

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION**

May 7, 2015

**PERMIT TO INSTALL**  
716-96B

**ISSUED TO**  
LINN Operating, Inc.

**LOCATED AT**  
NW ¼, SW ¼, Section 13, T29N-R03E  
Loud Township, Michigan

**IN THE COUNTY OF**  
Montmorency

**STATE REGISTRATION NUMBER**  
N6157

The Air Quality Division has approved this Permit to Install, pursuant to the delegation of authority from the Michigan Department of Environmental Quality. This permit is hereby issued in accordance with and subject to Section 5505(1) of Article II, Chapter I, Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. Pursuant to Air Pollution Control Rule 336.1201(1), this permit constitutes the permittee's authority to install the identified emission unit(s) in accordance with all administrative rules of the Department and the attached conditions. Operation of the emission unit(s) identified in this Permit to Install is allowed pursuant to Rule 336.1201(6).

DATE OF RECEIPT OF ALL INFORMATION REQUIRED BY RULE 203:

**March 23, 2015**

DATE PERMIT TO INSTALL APPROVED:

**May 7, 2015**

SIGNATURE:

DATE PERMIT VOIDED:

SIGNATURE:

DATE PERMIT REVOKED:

SIGNATURE:

**PERMIT TO INSTALL**

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**Common Abbreviations / Acronyms**

<b>Common Acronyms</b>		<b>Pollutant / Measurement Abbreviations</b>	
AQD	Air Quality Division	BTU	British Thermal Unit
BACT	Best Available Control Technology	°C	Degrees Celsius
CAA	Clean Air Act	CO	Carbon Monoxide
CEM	Continuous Emission Monitoring	dscf	Dry standard cubic foot
CFR	Code of Federal Regulations	dscm	Dry standard cubic meter
CO <sub>2</sub> e	Carbon Dioxide Equivalent	°F	Degrees Fahrenheit
COM	Continuous Opacity Monitoring	gr	Grains
EPA	Environmental Protection Agency	Hg	Mercury
EU	Emission Unit	hr	Hour
FG	Flexible Group	H <sub>2</sub> S	Hydrogen Sulfide
GACS	Gallon of Applied Coating Solids	hp	Horsepower
GC	General Condition	lb	Pound
GHGs	Greenhouse Gases	kW	Kilowatt
HAP	Hazardous Air Pollutant	m	Meter
HVLP	High Volume Low Pressure *	mg	Milligram
ID	Identification	mm	Millimeter
LAER	Lowest Achievable Emission Rate	MM	Million
MACT	Maximum Achievable Control Technology	MW	Megawatts
MAERS	Michigan Air Emissions Reporting System	ng	Nanogram
MAP	Malfunction Abatement Plan	NO <sub>x</sub>	Oxides of Nitrogen
MDEQ	Michigan Department of Environmental Quality (Department)	PM	Particulate Matter
MSDS	Material Safety Data Sheet	PM10	PM with aerodynamic diameter ≤10 microns
NESHAP	National Emission Standard for Hazardous Air Pollutants	PM2.5	PM with aerodynamic diameter ≤ 2.5 microns
NSPS	New Source Performance Standards	pph	Pounds per hour
NSR	New Source Review	ppm	Parts per million
PS	Performance Specification	ppmv	Parts per million by volume
PSD	Prevention of Significant Deterioration	ppmw	Parts per million by weight
PTE	Permanent Total Enclosure	psia	Pounds per square inch absolute
PTI	Permit to Install	psig	Pounds per square inch gauge
RACT	Reasonably Available Control Technology	scf	Standard cubic feet
ROP	Renewable Operating Permit	sec	Seconds
SC	Special Condition	SO <sub>2</sub>	Sulfur Dioxide
SCR	Selective Catalytic Reduction	THC	Total Hydrocarbons
SRN	State Registration Number	tpy	Tons per year
TAC	Toxic Air Contaminant	µg	Microgram
TEQ	Toxicity Equivalence Quotient	VOC	Volatile Organic Compound
VE	Visible Emissions	yr	Year

\* For High Volume Low Pressure (HVLP) applicators, the pressure measured at the HVLP gun air cap shall not exceed ten (10) pounds per square inch gauge (psig).

