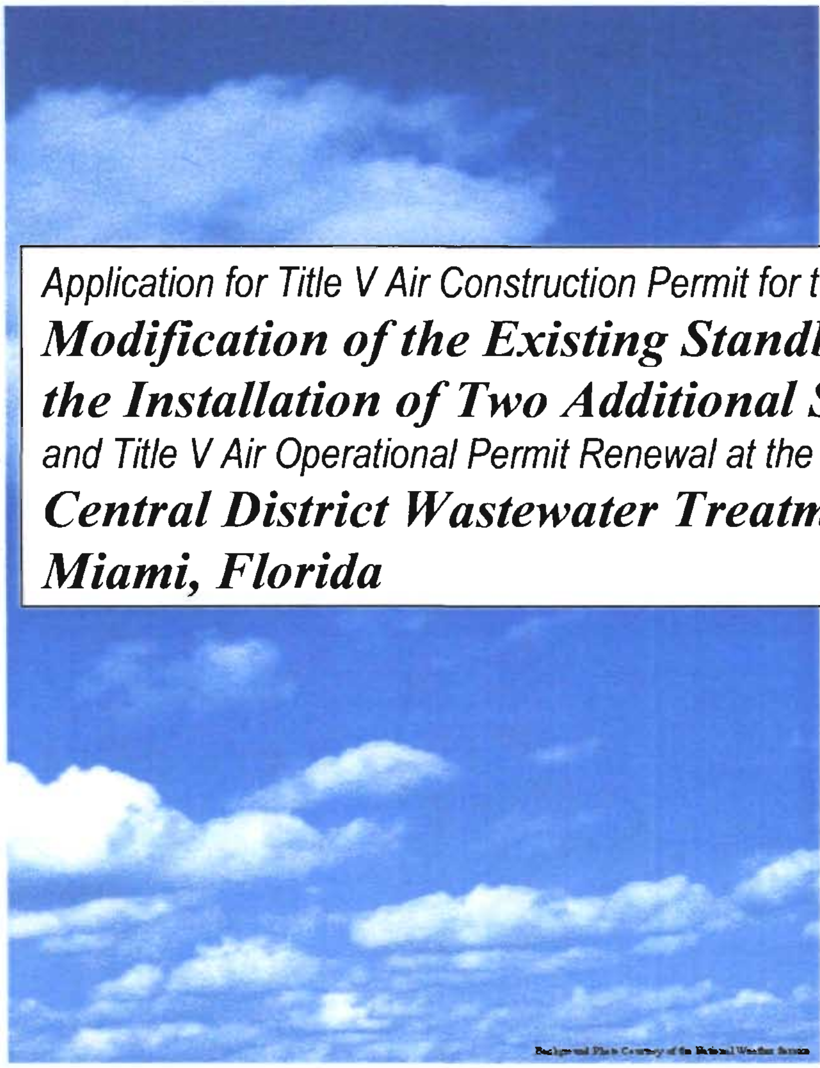


Application for Title V Air Construction Permit for the

Modification of the Existing Standby Generators and the Installation of Two Additional Standby Generators

and Title V Air Operational Permit Renewal at the

Central District Wastewater Treatment Plant Miami, Florida

* Scanned AC 6/25/07 √+ AV 7/12/07

SERVE • CONSERVE

Miami-Dade Water and Sewer Department
March 31, 2004

MIAMI-DADE WATER AND SEWER DEPARTMENT
P.O. Box 330316, Miami, Florida 33233-0316 • 3071 SW 38 Ave • Tel: 305-665-7471

• CONSERVE

April 1, 2004

Certified Mail: 7001 0360 0001 6782 8452
Return Receipt

RECEIVED

APR 06 2004

BUREAU OF AIR REGULATION

Mr. Alvaro Linero, P.E.
Administrator, New Source Review Section
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Subject: Application for Title V Air Construction Permit for the Modification of the Existing Standby Generators and the Installation of Two Additional Standby Generators and Title V Air Operational Permit Renewal at the Central District Wastewater Treatment Plant (WWTP), Miami, Florida, Facility I.D. No. 0250476

Dear Mr. Linero:

In accordance with Rule 62-210.300, F.A.C., enclosed, please find four (4) signed and sealed applications for the replacement of radiators on the existing standby generators; the installation of two additional standby generators and the renewal of the Title V Air Operation Permit for the Central District WWTP.

As the designated Responsible Official of this facility, I certify this application to be true, accurate, and complete based upon information and belief formed after reasonable inquiry. Please contact me at (786) 552-8102 or Mr. Richard M. O'Rourke, P.E. at (786) 552-8123 if there are any questions regarding this application.

Sincerely,

John W. Chorlog, Jr., P.E.
Assistant Director Wastewater

JWC/RMO/ro

c: L. Tallum, FDEP/SED
M. Muthiah, MD-DERM

Enclosure: Application for Title V Air Construction Permit for the Modification of the Existing Standby Generators and the Installation of Two Additional Standby Generators and Title V Air Operational Permit Renewal at the Central District WWTP, Miami, Florida (4 copies)

L04063dep.doc

Contents

Part I: Summary Report - Application for Title V Air Construction Permit for the Modification of the Existing Standby Generators and the Installation of Two Additional Standby Generators and Title V Air Operational Permit Renewal at the Central District Wastewater Treatment Plant, Miami, Florida

Contents, cont.

PART – II: DEP Application for Air Permit Form 62-210.900(1)

Contents, cont.

PART – III: Supplemental Information

Appendices **Page**

Acronyms

acfm	actual cubic feet per minute
ARC	ambient reference concentration
BACT	Best Achievable Control Technology
bhp	brake horsepower
bhp-hr	brake horsepower-hour
BSFC	brake-specific fuel consumption
BTU	British Thermal Unit
CAA	Clean Air Act
CBOI	Constant Beginning of Injection
CO_2	carbon dioxide
CO	carbon monoxide
EMD	Electro-Motive Division
EPA	Environmental Protection Agency
FAC	Florida Administrative Code
FDEP	Florida Department of Environmental Protection
FLM	Federal Land Manager
FP&L	Florida Power & Light Company
fps	feet per second
ft	foot (or feet)
g/bhp-hr	gram(s) per brake horsepower-hour
g/s	gram(s) per second
GEP	good engineering practice
H_2SO_4	sulfuric acid
HAP	hazardous air pollutant
HC	hydrocarbon
HNO_3	nitric acid
IC	internal combustion
IR	fuel injection timing retard
ISC	Industrial Source Complex
°K	degrees Kelvin
km	kilometer (s)
kW	kilowatt
kW-hr	kilowatt-hour
$\mu g/m^3$	microgram(s) per cubic meter

Acronyms, cont.

m	meter
m^3/s	cubic meter(s) per second
MIA	Miami International Airport
MDWASD	Miami-Dade Water and Sewer Department
m/s	meter(s) per second
NAAQS	National Ambient Air Quality Standards
NH_3	ammonia
NO	nitric oxide
NOx	nitrogen oxides
NO_2	nitrogen dioxide
PAH	polycyclic aromatic hydrocarbon
PEC	purchased equipment cost
PM	particulate matter
PM10	particulate matter less than 10 microns in diameter
ppm	parts per million
PSD	Prevention of Significant Deterioration
RACT	Reasonably Available Control Technology
RBLC	RACT/BACT/LAER Clearinghouse
rpm	revolutions per minute
scfm	standard cubic feet per minute
SCR	selective catalytic reduction
SO_2	sulfur dioxide
SO_3	sulfite
SO_4	sulfate
UTM	Universal Transverse Mercator
VOC	volatile organic compound
WASD	Water and Sewer Department (Miami-Dade)
WTP	water treatment plant
WWTP	wastewater treatment plant

Section 1

1. Introduction

The Miami-Dade Water and Sewer Department (MDWASD) in this application is proposing to renew the current Title V air operation permit; modify operational limitations on facility cogeneration and standby generation units; replace radiators on existing standby generators with remote radiators; and add two Diesel Fueled Standby Generators to the existing bank of standby electricity generators at its Central District Wastewater Treatment Plant (CDWWTP) located on Virginia Key in Miami, Florida.

CDWWTP is equipped with three (3) existing standby generator sets. These emission units serve as the plant standby generators and control NOx emissions with retarded engine timing and turbocharger aftercooling. Commercial operation began on January 1, 1980. These generators can be used to power portions wastewater treatment plant in the event of an emergency power loss from Florida Power & Light (FP&L), or in the event that FP&L request the plant to go on load control during periods of high power demand, situation that is normally referred as "peak shaving".

The two additional diesel fuel standby generators are being proposed to provide adequate power generation; and redundancy in the event that digester gas is not available for cogeneration unit operation; necessary to insure continuous treatment and disposal of domestic wastewater and the protection of the public health, welfare and environment.

An air quality impact analysis was not conducted in support of this application; as the units that are being added to the regulated group of emission units and the proposed modifications to the operations of the regulated emission units do not exceed Prevention of Significant Deterioration (PSD) increments. However, a previous statement of basis issued by the FDEP in 1999 contains an air quality impact analysis of higher facility emissions than what are proposed in this application.

Questions regarding the application can be addressed to the individual listed below at Miami-Dade Water and Sewer Department in Miami, Florida:

Mr. Richard M. O'Rourke, P.E.
Miami-Dade Water and Sewer Department
P.O. Box 330316
Miami, Florida 33233-0316
Telephone: (786) 552-8123
FAX: (786) 552-8640

Section 2

2. Facility Information

2.1 Facility Location

The Central District Wastewater Treatment Plant (CDWWTP) is located on Virginia Key in Miami, Florida; UTM coordinates: Zone 17, 565.2 km East and 2826.9 km North; Latitude: 25° 33' 33" North and Longitude: 80° 21' 04" West. A map locating the facility is provided in Figure 2-1.

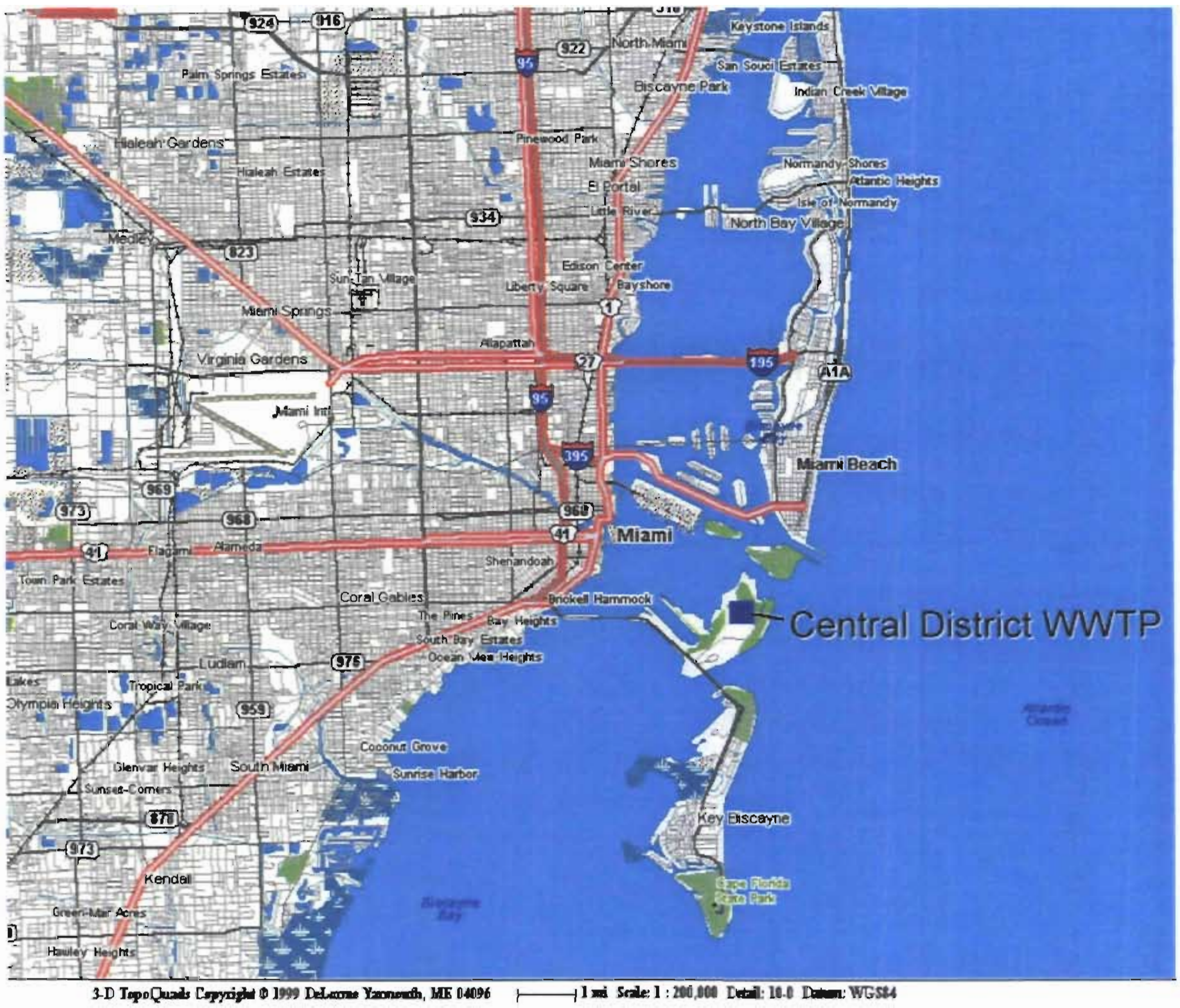


Figure 2-1 - Location Map of the Central District Wastewater Treatment Plant

A portion of the United States Geological Survey USGS Topographic Survey Map is shown in Figure 2-2. Also located on the island are public beaches; two small lakes (Lamar Lake to the east of the facility and Duck Lake to the south of the facility); the Marine Stadium to the west of the facility; and the Virginia Beach Park, Miami Seaquarium, and University of Miami Marine Laboratory to the south of the facility. The

