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Landfill Energy Systems Florida, LLC
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Authorized Representative:
Dennis Plaster, Vice President of Operations

Air Permit No. 1150089-008-AC
Expires: January 1, 2016
PSD-FL-422

Facility ID No. 1150089
Sarasota Landfill Gas-to-Energy Project

PROJECT

This is the final air construction permit, which authorizes the installation and operation of a new landfill gas-to-energy plant, which will be classified as electrical services under Standard Industrial Classification No. 4911. Primarily, the project will consist of the operation of four lean-burn engine/generators sets that will fire landfill gas to produce up to a combined nominal 6.4 megawatts (MW) of power to the electrical grid. The proposed plant will be will be collocated with the existing Central County Solid Waste Disposal Complex, which is located in Sarasota County at 4000 Knights Trail Road, Nokomis, Florida. The UTM coordinates are Zone 17, 362.85 kilometers (km) East and 3008.95 km North.

This final permit is organized into the following sections: Section 1 (General Information); Section 2 (Administrative Requirements); Section 3 (Emissions Unit Specific Conditions); and Section 4 (Appendices). Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of Section 4 of this permit.

STATEMENT OF BASIS

This air pollution construction permit is issued under the provisions of: Chapter 403 of the Florida Statutes (F.S.) and Chapters 62-4, 62-204, 62-210, 62-212, 62-296 and 62-297 of the Florida Administrative Code (F.A.C.). The permittee is authorized to conduct the proposed work in accordance with the conditions of this permit. This project is subject to the general preconstruction review requirements in Rule 62-212.300, F.A.C. and the preconstruction review requirements for major stationary sources in Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Executed in Tallahassee, Florida

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for Jeffery F. Koerner, Program Administrator
Office of Permitting and Compliance
Division of Air Resource Management

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this Final Air Permit package (including the Final Determination and Final Permit with Appendices) was sent by electronic mail, or a link to these documents made available electronically on a publicly accessible server, with received receipt requested before the close of business on the date indicated below to the following persons.

Mr. Dennis Plaster, VP Operations, IES/LFGES: dplaster@ieslfge.com
Mr. Michael Laframboise, VP Construction, IES/LGDES: michael.laframboise@landfillenergy.com
Mr. Jeffrey L. Pope, P.E., Burns & McDonnell: jpope@burnsmed.com
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Ms. Lynn Scearce, DEP OPC: lynn.scearce@dep.state.fl.us

Clerk Stamp

FILING AND ACKNOWLEDGMENT FILED, on this date, pursuant to Section 120.52(7), Florida Statutes, with the designated agency clerk, receipt of which is hereby acknowledged.

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PROPOSED PROJECT

Landfill Energy Systems Florida, LLC proposes to construct and operate a landfill gas-to-energy plant. The project will be constructed on land leased from Central County Solid Waste Disposal Complex (CCSWDC). CCSWDC currently operates under a single Title V air permit as a single facility. The project is considered an expansion of this existing facility and is subject to PSD preconstruction review for carbon monoxide (CO), nitrogen oxides (NO_X), and particulate matter with a mean particle diameter of 10 microns or less (PM_{10})/$PM_{2.5}$ in accordance with Rule 62-212.400, F.A.C. Construction is scheduled to commence in 2013 and be completed in 2014 for the first three engines. The fourth engine~~s~~ will be installed approximately one year later when the landfill is expected to produce enough landfill gas to operate the engine.

The proposed new plant will use landfill gas obtained from CCSWDC landfill to fuel four lean-burn reciprocating internal combustion engine/generator sets. The four engine/generator sets will deliver a combined nominal 6.4 MW of power to the electrical grid. Prior to combustion in the engines, the landfill gas will be routed through a landfill gas treatment system, which includes dewatering (a moisture knock-out vessel), gas compressors and blowers, air-to-gas coolers and 1 micron particulate filtration. Exhaust gas from each engine will exit an individual stack connected to the engine exhaust manifolds. A noise muffler will be installed on each engine exhaust stack. Each engine exhaust stack will be 1.5 feet in diameter with a volumetric flow rate of 13,700 actual cubic feet per minute (acfm). The fuel combustion system exhausts and noise mufflers will be located on the roof of the single building that houses the engines. The existing flare will be retained in its current location and used as necessary to control residual landfill gas not fired in the engines.

