STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

PAUL R. LEPAGE
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Juniper Ridge Energy LLC
Penobscot County
Old Town, Maine
A-1116-77-1-A

Departmental
Findings of Fact and Order
New Source Review
NSR #1

FINDINGS OF FACT

After review of the air emissions license amendment application, staff investigation reports and other documents in the applicant's file in the Bureau of Air Quality, pursuant to 38 Maine Revised Statutes Annotated (M.R.S.A.), Section 344 and Section 590, the Maine Department of Environmental Protection (Department) finds the following facts:

I. REGISTRATION

A. Introduction

FACILITY	Juniper Ridge Energy LLC
LICENSE TYPE	06-096 CMR 115, Major Modification
NAICS CODES	221118
NATURE OF BUSINESS	Electric Power Generation
FACILITY LOCATION	2828 Bennoch Road

B. Facility Description

Juniper Ridge Energy LLC (JRE), a subsidiary of Aria Energy, has proposed a landfill gas-to-energy plant to be installed at Juniper Ridge Landfill (JRL). JRL is a solid waste disposal facility owned by the State of Maine and operated by NEWSME Landfill Operations, LLC.

JRE is a separate and distinct legal entity under different ownership from JRL. JRE and JRL are located on contiguous property and, due to their operational interconnection, considered to be under common control. Therefore, they are considered to be a single stationary source for purposes of New Source Review (NSR). However, JRE and JRL have requested, and will maintain, separate air emission licenses which delineate the responsibilities of each party.

C. Emission Equipment

The following equipment is addressed in this air emission license:

Landfill Gas-to-Energy Engines

Equipment	Maximum Heat Input Capacity (MMBtu/hr)	Output (kW)	Maximum Firing Rate (scfm)	Fuel Type, TRS content	Stack #
Engine #1	16.5	1,600	550	landfill gas, < 1,000 ppmv	1
Engine #2	16.5	1,600	550	landfill gas, < 1,000 ppmv	2
Engine #3	16.5	1,600	550	landfill gas, < 1,000 ppmv	3

Process Equipment

Equipment	Maximum Heat Input Capacity (MMBtu/hr)	Maximum Flow Rate (scfm)
Trim Flare	15.6	520

Emergency Generators

Equipment	Maximum Heat Input Capacity (MMBtu/hr)	Output (kW)	Maximum Firing Rate (gal/hr)	Fuel Type, % sulfur	Stack #
Emergency Generator #1	1.1	150	7.9	distillate fuel, 0.0015%	4

D. Definitions

Distillate Fuel means fuel oil that complies with the specifications for fuel oil numbers 1 or 2, as defined by the American Society for Testing and Materials in ASTM D396, diesel fuel oil numbers 1 or 2, as defined in ASTM D975, kerosene, as defined in ASTM D3699, biodiesel as defined in ASTM D6751, or biodiesel blends as defined in ASTM D7467.

E. Application Classification

As described earlier, JRE is considered to be part of the same stationary source as JRL. Therefore, the installation of the landfill gas-to-energy plant is considered a modification of a major source.

The modification of a major source is considered a major modification based on whether or not expected emissions increases exceed the "Significant Emission Increase Levels" as given in *Definitions Regulation*, 06-096 Code of Maine Rules (CMR) 100 (as amended).

The emission increases are determined by subtracting the baseline actual emissions of the 24 months preceding the modification (or representative 24 months) from the projected actual emissions. The results of this test are as follows:

Pollutant	Baseline Actual Emissions 2013 - 2014 (ton/year)	Projected Actual & Licensed Emissions (ton/year)	Net Emissions Increase (ton/year)	Significance Emissions Increase Levels (ton/year)
PM	3.4	20.2	16.8	25
PM_{10}	3.4	20.2	16.8	15
$PM_{2.5}$	3.4	20.2	16.8	10
SO_2	351.3	158.0	-193.3	40
NO_x	13.8	56.2	42.4	40
CO	75.1	319.9	244.8	100
VOC	0.6	37.1	36.5	40
CO_2e	43,843	98,186	54,342	75,000

Notes: The landfill currently collects approximately 1,700 scfm of landfill gas. The Projected maximum collection rate for the landfill is 3,550 scfm. Projected actual emissions are based on the maximum collection rate of 3,550 scfm with the three engines operating at 100% and the remaining landfill gas being flared.

In June 2015 JRL installed a sulfur treatment system to maintain concentrations of total reduced sulfur (TRS) compounds in the landfill gas to less than 1,000 ppmv. This results in a net emissions decrease of proposed actual emissions over baseline emissions. The installation of the JRE landfill gas-to-energy plant has no impact on emissions of SO_2 from the source.

Listed emissions of CO_2e are from combustion equipment only and does not take into account fugitive emissions from the landfill.

Based on the emission increases listed above, this amendment is determined to be a major modification for PM_{10}, $PM_{2.5}$, NO_x, and CO under *Minor and Major Source Air Emission License Regulations* 06-096 CMR 115 (as amended).

JRE shall apply for a Part 70 license under Part 70 Air Emission License Regulation, 06-096 CMR 140, Section 3 (as amended), within 12 months of commencing operation, as provided in 40 CFR Part 70.5.

II. BEST PRACTICAL TREATMENT (BPT)

A. Introduction

In order to receive a license the applicant must control emissions from each unit to a level considered by the Department to represent Best Practical Treatment (BPT), as defined in *Definitions Regulation*, 06-096 CMR 100 (as amended). Separate control requirement categories exist for new and existing equipment as well as for those sources located in designated non-attainment areas.

BPT for new sources and modifications requires a demonstration that emissions are receiving Best Available Control Technology (BACT), as defined in 06-096 CMR 100. BACT is a top-down approach to selecting air emission controls considering economic, environmental and energy impacts.

Although Maine is part of the Ozone Transport Region (OTR), Maine has received a NO_x waiver from the USEPA, effective 8/28/14. Therefore, although this amendment is major for NO_x, this amendment does not require the application of a Lowest Achievable Emission Rate (LAER) analysis nor the purchase of NO_x offsets.

B. Facility Description

JRL operates an active solid waste landfill. Landfill gas (LFG) formed from the decomposition of the landfill materials are currently collected and controlled by the facility's three flares.

JRL has proposed the installation of a landfill gas-to-energy (LFGTE) facility consisting of three (3) Caterpillar model G3520C engines and a 15.6 MMBtu/hr utility flare (Trim Flare). The engines will fire LFG and be used to produce electricity to be sold off-site. The Trim Flare will be used to combust LFG delivered to the facility in excess of what is required by, or capable of being fired in, the engines.

JRL also operates and maintains a flare system which can operate in combination with, or in lieu of, the LFGTE facility. Although the LFGTE facility is owned and operated by JRE, JRL is still responsible for ensuring all LFG is collected and controlled in compliance with 40 CFR Part 60, Subpart WWW, *Standards of Performance for*

Municipal Solid Waste Landfills per Air Emission License A-921-70-B-R, Condition (14)(B).

JRL is required to operate pollution control equipment, as necessary, on the landfill gas to achieve (on a 12-month rolling average basis) a TRS concentration in the LFG of 1,000 ppmv or less prior to combustion per Air Emission License A-921-70-B-R, Condition (15)(B)(2). The control of TRS results in reduced SO_2 emissions from the combustion devices. It has been assumed that all LFG delivered to the LFGTE facility will meet this requirement.

C. Landfill Gas-to-Energy Engines

JRE proposes to install three (3) Caterpillar model G3520C engines (Engines #1-#3) which fire LFG to produce electricity to be sold off-site. The engines will each be new units rated at 16.5 MMBtu/hr firing landfill gas comprised of approximately 50% methane (CH_4). The engines planned for installation at JRE were manufactured on 7/28/05, 7/29/05, and 8/22/08 respectively

1. Replacement Units

As required by maintenance guidelines, Engines #1-#3 should be overhauled regularly to maintain engine performance and operation. JRE proposes to do this work off-site by removal of the affected engines and replacement with one of the same make, model, and maximum heat input. Once rebuilt, the engine would remain off-site or be used as a subsequent replacement unit on-site.

Following is the definition of "replacement unit" is per 40 CFR Part 51, §51.165(a)(1)(xxi) and is similarly referenced in 40 CFR §51.166:

Replacement unit means an emissions unit for which all the criteria listed in paragraphs (a)(1)(xxi)(A) through (D) of this section are met. No creditable emission reductions shall be generated from shutting down the existing emissions unit that is replaced.
(A) The emissions unit is a reconstructed unit within the meaning of §60.15(b)(1) of this chapter, or the emissions unit completely takes the place of an existing emissions unit.
(B) The emissions unit is identical to or functionally equivalent to the replaced emissions unit.
(C) The replacement does not alter the basic design parameters (as discussed in paragraph (h)(2) of this section) of the process unit.
(D) The replaced emissions unit is permanently removed from the major stationary source, otherwise permanently disabled, or permanently barred from operation by a permit that is enforceable as a practical matter. If the replaced emissions unit is brought back into operation, it shall constitute a new emissions unit.