Section 2 - Facility Information (cont.)

facility is approximately 1 mille north of the north end of the Virginia Key (3 miles north of residential areas), 0.5 miles south of Fisher Island (residential area), 1 mile south of Miami Beach and 2.5 miles east of downtown Miami. Additionally, an aerial photograph of the facility from the Miami-Dade County Geographic Information System (GIS) is also provided in Figure 2-3.

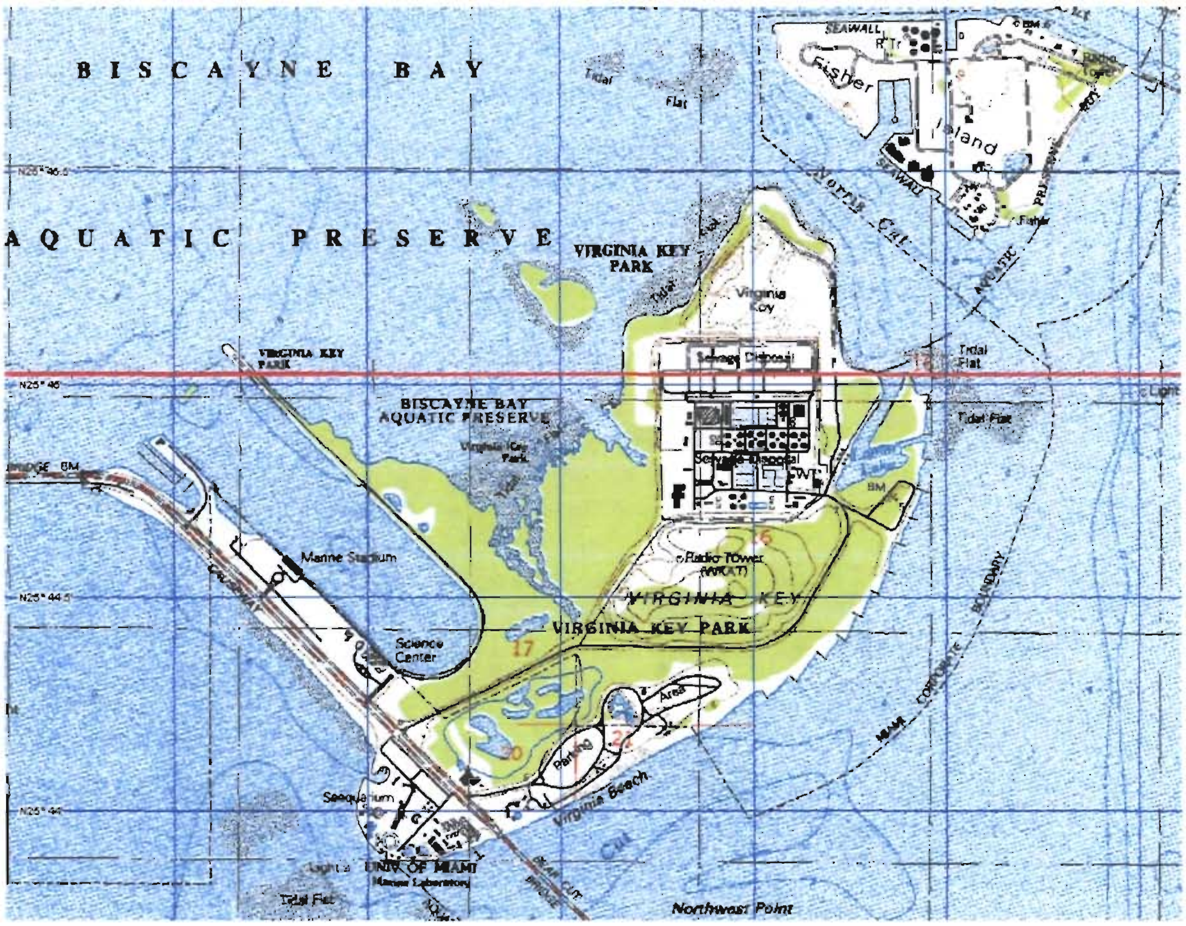


Figure 2-2 - USGS Topographic Map of the Central District Wastewater Treatment Plant

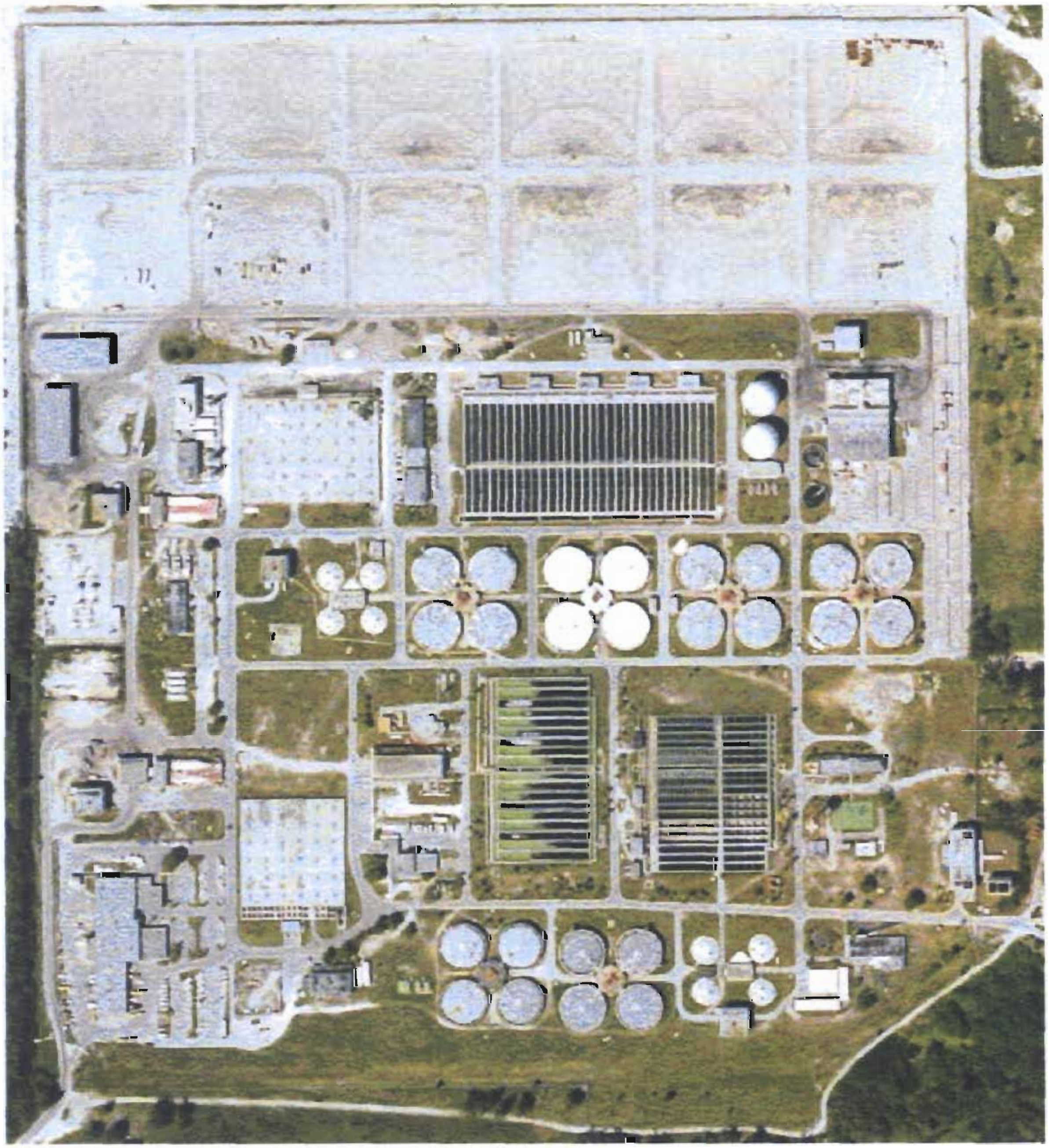


Figure 2-3 – Aerial Photograph of the Central District Wastewater Treatment Plant

The CDWWTP is engaged in wastewater treatment activities and is publicly owned. The first treatment facilities at the Virginia Key site became operational in 1956 with a capacity of 47 mgd. Since that time numerous additions and modifications to the plant have been made, including the change from aeration to oxygenation in the original plant. A flow diagram of the plant process is shown in Figure 2-4. The facility consists of two parallels wastewater treatment trains, Plant No. 1 and Plant No. 2, Plant 1 is rated at 60 mgd annual average daily flow and Plant 2 is rated for 83 mgd annual average daily flow. The total facility is rated at 143 mgd annual average daily flow.