This project will add the following emissions units.

ID No.	Emission Unit Description
010 - 013	Four lean-burn reciprocating internal combustion engine/generator sets

FACILITY REGULATORY CLASSIFICATION

- The project will be a major source of hazardous air pollutants (HAP).
- The project will be a Title V major source of air pollution in accordance with Chapter 62-213, F.A.C.
- The project includes no units subject to the acid rain provisions of the Clean Air Act.
- The project is subject to PSD preconstruction review in accordance with Rule 62-212.400, F.A.C.
- The project includes units subject to applicable New Source Performance Standards (NSPS) in Title 40, Part 60 of the Code of Federal Regulations.
- The project includes units subject to applicable National Emissions Standards for Hazardous Air Pollutants (NESHAP) in Title 40, Part 63 of the Code of Federal Regulations.

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SECTION 2. ADMINISTRATIVE REQUIREMENTS (DRAFT)

1. Permitting Authority: The Permitting Authority for this project is the Office of Permitting and Compliance in the Division of Air Resource Management of the Department of Environmental Protection (Department). The mailing address for the Office of Permitting and Compliance is 2600 Blair Stone Road, MS #5505, Tallahassee, Florida 32399-2400.

2. Compliance Authority: All documents related to compliance activities such as reports, tests, and notifications shall be submitted to the South District Office at 2295 Victoria Avenue, Suite 364, Fort Myers, Florida 33902-2549.

3. Appendices: The following Appendices are attached as a part of this permit: Appendix A (Citation Formats and Glossary of Common Terms); Appendix B (General Conditions); Appendix C (Common Conditions); Appendix D (Common Testing Requirements); Appendix E (Final BACT Determinations); Appendix F (NSPS Subpart A); Appendix G (NSPS Subpart JJJJ); Appendix H (NESHAP Subpart A); Appendix I (NESHAP Subpart ZZZZ); and Appendix J (US EPA Alternative Test Method ALT-096 (TECO 55I).

4. Applicable Regulations, Forms and Application Procedures: Unless otherwise specified in this permit, the construction and operation of the subject emissions units shall be in accordance with the capacities and specifications stated in the application. The facility is subject to all applicable provisions of: Chapter 403, F.S.; and Chapters 62-4, 62-204, 62-210, 62-212, 62-213, 62-296 and 62-297, F.A.C. Issuance of this permit does not relieve the permittee from compliance with any applicable federal, state, or local permitting or regulations.

5. New or Additional Conditions: For good cause shown and after notice and an administrative hearing, if requested, the Department may require the permittee to conform to new or additional conditions. The Department shall allow the permittee a reasonable time to conform to the new or additional conditions, and on application of the permittee, the Department may grant additional time. [Rule 62-4.080, F.A.C.]

6. Modifications: No emissions unit shall be constructed or modified without obtaining an air construction permit from the Department. Such permit shall be obtained prior to beginning construction or modification. [Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C.]

7. Construction and Expiration. The expiration date shown on the first page of this permit provides time to complete the physical construction activities authorized by this permit, complete any necessary compliance testing, and obtain an operation permit. Notwithstanding this expiration date, all specific emissions limitations and operating requirements established by this permit shall remain in effect until the facility or emissions unit is permanently shut down. For good cause, the permittee may request that that a permit be extended. Pursuant to Rule 62-4.080(3), F.A.C., such a request shall be submitted to the Permitting Authority in writing before the permit expires. [Rules 62-4.070(4), 62-4.080 & 62-210.300(1), F.A.C.]