Each proposed replacement LFGTE engine would take the place of an existing unit, would be the functional equivalent of the replaced emissions unit, and would not alter the basic design parameters of the process unit. The facility will not have more than three engines operating at any time without a permit modification to add additional emission units. Therefore, the replacement LFGTE engine meets the definition of replacement unit. The removed engine may subsequently be used as a "replacement unit" for itself or another engine on-site.

Per 40 CFR §51.165(a)(1)(vii)(B), a replacement unit, as defined in paragraph (a)(1)(xxi) of this section, is an existing emissions unit. This means that the replacement LFGTE engine would not be considered "new" to this source, and thus, not trigger New Source Review (NSR) permitting requirements.

It must also be determined whether the replacement of the LFGTE engines would be considered a modification of the source.

A modification means any physical change in or change in the method of operation of a source that would result in the emission increase of any regulated pollutant. Routine maintenance, repair, and replacement are not considered physical changes. A change in the actual number of hours of operation is not considered a change in the method of operation (provided it does not violate other federally enforceable permit conditions). In addition, the replacement of a LFGTE engine will not result in the emissions increase of any regulated pollutant as the actual emissions of all pollutants will remain the same both before and after the replacement resulting in no net emissions increase. (For further information see 40 CFR §51.165(a)(1)(v) and the definition of "Modification given in *Definitions Regulation,* 06-096 CMR 100.)

Therefore, the replacement of a LFGTE engine with an engine of the same make, model, and maximum heat input is determined not to be a modification of emissions units requiring New Source Review (NSR) permitting under *Minor and Major Source Air Emission License Regulations,* 06-096 CMR 115 (as amended).

<u>Notification Requirements</u>
At least 15 calendar days prior to installation of any replacement engine, JRE shall provide written notification to the Department (both to the Licensing Section and Regional Inspector). This notification shall contain the following information:

a. Emission unit number being replaced (i.e. Engine #1, #2, or #3);
b. Make, model, serial number, date of manufacture, and maximum heat input of the replacement engine (i.e. the engine new to the site);
c. Anticipated date installation will commence;
d. A statement that the replacement engine will meet the definition of a "replacement unit" as defined by 40 CFR §51.165(a)(1)(xxi);

e. A statement stating whether the engine is subject to 40 CFR Part 63, Subpart ZZZZ or 40 CFR Part 60, Subpart JJJJ.

Within seven days of initial startup of the replacement engine, JRE shall provide written notification to the Department (both to the Licensing Section and Regional Inspector) of the date of initial engine startup.

2. National Emission Standards for Hazardous Air Pollutants (NESHAP)

Any LFGTE engine, or replacement engine, which commenced construction prior to June 12, 2006 is subject to 40 CFR Part 63, Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*. This includes Engines #1 and #2. These engines are considered existing stationary reciprocating internal combustion engines (RICE) located at an area source. They are also classified as non-emergency, non-black start stationary RICE which combust landfill gas equivalent to more than 10% of their gross heat input on an annual basis. Following are the requirements of Subpart ZZZZ which apply to Engines #1 and #2 or any replacement engine subject to Subpart ZZZZ.

a. Operational Requirements

	Operating Limitations
Non-Emergency, non-black start stationary RICE which combusts landfill gas equivalent to 10% or more of the gross heat input on an annual basis.	- Change oil and filter every 1,440 hours of operation or annually, whichever comes first; - Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and - Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.

b. General Requirements to Minimize Emissions

At all times the facility shall operate and maintain the engine, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. [40 CFR §63.6605(b)]

c. Operation & Maintenance

JRE shall operate and maintain the engine according to the manufacturer's emission-related written instructions or develop a site-specific maintenance plan which must provide, to the extent practicable, for the maintenance and operation

of the engine in a manner consistent with good air pollution control practice for minimizing emissions. [40 CFR§63.6625(e)]

d. Startup Idle and Startup Time Minimization Requirements

During periods of startup the facility must minimize the engine's time spent at idle and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.
[40 CFR §63.6625(h) & 40 CFR Part 63, Subpart ZZZZ Table 2d]

e. Optional Oil Analysis Program

JRE has the option of utilizing an oil analysis program which complies with the requirements of §63.6625(i) in order to extend the specified oil change requirement. If this option is used, JRE must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine. [40 CFR§63.6625(j)]

f. Record Keeping

JRE shall keep records that include maintenance conducted on the engine in order to demonstrate that it was operated and maintained in accordance with the facility's maintenance plan. [40 CFR §63.6655(e)]

3. New Source Performance Standards (NSPS)

Any LFGTE engine, or replacement engine, which commenced construction after June 12, 2006 and was manufactured after July 1, 2007 is subject to 40 CFR Part 60, Subpart JJJJ, *Standards of Performance for Spark Ignition Internal Combustion Engines (SI ICE)*. This includes Engine #3. By meeting the requirements of Subpart JJJJ, Engine #3 also meets the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 CFR Part 63, Subpart ZZZZ. Following are the requirements of Subpart JJJJ which apply to Engine #3 or any replacement engine subject to Subpart JJJJ.

a. Emission Standards

The engine is subject to numerical emission limits under Subpart JJJJ. These limits are included in the Emission Limits and Streamlining section below.

b. Operational Requirements

JRE shall, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. [40 CFR §60.4243(b)]

c. Performance Tests

(1) JRE shall conduct an initial performance test for NO_x, CO, and VOC on the engine in accordance with 40 CFR §60.4244 and Table 2 within 180 days of startup of the engine. [40 CFR §60.4243(b)]
(2) JRE shall conduct subsequent performance testing on the engine every 8,760 hours of operation or 3 years, whichever comes first. [40 CFR §60.4243(b)] If an engine is non-operational, JRE does not need to start up the engine solely to conduct a performance test. However, JRE must conduct the performance test immediately upon startup of the engine. [40 CFR §60.4244(b)]
(3) Each performance test shall be conducted within 10% of 100% peak (or the highest achievable) load. [40 CFR §60.4244(a)]
(4) JRE shall conduct three separate test runs for each performance test. Each test run must be conducted within 10% of 100% peak (or the highest achievable) load and last at least 1 hour. [40 CFR §60.4244(c)]
(5) JRE shall submit a copy of each performance test report within 60 days after the test has been completed. [40 CFR §60.4245(d)]

d. Recordkeeping and Reporting

(1) JRE shall keep records of all maintenance conducted on the engine. [40 CFR §60.4245(a)(2)]
(2) JRE shall maintain documentation from the manufacturer that the engine is certified to meet the emission standards. [40 CFR §60.4245(a)(3)]

4. <u>BACT Findings</u>

The Department has previously determined BACT for control of emissions of VOC and Non-Methane Organic Compounds (NMOCs) from the landfill to be the operation of an active gas collection and control system in accordance with 40 CFR Part 60, Subpart WWW. Control of the LFG is accomplished through combustion. As such, the engines are themselves considered control equipment for these pollutants.

Following is a detailed BACT analysis for the engines for particulate matter, SO_2, NO_x, and CO.

a. $PM/PM_{10}/PM_{2.5}$

The following control technologies for the control of PM, PM_{10}, and $PM_{2.5}$ were evaluated:

(1) Good Combustion Practices;
(2) Proper Engine Maintenance Practices; and
(3) Coalescing Filters.

BACT for PM, PM_{10}, and $PM_{2.5}$ emissions from Engines #1-#3 is determined to be use of all three technologies mentioned above and emission limits of 0.08 lb/MMBtu and 1.20 lb/hr from each engine.

b. SO_2

SO_2 is produced when sulfur compounds present in the LFG are oxidized during combustion. Control of SO_2 is often accomplished through limiting the amount of sulfur present in the fuel.

JRL recently installed a sulfur treatment system to control TRS in the LFG to less than 1,000 ppmv. Additional add-on controls for JRE are determined not to be economically feasible.

BACT for SO_2 emissions from Engines #1-#3 is determined to be firing of LFG conditioned to less than 1,000 ppmv of TRS and an emission limit of 5.59 lb/hr from each engine. JRE shall maintain records of the TRS content of the gas fired based on records provided by JRL.

c. NO_x and CO

Since there is often a trade-off in emissions when either NO_x or CO is reduced, BACT for these two pollutants was considered together.

The following control technologies for the control of NO_x and CO were evaluated:

(1) Good Combustion Practices;
(2) Air/Fuel Ratio (AFR) controllers;
(3) Selective Catalytic Reduction (SCR); and
(4) Selective Non-Catalytic Reduction (SNCR).