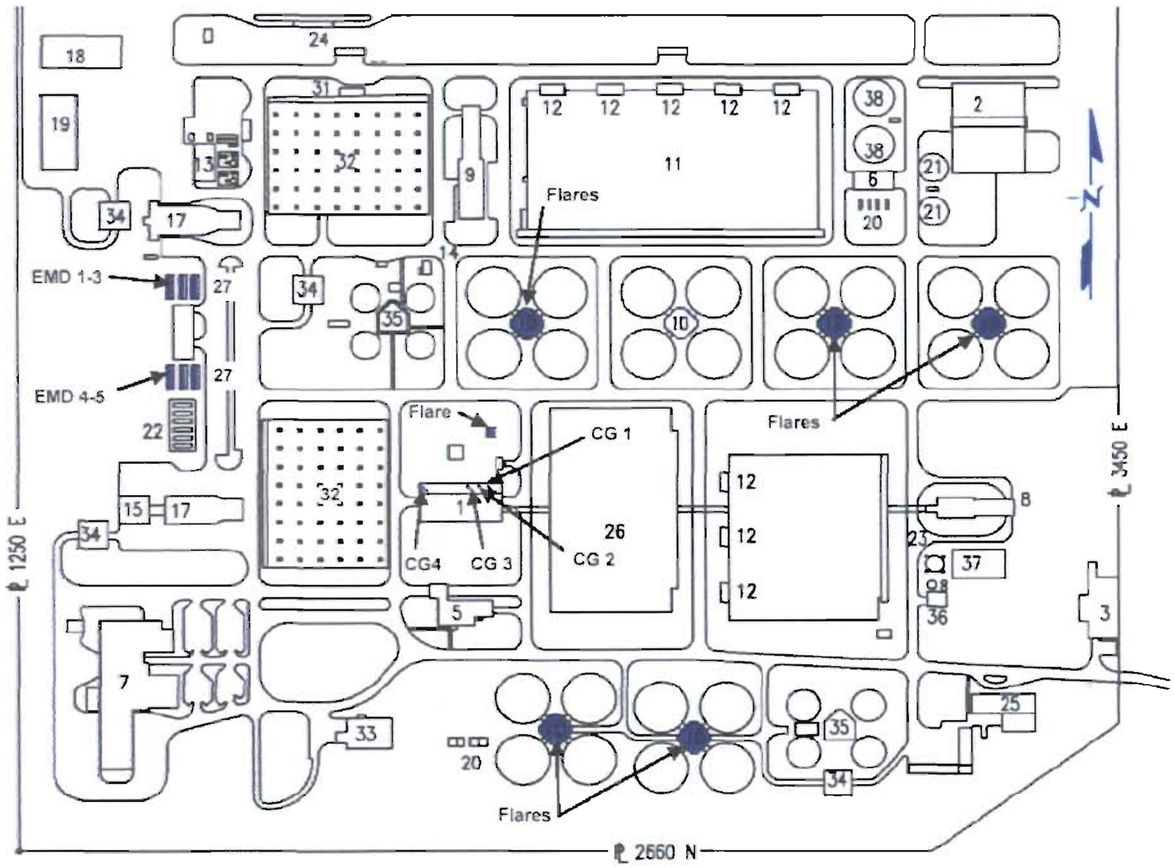


Figure 2-4 – Partial Facility Plot Plan of the Central District Wastewater Treatment Plant

The raw wastewater enters the facility through two large diameter force mains. In Plant No. 1, the wastewater passes through the grit chambers for grit removal and discharges into the oxygenation tanks for treatment by the activated sludge process utilizing pure oxygen. After passing through the oxygenation tanks, the flow enters the final settling tanks where the settleable suspended solids are removed from the main flow and are continuously pumped to a sludge distribution chamber, where part of the sludge is returned to the oxygenation tanks (RAS) and the remainder to waste sludge concentration tanks. In the concentrators, the sludge is thickened before pumping to the anaerobic digesters.

In Plant No. 2, the wastewater passes through the grit chambers for grit removal and discharges into the oxygenation tanks for treatment by the activated sludge process utilizing pure oxygen. The wastewater continues to the final settling tanks where the solids are settled and removed to the sludge pumping station.

A portion of the sludge is returned to the oxygenation tanks, and the remaining sludge is pumped to the sludge concentrators. The thickened sludge is then pumped to the anaerobic digesters. The methane gas produced in the digesters, at both plants, is scrubbed and used as fuel by the plant engines and for power generation.

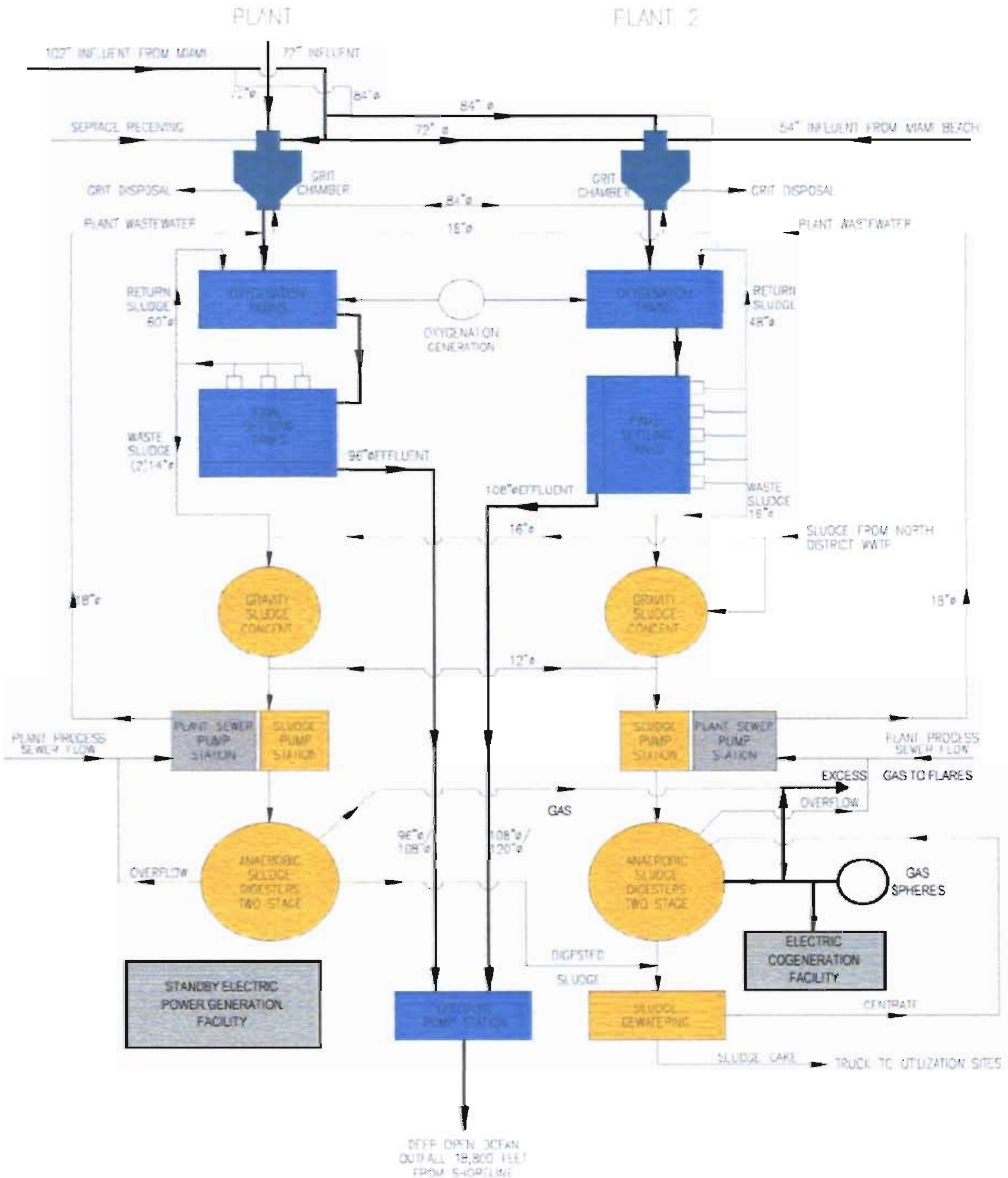


Figure 2-4 - Central District Wastewater Treatment Plant Process Flow Diagram

2.2 Standard Industrial Classification Codes (SIC)

Industry Group No.	49	Electric, Gas, and Sanitary Services
Industry No.	4952	Sewerage System

2.3 Facility Category

This facility, Central District Wastewater Treatment Plant is classified as a Major or Title V Source of air pollution because emissions of at least one regulated air pollutant, such as nitrogen oxides (NOx), carbon monoxide (CO), particulate matter (PM/PM_{10}), sulfur dioxide (SO_2), or volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. However, because overall facility emissions are greater than 250 TPY for at least one criteria pollutant, it is a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD).

This project as proposed is exempt from the requirements of Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) as will be discussed later in this Report. The additional emission units included in this project is proposed to be subject to specific emission limiting standard for purposes of Title V permitting as described within this report.

Section 3

3. Facility Emission Units and Project Information

3.1 Existing Facility Emission Units

A process flow diagram of the Central District WWTP is shown in Figure 2-5. The processes at the Central District WWTP include screening, grit removal, primary clarification, oxygenation process, secondary clarification, chlorination, and effluent pumping and disposal. Solids handling consists solely of screenings and the grit is collected from the primary clarifiers by the cyclone de-gritters, and conveyed to storage bins.

The Central District includes several non-process related emission sources that are used as support systems for the wastewater and solids processes.

The existing emissions units addressed by this permit application for renewal of the Title V Air Operating permit are:

Table 3-1 - Existing Emission Units

Emissions Unit No.	Emissions Unit Descriptions
007	1.2 MW Digester Gas Cogenerator No. 1,
008	Wastewater Treatment Plant - Liquid Processes
009	1.2 MW Digester Gas Cogenerator No. 2,
010	1.2 MW Digester Gas Cogenerator No. 3,
011	1.2 MW Digester Gas Cogenerator No. 4,
013	2.5 MW Diesel Engine Generator No. 1 (B1), EMD model No. 20-645E4B
014	2.5 MW Diesel Engine Generator No. 2 (A), EMD model No. 20-645E4B
015	2.5 MW Diesel Engine Generator No. 3 (B2), EMD model No. 20-645E4B
017	Solids Handling Processes
018	Digester Gas Flares

3.1.1 Proposed Emission Units

The scope of this project is to install two additional standby diesel-fueled engine driven generators to an existing bank of collectively regulated standby generators of the same manufacturer, and to modify and reduce current permitted operational limitations of the standby generators and co-generators.

The additional emissions units proposed in this permit application are:

Table 3-2 - Proposed Emission Units

Emissions Unit No.	Emissions Unit Description
Unknown	2.865 MW Diesel Engine Generator # 4, EMD model No. 20-645 F4B
Unknown	2.865 MW Diesel Engine Generator # 5, EMD model No. 20-645 F4B

3.2 Wastewater Treatment Plant

The Central District WWTP provides primary and secondary treatment for municipal sewage generated in the Central portions of Miami-Dade County. The wastewater entering the Central District WWTP contains a variety of inert, organic, and toxic pollutants that are the result of innumerable small-quantity discharges from domestic and commercial users. The unit processes used at the Central District WWTP are designed to remove the bulk of these pollutants through physical, chemical, and biological means. However, in the process, a fraction of the volatile compounds in the wastewater may be emitted into the atmosphere. The Central District WWTP treatment processes were designed to treat 143 million gallons per day (mgd) of treated effluent on an annual average basis. The Central District WWTP treatment process consists of screening, aerated grit removal, pure oxygen activated sludge, and secondary clarification, and additional secondary effluent filtration (for on-site reuse). A partial facility site plan is provided as Figure 2-4 with the basic elements of the plant being described below.

3.2.1 Liquid Processes

The Central District Wastewater Treatment Facility consists of two plants in parallel, the Plant No. 1 and Plant No. 2. As shown in figure 2-5, wastewaters enter the CDWWTP by means of 102-inch, 72-inch and 54-inch force mains that serve the Miami and Miami Beach areas. The 54-inch force main enters headworks of Plant No. 2 directly. The 102-inch and 71-inch force main carries sewage from Miami to Plant No. 1. A portion of the sewage from the 102-inch pipe is diverted to Plant No. 2 prior to entering the headworks of Plant no. 1 by a 72-inch pipe. The flow patterns are similar for both plants.

The flow passes through the headworks where bar screens remove large solids and the aerated grit chambers that remove grit which could damage downstream pumps and mechanical equipments. The flow then enters the oxygenation tanks for treatment by the activated sludge process utilizing pure oxygen. The flow continues to the final settling tanks where the solids are settled and collected in the sludge pumping station. A portion of the sludge is returned to the oxygenation tanks and the remaining sludge is pumped to the sludge concentrators. In the concentrators the sludge is thickened and further separated from the liquid carrier. The thickened sludge is then pumped to the sludge digesters where it is decomposed by anaerobic bacteria to form a non-objectionable sludge for disposal. The methane gas produced in the digesters is scrubbed and used as fuel in the plant engines.

The effluent flows from the final settling tanks in both plants are chlorinated and then flow into the effluent pumping station where they are pumped out the ocean outfall line and discharged over 3 miles off shore at a depth of 100 feet of water in the Atlantic Ocean.

3.2.2 Solids Processing

The screenings and grit that are removed from the wastewater at the head of the treatment plant are deposited in solid waste containers for transport and ultimate disposal at an approved landfill.