8. Source Obligation:

   (a) Authorization to construct shall expire if construction is not commenced within 18 months after receipt of the permit, if construction is discontinued for a period of 18 months or more, or if construction is not completed within a reasonable time. This provision does not apply to the time period between construction of the approved phases of a phased construction project except that each phase must commence construction within 18 months of the commencement date established by the Department in the permit.

   (b) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by virtue of a relaxation in any enforceable limitation which was established after August 7, 1980, on the capacity of the source or modification otherwise to emit a pollutant, such as a restriction on hours of operation, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

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(c) At such time that a particular source or modification becomes a major stationary source or major modification (as these terms were defined at the time the source obtained the enforceable limitation) solely by exceeding its projected actual emissions, then the requirements of subsections 62-212.400(4) through (12), F.A.C., shall apply to the source or modification as though construction had not yet commenced on the source or modification.

[Rule 62-212.400(12), F.A.C.]

9. Title V Permit: This permit authorizes specific modifications and/or new construction on the affected emissions units as well as initial operation to determine compliance with conditions of this permit. A Title V operation permit is required for regular operation of the permitted emissions unit. The permittee shall apply for a Title V operation permit at least 90 days prior to expiration of this permit, but no later than 180 days after completing the required work and commencing operation. To apply for a Title V operation permit, the applicant shall submit the appropriate application form, compliance test results, and such additional information as the Department may by law require. The application shall be submitted to the appropriate Permitting Authority with copies to each Compliance Authority. [Rules 62-4.030, 62-4.050, 62-4.220, and Chapter 62-213, F.A.C.]

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B. Landfill Gas Engines (EU 010 – 013)

This section of the permit addresses the following emissions units.

EU No.	Emission Unit Description
010 - 013	Four lean-burn, spark-ignited reciprocating internal combustion engine/generator sets (Caterpillar Model G3520C or equivalent) fired with landfill gas.

{Permitting Note: In accordance with Rule 62-212.400(PSD), F.A.C., the above engines are subject to Best Available Control Technology (BACT) determinations for the following pollutants: CO, NO_X, and $PM_{10}/PM_{2.5}$. The final BACT determinations are presented in Appendix E of this permit. Other emissions standards and performance restrictions specified in this permit allow the emission units to avoid PSD preconstruction review for volatile organic compound (VOC), non-methane organic compounds(NMOC) and sulfur dioxide (SO_2).}

EQUIPMENT

1. Landfill Gas Engine/Generator Sets: The permittee is authorized to install and operate four lean-burn, spark-ignited reciprocating internal combustion engine/generator sets (Caterpillar Model G3520C or equivalent) that will fire landfill gas with the following nominal design specifications per engine: a maximum engine rating of 2,242 brake-horsepower (bhp) at 100% load; a nominal electrical generator rating of 1.6 MW; and a heat input rate of approximately 16.61 million British thermal units/hour (MMBtu/hour) from landfill gas.

   a. Each engine shall be equipped with an air-to-fuel ratio controller and electronic ignition timing to maintain efficient fuel combustion.

   b. Each engine shall be equipped with an automatic fail-safe block valve which must be designed to stop the flow of landfill gas in the event of an engine failure. Excess landfill gas not fired in the engines shall be flared in accordance with the requirements of Subpart WWW in 40 CFR 60.

   c. Each engine shall be equipped with a non-resettable elapsed time meter to indicate the elapsed engine operating time in cumulative hours.

   d. A gas flow meter shall be installed to monitor the total volumetric flow rate to the landfill gas engines.

   {Permitting Note: The heat input rate is based on 100% load (2,242 bhp), a nominal landfill gas heating value of 500 British thermal units per standard cubic foot (Btu/scf) and an approximate landfill gas firing rate of 554 scfm per engine.} [Application No. 1150089-008-AC; Rules 62-4.070(3), 62-210.200(PTE) and 62-212.400(PSD), F.A.C.; and NESHAP Subpart ZZZZ]

2. Landfill Gas Treatment System: The permittee shall install a landfill gas treatment system that includes initial gas dewatering (moisture knock-out vessel), gas compressors and blowers, air-to-gas coolers and particulate removal. The particulate filtration system shall be designed to remove particles down to 1 micron via primary and polishing filters. The gas treatment system shall not be equipped with atmospheric vents. [Application No. 1150089-008-AC; and Rule 62-212.400(PSD), F.A.C.]