Impurities in the LFG quickly poison catalysts. Due to the very limited operational history of landfill gas-fired engines, no other add on control

technology has been developed for this equipment. Therefore, SCR and SNCR were eliminated as not technically viable at this time.

BACT for NO_x emissions from Engines #1-#3 is determined to be use of the integrated AFR controller and emission limits of 0.6 g/bhp-hr and 2.97 lb/hr from each engine.

BACT for CO emissions from Engines #1-#3 is determined to be use of the integrated AFR controller and emission limits of 3.5 g/bhp-hr and 17.30 lb/hr from each engine.

d. Periodic Monitoring

In addition to the recordkeeping requirements of 40 CFR Part 60, Subpart JJJJ, JRE shall monitor and record the following periodic monitors for Engines #1-#3 and their associated air pollution control equipment:

(1) Operating hours of each engine on a monthly basis.
(2) Total combined LFG combusted in the engines (scf) on a monthly basis.

5. Emission Limits and Streamlining

For Engines #1-#3 a listing of potentially applicable emission standards, the origin and authority of the standards, notation if streamlining of the standards has been requested, and the applicable emission limits can be found below. The limits below are for each engine.

Pollutant	Applicable Emission Standards	Origin and Authority	Licensed Emission Limits
PM	0.12 lb/MMBtu	06-096 CMR 103 §2(B)(1)(a)	0.08 lb/MMBtu*
	0.08 lb/MMBtu	06-096 CMR 115, BACT	
	1.20 lb/hr	06-096 CMR 115, BACT	1.20 lb/hr
PM_{10}	1.20 lb/hr	06-096 CMR 115, BACT	1.20 lb/hr
$PM_{2.5}$	1.20 lb/hr	06-096 CMR 115, BACT	1.20 lb/hr
SO_2	5.59 lb/hr	06-096 CMR 115, BACT	5.59 lb/hr
NO_x	2.0 g/bhp-hr	40 CFR §60.4233(e) & Table 1**	0.6 g/bhp-hr*
	0.6 g/bhp-hr	06-096 CMR 115, BACT	
	2.97 lb/hr	06-096 CMR 115, BACT	2.97 lb/hr

Pollutant	Applicable Emission Standards	Origin and Authority	Licensed Emission Limits
CO	5.0 g/bhp-hr	40 CFR §60.4223(e) & Table 1**	3.5 g/bhp-hr*
	3.5 g/bhp-hr	06-096 CMR 115, BACT	
	17.30 lb/hr	06-096 CMR 115, BACT	17.30 lb/hr
VOC	1.0 g/bhp-hr	40 CFR §60.4223(e) & Table 1**	0.56 g/bhp-hr*
	0.56 g/bhp-hr	06-096 CMR 115, BACT	
	2.77 lb/hr	06-096 CMR 115, BACT	2.77 lb/hr
Visible Emissions	20% opacity on a six (6)-minute block average basis except for two (2) six (6)-minute block averages in a 3-hour period	06-096 CMR 101, §2(B)(1)(d)	20% opacity on a six (6)-minute block average basis except for two (2) six (6)-minute block averages in a 3-hour period

Table Notes: * streamlining requested
** Only applicable to engines subject to 40 CFR Part 60, Subpart JJJJ

D. Trim Flare

The LFGTE facility will be the primary combustion device for control of emissions of VOC and NMOC from the landfill. JRE will operate a "Trim Flare" for control of LFG over and above what can be accommodated by the LFGTE facility, either due to excess LFG production or one or more of the engines being out of service. The Trim Flare and the LFGTE facility are both considered control equipment for the landfill and each are capable of achieving 98% overall destruction of NMOC.

The Trim Flare is rated for 520 scfm of LFG. At 50% methane, this equates to approximately 15.6 MMBtu/hr heat input.

1. BACT Findings

The Department has previously determined BACT for control of emissions of VOC and NMOCs from the landfill to be the operation of an active gas collection and control system in accordance with 40 CFR Part 60, Subpart WWW. Control of the LFG is accomplished through combustion. As such, the Trim Flare is itself considered to be control equipment for these pollutants.

a. The BACT emission limits for the Trim Flare are based on the following:

PM/PM_{10}	- 17 lb/10^6 scf CH_4 from AP-42, Table 2.4-5 dated 11/98
SO_2	- combustion of LFG with a maximum TRS content of 1,000 ppmv
NO_x	- 0.068 lb/MMBtu from AP-42, Table 13.5-1 dated 4/15
CO	- 0.37 lb/MMBtu from manufacturer's specifications and consistent with AP-42, Table 13.5-2 dated 4/15
VOC	- 98% destruction
Opacity	- 06-096 CMR 115, BACT

b. Periodic Monitoring
JRE shall monitor and record the total LFG combusted at the Trim Flare (scf) on a monthly basis.

2. Emission Limits and Streamlining

For the Trim Flare a listing of potentially applicable emission standards, the origin and authority of the standards, notation if streamlining of the standards has been requested, and the applicable emission limits can be found below.

Pollutant	Applicable Emission Standards	Origin and Authority	Licensed Emission Limits
PM	0.12 lb/MMBtu	06-096 CMR 103 §2(B)(1)(a)	0.02 lb/MMBtu*
	0.02 lb/MMBtu	06-096 CMR 115, BACT	
	0.27 lb/hr	06-096 CMR 115, BACT	0.27 lb/hr
PM_{10}	0.27 lb/hr	06-096 CMR 115, BACT	0.27 lb/hr
$PM_{2.5}$	0.27 lb/hr	06-096 CMR 115, BACT	0.27 lb/hr
SO_2	5.28 lb/hr	06-096 CMR 115, BACT	5.28 lb/hr
NO_x	1.06 lb/hr	06-096 CMR 115, BACT	1.06 lb/hr
CO	5.77 lb/hr	06-096 CMR 115, BACT	5.77 lb/hr
VOC	0.05 lb/hr	06-096 CMR 115, BACT	0.05 lb/hr
Visible Emissions	30% opacity on a six (6) minute block average basis except for two (2) six (6) minute block averages in a 3-hour period	06-096 CMR 101, §2(B)(1)(f)	20% opacity on a six (6) minute block average basis *
	20% opacity on a six (6) minute block average basis	06-096 CMR 115, BACT	

Table Notes: * streamlining requested

E. Emergency Generator #1

JRE proposes to install a new emergency generator (Emergency Generator #1). Emergency Generator #1 is a generator set with consisting of an engine and an electrical generator. Emergency Generator #1 has an engine rated at 1.1 MMBtu/hr and fires distillate fuel.

1. New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAP)

The federal regulation 40 CFR Part 60, Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines (CI ICE)* is applicable to Emergency Generator #1 listed above since the unit was ordered after July 11, 2005 and manufactured after April 1, 2006. By meeting the requirements of Subpart IIII, Emergency Generator #1 will also meet the requirements found in the *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines*, 40 CFR Part 63, Subpart ZZZZ.

a. Emergency Definition:
Emergency stationary ICE means any stationary reciprocating internal combustion engine that meets all of the following criteria:

(1) The stationary ICE is operated to provide electrical power or mechanical work during an emergency situation. Examples include stationary ICE used to produce power for critical networks or equipment (including power supplied to portions of a facility) when electric power from the local utility (or the normal power source, if the facility runs on its own power production) is interrupted, or stationary ICE used to pump water in the case of fire or flood, etc. There is no time limit on the use of emergency stationary ICE in emergency situations.

(2) Paragraph (1) above notwithstanding, the emergency stationary ICE may be operated for any combination of the purposes specified below for a maximum of 100 hours per calendar year:

(i) Maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require

maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(ii) Emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP-002-3, Capacity and Energy Emergencies (incorporated by reference, see §63.14), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP-002-3.

(iii) Periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(3) Paragraphs (1) and (2) above notwithstanding, emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. These 50 hours are counted as part of the 100 hours per calendar year for maintenance checks and readiness testing, emergency demand response, and periods of voltage deviation or low frequency, as provided in paragraph (2) above.

The 50 hours per calendar year for non-emergency situations cannot be used for peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity, except if the following conditions are met:

(i) The engine is dispatched by the local balancing authority or local transmission and distribution system operator.

(ii) The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(iii) The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(iv) The power is provided only to the facility itself or to support the local transmission and distribution system.