The wastewater sludge (or residuals) handling facilities are sized to handle the sludge from both the Virginia Key Plant and the North District Plant. Sludge from the North District WWTP is received at Pump Station No. 2 and then pumped to the Central District WWTP with the raw sewage from Miami or alternatively to the gravity sludge concentration tanks at Plant No. 2. The waste sludge from both the Virginia Key Plant and the North District Plant is ultimately sent to the gravity sludge concentration tanks where the sludge is thickened. The thickened sludge is then pumped to the anaerobic digesters which provide two-stage sludge digestion. Waste gas, consisting of methane, carbon dioxide, and traces of hydrogen sulfide is produced in the first stage (or primary) digesters. After approximately 21 days in the primary digesters, sludges are transferred to the secondary digesters, where virtually no gas production occurs. The secondary digesters act as thickeners. Supernatant drawn from the secondary digesters is pumped to the head of the plant. Digested sludges are transferred from the secondary digesters to thickening tanks at the dewatering building, where centrifuges are located. The centrifuges remove water from the digested sludge and the dewatered sludge cake (now classified as biosolids) is conveyed into the waiting trucks located below the centrifuges. The trucks transfer the biosolids to the temporary storage buildings, where the biosolids are loaded on trucks for disposal of at either an approved landfill or a permitted agricultural use site. The solids processing is listed as insignificant in the current Title V operating permit.

The anaerobic digesters also represent a source of emissions when excess gas is sent to the digester gas flares. Waste gas is only flared when production exceeds the available storage capacity of the gas storage spheres or the consumption rate of the digester fueled cogeneration engines, or when methane or hydrogen sulfide concentrations exceed safe limits in the anaerobic digester operations buildings. FDEP classifies flares as emission control devices.

3.3 Anaerobic Digester Gas Flares

The anaerobic digesters are equipped with flares for the control methane and hydrogen sulfide emissions from the digesters. There are a total of six anaerobic digester clusters at the Central District WWTP each digester cluster is equipped with flares. Five of the digester clusters are equipped with two flares; each flare has a maximum throughput of 18,000 scf/hr. One digester cluster, no. 2 of plant 2, is equipped with a single flare that has a throughput of 36,000 scf/hr. The maximum available throughput for all flares is 216,000 scf/hr. These flares are listed as unregulated emission units in the current Title V air operating permit.

Occasionally, when gas production rates exceed consumption rates of the cogeneration units, or there is insufficient capacity to store additional digester gas, or when elevated methane or hydrogen sulfide concentrations are detected in the digester control buildings the digester gas is automatically routed to the flares. The flares are part of the anaerobic digesters and are used as a safety device to prevent the release of methane and hydrogen sulfide containing digester gas to the atmosphere. Plant operating records in 2003 indicate that the cogeneration engines consumed over 63 percent of the calculated gas produced, the remainder of gas being flared.

3.4 Cogeneration Units

CDWWTP is equipped with four digester gas-fired cogeneration engines (E.U. Nos. 007, 009, 010 and 011), that burn scrubbed digester gas produced in the anaerobic digesters. The scrubbed digester gas, has an approximate higher heating value of 700 btus/scf and in 2003 the average hydrogen sulfide (H_2S) concentration was 98 grains per 100 scf. These cogenerators provide heat for the anaerobic digesters and produce electricity for the plant. Each cogenerator set consists of a Cooper Superior 1,700 hp turbocharged prime mover coupled to a 1,200 kW electrical generator. They are equipped with lean-burn technology to reduce NOx emissions. The cogenerators are only allowed to burn digester gas. Commercial operation began on May 22, 1992.

3.4.1 Revisions to Cogeneration Unit Limitations

Under the current facility Title V air operating permit, there is no limit to the hours of operations for the four cogeneration units. MDWASD proposes as part of the this application to reduce the current permitted hours of operation of 8,760 hours per year for each of the 4 units (35,040 combined) for the cogeneration engines to 26,280 hours of combined operation annually. This is equivalent to the running 3 of the 4 cogeneration units continuously. A revision of the current maximum allowable NOx emission rate of 7.6 lb/hr per cogeneration unit is not being sought; however MDWASD proposes to reduce the multi-unit annual emissions cap for NOx emissions from 133 tons/yr to 100 tons/yr.

3.5 Existing Standby Generator Units

The CDWWTP has three (3) Electro-Motive Division, EMD model 20-645E4 standby generator sets installed. Each generator set consists of a 3,600 hp prime mover coupled to a 2,500 kW continuous rated electrical generator. Commercial operation for the generator sets began in January 1980. Exhaust emissions for nitrogen oxides (NOx) and sulfur dioxide (SO_2) are controlled in accordance with the Best Achievable Control Technology (BACT) determination dated; March 17, 1999 as per Permit No. 0250476-002-AC, PSD-FL 240. The implementation of the approved BACT reduced the emissions of NOx in the engine exhaust of these units by approximately 28 percent from the uncontrolled levels for model 20-645E4 engines. Operation of the generator sets is used to provide the necessary and adequate back up power generation capacity as needed to ensure uninterrupted wastewater treatment process for to the Central Dade County population.

Table 3-3 summarizes the operating characteristics and Figure 3-1 is a photo of the existing standby generator sets. The exhaust silencers are within the enclosures and the exhaust stacks are mounted on top of the existing enclosures.

Table 3-3.
Summary of Exhaust and Operating Characteristics
of the Existing EMD Model 20E4B Standby Generator Sets
Miami-Dade WASD Central District WWTP

Number of Units		3
Generator Capacity		
	Peaking (110% load-2 hours max)	2,750 kW, each
	Continuous (full load-100%)	2,500 kW, each
Brake Specific Fuel Consumption (lb/bhp-hr)		
	Peaking-110%	0.375, each
	Full Load-100%	0.375, each
	Partial Load-75%	approx. 0.394, each
	Partial Load-50%	approx. 0.413,
	Minimum Load-20%	each approx. 0.469, each
Operating Speed:		900 rpm
Exhaust Characteristics - Vertical Exhaust		
	Height	21 feet
	Diameter	2.5 feet
	Flow	23,000 acfm
	Temperature	735 ° F

Figure 3-1 - Photograph of the Existing EMD Units at the Central District WWTP

3.5.1 Proposed Radiator Replacement

MDWASD is proposing to replace the existing radiators on Standby Generators 1, 2 & 3 (E.U. Nos. 013, 014 and 015) at the Central District with remote radiators. These original equipment radiators are integral with the existing units and are becoming difficult to maintain and service. As part of the ongoing maintenance of these units it was determined that the replacement of the existing radiators with external radiators was the most cost effective means of maintaining these units for continued service. These replacement radiators are the same as the external radiators used at other MDWASD facilities and will be the same as the external radiators to be used on the additional standby generators proposed with this application. A photograph of an external radiator installation for an EMD Model 20-645E4B is shown in figure 3-2 below. The fans on the original integral radiators are driven directly from an engine driven power take of at the front of the unit. By replacing the original radiator with an external radiator that has electric motor driven fans, a slight reduction of the auxiliary loading on the engine of approximately 100 hp is anticipated; and the overall loading on the engine at the rated generator capacity will decrease accordingly.

Figure 3-2 - EMD Model 20-645F4B Unit with External Radiator

3.5.2 Revisions to Existing Standby Generator Limitations

These original three standby generator units underwent a prevention of significant deterioration (PSD) review and permit number (PSD-FL-240) as part of an initial Title V air construction permit application and subsequent initial Title V air operation permit. As a result of this review and BACT determination; the permit limits these units to a maximum NOx emission rate of 58 lb/hr individually and 267 tons per 12 consecutive months combined and to a maximum fuel consumption of 1,800,000 gals/year. Because the proposed modifications reduce engine loading, with an unknown associated reduction in hourly NOx emissions and fuel consumption; and to facilitate a multi-unit emission cap on the existing and proposed standby generator units, the MDWASD is requesting that the maximum emission rate be revised to 2.15 lbs/MMBtu which is consistent with the information used as the basis for the NOx emission limitation of 58 lb/hr.

3.6 Installation of Additional Standby Generator Units

MDWASD is proposing to install two (2) EMD Model 20-645F4B generator sets, to the existing bank of standby generators. Each model EMD Model 20-645F4B generator set consists of a 4,000 hp diesel fueled internal combustion engine prime mover, coupled to a 2,865 kW electrical generator

Emissions from the two proposed additional standby generators will be controlled in a manner similar to the BACT used for NOx and SO_2 emissions reduction as the existing standby generation units. The modifications that are being made to the standard EMD model 20-645F4B for the control of NOx emissions, include utilizing injectors with fixed timing, changing the fuel injection timing and using 4-pass combustion air aftercoolers to increase the cooling of the air. The injectors used on these engines are called CBOI (constant beginning or injection) injectors by EMD. The standard injector used by EMD is designed so that as engine loads increase, the point at which fuel injection into the cylinder starts advances. The CBOI injector has fixed timing and there is no advance based on engine load. The standard injection timing on an EMD engine is 0 degrees before top dead center (BTDC). In order to achieve the proper operation with the CBOI injectors, the timing on these engines is set for 1 degree BTDC. The intercoolers cool the combustion air before it enters the air box and the cylinders. The standard EMD intercooler is a 2-pass type heat exchanger. In order to achieve additional cooling and assist in the reduction of thermal NOx formation, these engines will have 4-pass intercoolers installed. Additionally, these engines will also burn low sulfur (0.05 weight %) diesel fuel, this is representative of BACT for sulfur dioxide (SO2). The combination of low-sulfur diesel fuel and the combustion modifications are representative of BACT for particulate matter with a diameter less than 10 micrometers (PM-10). Use of these combustion control techniques will reduce the emissions of NOx in the engine exhaust by approximately 52 percent from uncontrolled levels.

Table 3-4 summarizes the operating characteristics and Figure 3-3 is a photo of a proposed unit in Texas without external radiators, exhaust and silencers. All standby generator sets are located within individual enclosure structures. Both the exhaust silencers and stacks are mounted on top of the proposed units' enclosures.

Table 3-4.
Summary of Exhaust and Operating Characteristics
of the Proposed EMD Model 20F4B Standby Generator Sets
Miami-Dade WASD Central District WWTP

Number of Units	2 Proposed
Generator Capacity	
Peaking (110% load-2 hours max)	3,150 kW
Continuous (full load-100%)	2,865 kW
Brake Specific Fuel Consumption (lb/bhp-hr)	
Peaking-110%	0.346, each
Full Load-100%	0.346, each
Partial Load-75%	approx. 0.363, each
Partial Load-50%	approx. 0.381, each
Operating Speed	900 rpm
Exhaust Characteristics – Nearly Vertical Exhaust	
Height	16.5 ft
Diameter	1.75 ft
Flow	21,350 acfm
Temperature	635°F

Figure 3-3 - EMD Model 20F4B Unit and Enclosure at Stewart & Steven's Texas Facility

3.6.1 Proposed Standby Generator Limitations

MDWASD is requesting that the maximum allowable NOx emission rate for these EMD Model 20-645F4B units to set at 2.75 lbs/MMBtu which is approximately a 52 percent reduction from the uncontrolled NOx emissions of an EMD Model 20-645F4B. Since the NOx emissions from this model are slightly higher than the existing units, MDWASD is requesting that the maximum fuel consumption for all of the standby generators be limited to 725,000 gals/year.

4. Project Emissions

The emissions associated with this project are the typical pollutants from combustion of diesel fuel oil in internal combustion reciprocating engines. The primary pollutants associated with this project are Nitrogen Oxides (NOx), Sulfur Oxides (SOx), Carbon Monoxide (CO), Particle Matter (PM), and Volatile Organic Compounds (VOC).

4.1 Potential Emissions

Future potential emissions were estimated for the cogeneration engines are based on reducing current permitted hours of operation of 8,760 hours per year for each of the 4 units (35,040 combined) to 26,280 hours of operation annually. This is equivalent to the running 3 of the 4 cogeneration units continuously. The potential emissions of the existing and proposed standby generators are based on reducing the current permitted annual fuel consumption from 1,800,000 gallons to 725,000 gallons and the digester flares based on 24 hours per day and 365 days of operation. Potential emissions were estimated using emission factors obtained from the EPA FIRE database, AP-52, the Joint Emission Inventory Program (JEIP), and the Texas Air Control (TAC).

Table 4-1, provided on page 4-2, is a tabulation of the potential annual emissions for the significant regulated and unregulated emission units with the proposed and existing limitations on operations. The proposed annual fuel consumption for all standby generators, including the proposed is based on the current fuel consumption limits at 725,000 gallons of No.2 fuel oil per year. This tabulation, with potential annual NOx emissions of 232.9 tons, indicates that NOx emissions are greater than any of the other criteria pollutant and that NOx emissions are of primary of concern for the facility.