3. Hours of Operation: Operation of the new engine/generator sets is not limited (8,760 hours per year). [Application No. 1150089-008-AC; and Rule 62-210.200(PTE), F.A.C.]

PERFORMANCE RESTRICTIONS

4. Permitted Capacity: Each landfill gas engine has a maximum power rating of 2,242 bhp at 100% load (approximately 16.61 MMBtu/hour). The electrical generator set has a nominal power rating of 1,600 kilowatts. [Rule 62-210.200(PTE), F.A.C.]

5. Authorized Fuel: Only landfill gas shall be fired in the engine/generator sets. [Application No. 1150089-008-AC and Rule 62-210.200(PTE), F.A.C.]

6. Applicable NSPS Provisions: The landfill gas engines are subject to, and shall comply with, the applicable provisions in NSPS Subpart A (General Provisions) and NSPS Subpart JJJJ (Stationary Spark Ignition

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Internal Combustion Engines) of 40 CFR 60, which are identified in Appendix F and G of this permit. [NSPS Subparts A and JJJJ in 40 CFR 60; and Rule 62-204.800, F.A.C.]

7. Applicable NESHAP Provisions: The landfill gas engines are subject to, and shall comply with, the applicable provisions in NESHAP Subpart A (General Provisions) and NESHAP Subpart ZZZZ (Reciprocating Internal Combustion Engines) of 40 CFR 63, which are identified in Appendix H and I of this permit. [NESHAP Subparts A and ZZZZ in 40 CFR 63; and Rule 62-204.800, F.A.C.]

EMISSIONS STANDARDS

8. Nitrogen Oxides: The emissions of NO_X from each engine/generator set shall not exceed 0.6 gram per brake horsepower hour (g/bhp-hour) and 3.0 pound/hour (lb/hour). [Rule 62-212.400(BACT), F.A.C.]

9. Carbon Monoxide: The emissions of CO from each engine/generator set shall not exceed 3.5 g/bhp-hour and 17.3 lb/hour. [Rule 62-212.400(BACT), F.A.C.]

10. Particulate Matter: The permittee shall minimize emissions of particulate matter by installing, operating and maintaining the required landfill gas treatment system as well as maintaining the air-to-fuel ratio to ensure efficient combustion. In addition, as determined by EPA Method 9, visible emissions from each engine/generator set shall not exceed 10% opacity, based on a six-minute average. *{Permitting Note: Based on these work practice standards, the maximum emissions of $PM/PM_{10}/PM_{2.5}$ from each engine/generator are estimated to be 0.24 g/bhp-hour, 1.2 lb/hour and 5.2 tons/year}.* [Rule 62-212.400(BACT), F.A.C.]

11. Volatile Organic Compounds: The emissions of VOC from each engine/generator set shall not exceed 0.42 g/bhp-hour and 2.08 lb/hour. [NSPS Subparts A and JJJJ in 40 CFR 60; Rules 62-204.800 and 62-212.400(12), F.A.C.; and to avoid PSD preconstruction review for VOC]

12. Non-Methane Organic Compounds: The emissions of NMOC from each engine/generator set shall not exceed 0.52 g/bhp-hour and 2.57 lb/hour. [Rule 62-212.400(12), F.A.C.; and to avoid PSD preconstruction review for NMOC]

13. VOC/NMOC Emission Caps: The emissions of VOC/NMOC from all four engines (EU 010 – 013, combined) shall not exceed 36.4 tons per consecutive 12 months for VOC and 45 tons per consecutive 12 months for NMOC. Compliance with each of these VOC/NMOC emissions caps shall be demonstrated on a 12-month rolling basis using the following equation:

    $(EF_{engine})(lb/454)(ton/2000\ lb)(Engine\ 1 + Engine\ 2 + Engine\ 3 + Engine\ 4) \leq 36.0$ TPY, VOC/45 TPY, NMOC