(v) The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

[40 CFR §60.4211(f) and §60.4219]

b. 40 CFR Part 60, Subpart IIII Requirements:

(1) Manufacturer Certification Requirement
Emergency Generator #1 shall be certified by the manufacturer as meeting the emission standards for new nonroad compression ignition engines found in 40 CFR §60.4202. [40 CFR §60.4205(b)]

(2) Ultra-Low Sulfur Fuel Requirement
The fuel fired in Emergency Generator #1 shall not exceed 15 ppm sulfur (0.0015% sulfur). [40 CFR §60.4207(b)]

(3) Non-Resettable Hour Meter Requirement
A non-resettable hour meter shall be installed and operated on Emergency Generator #1. [40 CFR §60.4209(a)]

(4) Operation and Maintenance Requirements
Emergency Generator #1 shall be operated and maintained according to the manufacturer's emission-related written instructions or procedures developed by facility that are approved by the engine manufacturer. JRE may only change those emission-related settings that are permitted by the manufacturer. [40 CFR §60.4211(a)]

(5) Annual Time Limit for Maintenance and Testing
As an emergency engine, Emergency Generator #1 shall be limited to 100 hours/year for maintenance checks and readiness testing, emergency demand response, and periods of voltage or frequency deviation from standards. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or otherwise supply power as part of a financial arrangement with another entity unless the conditions in §60.4211(f)(3)(i) are met). [40 CFR §60.4211(f)]

(6) Initial Notification Requirement
No initial notification is required for emergency engines.
[40 CFR §60.4214(b)]

(7) Recordkeeping
JRE shall keep records that include maintenance conducted on Emergency Generator #1 and the hours of operation of the engine recorded through the non-resettable hour meter. Documentation shall include the hours spent for emergency operation, including what classified the operation as emergency and how many hours spent for non-emergency. If Emergency Generator #1 is operated during a period of demand response or deviation from standard voltage or frequency, or to supply power during a non-emergency situation as

part of a financial arrangement with another entity as specified in §60.4211(f)(3)(i), JRE shall keep records of the notification of the emergency situation, and the date, start time, and end time of engine operation for these purposes. [40 CFR §60.4214(b)]

(8) Annual Reporting Requirements for Demand Response Availability Over 15 Hours Per Year (for engines greater than 100 brake hp)
If JRE operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §60.4211(f)(3)(i), the facility shall submit an annual report containing the information in §60.4214(d)(1)(i) through (vii). The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year. The annual report must be submitted electronically using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form is not available in CEDRI at the time that the report is due, the written report must be submitted to the following address:

U.S. Environmental Protection Agency, Region I
5 Post Office Square, Suite 100 (OES04-2)
Boston, MA 02109-3912
Attn: Air Compliance Clerk

[40 CFR §60.4214(d)]

2. <u>BACT Findings</u>

The BACT emission limits for Emergency Generator #1 are based on the following:

PM/PM_{10}	- 0.12 lb/MMBtu from 06-096 CMR 115 BACT
SO_2	- combustion of distillate fuel with a maximum sulfur content not to exceed 15 ppm (0.0015% sulfur by weight)
NO_x	- 4.41 lb/MMBtu from AP-42, Table 3.3-1 dated 10/96
CO	- 0.95 lb/MMBtu from AP-42, Table 3.3-1 dated 10/96
VOC	- 0.35 lb/MMBtu from AP-42, Table 3.3-1 dated 10/96
Opacity	- 06-096 CMR 101

3. Emission Limits and Streamlining

For Emergency Generator #1 a listing of potentially applicable emission standards, the origin and authority of the standards, notation if streamlining of the standards has been requested, and the applicable emission limits can be found below.

Pollutant	Applicable Emission Standards	Origin and Authority	Licensed Emission Limits
PM	0.13 lb/hr	06-096 CMR 115, BACT	0.13 lb/hr
PM_{10}	0.13 lb/hr	06-096 CMR 115, BACT	0.13 lb/hr
$PM_{2.5}$	0.13 lb/hr	06-096 CMR 115, BACT	0.13 lb/hr
SO_2	negligible	06-096 CMR 115, BACT	negligible
NO_x	4.76 lb/hr	06-096 CMR 115, BACT	4.76 lb/hr
CO	1.03 lb/hr	06-096 CMR 115, BACT	1.03 lb/hr
VOC	0.38 lb/hr	06-096 CMR 115, BACT	0.38 lb/hr
Visible Emissions	20% opacity on a six (6) minute block average basis except for two (2) six (6) minute block averages in a 3-hour period	06-096 CMR 101, §2(B)(1)(d)	20% opacity on a six (6) minute block average basis except for two (2) six (6) minute block averages in a 3-hour period

F. Incorporation into the Part 70 Air Emission License

The requirements in this 06-096 CMR 115 New Source Review amendment shall apply to the facility upon amendment issuance. Per *Part 70 Air Emission License Regulations*, 06-096 CMR 140 (as amended), Section 1(C)(8), for a modification that has undergone NSR requirements or been processed through 06-096 CMR 115, the source must then apply for an amendment to the Part 70 license within one year of commencing the proposed operations as provided in 40 CFR Part 70.5. JRE shall apply for a Part 70 license to address the equipment contained in this license within one year of commencing operations.

G. Annual Emissions

1. The facility (JRE and JRL combined) shall be restricted to the following annual emissions, based on a 12 month rolling total. The tons per year limits were calculated based on the following:

   - Operation of Engines #1-#3 at 100% load for 8,760 hr/year;
   - Operation of the Trim Flare at 100% capacity for 8,760 hr/year;
   - Operation of Emergency Generator #1 for 100 hr/year;
   - A maximum LFG production rate from the landfill of 3,550 scfm;
   - JRL flaring 1,380 scfm of LFG (i.e. maximum LFG production rate of the landfill minus the maximum LFG usage of the LFGTE facility).

   This scenario represents worse-case emissions from this stationary source.

Total Licensed Annual Emissions for the Facility
Tons/year

	PM	PM_{10}	$PM_{2.5}$	SO_2	NO_x	CO	VOC
Engine #1	5.3	5.3	5.3	24.5	13.0	75.8	12.1
Engine #2	5.3	5.3	5.3	24.5	13.0	75.8	12.1
Engine #3	5.3	5.3	5.3	24.5	13.0	75.8	12.1
Emerg. Gen. #1	–	–	–	–	0.2	0.1	–
Trim Flare	1.2	1.2	1.2	23.1	4.7	25.3	0.2
JRL Flares	3.1	3.1	3.1	61.4	12.3	67.1	0.6
Total TPY	**20.2**	**20.2**	**20.2**	**158.0**	**56.2**	**319.9**	**37.1**

Pollutant	Tons/year
Single HAP	9.9
Total HAP	24.9

2. Greenhouse Gases
   Greenhouse gases are considered regulated pollutants as of January 2, 2011, through 'Tailoring' revisions made to EPA's *Approval and Promulgation of Implementation Plans,* 40 CFR Part 52, Subpart A, §52.21, *Prevention of Significant Deterioration of Air Quality* rule. Greenhouse gases, as defined in 06-096 CMR 100 (as amended), are the aggregate group of the following gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. For licensing purposes, greenhouse gases (GHG) are calculated and reported as carbon dioxide equivalents (CO_2e).

The quantity of CO_2e emissions from this facility is greater than 100,000 tons per year, based on the following:

- the facility's fuel use limits;
- estimation of fugitive emissions;
- worst case emission factors from the following sources: U.S. EPA's AP-42, the Intergovernmental Panel on Climate Change (IPCC), and 40 CFR Part 98, *Mandatory Greenhouse Gas Reporting*; and
- global warming potentials contained in 40 CFR Part 98.

As defined in 06-096 CMR 100, any source emitting 100,000 tons/year or more of CO_2e is a major source for GHG. This license includes applicable requirements addressing GHG emissions from this source, as appropriate.

3. Calculation of Air Emission License Fee
The emissions calculated in (1) above are for the entire stationary source. JRE's air emission license fee shall be calculated based on emissions from the LFGTE facility only. Emissions for calculation of the air emission license fee for JRE are based on the following:

- Operation of Engines #1-#3 at 100% load for 8,760 hr/year;
- Operation of the Trim Flare at 100% capacity for 8,760 hr/year;
- Operation of Emergency Generator #1 for 100 hr/year;

Total Licensed Annual Emissions for JRE <u>for Fee Purposes Only</u>
Tons/year

	PM	SO_2	NO_x	VOC
Engine #1	5.3	24.5	13.0	12.1
Engine #2	5.3	24.5	13.0	12.1
Engine #3	5.3	24.5	13.0	12.1
Emerg. Gen. #1	–	–	0.2	–
Trim Flare	1.2	23.1	4.7	0.2
Total TPY	**17.1**	**96.6**	**43.9**	**36.5**

III. AMBIENT AIR QUALITY ANALYSIS

A. Overview

A refined modeling analysis was performed to show that emissions from JRE, in conjunction with other sources, will not cause or contribute to violations of National Ambient Air Quality Standards (NAAQS) for SO_2, PM_{10}, $PM_{2.5}$, NO_2 or CO or to Class II increments for SO_2, PM_{10}, $PM_{2.5}$ or NO_2.

