory Policies Act (PURPA) -- one of five parts of the National Energy Act of 1978 -- was designed to promote conservation of energy and energy security by removing barriers to the development of cogeneration facilities and facilities that employ waste or renewable fuels. Such facilities are called Qualifying Facilities, or QFs. Under PURPA, utilities are required to purchase electricity from QFs at each utility's avoided cost of generating power. PURPA provides that a small power production facility, such as a LFG-to-energy project that meets FERC standards can become a QF.

In order to apply for QF status, applicants must prepare either (1) a Notice of Self-Certification, which asserts compliance with the FERC's technical and ownership criteria, or (2) an Application for Commission Certification of Qualifying Status, which requires a draft Federal Register notice and which provides actual FERC approval of QF status. In either case, the applicant must also file Form 565, which is a list of questions about the project, and must pay any filing fees associated with certifications, exemptions, and other activities. FERC will provide the QF "Info Packet" that describes the necessary steps, requirements, and background information. After submittal of the initial application, further justifications and submittal of information may be required.

For the QF Info Packet and applications, contact:

Federal Energy Regulatory Commission
Qualifying Facilities Division
825 North Capitol Street, N.E.
Washington, DC 20426
Phone: (202) 208-0571

2. STATE INCENTIVE PROGRAMS

The New Jersey Department of Environmental Protection (NJDEP) is a proponent of LFG-to-energy projects and supports their development whenever practical. At this time NJDEP offers several incentives that are advantageous to LFG-to-energy development, some of which offer various forms of monetary assistance. Some of the programs available include:

- **Pollution Control Equipment Sales Tax Exemption:** The purchase of qualifying pollution control equipment is NJ state sales tax exempt. Please contact your tax accountant for applicability.
- **New Jersey Emissions Trading Program:** This popular program provides emission credits for pollutant (VOC) reductions which can then be sold or traded. Please contact NJDEP's Office of Air Quality at (609) 984-6721.
- **Bonus NO_x Allocations and Incentives:** Additional Information may be obtained from the Office of Air Quality at (609) 984-6721.
- **Recycling Equipment Loans:** This revolving loan program provides low-cost loans for qualifying recycling equipment purchases. For additional information and/or an application, please call the Office of Planning and Recycling at (609) 984-3438.
- **Recycling Tax Credit Program:** Provides for a 50% sales tax credit on the purchase of qualifying recycling equipment. For additional information, please contact NJDEP's Office of Recycling and Planning at (609) 984-3438.

The New Jersey Economic Development Authority can also provide financial assistance in the form of loans to qualifying project developers.

Impediments to LFG recovery projects include utility deregulation and its ensuing economic uncertainty, a typically low rate of return for investors, and regulatory obstacles. NJDEP is actively working toward removing the hurdles to LFG-to-energy development as well as initiating other incentives. This is being pursued through rethinking traditional policies that may discourage LFG-to-energy projects, continuing education on the benefits of LFG projects, and maintaining a commitment to encourage these projects.

APPENDIX A: STATE CONTACTS

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of Environmental Protection
Environmental Regulation
Office of Permit Information and Assistance
CN 423
Trenton, NJ 08625
609-292-5548

Air Quality

Bureau of New Source Review
Department of Environmental Protection
CN 027
Trenton, NJ 08625
609-633-2753

Water Quality

Division of Water Quality
Environmental Regulation
Department of Environmental Protection
CN 029
Trenton, NJ 08625
609-292-4860

Bureau of Stormwater Permitting
Division of Water Quality
Environmental Regulation
Department of Environmental Protection
CN 029
Trenton, NJ 08625
609-292-4860

Bureau of Construction and Connection
Division of Water Quality
Department of Environmental Protection
CN 029
Trenton, NJ 08625
609-292-4429

Water Supply

Bureau of Water Allocation
Water Supply Program
Department of Environmental Protection
CN 426
Trenton, NJ 08625
609-984-6831

Solid Waste

Division of Solid and Hazardous Waste
Department of Environmental Protection
CN 414
Trenton, NJ 08625
609-984-6650

SPECIAL PERMITTING AREAS

Delaware River Basin Commission
25 State Police Drive
Box 7360
West Trenton, NJ 08628
609-883-9500

Hackensack Meadowlands Development
Commission
One DeKorte Park Plaza
Lyndhurst, NJ 07071
201-460-1700

Pinelands Commission
P.O. Box 7
Springfield Road
New Lisbon, NJ 08064

Delaware and Raritan Canal Commission
Prallsville Mills
P.O. Box 539
Stockton, NJ 08559-0539
609-397-2000

USGS MAPS

May be purchased from:

NJDEP, Bureau of Revenue
CN 417
Trenton, NJ 08625-0417
609-777-7138

Other State Agencies:

Department of Commerce and
Economic Development
Office of Business Advocacy
CN 823
Trenton, NJ 08625
609-292-0700

Department of Transportation
Central Permits Office
1035 Parkway Avenue
CN600
Trenton, NJ 08624
609-530-3766