### GENERAL CONDITIONS

1. The process or process equipment covered by this permit shall not be reconstructed, relocated, or modified, unless a Permit to Install authorizing such action is issued by the Department, except to the extent such action is exempt from the Permit to Install requirements by any applicable rule. **(R 336.1201(1))**
2. If the installation, construction, reconstruction, relocation, or modification of the equipment for which this permit has been approved has not commenced within 18 months, or has been interrupted for 18 months, this permit shall become void unless otherwise authorized by the Department. Furthermore, the permittee or the designated authorized agent shall notify the Department via the Supervisor, Permit Section, Air Quality Division, Michigan Department of Environmental Quality, P.O. Box 30260, Lansing, Michigan 48909-7760, if it is decided not to pursue the installation, construction, reconstruction, relocation, or modification of the equipment allowed by this Permit to Install. **(R 336.1201(4))**
3. If this Permit to Install is issued for a process or process equipment located at a stationary source that is not subject to the Renewable Operating Permit program requirements pursuant to R 336.1210, operation of the process or process equipment is allowed by this permit if the equipment performs in accordance with the terms and conditions of this Permit to Install. **(R 336.1201(6)(b))**
4. The Department may, after notice and opportunity for a hearing, revoke this Permit to Install if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of this permit or is violating the Department's rules or the Clean Air Act. **(R 336.1201(8), Section 5510 of Act 451, PA 1994)**
5. The terms and conditions of this Permit to Install shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by this Permit to Install. If the new owner or operator submits a written request to the Department pursuant to R 336.1219 and the Department approves the request, this permit will be amended to reflect the change of ownership or operational control. The request must include all of the information required by subrules (1)(a), (b), and (c) of R 336.1219 and shall be sent to the District Supervisor, Air Quality Division, Michigan Department of Environmental Quality. **(R 336.1219)**
6. Operation of this equipment shall not result in the emission of an air contaminant which causes injurious effects to human health or safety, animal life, plant life of significant economic value, or property, or which causes unreasonable interference with the comfortable enjoyment of life and property. **(R 336.1901)**
7. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the Department. The notice shall be provided not later than two business days after start-up, shutdown, or discovery of the abnormal condition or malfunction. Written reports, if required, must be filed with the Department within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal condition or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
8. Approval of this permit does not exempt the permittee from complying with any future applicable requirements which may be promulgated under Part 55 of 1994 PA 451, as amended or the Federal Clean Air Act.
9. Approval of this permit does not obviate the necessity of obtaining such permits or approvals from other units of government as required by law.
10. Operation of this equipment may be subject to other requirements of Part 55 of 1994 PA 451, as amended and the rules promulgated thereunder.

11. Except as provided in subrules (2) and (3) or unless the special conditions of the Permit to Install include an alternate opacity limit established pursuant to subrule (4) of R 336.1301, the permittee shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of density greater than the most stringent of the following. The grading of visible emissions shall be determined in accordance with R 336.1303. **(R 336.1301)**
  - a) A six-minute average of 20 percent opacity, except for one six-minute average per hour of not more than 27 percent opacity.
  - b) A visible emission limit specified by an applicable federal new source performance standard.
  - c) A visible emission limit specified as a condition of this Permit to Install.
  
12. Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in R 336.1370(2). **(R 336.1370)**
  
13. The Department may require the permittee to conduct acceptable performance tests, at the permittee's expense, in accordance with R 336.2001 and R 336.2003, under any of the conditions listed in R 336.2001. **(R 336.2001)**

**SPECIAL CONDITIONS**

**EMISSION UNIT SUMMARY TABLE**

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

<b>Emission Unit ID</b>	<b>Emission Unit Description (Process Equipment &amp; Control Devices)</b>	<b>Flexible Group ID</b>
EUENGINE1	One (1) natural gas-fired reciprocating engine used for compressing gas at an oil and gas production facility.	FGFACILITY
Changes to the equipment described in this table are subject to the requirements of R 336.1201, except as allowed by R 336.1278 to R 336.1290.		

**The following conditions apply to:**  
**EUENGINE1**

**DESCRIPTION:** One (1) natural gas-fired reciprocating engine used for compressing gas at an oil and gas production facility.

**Flexible Group ID:** NA

**POLLUTION CONTROL EQUIPMENT:** NA

**I. EMISSION LIMITS**

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period / Operating Scenario</b>	<b>Equipment</b>	<b>Testing / Monitoring Method</b>	<b>Underlying Applicable Requirements</b>
1. NO <sub>x</sub>	67.5 tpy	12-month rolling time period as determined at the end of each calendar month.	EUENGINE1	SC VI.5 and Appendix A	<b>R 336.1205, 40 CFR 52.21 (c) and (d)</b>
2. CO	5.0 tpy	12-month rolling time period as determined at the end of each calendar month.	EUENGINE1	SC VI.6 and Appendix A	<b>R 336.1205, 40 CFR 52.21 (d)</b>