The current licensing action for JRE represents a major modification to an existing major source. Based upon the magnitude of proposed emissions increase and the distance from the source to any Class I area, the affected Federal Land Managers (FLMs) and MEDEP-BAQ have determined that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

B. Model Inputs

The AERMOD-PRIME refined model was used to address NAAQS and increments in all areas. When applicable, the modeling analysis accounted for the potential of building wake and cavity effects on emissions from all modeled stacks that are below their calculated formula GEP stack heights.

All modeling was performed in consultation with the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) and used procedures recommended and/or required by the United States Environmental Protection Agency (USEPA).

All modeling was performed in accordance with all applicable requirements of the Maine Department of Environmental Protection, Bureau of Air Quality (MEDEP-BAQ) and the United States Environmental Protection Agency (USEPA).

A valid five-year hourly off-site meteorological database was used in the AERMOD-PRIME refined modeling analysis. The following parameters and their associated heights were collected at the Old Town Mill's meteorological monitoring site, during the five-year period 1991-1995:

TABLE III-1 : Meteorological Parameters and Collection Heights

Parameter	Sensor Height(s)
Wind Speed	10 meters, 76 meters
Wind Direction	10 meters, 76 meters
Standard Deviation of Wind Direction (Sigma A)	10 meters, 76 meters
Temperature	10 meters, 76 meters

Surface data collected at the Bangor National Weather Service (NWS) site were substituted for any missing data. All other missing data were interpolated or coded as missing, per USEPA guidance. In addition, hourly Bangor NWS data, from the same time period, were used to supplement the primary surface dataset for the required variables that were not explicitly collected at the Old Town Mill's monitoring site.

The surface meteorological data was combined with concurrent hourly cloud cover and upper-air data obtained from the Caribou NWS. Missing cloud cover and/or upper-air data values were interpolated or coded as missing, per USEPA guidance.

All necessary representative micrometeorological surface variables for inclusion into AERMET (surface roughness, Bowen ratio and albedo) were calculated using AERSURFACE utility program and from procedures recommended by USEPA.

Point-source parameters, used in the modeling for JRE are listed in Table III-2.

TABLE III-2 : Point Source Stack Parameters

Facility/Stack	Stack Base Elevation (m)	Stack Height (m)	GEP Stack Height (m)	Stack Diameter (m)	UTM Easting NAD83 (m)	UTM Northing NAD83 (m)
CURRENT/PROPOSED						
Juniper Ridge Energy (JRE)						
• Engine 1	62.86	19.81	24.93	0.39	522,269	4980,337
• Engine 2	62.81	19.81	24.98	0.39	522,271	4980,332
• Engine 3	62.76	19.81	25.03	0.39	522,272	4980,326
• Trim Flare	62.06	6.86	24.61	0.13	522,309	4980,373
Juniper Ridge Landfill (JRL)						
• Flare 4	62.54	19.93*	25.25	1.32*	522,210	4980,350
UMaine						
• Stack #4	26.12	45.72	24.76	1.52	525,779	4971,789
Expera Old Town						
• #5 Boiler	27.68	54.86	89.99	2.29	528,723	4973,714
• Biomass Boiler	26.95	41.15	86.69	1.98	528,734	4973,635
• Recovery Boiler	24.87	76.20	105.94	2.95	528,866	4973,676
• Smelt Dissolving Tank	24.93	76.20	105.09	1.50	528,864	4973,688
• Lime Kiln	27.28	49.68	104.72	1.22	528,786	4973,828

* Flare effective release height and diameter, calculated per USEPA guidance

AERMOD-PRIME refined modeling was performed for a total of four scenarios that represented a range of JRE engine operations.

Emission parameters for NAAQS and Class II increment modeling are listed in Table III-3. The emission parameters are based on the maximum license allowed operating configuration.

For the purpose of determining maximum predicted impacts, the following assumptions were used:

- all NO_x emissions were conservatively assumed to convert to NO_2 (USEPA Tier I Method),
- all particulate emissions were conservatively assumed to convert to PM_{10} and $PM_{2.5}$

TABLE III-3 : Stack Emission Parameters

Facility/Stack	Averaging Periods	SO_2 (g/s)	PM_{10} (g/s)	$PM_{2.5}$ (g/s)	NO_2 (g/s)	CO (g/s)	Stack Temp (K)	Stack Velocity (m/s)
MAXIMUM LICENSE ALLOWED								
Juniper Ridge Energy								
• Engine 1	All	0.70	0.15	0.15	0.37	2.18	757.04	48.69
• Engine 2	All	0.70	0.15	0.15	0.37	2.18	757.04	48.69
• Engine 3	All	0.70	0.15	0.15	0.37	2.18	757.04	48.69
Juniper Ridge Landfill								
• Flare	All	2.43	0.12	0.12	0.49	2.66	1273.15	20.00
UMaine								
• Stack #4	All	9.64	-	-	-	-	450.00	12.48
Expera Old Town								
• #5 Boiler	All	16.00	-	-	-	-	455.40	9.76
• Biomass Boiler	All	0.84	-	-	-	-	444.00	15.34
• Recovery Boiler	All	18.02	-	-	-	-	505.40	17.65
• Smelt Dissolving Tank	All	0.42	-	-	-	-	348.70	3.78
• Lime Kiln	All	0.89	-	-	-	-	338.70	10.30
2012 BASELINE ($PM_{2.5}$ INCREMENT)								
Juniper Ridge Energy								
• No JRE sources existed in the 2012 baseline year; no baseline credit to be taken.								
Juniper Ridge Landfill								
• Juniper Ridge Energy conservatively assumed no credit for JRL sources existing in the 2012 baseline year.								
1987 BASELINE (NO_2 INCREMENT)								
Juniper Ridge Energy								
• No JRE sources existed in the 1987 baseline year; no baseline credit to be taken.								
Juniper Ridge Landfill								
• No JRL sources existed in the 1987 baseline year; no baseline credit to be taken.								
UMaine								
• Juniper Ridge Energy conservatively assumed no credit for UMaine sources existing in the 1987 baseline year.								
Expera Old Town								
• Juniper Ridge Energy conservatively assumed no credit for Expera sources existing in the 1987 baseline year.								
1977 BASELINE (SO_2/PM_{10} INCREMENT)								
Juniper Ridge Energy								
• No sources existed in the 1977 baseline year; no baseline credit to be taken.								
Juniper Ridge Landfill								
• No sources existed in the 1977 baseline year; no baseline credit to be taken.								
UMaine								
• Juniper Ridge Energy conservatively assumed no credit for UMaine sources existing in the 1977 baseline year.								
Expera Old Town								
• Juniper Ridge Energy conservatively assumed no credit for Expera sources existing in the 1977 baseline year.								

C. Single Source Modeling Impacts

The AERMOD-PRIME model results for JRE alone are shown in Table III-4. Maximum predicted impacts that exceed their respective significance level are indicated in boldface type. For comparison to the Class II significance levels, the impacts for all pollutants/averaging periods were conservatively based on the maximum High-1st-High predicted values. No further modeling was required for pollutants that did not exceed their respective significance levels.

TABLE III-4 : Maximum AERMOD-PRIME Impacts from JRE Alone

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (m)	Receptor UTM N (m)	Receptor Elevation (m)	Class II Significance Level ($\mu g/m^3$)
SO_2	1-hour	**157.47**	522,428	4980,148	60.34	**10***
	3-hour	**109.31**	522,378	4980,248	61.16	**25**
	24-hour	**49.03**	522,378	4980,248	61.16	**5**
	Annual	**2.39**	522,528	4980,148	57.69	**1**
PM_{10}	24-hour	**8.63**	522,528	4980,148	57.69	**5**
	Annual	0.43	522,428	4980,148	58.89	**1**
$PM_{2.5}$	24-hour	**8.63**	522,528	4980,148	57.69	**5**
	Annual	0.43	522,428	4980,148	58.89	**1**
NO_2	1-hour	**83.38**	522,428	4980,148	60.34	**7.5****
	Annual	**1.10**	522,528	4980,148	57.69	**1**
CO	1-hour	487.35	522,428	4980,148	60.34	**2000**
	8-hour	214.66	522,428	4980,248	60.14	**500**

* Interim Significant Impact Level (SIL) adopted by Maine
** Interim Significant Impact Level (SIL) currently recommended by USEPA

D. Combined Source Modeling Impacts

As indicated in boldface type in Table III-4, other sources not explicitly included in the modeling analysis must be accounted for by using representative background concentrations for the area.

Background concentrations, listed in Table III-5, are derived from representative rural background data for use in the Eastern Maine region.