    Where:

    EF_{engine} = VOC/NMOC emission rate from most recent annual stack test, g/bhp-hour

    $Engine_{bhp\text{-}hours}$ = Rolling 12-month total of operating bhp-hours for each engine (EU 010 - 013)

    If necessary, the permittee shall adjust engine operation to comply with the VOC/NMOC emissions caps. [Rule 62-212.400(12), F.A.C.; and to avoid PSD preconstruction review for VOC/NMOC]

14. Sulfur Dioxide: The emissions of SO_2 from each engine/generator set shall not exceed 48 pounds/million standard cubic feet (lb/MMscf). [Rule 62-212.400(12), F.A.C.; and to avoid PSD preconstruction review for SO_2).]

15. Sulfur Dioxide Emission Cap: The emissions of SO_2 from all four engines (EU 010 – 013, combined) shall not exceed 36 tons per consecutive 12 months. Compliance with SO_2 emissions cap shall be demonstrated on a 12-month rolling basis using the following information: the sulfur level in the scrubbed landfill gas fired; the amount of landfill gas fired in each combustion source; and the assumption that all sulfur is converted to SO_2. [Rule 62-212.400(12), F.A.C.; and to avoid PSD preconstruction review for SO_2]

16. Visible Emissions: Visible emissions from each engine/generator set exhaust shall not exceed 10% opacity. [Rule 62-212.400(BACT), F.A.C.]

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TESTING REQUIREMENTS

17. Test Requirements: During each required compliance stack test, the permittee shall operate a tested landfill gas engine at permitted capacity (90% to 100% of 2,242 bhp). The permittee shall notify the Compliance Authority in writing at least 15 days prior to any scheduled stack tests. Tests shall be conducted in accordance with the applicable requirements specified in Appendix D (Common Testing Requirements) of this permit. *{Permitting Note: Although the NSPS provides for a 30-day test notification, a 15-day notice is sufficient in Florida.}* [Rule 62-297.310(7)(a)9, F.A.C.]

18. Test Methods: Required tests shall be performed in accordance with the following reference methods.

Method	Description of Method and Comments
1-4	Traverse Points, Velocity and Flow Rate, Gas Analysis, and Moisture Content
7 or 7E	Determination of Nitrogen Oxide Emissions from Stationary Sources
9	Visual Determination of the Opacity of Emissions from Stationary Sources
10	Determination of Carbon Monoxide Emissions from Stationary Sources {Note: The method shall be based on a continuous sampling train.}
19	Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates (Optional F-factor method may be used to determine flow rate and gas analysis to calculate mass emissions in lieu of Methods 1-4.)
18	Measurement of Gaseous organic Compound Emissions by Gas Chromatography *{Note: the emission standards are based on VOC measured as methane.}*
25A	Method for Determining Gaseous Organic Concentrations (Flame Ionization)
25C	Method for Determining Non-Methane Organic Compounds in Landfill Gases
TECO-55I	ALT-096 Direct total Non-methane Hydrocarbon Analyzer

The above methods are described in Appendix A of 40 CFR 60 and are adopted by reference in Rule 62-204.800, F.A.C. No other methods may be used unless prior written approval is received from the Department. [Rules 62-204.800 and 62-297.100, F.A.C.; and Appendix A of 40 CFR 60]

19. Initial Compliance Tests: Each landfill gas engine shall be tested to demonstrate initial compliance with the emissions standards for CO, NO_X and VOC under 40 CFR 60, Subpart JJJJ as well as the BACT standards of this permit. In addition, each unit shall be tested for opacity in accordance with EPA Method 9. Each emission unit shall be tested for NMOC in accordance with EPA Method 25C, or Method 25A and 18, or alternative test method ALT-096 (TECO-55I) as instructed in the EPAs alternative approval letter in Appendix J. of this permit. The initial performance test must be conducted within 60 days after achieving permitted capacity, but not later than 180 days after initial startup of each unit. [Rules 62-212.400(BACT), 62-297.310(7)(a)1, F.A.C. and NSPS Subpart JJJJ in 40 CFR 60]