**II. MATERIAL LIMITS**

NA

**III. PROCESS/OPERATIONAL RESTRICTIONS**

1. No later than 60 days after issuance of this permit, the permittee shall submit to the AQD District Supervisor, for review and approval, an updated preventative maintenance / malfunction abatement plan (PM / MAP) for EUENGINE1. After approval of the PM / MAP by the AQD District Supervisor, the permittee shall not operate EUENGINE1 unless the PM / MAP, or an alternate plan approved by the AQD District Supervisor, is implemented and maintained. The plan shall incorporate procedures recommended by the equipment manufacturer as well as incorporating standard industry practices. At a minimum the plan shall include:
  - a) Identification of the equipment and, if applicable, air-cleaning device and the supervisory personnel responsible for overseeing the inspection, maintenance, and repair
  - b) Description of the items or conditions to be inspected and frequency of the inspections or repairs

- c) Identification of the equipment and, if applicable, air-cleaning device, operating parameters that shall be monitored to detect a malfunction or failure, the normal operating range of these parameters and a description of the method of monitoring or surveillance procedures
- d) Identification of the major replacement parts that shall be maintained in inventory for quick replacement
- e) A description of the corrective procedures or operational changes that shall be taken in the event of a malfunction or failure to achieve compliance with the applicable emission limits

If the plan fails to address or inadequately addresses an event that meets the characteristics of a malfunction at the time the plan is initially developed, the owner or operator shall revise the plan within 45 days after such an event occurs and submit the revised plan for approval to the AQD District Supervisor. Should the AQD determine the PM / MAP to be inadequate, the AQD District Supervisor may request modification of the plan to address those inadequacies. **(R 336.1205, R 336.1702(a), R 336.1910, R 336.1911, R 336.1912, 40 CFR 52.21 (c) & (d))**

#### **IV. DESIGN/EQUIPMENT PARAMETERS**

1. The permittee shall install, calibrate, maintain and operate in a satisfactory manner a device to monitor the natural gas usage for EUENGINE1 on a continuous basis. **(R 336.1205, 40 CFR 52.21 (c) & (d))**

#### **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Upon request by the AQD District Supervisor, the permittee shall verify NO<sub>x</sub> and CO emission factors used to calculate emissions from EUENGINE1, by testing at owner's expense, in accordance with Department requirements. If a test has been conducted, any resulting increase in an emission factor shall be implemented to calculate NO<sub>x</sub> and CO. No less than 60 days prior to testing, the permittee shall submit a complete test plan to the AQD. The AQD must approve the final plan prior to testing. Verification of emission rates includes the submittal of a complete report of the test results to the AQD within 60 days following the last date of the test. **(R 336.1205, R 336.2001, R 336.2003, R 336.2004, 40 CFR 52.21 (c) & (d))**

#### **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1205, R 336.1702(a), R 336.1901)**
2. The permittee shall monitor and record, in a satisfactory manner, the natural gas usage for EUENGINE1 on a continuous basis. **(R 336.1205, 40 CFR 52.21 (c) & (d))**
3. The permittee shall maintain a record of all maintenance activities conducted according to the PM / MAP (pursuant to SC III.1). The permittee shall keep all records on file at the facility and make it available to the Department upon request. **(R 336.1205, R 336.1702(a), R 336.1911, 40 CFR 52.21 (c) & (d))**
4. The permittee shall keep, in a satisfactory manner, monthly fuel use records for EUENGINE1, as required by SC VI.2. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205, 40 CFR 52.21 (c) & (d))**
5. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period NO<sub>x</sub> emission calculation records for EUENGINE1, as required by SC I.1 and Appendix A. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205, 40 CFR 52.21 (c) & (d))**

- The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period CO emission calculation records for EUENGINE1, as required by SC I.2 and Appendix A. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205, 40 CFR 52.21 (d))**

**VII. REPORTING**

NA

**VIII. STACK/VENT RESTRICTIONS**

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

<b>Stack &amp; Vent ID</b>	<b>Maximum Exhaust Diameter/Dimensions (inches)</b>	<b>Minimum Height Above Ground (feet)</b>	<b>Underlying Applicable Requirements</b>
1. SVENGINE1	6.0	31.3	<b>R 336.1225 40 CFR 52.21 (c) &amp; (d)</b>

**IX. OTHER REQUIREMENTS**

- The permittee shall comply with the provisions of the National Emission Standards for Hazardous Air Pollutants, as specified in 40 CFR, Part 63, Subpart A and Subpart ZZZZ, as they apply to EUENGINE1. **(40 CFR Part 63 Subparts A and ZZZZ, 40 CFR 63.6595)**

**FLEXIBLE GROUP SUMMARY TABLE**

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

<b>Flexible Group ID</b>	<b>Flexible Group Description</b>	<b>Associated Emission Unit IDs</b>
FGFACILITY	All process equipment source-wide including equipment covered by other permits, grand-fathered equipment and exempt equipment.	NA

**The following conditions apply Source-Wide to:**  
**FGFACILITY**

**DESCRIPTION:** All process equipment source-wide including equipment covered by other permits, grand-fathered equipment and exempt equipment.