TABLE III-5 : Background Concentrations

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)	Date	Monitoring Site
SO_2	1-hour	24	2009-2011	Presque Isle
	3-hour	18	2009-2011	Acadia National Park
	24-hour	11		
	Annual	1		
PM_{10}	24-hour	20	2011-2013	Acadia National Park
	Annual	10		
$PM_{2.5}$	24-hour	17	2008-2010	Greenville
	Annual	5		
NO_2	1-hour	43	2009-2012	Presque Isle
	Annual	4	2010-2012	
CO	1-hour	365	2010-2012	Acadia National Park
	8-hour	322		

MEDEP examined other nearby sources to determine if any impacts would be significant in or near JRE's significant impact area. Due to the JRE's location, extent of their significant impact area and other nearby source emissions, MEDEP has determined that three sources would be considered for combined source modeling: Juniper Ridge Landfill (Old Town), Expera (Old Town), and UMaine (Orono).

The maximum AERMOD-PRIME combined-source modeled impacts, which were explicitly normalized to the form of their respective NAAQS, were added with conservative rural background concentrations to demonstrate compliance with NAAQS as shown in Table III-6.

Because all pollutant/averaging period impacts using this method meet NAAQS, no further NAAQS modeling analyses need to be performed.

TABLE III-6 : Maximum Combined Source Impacts ($\mu g/m^3$)

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (m)	Receptor UTM N (m)	Receptor Elevation (m)	Back-Ground ($\mu g/m^3$)	Total Impact ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)
SO_2	1-hour	99.32	522,428	4980,198	60.27	24	123.32	196
	3-hour	102.44	522,428	4980,248	60.14	18	120.44	1,300
	24-hour	47.72	522,478	4989,198	58.89	11	58.72	365
	Annual	2.51	522,528	4980,148	57.69	1	3.51	80
PM_{10}	24-hour	8.10	522,478	4989,198	58.89	20	28.10	150
	Annual	0.43	522,528	4980,148	57.69	10	10.43	50
$PM_{2.5}$	24-hour	8.10	522,478	4989,198	58.89	17	25.10	35
	Annual	0.43	522,528	4980,148	57.69	5	5.43	12
NO_2	1-hour	40.93	522,428	4982,048	60.14	43	83.93	188
	Annual	1.10	522,528	4980,148	57.96	4	5.10	100
CO	1-hour	395.46	522,478	4980,148	59.73	365	760.46	40,000
	8-hour	207.33	522,378	4980,248	61.16	322	529.33	10,000

E. Secondary Formation of $PM_{2.5}$

In accordance with *Guidance for $PM_{2.5}$ Permit Modeling* (USEPA 454/B-14-001, 2014), some $PM_{2.5}$ compliance demonstrations must account for both primary $PM_{2.5}$ from a source's direct PM emissions, as well as secondarily formed $PM_{2.5}$ from a source's precursor emissions of NO_x and SO_2. Since the proposed $PM_{2.5}$ emissions for this modification are greater than 10TPY and NO_x emissions are expected to be more than 40TPY (NO_x emissions are expected to increase by 42.4TPY), a qualitative review of secondary impacts due to $PM_{2.5}$ precursor emissions (secondary $PM_{2.5}$) is required.

A qualitative assessment of secondary $PM_{2.5}$ formation analyzed the following factors: types of fuel being used at JRE, historic atmospheric and meteorological conditions, existing local background air quality data, $PM_{2.5}$ speciation, overall increase of NO_x (42.4TPY) and decrease of SO_2 precursor emissions (-193.3TPY) and the physical/temporal alignment at predicted maximum impacts from the AERMOD-PRIME modeling.

Based on the above factors, MEDEP-BAQ has determined that no significant secondary $PM_{2.5}$ formation is likely to occur. Therefore, no additional review of NO_x and SO_2 precursor emissions, in relation to NAAQS or Class II increment modeling, is required.

F. Class II Increment

In addition to NAAQS modeling, The AERMOD-PRIME refined model was also used to predict maximum Class II increment impacts.

Results of the Class II increment analysis are shown in Table III-7. All modeled maximum increment impacts were below all increment standards. Because all predicted increment impacts meet increment standards, no additional Class II SO_2, PM_{10}, $PM_{2.5}$ or NO_2 increment modeling needed to be performed.

TABLE III-7 : Class II Increment Consumption

Pollutant	Averaging Period	Max Impact ($\mu g/m^3$)	Receptor UTM E (km)	Receptor UTM N (km)	Receptor Elevation (m)	Class II Increment ($\mu g/m^3$)
SO_2	3-hour	102.44	522,428	4980,248	60.14	512
	24-hour	47.72	522,478	4989,198	58.89	91
	Annual	2.51	522,528	4980,148	57.69	20
PM_{10}	24-hour	8.10	522,478	4989,198	58.89	30
	Annual	0.43	522,528	4980,148	57.69	17
$PM_{2.5}$	24-hour	8.10	522,478	4989,198	58.89	9
	Annual	0.43	522,528	4980,148	57.69	4
NO_2	Annual	1.10	522,528	4980,148	57.96	25

Federal guidance and 06-096 CMR 115 require that any major new source or major source undergoing a major modification provide additional analyses of impacts that would occur as

a direct result of the general, commercial, residential, industrial and mobile-source growth associated with the construction and operation of that source.

GENERAL GROWTH: Some increases in local emissions due to construction related activities are expected to occur for several months, with the majority of emissions due to truck and construction-vehicle traffic (such as site preparation, concrete delivery/pouring, delivery of materials, etc.). Increases in potential emissions of NO_x and $PM_{2.5}$ due to vehicles will likely be temporary and short-lived. Emissions of dust from construction related activities will be minimized by the use of "Best Management Practices" for construction on-site.

RESIDENTIAL, COMMERCIAL AND INDUSTRIAL GROWTH: Population growth in the impact area of the proposed source can be used as a surrogate factor for the growth in emissions from residential combustion sources. The manpower requirements, operations and support required for the construction and operation of JRE will, for the most part, be available from the existing work staff. It is expected that no new significant residential, commercial or industrial growth will follow from the modification associated with JRE.

MOBILE SOURCE AND AREA SOURCE GROWTH: Since area and mobile sources are considered minor sources of NO_2, their contribution to increment has to be considered. Technical guidance from USEPA points out that screening procedures can be used to determine whether additional detailed analyses of minor source emissions are required. Compiling a minor source inventory may not be required if it can be shown that little or no growth has taken place in the impact area of the proposed source since the pollutant baseline dates (1977/1988) were established. Very little growth has taken place in the surrounding area of JRE since the baseline dates. In addition, no significant long-term increase in Vehicle Miles Traveled (VMT) is expected as a result of the modification. No further analyses of mobile or area source growth are needed.

G. Impacts on Plants, Soils & Animals

In accordance with guidance provided in USEPA's Prevention of Significant Deterioration manual, JRE evaluated the impacts of its emissions using procedures described in *A Screening Procedure for the Impacts of Air Pollution on Plants, Soils and Animals* (USEPA, 450/2-81-078, 1980).

Maximum predicted impacts from the AERMOD-PRIME modeling were compared to USEPA's 'Screening Concentrations' (see Table III-8), which represent the minimum concentration at which adverse growth effects or tissue injury in sensitive vegetation can be expected. For comparison to the Screening Concentrations, the model impacts for all pollutants/averaging periods were conservatively based on the maximum High-1st-High predicted values.

TABLE III-8 : Maximum Impacts on Plants, Soils & Animals (μg/m³)

Pollutant	Averaging Period	Max Impact (μg/m³)	Screening Concentration (μg/m³)
SO_2	1-hour	157.47	917
	3-hour	109.31	786
	Annual	2.39	18
NO_2	4-hour	83.38	3,760
	8-hour	83.38	3,760
	Month	83.38	564
	Annual	1.10	94
CO	Week	487.35	1,800,000

Because all predicted impacts are below the Screening Concentrations, no further assessment of the impacts to plants, soils and animals is required, per USEPA guidance.

H. Class I Impacts

Based upon the magnitude of proposed emissions increases and the distance from JRE to any Class I area, the affected Federal Land Managers (FLMs) and MEDEP-BAQ have determined that an assessment of Class I Air Quality Related Values (AQRVs) is not required.

I. Summary

In summary, it has been demonstrated that JRE in its proposed configuration will not cause or contribute to a violation of any SO_2, PM_{10}, $PM_{2.5}$, NO_2 or CO NAAQS or to Class II increments for SO_2, PM_{10}, $PM_{2.5}$ or NO_2.

ORDER

Based on the above Findings and subject to conditions listed below, the Department concludes that the emissions from this source:

- will receive Best Practical Treatment,
- will not violate applicable emission standards,
- will not violate applicable ambient air quality standards in conjunction with emissions from other sources.

The Department hereby grants Air Emission License A-1116-77-1-A pursuant to the preconstruction licensing requirements of 06-096 CMR 115 and subject to the standard and special conditions below.

Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

STANDARD CONDITIONS

(1) Employees and authorized representatives of the Department shall be allowed access to the licensee's premises during business hours, or any time during which any emissions units are in operation, and at such other times as the Department deems necessary for the purpose of performing tests, collecting samples, conducting inspections, or examining and copying records relating to emissions (38 M.R.S.A. §347-C).