Table 4-1 is shown the calculations for the proposal annual emission. Annual fuel consumption for the standby generators will be based on the proposed fuel consumption limitation of 725,000 gallons of No.2 fuel oil per year

Section 4 - Project Emissions (cont.)

Table 4-1 Proposed Annual Emissions

Miami-Dade Water and Sewer Department -- Central District Wastewater Treatment Plant
Installation of Standby Diesel Generator Nos. 4 and 5

Calculation of Proposed Annual Emissions — **Proposed Annual Operations**

	Wastewater Treatment Plant	Cogenerator Nos. 1-4	Standby Generator Nos. 1-5	Digester Flares
Hours of Operation	8760	26280	52560	8760
Proposed Hours of Operation	Unregulated	26280	Unlimited	Unregulated
Treatment Capacity (Annual Flow) MG	52195	-	-	-
Treatment Capacity (Annual Flow) MGD	143			
Fuel Consumption in 1000gals/hr or MMCF/hr	-	0.01803653	-	-
Annual Fuel consumption (production) in 1000gals or MMCF	(700.98)	474	725	226.98
Annual Heat Input (mmBtus) based on 700/ MMCF or 138 /1000 gals	-	331800	100050	158886

Proposed Annual Criteria Pollutant Emissions in Tons

	Emission Factor[2]	Units	Source, SCC[1]	Wastewater Treatment Plant	Cogenerator Nos. 1-4	Standby Generator Nos. 1-5	Digester Flares	Plant Total
Nitrogen Oxides (NOx)	2.75	Lbs/mmBTU	Proposed	-	-	137.57	-	
Nitrogen Oxides (NOx)	2.15	Lbs/mmBTU	Proposed	-	-	107.55	-	
Nitrogen Oxides (NOx)	7.6	Lbs/hr	Permit	-	7.6	-	-	
Nitrogen Oxides (NOx)	6.00E-02	Lbs/mmBTU	TAC	-	-	-	4.77	
Nitrogen Oxides (NOx)	-	**Tons**		-	**99.86**	**137.57**	**4.77**	**242.2**
Carbon Monoxide (CO)	3.99E+02	Lbs/MMCF	20200204	-	94.56	-	-	
Carbon Monoxide (CO)	1.16E+02	Lbs/1000gals	20200401	-	-	42.05	-	
Carbon Monoxide (CO)	5.50E-01	Lbs/mmBTU	TAC	-	-	-	43.69	
Carbon Monoxide (CO)	-	**Tons**		-	**94.56**	**42.05**	**43.69**	**180.3**
PM10, Primary	2.01E+01	Lbs/MMCF	20200204	-	4.77	-	-	
PM10, Primary	7.85E+00	Lbs/1000gals	20200401	-	-	2.85	-	
PM10	-	**Tons**		-	**4.77**	**2.85**	-	**7.62**
Sulfur Oxides (SOx)	2.63E+02	Lbs/MMCF	Plant Data	-	62.4	-	-	
Sulfur Oxides (SOx)	6.90E+00	Lbs/1000gals	20200401	-	-	2.5	-	
Sulfur Oxides (SOx)	7.79E+02	Lbs/mmcf	Plant Data	-	-	-	88.42	
Sulfur Oxides (SOx)	-	**Tons**		-	**62.4**	**2.5**	**88.42**	**153.32**
Volatile Organic Compounds (VOC)	1.11E+02	lbs/year/MGD	JEIP	7.94	-	-	-	
Volatile Organic Compounds (VOC)	1.16E+02	Lbs/MMCF	20200204	-	27.49	-	-	
Volatile Organic Compounds (VOC)	1.37E+01	Lbs/1000gals	20200401	-	-	4.97	-	
Volatile Organic Compounds (VOC)	1.40E-01	Lbs/MMCF	AP-42	-	-	-	0.02	
Volatile Organic Compounds (VOC)	-	**Tons**		**7.94**	**27.49**	**4.97**	**0.02**	**40.42**

Notes:

1. Digester gas production based on current plant flows and volitile loadings and is approximately 1.343 E-2 MMscf/MG
2. EPA Source Classification Codes
3. Emissions Factors based on Existing/Proposed Permit Limits, Manufacturer Data, JEIP, TAC or EPA Source Classification Codes
4. SO_2 emission factors for the cogenerators and flares are derived from the average H_2S concentrations of 290 grains H_2S/100cf for the raw digester gas and 98 grains H_2S/100cf of scrubbed digester gas in 2003.

   Cogenerator SO_2 Emission factor = (0.98 grains/scf) * (0.0648 g/grain) * (1000000 scf/MMscf) * (mole H_2S/34 g) * (mole SO_2/mole H2S) * (64 g/mole SO_2) * (1 lb/454 g) = 263.3 lb SO_2/MMscf

   Flare SO_2 Emission factor = (2.90 grains/scf) * (0.0648 g/grain) * (1000000 scf/MMscf) * (mole H_2S/34 g) * (mole SO_2/mole H2S) * (64 g/mole SO_2) * (1 lb/454 g) = 779.1 lb SO_2/MMscf

5. Emissions (tons/yr) = (emission factor [lbs/unit]) x (units) / 2000 lbs/ton

The potential emissions of criteria and hazardous air pollutants associated with the proposed operational limitations of the existing and proposed standby generators are provided in table 4-2. This tabulation demonstrates that the standby generators do not emit significant levels of hazardous air pollutants.

Table 4-2
Miami-Dade Water and Sewer Department
Central District Wastewater Treatment Plant
Facility Identification No.: 0250476
Potential Criteria and Hazardous Air Pollutant Emissions from
Existing and Proposed Standby Generator Sets

				Maximum Hours of Operation	43,800
				Maximum Fuel consumption in 1000gals	725.000
				Maximum Heat Input (mmBtus) based on 138MMbtu/1000 gals	100,050
				Brake Horsepower Hours in 1000 bhp-hr (based on BSFC of 0.346 lbs fuel/bhp-hr)[1]	14,757.7
Priority Pollutants	**CAS**	**Emission Factor**	**Units**	**Source, SCC**	**Pounds Emitted**
NOx - Oxides of Nitrogen		3.75E+00	Lbs/MMBTU	Requested	375,187.5
CO - Carbon Monoxide	630-08-0	1.16E+02	Lbs/1000 Gallons	FIRE, 20200401	84,100.0
PM - Particulate Matter		9.55E+00	Lbs/1000 Gallons	FIRE, 20200401	6,923.8
PM10 - Particulate Matter (<10 microns)		7.85E+00	Lbs/1000 Gallons	FIRE, 20200401	5,691.3
PM2.5 - Particulate Matter (<2.5 microns)		7.55E+00	Lbs/1000 Gallons	FIRE, 20200401	5,473.8
SO2 - Sulfur Dioxide		6.90E+00	Lbs/1000 Gallons	FIRE, 20200401	5,002.5
VOC - Volatile organic compounds		1.37E+01	Lbs/1000 Gallons	FIRE, 20200401	9,932.5
Hazardous Air Pollutants	**CAS**	**Emission Factor**	**Units**	**Source, SCC**	**Pounds Emitted**
Acetaldehyde	75-07-0	2.52E-05	Lbs/MMBTU	FIRE, 20200401	2.5
Acrolein	107-02-8	7.88E-06	Lbs/MMBTU	FIRE, 20200401	0.8
Benzene	71-43-2	7.76E-04	Lbs/MMBTU	FIRE, 20200401	77.6
Dichlorobenzene	106-46-7	1.20E-04	Lbs/1000bhp-hr	PEEP[2]	1.8
Formaldehyde	50-00-0	7.89E-05	Lbs/MMBTU	FIRE, 20200401	7.9
Naphthalene	91-20-3	1.30E-04	Lbs/MMBTU	FIRE, 20200401	13.0
Toluene	108-88-3	2.81E-04	Lbs/MMBTU	FIRE, 20200401	28.1
Trichloroethylene	79-01-6	0	Lbs/MMBTU	FIRE, 20200401	-
Vinyl chloride	75-01-4	0	Lbs/MMBTU	FIRE, 20200401	-
Xylenes (total)	1330-20-7	2.81E-04	Lbs/MMBTU	AP-42	28.1
				Total Hazardous Air Pollutants (pounds)	159.8

[1] Based on brake specific fuel consumption of 0.346 lbs fuel/bhp-hr and 7.043 lbs/gal

[2] Pooled Emission Estimating Program

The potential NOx emissions of the facilities regulated emission units are provided in Table 4-3. The emissions are calculated on an annual basis, and daily basis for the Standby Generators and Superior Cogenerators; as well as a monthly basis for the Superior cogeneration units. The tabulation demonstrates that the proposed emission and operation limitations for the standby generator units and cogeneration units provide a reasonable assurance buffer of at least 2 days that the combined NOx emissions will not exceed over 250 tons annually. Since the proposed emission and operation limitations for these units provides at least 2 days of reasonable assurance, MDWASD is requesting that the monitoring required under the current operating permit of the standby generators daily fuel consumption, be reduced from daily to monitoring every other day. Increasing the reasonable assurance to two days of emissions reduces the overall potential emissions and the reduction in the monitoring requirements of the standby generators to every other will enhance the facility's ability to remain in administrative compliance.

Table 4-3
Total NOx Emissions
Proposed Operating Limitations and "Reasonable Assurance"

Miami-Dade Water and Sewer Department -- Central District Wastewater Treatment Plant
Installation of Standby Diesel Generators Nos. 4 & 5

Current Inventory of Permitted Regulated Emissions

		NOx Emission Limitations		Operating Limitation	
Permitted Source	**Tons/Yr**	**lb/hr**	**lb/MMBTU**	**hrs/yr**	**gals/yr**
Cogeneration Units	133.15	7.6		35,040	
Standby Generators (20E4B)	267.03		2.15		1,800,000
Total	**400.18**				

Calculation of Maximum Potential Daily NOx Emissions of
Proposed Regulated Emission Units for "Reasonable Assurance"

	Daily Potential NOx Emissions	
Cogeneration Units		
Daily Emissions, lbs	729.60	4 units @ 7.6 lbs/hr
Daily NOX emissions, tons	0.36	
Monthly NOX emissions, tons	11.20	
Standby generators (20E4B)		
Daily fuel consumption, gal	12,984	3 units
Daily NOX emissions, tons	1.93	@2.15 lb/MMBTU & 138 MMBTU/1000gals
Proposed Standby generators (20F4B)		
Daily fuel consumption, gal	9,433	2 units
Daily NOX emissions, tons	1.79	@2.75 lb/MMBTU & 138 MMBTU/1000gals
Maximum Potential Daily NOx Emissions	**4.08**	**Tons**

Total NOx Emissions
Proposed Operating Limitations and "Reasonable Assurance"

Source	**Tons/Yr**	**Monitoring Frequency**	**Proposed Operating Limitation**	**Units**	**Emission Limitation**	**Units**
Cogeneration Units	99.86	monthly	26,280	hr/yr	7.6	lb/hr
Standby Generators (All Models)	137.57	every day	725,000	gals/yr	2.75	lb/MMBTU
Total Annual Potential NOx Emissions	**237.43**	**Tons**				
Maximum Potential "Reasonable Assurance" (3 days)	12.24					
Total	**249.67**	**Tons**				
PSD Threshold	250.00	Tons				
Balance	**0.33**	**Tons**				

4.2 Summary of Future Emissions

The proposed project emissions result in overall emissions less than the significant emission levels per Table 62-212.400-2, F.A.C. for PSD pollutants. This project will emit negligible quantities of sulfuric acid mist (H_2SO_4 mist or SAM), fluorides, beryllium, mercury and lead. Therefore the proposed revisions and installation of the additional standby generators will not be subject to PSD review.

Section 5

5. Rule Applicability

The proposed project is subject to pre-construction review requirements under the provisions of Chapter 403, Florida Statutes, and Chapters 62-4, 62-204, 62-210, 62-212, 62-214, 62-296, and 62-297 of the Florida Administrative Code (F.A.C.).