**POLLUTION CONTROL EQUIPMENT:** NA

**I. EMISSION LIMITS**

<b>Pollutant</b>	<b>Limit</b>	<b>Time Period / Operating Scenario</b>	<b>Equipment</b>	<b>Testing / Monitoring Method</b>	<b>Underlying Applicable Requirements</b>
1. NO <sub>x</sub>	89 tpy	12-month rolling time period as determined at the end of each calendar month.	FGFACILITY	SC VI.2 and Appendix A	<b>R 336.1205(3)</b>
2. CO	89 tpy	12-month rolling time period as determined at the end of each calendar month.	FGFACILITY	SC VI.3 and Appendix A	<b>R 336.1205(3)</b>
3. VOC	89 tpy	12-month rolling time period as determined at the end of each calendar month.	FGFACILITY	SC VI.4 and Appendix A	<b>R 336.1205(3)</b>
4. Each Individual HAP	Less than 9 tpy*	12-month rolling time period as determined at the end of each calendar month.	FGFACILITY	SC VI.5 and Appendix A	<b>R 336.1205(3)</b>
5. Aggregate HAPs	Less than 22.5 tpy*	12-month rolling time period as determined at the end of each calendar month.	FGFACILITY	SC VI.5 and Appendix A	<b>R 336.1205(3)</b>

\* This limit applies to the cumulative total HAP emissions.

## **II. MATERIAL LIMITS**

1. The permittee shall not burn any sour natural gas in FGFACILITY. Sour gas is defined as any gas containing more than 1 grain of hydrogen sulfide or more than 10 grains of total sulfur per 100 standard cubic feet. **(R 336.1205(3))**
2. The sweet natural gas usage for FGFACILITY shall not exceed 135 million cubic feet per year based on a 12-month rolling time period as determined at the end of each calendar month. **(R 336.1205(1)(a) & (3))**

## **III. PROCESS/OPERATIONAL RESTRICTIONS**

NA

## **IV. DESIGN/EQUIPMENT PARAMETERS**

NA

## **V. TESTING/SAMPLING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. Verification of H<sub>2</sub>S and/or sulfur content of the natural gas burned in FGFACILITY may be required upon request by the AQD District Supervisor. This condition is necessary to ensure compliance with SC II.1. **(R 336.1205(3))**

## **VI. MONITORING/RECORDKEEPING**

Records shall be maintained on file for a period of five years. **(R 336.1201(3))**

1. The permittee shall complete all required calculations in a format acceptable to the AQD District Supervisor and make them available by the last day of the calendar month, for the previous calendar month, unless otherwise specified in any monitoring/recordkeeping special condition. **(R 336.1205(3))**
2. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period NO<sub>x</sub> emission calculation records for FGFACILITY, as required by SC I.1 and Appendix A. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205(3))**
3. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period CO emission calculation records for FGFACILITY, as required by SC I.2 and Appendix A. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205(3))**
4. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period VOC emission calculation records for FGFACILITY, as required by SC I.3 and Appendix A. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205(3))**
5. The permittee shall keep, in a satisfactory manner, individual and aggregate HAP emission calculations determining the annual emission rate of each in tons per 12-month rolling time period as determined at the end of each calendar month, as required by SC I.4, I.5 and Appendix A. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205(3))**
6. The permittee shall keep, in a satisfactory manner, monthly and 12-month rolling time period fuel use records for FGFACILITY. The permittee shall keep all records on file at the facility and make them available to the Department upon request. **(R 336.1205(3))**

**VII. REPORTING**

NA

**VIII. STACK/VENT RESTRICTIONS**

NA

**IX. OTHER REQUIREMENTS**

1. The permittee shall comply with all provisions of the National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 63, Subpart HH, as they apply to FGFACILITY. **(40 CFR Part 63, Subpart HH)**

**APPENDIX A**  
**Procedures for Calculating NO<sub>x</sub>, CO, VOC, and HAP Emissions**

The permittee shall demonstrate compliance with the NO<sub>x</sub>, CO, VOC, and HAP emission limits by keeping track of all fuel usage for all equipment using such fuel at this facility and multiplying that fuel usage by an equipment-specific emission factor. The emission factors are typically expressed as the mass of pollutant per unit of fuel.

**EUENGINE1**

The permittee shall use emission factors from vendor data or from source specific testing (stack testing), as available for EUENGINE1. This also applies to engine(s) from engine change-out(s). If emission factors from other sources are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

**Fuel burning equipment at the facility:**

The permittee shall use emission factors contained in the most recent AP-42 (Compilation of Air Pollutant Emission Factors) or the most recent FIRE (Factor Information Retrieval) database if vendor or stack testing data is not available. If emission factors from other sources are used, the permittee shall obtain the approval of the AQD District Supervisor before using the emission factors to calculate emissions.

The permittee shall document the source of each emission factor used in the calculations.