(2) The licensee shall acquire a new or amended air emission license prior to commencing construction of a modification, unless specifically provided for in Chapter 115. [06-096 CMR 115]

(3) Approval to construct shall become invalid if the source has not commenced construction within eighteen (18) months after receipt of such approval or if construction is discontinued for a period of eighteen (18) months or more. The Department may extend this time period upon a satisfactory showing that an extension is justified, but may condition such extension upon a review of either the control technology analysis or the ambient air quality standards analysis, or both. [06-096 CMR 115]

(4) The licensee shall establish and maintain a continuing program of best management practices for suppression of fugitive particulate matter during any period of construction, reconstruction, or operation which may result in fugitive dust, and shall submit a description of the program to the Department upon request. [06-096 CMR 115]

(5) The licensee shall pay the annual air emission license fee to the Department, calculated pursuant to Title 38 M.R.S.A. §353-A. [06-096 CMR 115]

(6) The license does not convey any property rights of any sort, or any exclusive privilege. [06-096 CMR 115]

(7) The licensee shall maintain and operate all emission units and air pollution systems required by the air emission license in a manner consistent with good air pollution control practice for minimizing emissions. [06-096 CMR 115]

(8) The licensee shall maintain sufficient records to accurately document compliance with emission standards and license conditions and shall maintain such records for a minimum of six (6) years. The records shall be submitted to the Department upon written request. [06-096 CMR 115]

(9) The licensee shall comply with all terms and conditions of the air emission license. The filing of an appeal by the licensee, the notification of planned changes or anticipated noncompliance by the licensee, or the filing of an application by the licensee for a renewal of a license or amendment shall not stay any condition of the license. [06-096 CMR 115]

(10) The licensee may not use as a defense in an enforcement action that the disruption, cessation, or reduction of licensed operations would have been necessary in order to maintain compliance with the conditions of the air emission license. [06-096 CMR 115]

(11) In accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department, the licensee shall:

A. perform stack testing to demonstrate compliance with the applicable emission standards under circumstances representative of the facility's normal process and operating conditions:
   1. within sixty (60) calendar days of receipt of a notification to test from the Department or EPA, if visible emissions, equipment operating parameters, staff inspection, air monitoring or other cause indicate to the Department that equipment may be operating out of compliance with emission standards or license conditions; or
   2. pursuant to any other requirement of this license to perform stack testing.

B. install or make provisions to install test ports that meet the criteria of 40 CFR Part 60, Appendix A, and test platforms, if necessary, and other accommodations necessary to allow emission testing; and

C. submit a written report to the Department within thirty (30) days from date of test completion.

[06-096 CMR 115]

(12) If the results of a stack test performed under circumstances representative of the facility's normal process and operating conditions indicate emissions in excess of the applicable standards, then:

A. within thirty (30) days following receipt of such test results, the licensee shall re-test the non-complying emission source under circumstances representative of the facility's normal process and operating conditions and in accordance with the Department's air emission compliance test protocol and 40 CFR Part 60 or other method approved or required by the Department; and

B. the days of violation shall be presumed to include the date of stack test and each and every day of operation thereafter until compliance is demonstrated under normal and representative process and operating conditions, except to the extent that the facility can prove to the satisfaction of the Department that there were intervening days during which no violation occurred or that the violation was not continuing in nature; and

C. the licensee may, upon the approval of the Department following the successful demonstration of compliance at alternative load conditions, operate under such alternative load conditions on an interim basis prior to a demonstration of compliance under normal and representative process and operating conditions.
[06-096 CMR 115]

(13) Notwithstanding any other provisions in the State Implementation Plan approved by the EPA or Section 114(a) of the CAA, any credible evidence may be used for the purpose of establishing whether a person has violated or is in violation of any statute, regulation, or Part 70 license requirement. [06-096 CMR 115]

(14) The licensee shall maintain records of malfunctions, failures, downtime, and any other similar change in operation of air pollution control systems or the emissions unit itself that would affect emissions and that is not consistent with the terms and conditions of the air emission license. The licensee shall notify the Department within two (2) days or the next state working day, whichever is later, of such occasions where such changes result in an increase of emissions. The licensee shall report all excess emissions in the units of the applicable emission limitation. [06-096 CMR 115]

(15) Upon written request from the Department, the licensee shall establish and maintain such records, make such reports, install, use and maintain such monitoring equipment, sample such emissions (in accordance with such methods, at such locations, at such intervals, and in such a manner as the Department shall prescribe), and provide other information as the Department may reasonably require to determine the licensee's compliance status.
[06-096 CMR 115]

SPECIFIC CONDITIONS

(16) **Engines #1-#3**

A. JRE shall fire only LFG, natural gas, or propane in Engines #1-#3. [06-096 CMR 115, BACT]

B. Engines #1-#3 shall only fire LFG that has been conditioned to contain 1,000 ppmv TRS or less. JRE shall maintain records of the TRS content of the gas fired based on records provided from JRL. [06-096 CMR 115, BACT]

C. JRE shall operate and maintain the coalescing filters on Engines #1-#3 in good working order. [06-096 CMR 115, BACT]

D. At least 15 calendar days prior to installation of any replacement engine, JRE shall provide written notification to the Department (both to the Licensing Section and Regional Inspector). This notification shall contain the following information:

1. Emission unit number being replaced (i.e. Engine #1, #2, or #3);
2. Make, model, serial number, date of manufacture, and maximum heat input of the replacement engine (i.e. the engine new to the site);
3. Anticipated date installation will commence;
4. A statement that the replacement engine will meet the definition of a "replacement unit" as defined by 40 CFR §51.165(a)(1)(xxi);
5. A statement stating whether the engine is subject to 40 CFR Part 63, Subpart ZZZZ or 40 CFR Part 60, Subpart JJJJ.

[06-096 CMR 115, BACT]

E. Within seven days of startup of the replacement engine, JRE shall provide written notification to the Department (both to the Licensing Section and Regional Inspector) of the date of engine startup. [06-096 CMR 115, BACT]

F. Emissions from Engines #1-#3 shall <u>each</u> not exceed the following limits:

Pollutant	lb/MMBtu	Origin and Authority
PM	0.08	06-096 CMR 115, BACT

Pollutant	g/bhp-hr	Origin and Authority
NO_x	0.6	06-096 CMR 115, BACT
CO	3.5	06-096 CMR 115, BACT
VOC	0.56	06-096 CMR 115, BACT

Pollutant	lb/hr	Origin and Authority
PM	1.20	06-096 CMR 115, BACT
PM_{10}	1.20	06-096 CMR 115, BACT
$PM_{2.5}$	1.20	06-096 CMR 115, BACT
SO_2	5.59	06-096 CMR 115, BACT
NO_x	2.97	06-096 CMR 115, BACT
CO	17.30	06-096 CMR 115, BACT
VOC	2.77	06-096 CMR 115, BACT

G. Visible emissions from Engines #1-#3 shall each not exceed 20% opacity on a six (6) minute block average basis, except no more than two (2) six (6) minute block averages in a 3-hour block period. [06-096 CMR 101 §2(B)(1)(d)]

H. Engines subject to 40 CFR Part 63, Subpart ZZZZ shall meet all requirements of the subpart, including the following:

1. Operation Requirements

	Operating Limitations
Non-Emergency, non-black start stationary RICE which combusts landfill gas equivalent to 10% or more of the gross heat input on an annual basis.	- Change oil and filter every 1,440 hours of operation or annually, whichever comes first; - Inspect spark plugs every 1,440 hours of operation or annually, whichever comes first, and replace as necessary; and - Inspect all hoses and belts every 1,440 hours of operation or annually, whichever comes first, and replace as necessary.