This facility is located in an area designated, in accordance with Rule 62-204.340, F.A.C., as attainment for the criteria pollutants ozone, PM_{10}, carbon monoxide, sulfur dioxide, and nitrogen dioxide; designated as unclassifiable for lead; and also designated as a maintenance area for ozone.

The proposed project is not subject to review under Rule 62-212.400, F.A.C., Prevention of Significant Deterioration (PSD) as previously demonstrated in Section 4.

Rule 62-4.030, F.A.C., prohibits modification of any existing emissions unit without first receiving a permit. It further specifies that a permitted installation may only be modified in a manner that is consistent with the terms of such a permit. Rule 62-210.200, F.A.C., defines "modification" to mean generally a change that results in an increase in actual emissions of air pollutants. As discussed, emissions will not increase significantly. Rules 62-210.300(1) and 62-212.300(1)(a), F.A.C., also reiterate the requirement for construction permits.

The emission units affected by this permit shall comply with all applicable provisions of the Florida Administrative Code (including applicable portions of the Code of Federal Regulations incorporated therein) and, specifically, the following Chapters and Rules.

5.1 State Regulations

Chapter 62-4	Permits.
Rule 62-204.220	Ambient Air Quality Protection
Rule 62-204.240	Ambient Air Quality Standards
Rule 62-204.800	Federal Regulations Adopted by Reference
Rule 62-210.200	Definitions
Rule 62-210.300	Permits Required
Rule 62-210.350	Public Notice and Comments
Rule 62-210.370	Reports
Rule 62-210.550	Stack Height Policy
Rule 62-210.650	Circumvention
Rule 62-210.700	Excess Emissions
Rule 62-210.900	Forms and Instructions
Rule 62-212.300	General Pre-construction Review Requirements
Rule 62-213	Operation Permits for Major Sources of Air Pollution
Rule 62-296.320	General Pollutant Emission Limiting Standards

6. Air Pollution Control Techniques

Emissions from this project are those that typically result from combustion of digester gas and diesel fuel in internal combustion reciprocating engines: NOx, PM/PM_{10}, CO, VOC and SO_2. SO_2 is not a pollutant emitted in significant quantity by natural gas fueled engines but SO_2 can be a pollutant of concern for digester gas fuel engines. Combustion control is the technique used to control emissions from these proposed replacement engines. Combustion controlled by electronic engine controls, which are discussed in more detail below.

6.1 Air Pollutants[1]

6.1.1 Nitrogen Oxides (NOx) Emissions

Nitrogen oxides (NOx) are formed through three fundamentally different mechanisms. The principal mechanism of NOx formation with gas-fired engines is thermal NOx. The thermal NOx mechanism occurs through the thermal dissociation and subsequent reaction of nitrogen (N_2) and oxygen (O_2) molecules in the combustion air. Most NOx formed through the thermal NOx mechanism occurs in high-temperature regions in the cylinder where combustion air has mixed sufficiently with the fuel to produce the peak temperature fuel/air interface. The second mechanism, called prompt NOx, occurs through early reactions of nitrogen molecules in the combustion air and hydrocarbon radicals from the fuel. Prompt NOx reactions occur within the flame and are usually negligible compared to the level of NOx formed through the thermal NOx mechanism. The third mechanism, fuel NOx, stems from the evolution and reaction of fuel-bound nitrogen compounds with oxygen. Most distillate oils, have no chemically bound, and natural gas has negligible chemically bound fuel N_2 and essentially all NOx formed is thermal NOx.

Essentially all NOx formed in natural gas-fired reciprocating engines occurs through the thermal NOx mechanism. The formation of NOx through the prompt NOx mechanism may be significant only under highly controlled situations in rich-burn engines when the thermal NOx mechanism is suppressed. The rate of NOx formation through the thermal NOx mechanism is highly dependent upon the stoichiometric ratio, combustion temperature, and residence time at the combustion temperature. Maximum NOx formation occurs through the thermal NOx mechanism near the stoichiometric air-to-fuel mixture ratio since combustion temperatures are greatest at this air-to-fuel ratio.

Nitrogen oxides form in the combustion process as a result of the dissociation of molecular nitrogen and oxygen to their atomic forms and subsequent recombination into seven different oxides of nitrogen. Thermal NOx forms as a result of high temperatures in the combustion chamber (cylinders in IC engines). Increased combustion temperatures lead to

---

[1] Text of this section is adapted from *Compilation of Air Pollutant Emission Factors (AP- 42),* Volume I. Stationary Point and Area Sources, Chapter 3 Stationary Internal Combustion Sources, Fifth Edition.

increased NOx formation. In internal combustion engines, combustion temperature is dependent upon the inlet temperature of the intake air used in combustion, the ratio of air to fuel, and the formation of thermal NOx is highly dependent on this ratio.

Fuel NOx is formed when fuels containing chemically bound nitrogen are burned. This phenomenon is not important when combusting natural gas because natural gas has little or no fuel nitrogen. Because natural gas or digester gas will be the only fuel used in the cogeneration engines, the fuel NOx phenomenon is not important for this potion of the project.

To the rich side of the stoichiometric ratio, NOx decreases because of a lack of oxygen in the combustion chamber and lower combustion temperatures. Fuel quenching occurs under these conditions, which keeps combustion temperatures low. To the lean side of the stoichiometric ratio, NOx reaches a peak where combustion temperature is high and ample oxygen exists for thermal NOx formation. As conditions become leaner (air/fuel ratio increases) the combustion temperature decreases because of air quenching. The lowest NOx emissions occur in under the leanest combustion conditions.

Prestratified charge combustion is a retrofit system that is limited to 4-stroke carbureted natural gas or digester gas engines. In this system, controlled amounts of air are introduced into the intake manifold in a specified sequence and quantity to create a fuel-rich and fuel-lean zone. This stratification provides both a fuel-rich ignition zone and rapid flame cooling in the fuel-lean zone, resulting in reduced formation of NOx. The Superior cogeneration engines utilize a prestratified design and are fitted with precombustion chambers to achieve lean burn within the primary cylinder combustion chamber.

6.1.2 Particulate Matter (PM/PM_{10}) Emissions

White, blue, and black smoke may be emitted from IC engines. Liquid particulates appear as white smoke in the exhaust during an engine cold start, idling, or low load operation. These are formed in the quench layer adjacent to the cylinder walls, where the temperature is not high enough to ignite the fuel. Blue smoke is emitted when lubricating oil leaks, often past worn piston rings, into the combustion chamber and is partially burned. Proper maintenance is the most effective method of preventing blue smoke emissions from all types of IC engines. The primary constituent of black smoke is agglomerated carbon particles (soot). Particulate matter is formed in internal combustion engines primarily through combustion of fuel oil and lubricating oil. The particulate matter emitted from IC engines will mainly be less than 10 microns in diameter (PM_{10}). PM emissions from natural gas or digester gas fired engines are very low because natural gas or digester gas is efficiently combusted and contains no ash. Combustion of natural gas or digester gas under lean fuel conditions results in low PM and PM_{10} emissions.

6.1.3 Carbon Monoxide (CO) Emissions

Carbon monoxide (CO) is a colorless, odorless, relatively inert gas formed as an intermediate combustion product that appears in the exhaust when the reaction of CO to CO_2 cannot proceed to completion. This situation occurs if there is a lack of available oxygen near the hydrocarbon (fuel) molecule during combustion, if the gas temperature is too low, or if the residence time in the cylinder is too short. The oxidation rate of CO is limited by reaction kinetics and, as a consequence, can be accelerated only to a certain extent by improvements in air and fuel mixing during the combustion process.

Carbon monoxide is emitted from combustion processes due to incomplete fuel combustion. Incomplete combustion occurs when insufficient oxygen exists near the fuel molecule or when quenching of combustion occurs, thus preventing complete conversion of fuel carbon-to-carbon dioxide. Proper combustion design and operation ensure that CO emissions are minimized. The previous figure also illustrates the effect of fuel to air ratio on CO emissions. CO emissions are lowest under combustion conditions that are slightly lean of the stoichiometric ratio because sufficient oxygen is present for complete oxidation of the fuel carbon while temperature is at its greatest. Under fuel rich conditions, there is not sufficient oxygen for complete combustion. CO emissions increase slightly under the leanest combustion conditions because of lower combustion temperatures and lower fuel mixture flammability.

6.1.4 Volatile Organic Compound (VOC) Emissions

In natural gas or digester gas fired IC engines, hydrocarbon emissions are present in exhaust gas because of incomplete combustion of fuel. Natural gas or digester gas is composed of several gaseous hydrocarbons including methane, ethane, propane, butane and heavier hydrocarbons. A portion of these will pass through the combustion chamber without reacting and will be found in the engine exhaust. Regulated volatile organic compounds (VOC) are comprised of the non-methane portion of the total hydrocarbons, because methane is considered to be not photochemically reactive. Emissions of VOC are similar to CO emissions: higher at operating conditions richer and leaner than the stoichiometric ratio. This is illustrated in the previous figure.

6.1.5 Sulfur Oxides (SO_x) Emissions

Sulfur oxide emissions are a function of only the sulfur content in the fuel rather than any combustion variables. In fact, during the combustion process, essentially all the sulfur in the fuel is oxidized to sulfur dioxide (SO_2). The oxidation of SO_2 yields sulfur trioxide (SO_3), which reacts with water to give sulfuric acid (H_2SO_4), a contributor to acid rain. Sulfuric acid also reacts with basic substances to give sulfates, which are fine particulates that contribute to PM-10 and visibility reduction.

6.2 Emission Controls

Both Electro Motive Division EMD and Superior co-generation engines use inlet air coolers, also referred to as an intercooler or aftercooler when used to cool compressed air charge from either a turbocharger or blower, to reduce the temperature of the intake air used in combustion to reduce the formation of thermal NOx emissions.

Operation in the lean combustion range results in the lowest NOx emissions, with minimal CO and VOC emissions. Although CO and VOC emissions are lower under conditions just leaner than the stoichiometric ratio, emissions of these pollutants do not substantially increase under the leanest conditions. Operation under the leanest conditions results in a good compromise between dramatically reducing emissions of NOx and slightly increasing emissions of CO and VOC.

The Superior co-generation engines are equipped with pre-combustion chambers. The engine uses a spark plug to ignite a small volume of near stoichiometric air/fuel mixture in a pre-combustion chamber. This combustion in the pre-combustion chamber rapidly expands through holes in the pre-chamber nozzle to ignite the very lean mixture in the main chamber or cylinder. The pre-chamber provides a high temperature, high-speed ignition source for the combustion process, which, overall is very lean. Effectively, the pre-chamber pushes out the lean limit observed for open chamber engines. Pre-chambers have the capability to operate at higher efficiency and lower NOx levels than open chamber engines. CO and HC levels will be somewhat higher than open chamber engines due to the larger quench (cool) zone around the cylinder wall.

6.3 Compliance Procedures

The diesel fueled standby generators will be subject to an annual fuel consumption limitation of 725,000 gallons and NOx emission limitation of 2.15 lbs/MMBtu for the existing standby generators and 2.75 lbs/MMBtu for the proposed standby generators. The combined hours of operation for the cogeneration units shall not exceed 26,280 hours in any consecutive 12-month period and will be subject to an annual operation limit of continue to be subject to a NOx emission limitation of 7.6 lb/hr each. All of the engines are subject to the general visible emissions limitation of less than 20% opacity of Rule 62-296.320(4)(b), F.A.C. Compliance with the allowable limiting standards for NOx will be demonstrated each federal fiscal year (October 1-September 30) by an annual compliance test using EPA Method 7 or 7E, for the standby generators and EPA Method 7, 7E or 5, for the cogeneration units as described in 40 CFR 60, Appendix A (1997 version), adopted by reference in Rule 62-204.800, F.A.C., and adopted in Rule 62-297.401, F.A.C. Sampling of the exhaust gas shall be via a rake probe placed into the engine exhaust outlet.

7. Source Impact Analysis

Because MDWASD is proposing to limit total facility potential emissions to escape PSD review; a source impact analysis is not required for this project. However a previous source impact analysis was prepared in support of a previous construction permit application to increase the allowable standby generator operations above the PSD review threshold. As a result of this PSD review the existing standby generators were limited to a maximum allowable rate NOx emission of 58 lb/hr each, and 267 tons per 12 consecutive months combined; and maximum fuel consumption of 1,800,000 gals/year. Because the previous source air quality impact analysis demonstrated that ambient concentrations of NOx at all receptors impacted by the standby generators would be below the NAAQS; and the proposed allowable emissions in this application are significantly lower, no significant impact is anticipated.