20. Periodic Compliance Tests: Every 8,760 engine hours or at least once every three years, whichever comes first, each landfill gas engine shall be tested to demonstrate compliance with the emissions standards for CO, NO_X and VOC under 40 CFR 60, Subpart JJJJ as well as the BACT standards of this permit. During these periodic tests, at least one landfill gas engine shall also be tested for opacity in accordance with EPA Method 9 and NMOC in accordance with EPA Method 25C, or Method 25A and 18, or alternative test method ALT-096 (TECO-55I) as instructed in the EPAs alternative approval letter in Appendix J. of this permit. [Rules 62-212.400(BACT), 62-297.310(7)(a)1 and 4, F.A.C., and NSPS Subpart JJJJ in 40 CFR 60]

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21. Landfill Gas Composition Analysis: The ASTM Method D5504-01, or equivalent, shall be used to satisfy the sampling/analysis of landfill gas. The landfill gas shall be collected and transported in an appropriate canister (e.g. SUMMA®, Bottle-Vac Sampler or equivalent). [Rule 62-4.070(3), F.A.C.]

MONITORING REQUIREMENTS

22. Landfill Gas Sampling/Analysis: At least semiannually, the permittee shall obtain the following representative samples of landfill gas: a sample taken during each required compliance stack test; and a sample taken during the next semiannual period. A representative sample shall be taken in each calendar semiannual period (January – June and July – December) approximately six months apart. Each gas sample shall be collected under normal operating conditions (i.e., with valves open for all operating cells) by appropriate canister (e.g. SUMMA®, Bottle-Vac Sampler or equivalent). Each sample shall have an analysis conducted to determine the sulfur content. Based on the sampling results and Rule 62-297.310(7)(b)(Special Compliance Tests), F.A.C., the Compliance Authority may request additional gas sampling and analyses. [Rules 62-210.200(PTE) and 62-212.400(12), F.A.C. to avoid PSD review for SO_2 emissions]

23. Gas Flow Meter Daily Records: Daily records shall be used to monitor and record the fuel usage for all engines combined with a separate fuel meter to measure the volumetric flow rate of the landfill gas. [NESHAP Subpart ZZZZ of 40 CFR 63]

24. Monthly Records: Within ten calendar days following each month, the permittee shall observe and record the following information in a written log or electronic format accessible to a compliance inspector: number of hours of operation of each engine; total monthly landfill gas flow rate to all engines combined; and SO_2 emissions for the month and previous 12 months, rolling total. Emissions of SO_2 shall be calculated from the monthly fuel consumption as well as the analytical results for the sulfur contents of the landfill gas representative of the given month of operation based on the semiannual sampling for that period. [Rule 62-210.200 (232), F.A.C.]

RECORDS AND REPORTS

25. Test Reports: The required test report shall be filed with the Department as soon as practical but no later than 45 days after the last sampling run of each test is completed. The test report shall provide sufficient detail on the emissions unit tested and the test procedures used to allow the Department to determine if the test was properly conducted and the test results properly computed. As a minimum, the test report, other than for an EPA test, shall provide the applicable information identified in Rule 62-297.310(8)(c). [Rule 62-297.310(8), F.A.C.]

26. Gas Flow Meter Report: An annual report shall be submitted including the following data:

    a. Fuel flow rate of the landfill gas and the heating values that were used in your calculations. You must also demonstrate that the percentage of heat input provided by landfill gas is equivalent to 10% or more of the total fuel consumption on an annual basis.

    b. The operating limits provided in your federally enforceable permit, and any deviations from these limits.

    c. Any problems or errors suspected with the meters.

    [NESHAP Subpart ZZZZ of 40 CFR 63]

27. Initial Notification: An Initial Notification shall be submitted no later than 120 days after you begin startup of the engine/generator sets. [NESHAP Subpart ZZZZ of 40 CFR 63]

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