2. General Requirement to Minimize Emissions
At all times the facility shall operate and maintain the engine, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. [40 CFR §63.6605(b)]

3. Operation & Maintenance
JRE shall operate and maintain the engine according to the manufacturer's emission-related written instructions or develop a site-specific maintenance plan which must provide, to the extent practicable, for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. [40 CFR§63.6625(e)]

4. Startup Idle and Startup Time Minimization Requirements
During periods of startup the facility must minimize the engine's time spent at idle and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the non-startup emission limitations apply.
[40 CFR §63.6625(h) & 40 CFR Part 63, Subpart ZZZZ Table 2d]

5. Optional Oil Analysis Program
JRE has the option of utilizing an oil analysis program which complies with the requirements of §63.6625(i) in order to extend the specified oil change requirement. If this option is used, JRE must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine. [40 CFR§63.6625(j)]

6. Record Keeping
   JRE shall keep records that include maintenance conducted on the engine in order to demonstrate that they were operated and maintained in accordance with the facility's maintenance plan. [40 CFR §63.6655(e)]

I. Engines subject to 40 CFR Part 60, Subpart JJJJ shall meet all requirements of the subpart, including the following:

1. JRE shall, to the extent practicable, maintain and operate the engines in a manner consistent with good air pollution control practice for minimizing emissions. [40 CFR §60.4243(b)]

2. Performance Tests

   a. JRE shall conduct an initial performance test for NO_x, CO, and VOC on each engine in accordance with 40 CFR §60.4244 and Table 2 within 180 days of startup of the engine. [40 CFR §60.4243(b)]
   b. JRE shall conduct subsequent performance testing on each engine every 8,760 hours of operation or 3 years, whichever comes first. [40 CFR §60.4243(b)] If an engine is non-operational, JRE does not need to start up the engine solely to conduct a performance test. However, JRE must conduct the performance test immediately upon startup of the engine. [40 CFR §60.4244(b)]
   c. Each performance test shall be conducted within 10% of 100% peak (or the highest achievable) load. [40 CFR §60.4244(a)]
   d. JRE shall conduct three separate test runs for each performance test. Each test run must be conducted within 10% of 100% peak (or the highest achievable) load and last at least 1 hour. [40 CFR §60.4244(c)]
   e. JRE shall submit a copy of each performance test report within 60 days after the test has been completed. [40 CFR §60.4245(d)]

J. Any replacement unit which is installed to replace an engine subject to 40 CFR Part 60, Subpart JJJJ must also meet the requirements of Subpart JJJJ. [06-096 CMR 115, BACT]

K. Performance Tests

JRE shall do one of the following for each LFGTE engine or replacement engine:

1. Demonstrate compliance with the NO_x and CO g/bhp-hr emission limits and the PM lb/MMBtu emission limit by stack testing within 180 days of startup (for engines not subject to 40 CFR Part 60, Subpart JJJJ); or
2. Conduct an initial performance test for NO_x, CO, and VOC in accordance with 40 CFR §60.4244 and Table 2 within 60 days after achieving maximum production, but no later than 180 days after initial startup [40 CFR §60.4243(b)]; or

3. Within 30 days of startup, provide documentation to the Department of previous testing which demonstrates that the engine meets the applicable emission standards.

[06-096 CMR 115, BACT]

L. Periodic Monitoring

JRE shall monitor and record the following periodic monitors for Engines #1-#3 (or any replacement unit) and their associated air pollution control equipment:

1. Records of all maintenance conducted on each engine. [40 CFR §60.4245(a)(2) and 06-096 CMR 115, BACT]
2. If applicable, documentation from the manufacturer that the engines are certified to meet the emission standards. [40 CFR §60.4245(a)(3)]
3. Operating hours of each engine on a monthly basis. [06-096 CMR 115, BACT]
4. Total combined LFG combusted in the engines (scf) on a monthly basis. [06-096 CMR 115, BACT]

(17) **Trim Flare**

A. The Trim Flare shall only fire LFG that has been conditioned to contain 1,000 ppmv TRS or less. [06-096 CMR 115, BACT]

B. Emissions from the Trim Flare shall not exceed the following limits:

Pollutant	lb/MMBtu	Origin and Authority
PM	0.02	06-096 CMR 115, BACT

Pollutant	lb/hr	Origin and Authority
PM	0.27	06-096 CMR 115, BACT
PM_{10}	0.27	06-096 CMR 115, BACT
$PM_{2.5}$	0.27	06-096 CMR 115, BACT
SO_2	5.28	06-096 CMR 115, BACT
NO_x	1.06	06-096 CMR 115, BACT
CO	5.77	06-096 CMR 115, BACT
VOC	0.05	06-096 CMR 115, BACT

C. Visible emissions from the Trim Flare shall not exceed 20% opacity on a six (6) minute block average basis. [06-096 CMR 115, BACT]

D. JRE shall monitor and record the total LFG combusted at the Trim Flare (scf) on a monthly basis. [06-096 CMR 115, BACT]

(18) **Emergency Generator #1**

A. Emergency Generator #1 shall be limited to 100 hours of operation per calendar year, excluding operating hours during emergency situations. [06-096 CMR 115, BACT]

B. Emissions from Emergency Generator #1 shall not exceed the following limits:

Pollutant	lb/hr	Origin and Authority
PM	0.13	06-096 CMR 115, BACT
PM_{10}	0.13	06-096 CMR 115, BACT
$PM_{2.5}$	0.13	06-096 CMR 115, BACT
NO_x	4.76	06-096 CMR 115, BACT
CO	1.03	06-096 CMR 115, BACT
VOC	0.38	06-096 CMR 115, BACT

C. Visible emissions from Emergency Generator #1 shall not exceed 20% opacity on a six (6) minute block average, except for no more than two (2) six (6) minute block averages in a continuous 3-hour period. [06-096 CMR 101, §2(B)(1)(d)]

D. Emergency Generator #1 shall meet the applicable requirements of 40 CFR Part 60, Subpart IIII, including the following:

1. Manufacturer Certification
   Emergency Generator #1 shall be certified by the manufacturer as meeting the emission standards for new non-road compression ignition engines found in §60.4202. [40 CFR §60.4205(b)]

2. Ultra-Low Sulfur Fuel
   The fuel fired in Emergency Generator #1 shall not exceed 15 ppm sulfur (0.0015% sulfur). Compliance with the fuel sulfur content limit shall be based on fuel records from the supplier documenting the type of fuel delivered and the sulfur content of the fuel. [40 CFR §60.4207(b) and 06-096 CMR 115, BACT]

3. Non-Resettable Hour Meter
   A non-resettable hour meter shall be installed and operated on Emergency Generator #1. [40 CFR §60.4209(a)]

4. Annual Time Limit for Maintenance and Testing
   a. As an emergency engine, Emergency Generator #1 shall be limited to 100 hours/year for maintenance checks and readiness testing, emergency demand response, and periods of voltage or frequency deviation from standards. Up to 50 hours/year of the 100 hours/year may be used in non-emergency situations (this does not include peak shaving, non-emergency demand response, or to generate income for a facility by providing power to an electric grid or

otherwise supply power as part of a financial arrangement with another entity unless the conditions in §60.4211(f)(3)(i) are met). These limits are based on a calendar year. Compliance shall be demonstrated by records (electronic or written log) of all engine operating hours. [40 CFR §60.4211(f) and 06-096 CMR 115, BACT]

b. JRE shall keep records that include maintenance conducted on Emergency Generator #1 and the hours of operation of engine recorded through the non-resettable hour meter. Documentation shall include the hours spent for emergency operation, including what classified the operation as emergency and how many hours spent for non-emergency. If the Emergency Generator #1 is operated during a period of demand response or deviation from standard voltage or frequency, or to supply power during a non-emergency situation as part of a financial arrangement with another entity as specified in §60.4211(f)(3)(i), JRE shall keep records of the notification of the emergency situation, and the date, start time, and end time of engine operation for these purposes.

5. Operation and Maintenance
Emergency Generator #1 shall be operated and maintained according to the manufacturer's emission-related written instructions or procedures developed by JRE that are approved by the engine manufacturer. JRE may only change those emission-related settings that are permitted by the manufacturer.
[40 CFR §60.4211(a)]

6. Annual Reporting For Demand Response Availability Over 15 Hours Per Year (for engines greater than 100 brake hp)
If JRE operates or is contractually obligated to be available for more than 15 hours per calendar year in a demand response program, during a period of deviation from standard voltage or frequency, or supplying power during a non-emergency situation as part of a financial arrangement with another entity as specified in §60.4211(f)(3)(i), JRE shall submit an annual report containing the information in §60.4214(d)(1)(i) through (vii). The first annual report must cover the calendar year 2015 and must be submitted no later than March 31, 2016. Subsequent annual reports for each calendar year must be submitted no later than March 31 of the following calendar year. The annual report must be submitted electronically using the Compliance and Emissions Data Reporting Interface (CEDRI) that is accessed through EPA's Central Data Exchange (CDX) (www.epa.gov/cdx). However, if the reporting form is not available in CEDRI at the time that the report is due, the written report must be submitted to the

following address:

U.S. Environmental Protection Agency, Region I
5 Post Office Square, Suite 100 (OES04-2)
Boston, MA 02109-3912
Attn: Air Compliance Clerk

[40 CFR §60.4214(d)]

(19) JRE shall submit an application for a Part 70 air emission license no later than 12 months from commencement of the requested operation. [06-096 CMR 140, Section 1(C)(8)]

DONE AND DATED IN AUGUSTA, MAINE THIS 30 DAY OF March, 2016.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: Marc Allen Robert Cone for
PAUL MERCER, COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application: 9/23/15
Date of application acceptance: 9/24/15

Date filed with the Board of Environmental Protection:

Filed
MAR 31 2016
State of Maine
Board of Environmental Protection

This Order prepared by Lynn Muzzey, Bureau of Air Quality.