8. Conclusion

Based on the foregoing technical evaluation and other available information, a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations. The FDEP should issue a draft Title V air construction permit to MDWASD for the replacement of radiators on existing three standby electrical generators; and the installation of the additional two diesel fueled standby electrical generators, EMD #4 and EMD #5 to the existing bank of generators at its CDWWTP.

The new engines will be subject to the requirements of the facility-wide specific conditions of Section II of the permit. The diesel fueled standby generators will be subject to an annual fuel consumption limitation of 725,000 gallons and NOx emission limitation of 2.15 lbs/MMBtu for the existing standby generators and 2.75 lbs/MMBtu for the proposed standby generators. The combined hours of operation for the cogeneration units shall not exceed 26,280 hours in any consecutive 12-month period and will be subject to an annual operation limit of continue to be subject to a NOx emission limitation of 7.6 lb/hr each. All of the engines are subject to the general visible emissions limitation of less than 20% opacity of Rule 62-296.320(4)(b), F.A.C. Compliance with the allowable limiting standards for NOx will be demonstrated each federal fiscal year (October 1-September 30) by an annual compliance test using EPA Method 7 or 7E, for the standby generators and EPA Method 7, 7E or 5, for the cogeneration units as described in 40 CFR 60, Appendix A (1997 version), adopted by reference in Rule 62-204.800, F.A.C., and adopted in Rule 62-297.401, F.A.C. Sampling of the exhaust gas shall be via a rake probe placed into the engine exhaust outlet.

This evaluation was prepared by:

Richard M. O'Rourke, P.E.
Number 42683
Miami-Dade Water and Sewer Department
P.O. Box 330316
Miami, Florida 33233-0316
Telephone: (786) 552-8123
FAX: (786) 552-8640

Department of Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit for a proposed project:
- subject to prevention of significant deterioration (PSD) review, nonattainment area (NAA) new source review, or maximum achievable control technology (MACT) review; or
- where the applicant proposes to assume a restriction on the potential emissions of one or more pollutants to escape a federal program requirement such as PSD review, NAA new source review, Title V, or MACT; or
- at an existing federally enforceable state air operation permit (FESOP) or Title V permitted facility.

Air Operation Permit – Use this form to apply for:
- an initial federally enforceable state air operation permit (FESOP); or
- an initial/revised/renewal Title V air operation permit.

Air Construction Permit & Revised/Renewal Title V Air Operation Permit (Concurrent Processing Option) – Use this form to apply for both an air construction permit and a revised or renewal Title V air operation permit incorporating the proposed project.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: Miami-Dade Water and Sewer Department	
2. Site Name: Central District Wastewater Treatment Plant	
3. Facility Identification Number: 0250476	
4. Facility Location: Central District WWTP Street Address: 3869 Rickenbacker Causeway City: Miami County: Miami-Dade Zip Code: 33146	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: Richard O'Rourke , P.E.
2. Application Contact Mailing Address...P.O. Box 330316, Miami, Fl. 33233-0316 Organization/Firm: Miami-Dade Water and Sewer Street Address: 3071 S.W. 38 Avenue City: Miami State: Florida Zip Code: 33146
3. Application Contact Telephone Numbers... Telephone: (786) 552-8123 ext. Fax: (786) 552 - 8640
4. Application Contact Email Address: rorou0l@miamidade.gov

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	4-6-04
2. Project Number(s):	0250476-004-AC 0250476-005-AV
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

APPLICATION INFORMATION

Purpose of Application

This application for air permit is submitted to obtain: (Check one)

Air Construction Permit

☐ Air construction permit.

Air Operation Permit

☐ Initial Title V air operation permit.

☐ Title V air operation permit revision.

☐ Title V air operation permit renewal.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

☐ Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

☐ Air construction permit and Title V permit revision, incorporating the proposed project.

☒ Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

☒ I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

This application is to obtain a construction permit for the installation of two (2) additional standby generators to an existing bank of three (3) standby generators; and to replace the radiators of the three (3) existing standby generators with external radiators.

This application is also for TITLE V permit renewal incorporating the proposed installations and proposes to reduce the existing operation permit operational limitations to synthetically limit NOx emissions below 250 tons per year to avoid the prevention of significant deterioration (PSD) pre-construction review requirements.

The addition of the two new generators will be performed under ER # 47085. (Installation of the 4th and 5th Standby Generator at the Central District WWTP).

The replacement of the radiators of the three (3) existing standby generators with external radiators will be performed under ER # 47557. (Remote Radiators for Standby Generators 1, 2 & 3, ER-47557 at the Central District WWTP).

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Proc. Fee
007	GEN.#1; 1200 KW; I.C.ENG; CH4 DGSTR GAS FIRED Superior 16GTLB Cogeneration Engine		$ 0.00
008	WASTE WATER TREATMENT PLANT-Liquid Processes		$ 0.00
009	GEN.#2; 1200 KW; I.C.ENG; CH4 DGSTR GAS FIRED Superior 16GTLB Cogeneration Engine		$ 0.00
010	GEN.#3; 1200 KW; I.C.ENG; CH4 DGSTR GAS FIRED Superior 16GTLB Cogeneration Engine		$ 0.00
011	GEN.#4; 1200 KW; I.C.ENG; CH4 DGSTR GAS FIRED Superior 16GTLB Cogeneration Engine		$ 0.00
013	2.5 MW Diesel Engine Generator No. 1 (B1), EMD model No. 20-645E4B		$ 0.00
014	2.5 MW Diesel Engine Generator No. 2 (A), EMD model No. 20-645E4B		$ 0.00
015	2.5 MW Diesel Engine Generator No. 3 (B2), EMD model No. 20-645E4B		$ 0.00
017	Solids Handling Processes		$ 0.00
018	Anaerobic Digesters Gas (Flares)		$ 0.00
New	Diesel Engine Generator # 4, EMD model No. 20-645F4B	AC1B	$ 0.00
New	Diesel Engine Generator # 5, EMD model No. 20-645F4B	AC1B	$ 0.00

Application Processing Fee

Check one: ☐ Attached - Amount: $_______________ ☒ Not Applicable

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1.	Owner/Authorized Representative Name : John W. Chorlog, P.E.
2.	Owner/Authorized Representative Mailing Address... P.O. Box 330316, Miami, Fl. 33233 Organization/Firm: Miami-Dade Water and Sewer Street Address: 3071 S.W. 38 Avenue City: Miami State: Florida Zip Code: 33146
3.	Owner/Authorized Representative Telephone Numbers... Telephone: (786) 552 - 8102 ext. Fax: (786) 552 - 8637
4.	Owner/Authorized Representative Email Address: jwcho01@miamidade.gov
5.	Owner/Authorized Representative Statement: *I, the undersigned, am the owner or authorized representative of the facility addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other requirements identified in this application to which the facility is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit.* Signature 4/1/04 Date

APPLICATION INFORMATION

Application Responsible Official Certification

Complete if applying for an initial/revised/renewal Title V permit or concurrent processing of an air construction permit and a revised/renewal Title V permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name: John W. Chorlog, P.E.

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):
   - [ ] For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.
   - [ ] For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
   - [x] For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.
   - [ ] The designated representative at an Acid Rain source.

3. Application Responsible Official Mailing Address...
   Organization/Firm: Miami-Dade Water and Sewer Department
   Street Address: P.O. Box 330316
   City: Miami State: Florida Zip Code: 33233-0316

4. Application Responsible Official Telephone Numbers...
   Telephone: (786) 552-8102 ext. Fax: (786) 552- 8637

5. Application Responsible Official Email Address: jwcho01@miamidade.gov

6. Application Responsible Official Certification:

   I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

   Signature Date 4/1/04

APPLICATION INFORMATION

Professional Engineer Certification

1.	Professional Engineer Name: Richard O' Rourke, P.E. Registration Number: 42683
2.	Professional Engineer Mailing Address... P.O. Box 330316 Organization/Firm: Miami-Dade Water and Sewer Department Street Address: 3071 S.W. 38 Avenue City: Miami State: Florida Zip Code: 33146
3.	Professional Engineer Telephone Numbers... Telephone: (786) 552 -8123 ext. Fax: (786) 552- 8640
4.	Professional Engineer Email Address: rorouo1@miamidade.gov
5.	Professional Engineer Statement: *I, the undersigned, hereby certify, except as particularly noted herein*, that:* *(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and* *(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.* *(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.* *(4) If the purpose of this application is to obtain an air construction permit (check here ☐, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here* **X***, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.* *(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here , if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.* Signature 42683 31 MARCH 2004 (seal) Date

* Attach any exception to certification statement.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone 17 East (km) 585.20 North (km) 2848.10		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) 25 44 43 Longitude (DD/MM/SS) 80 08 55	
3. Governmental Facility Code: 3	4. Facility Status Code: A	5. Facility Major Group SIC Code: 49	6. Facility SIC(s): 4952
7. Facility Comment: The Central District WWTP is a publicly owned treatment works. This facility consists of three nominal 2.5 Megawatt (MW) diesel engine-driven generators, designated as units 013, 014 and 015; four nominal 1.2 MW digester gas engine-driven Cogenerators, designated as units 007, 009, 010 and 011; one wastewater treatment Plant with liquid processes, as unit 008, Solid Handling Process as unit 017; anaerobic digestor gas flares as unit 018. Additionally, two new 2.8 MW standby generators will be added upon receipt of Agency approval.			

Facility Contact

1. Facility Contact Name: Bennie Walton
2. Facility Contact Mailing Address... Organization/Firm: Miami-Dade Water and Sewer Department Central District WWTP Street Address: 3989 Rickenbacker Causeway City: Key Biscayne State: Florida Zip Code: 33190
3. Facility Contact Telephone Numbers: Telephone: (305) 365 -5601 ext. Fax: (305) 365 - 5617
4. Facility Contact Email Address: bwalt@miamidade.gov

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I. that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name:
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Facility Primary Responsible Official Email Address:

FACILITY INFORMATION

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☐ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☐ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☒ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment: The Central District WWTP is a major source of air pollution and is required to obtain a Title V operating permit (Chapter 62-213, FAC).	

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
CO	A	N
NOX	A	Y
SO2	A	N
PM10	SM	N
VOC	SM	N

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility Wide Cap [Y or N]? (all units)	3. Emissions Unit ID No.s Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap
NOx	N	07,09,10&11		100[1]	ESCPSD
NOx	N	13,14,15&New		138[2]	ESCPSD

Facility-Wide or Multi-Unit Emissions Cap Comment:

1. Currently, the existing emissions units 007, 009, 010 and 011 have a NOx emission limitation of 7.6 lb/hr each and 133 tons/year combined. There is no limitation on hours of operations, as per Air Title V permit No. 0250476-001-AV. MDWASD is requesting an annual operation limit of 26,280 hours for the four (4) cogeneration units combined to limit the potential NOx emissions from this group of emission units to 100 tons annually.

2. Currently, the existing units Nos. 013, 014 and 015 have a maximum allowable rate NOx emission of 58 lb/hr each, and 267 tons per 12 consecutive months combined; there are no limits on the hours of operation, but the maximum fuel consumption allowed to be burned is 1,800,000 gals/year. To facilitate the facility emission cap placed on the above existing and proposed emission units, the facility requests that the maximum allowable NOx emission rate be changed to 2.15 lb/MMBtu for the existing units 013, 014, and 015 (this in consistent with PDS-FL-248); and a maximum allowable NOx emission rate of 2.75 lbs/MMBtu for the proposed units. In order to meet the requested 138 TPY limit, for this group of emission units, MDWASD requests that the annual fuel consumption limit be reduced to 725,000 gallons.

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1.	Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [x] Attached, Document ID: A [ ] Previously Submitted, Date:__________
2.	Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [x] Attached, Document ID: B [ ] Previously Submitted, Date:__________
3.	Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [x] Attached, Document ID: C [ ] Previously Submitted, Date:__________

Additional Requirements for Air Construction Permit Applications

1.	Area Map Showing Facility Location: [x] Attached, Document ID: See report [ ] Not Applicable (existing permitted facility)
2.	Description of Proposed Construction or Modification: [x] Attached, Document ID: See report
3.	Rule Applicability Analysis: [x] Attached, Document ID: See report
4.	List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.): [x] Attached, Document ID: D [ ] Not Applicable (no exempt units at facility)
5.	Fugitive Emissions Identification (Rule 62-212.400(2), F.A.C.): [ ] Attached, Document ID:________ [x] Not Applicable
6.	Preconstruction Air Quality Monitoring and Analysis (Rule 62-212.400(5)(f), F.A.C.): [ ] Attached, Document ID:________ [x] Not Applicable
7.	Ambient Impact Analysis (Rule 62-212.400(5)(d), F.A.C.): [ ] Attached, Document ID:________ [x] Not Applicable
8.	Air Quality Impact since 1977 (Rule 62-212.400(5)(h)5., F.A.C.): [ ] Attached, Document ID:________ [x] Not Applicable
9.	Additional Impact Analyses (Rules 62-212.400(5)(e)1. and 62-212.500(4)(e), F.A.C.): [ ] Attached, Document ID:________ [x] Not Applicable
10.	Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): [ ] Attached, Document ID:________ [x] Not Applicable

FACILITY INFORMATION

Additional Requirements for FESOP Applications

1. List of Exempt Emissions Units (Rule 62-210.300(3)(a) or (b)1., F.A.C.): ☐ Attached, Document ID:________ ☐ Not Applicable (no exempt units at facility)	

Additional Requirements for Title V Air Operation Permit Applications

1. List of Insignificant Activities (Required for initial/renewal applications only): ☒ Attached, Document ID: D ☐ Not Applicable (revision application)	
2. Identification of Applicable Requirements (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought): ☒ Attached, Document ID: E ☐ Not Applicable (revision application with no change in applicable requirements)	
3. Compliance Report and Plan (Required for all initial/revision/renewal applications): ☒ Attached, Document ID: E Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.	
4. List of Equipment/Activities Regulated under Title VI (If applicable, required for initial/renewal applications only): ☐ Attached, Document ID:________ ☐ Equipment/Activities On site but Not Required to be Individually Listed ☒ Not Applicable	
5. Verification of Risk Management Plan Submission to EPA (If applicable, required for initial/renewal applications only) : ☒ Attached, Document ID: N ☐ Not Applicable	
6. Requested Changes to Current Title V Air Operation Permit: ☒ Attached, Document ID: O ☐ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   [x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [x] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

   1.2 MW Digester Gas Cogenerator No. 1

3. Emissions Unit Identification Number: 007

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 5-22-1992	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [ ] Yes [x] No

9. Package Unit:
   Manufacturer: Cooper Superior   Model Number: 16GTLB

10. Generator Nameplate Rating: 1.2 MW

11. Emissions Unit Comment: Four (4) 1.2 MW digester emission units are plant cogenerators that produce electricity and heat anaerobic digesters, equipped with lean-burn low-combustion technology to reduce NOx emission. Each generator is allowed to burn digester gas. Commercial operation began on May 22, 1992.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Miscellaneous Control Devices.

Cogenerator engines are equipped with pre-combustion chambers for lean burn combustion to reduce NOx emissions.

Digester Gas is scrubbed prior to combustion to lower H_2S concentration in digester gas and reduce SO_2 emissions. Scrubbing the raw digester gas lowered the H_2S concentration in the scrubbed gas by approximately 66% in 2003.

2. Control Device or Method Code(s): 99 – Miscellaneous Control Devices

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1.	Maximum Process or Throughput Rate:
2.	Maximum Production Rate: 4.8 MW
3.	Maximum Heat Input Rate: 331,653.6 MMBtu/Year
4.	Maximum Incineration Rate: pounds/hr tons/day
5.	Requested Maximum Operating Schedule: 26,280 hours (combined) 24 hours/day 7 days/week 52 weeks/year 8,760 hours/year
6.	Operating Capacity/Schedule Comment: The maximum production rate is the total nominal power output of all cogeneration units (EU's 007, 009, 010, 011) combined. The maximum heat input rate of 331,653.6 MMBTU/Year is for all cogeneration units combined; and is based on a heat input requirement of 12.62 MMBTU/Hr at 1,200 KW for 26,280 Hours of operation. The request maximum operating schedule of 26,280 hours/year is for all cogeneration combined. (8760 hours/unit)(3 units)= 26,280 hours for the four generators.

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: CG-1	2. Emission Point Type Code: 3

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:

Each generator is equipped with a horizontal exhaust stack with silencer.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: H	6. Stack Height: 38 feet	7. Exit Diameter: 1.50 feet
8. Exit Temperature: 875 degrees F	9. Actual Volumetric Flow Rate: 10,259 acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): 565.2 North (km): 2,826.2	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment:

There are four identical stacks, one for each cogeneration engine, located on the north roof of the cogeneration building. Cogeneration unit #1 (EU 007) is the eastern most stack and cogeneration unit #4 (EU 011) is the western most stack.

Emission Point is representative for all 4 cogeneration units.

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment __1_ of _1_

<table>
<tr><td colspan="3">1. Segment Description (Process/Fuel Type):

Digester Gas Combustion (emission in lb per million cubic feet burned).</td></tr>
<tr><td colspan="2">2. Source Classification Code (SCC):
2-02-002-04</td><td>3. SCC Units: Million Cubic Feet Burned (all gaseous fuels)</td></tr>
<tr><td>4. Maximum Hourly Rate:</td><td>5. Maximum Annual Rate:
474</td><td>6. Estimated Annual Activity Factor:</td></tr>
<tr><td>7. Maximum % Sulfur:</td><td>8. Maximum % Ash:</td><td>9. Million Btu per SCC Unit:
700</td></tr>
<tr><td colspan="3">10. Segment Comment: Maximum fuel consumption rate per unit is approximately 350 scfm.

Digester gas heating values vary between 650 BTU/scf to 730 BTU/scf. An average of 700 BTU/scf is used in the application. To determine the maximum annual rate, a generator heat input requirement 12.62 MMBTU/hr at full load (1,200 KW) was used.</td></tr>
</table>

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOx	**99**		**EL**
CO			**NS**
SO2	**99**		**NS**
PM10			**NS**
VOC			**NS**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NOX Nitrogen Oxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 7.60 lb/hour 99.9 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 7.6 lbs/hr Source : Existing Permit Limitation	7. Emissions Method Code: 0
Calculation of Emissions: Hourly Potential Emissions base on the existing NOx emission limitation of 7.6 lbs NOx/hr for single unit Annual Potential emission is total (7.6 lbs/hr NOx)(26,280 hrs/yr*)(1 ton/2000 lb) = 99.9 tons/yr	
9. Pollutant Potential Emissions Comment: *The maximum 7.6 lbs/hr emissions limit was established in permit no. 0250476-001-AV. The facility is requesting a limit on the hours of operation of the 4 machines of 26,280 hours instead of unlimited operations (35,040 hours), which are currently allowed.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO Carbon Monoxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 94.60 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 399 lb of CO emitted/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4

8. Calculation of Emissions:

Ton per year is based on annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= CO emissions in lb/hr
(474.00 MMCF/yr)(399 lb of CO emissions/MMCF)(1ton/2000 lb)= 94.60 TPY

9. Pollutant Potential Emissions Comment:
Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2 Sulfur Dioxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 62.4 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 263.3 lb of SO_2 emissions/MMCF Source: Derived Emission Factor	7. Emissions Method Code: 2

8. Calculation of Emissions:

Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF:

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= SO_2 emissions in lb/hr
(474.00 MMCF/yr)(263.3 lb of SO_2 emissions/MMCF)(1ton/2000 lb)= 62.4 TPY

9. Pollutant Potential Emissions Comment:
Derived SO_2 Emission factor from plant data for 2003 average H_2S content of the scrubbed digester gas 98 grains/100 SCF
SO_2 Emission factor = (0.98 grains/ SCF) * (0.0648 g/grain) * (1000000 SCF/MMCF) * (mole H_2S/34 g) * (mole SO_2/ mole H_2S) * (64 g/mole SO_2) * (1 lb/ 454 g) = 263.3 lb/MMCF

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM_{10} Particulate Matter	2. Total Percent Efficiency of Control:
3. Potential Emissions: 4.77 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 20.11 lbs of PM_{10}/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4

Calculation of Emissions:

Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= PM_{10} emissions in lb/hr
(474.00 MMCF/yr)(20.11 lb of PM_{10} emissions/MMCF)(1ton/2000 lb)= 4.77 TPY

9. Pollutant Potential Emissions Comment:
Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Particulate Matter	2. Total Percent Efficiency of Control:
3. Potential Emissions: 27.49 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
7. Emission Factor: 116 lbs of VOC/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4

Calculation of Emissions:

Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= VOC emissions in lb/year

(474.00 MMCF/yr)(116 lb of VOC emissions/MMCF)(1ton/2000 lb)= 27.49 TPY

9. Pollutant Potential Emissions Comment:

Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _1_ of _1_

1. Basis for Allowable Emissions Code: ESCPSD	2. Future Effective Date of Allowable Emissions: 1 year from effective permit
3. Allowable Emissions and Units: 100 TPY	4. Equivalent Allowable Emissions:
5. Method of Compliance: Monitoring of hourly operations and annual compliance testing of the units using approved EPA methods 7, 7E or 5. Sampling of the exhaust gas shall be via a rake probe placed into the engine exhaust outlet.	
6. Allowable Emissions Comment (Description of Operating Method): The facility will limit total annual hours of operation of the 4 units combined 26,280 hours.	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype: 20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40% Maximum Period of Excess Opacity Allowed: 2 min/hour	
4. Method of Compliance: Annual verification by EPA Method 9.	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	 Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: B [ ] Previously Submitted, Date ______

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: F [ ] Previously Submitted, Date ______

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: G [ ] Previously Submitted, Date ______

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: H [ ] Previously Submitted, Date ______
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: I [ ] Previously Submitted, Date ______
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: ______
   Test Date(s)/Pollutant(s) Tested: ______
   [x] Previously Submitted, Date: 15 July 2003
   Test Date(s)/Pollutant(s) Tested: 5 June 2003 / NOx & VE
   [ ] To be Submitted, Date (if known): ______
   Test Date(s)/Pollutant(s) Tested: ______
   [ ] Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   [ ] Attached, Document ID: ______ [x] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ______________	☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ______________	☒ Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______________	☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☒ Attached, Document ID: __________	
2. Compliance Assurance Monitoring ☒ Attached, Document ID: __________	☐ Not Applicable
3. Alternative Methods of Operation ☒ Attached, Document ID: __________	☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading) ☒ Attached, Document ID: __________	☐ Not Applicable

5. Acid Rain Part Application
☐ Certificate of Representation (EPA Form No. 7610-1)
  ☐ Copy Attached, Document ID:_
☐ Acid Rain Part (Form No. 62-210.900(1)(a))
  ☐ Attached, Document ID:__________
  ☐ Previously Submitted, Date:________
☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
  ☐ Attached, Document ID:__________
  ☐ Previously Submitted, Date:________
☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.)
  ☐ Attached, Document ID:__________
  ☐ Previously Submitted, Date:________
☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
  ☐ Attached, Document ID:__________
  ☐ Previously Submitted, Date:________
☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
  ☐ Attached, Document ID:__________
  ☐ Previously Submitted, Date:________
☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
  ☐ Attached, Document ID:__________
  ☐ Previously Submitted, Date:________
☒ Not Applicable	

Additional Requirements Comment

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☒ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

   Wastewater treatment Plant - Liquid Processes

3. Emissions Unit Identification Number: 008

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 1956	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? ☐ Yes ☒ No

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating:

11. Emissions Unit Comment:
As per our current Title V air operating permit (0250476-001-AV), this emissions unit is unregulated. Liquid processes consists of aerated grit chambers, oxygenation tanks, sludge concentration tanks, secondary clarifiers, and chlorine contact basins. The Central District WWTP has a design capacity of 143 mgd annual average daily flow.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description: Detailed Description: Aerated grit chambers and sludge concentration tanks are ducted odor control scrubbers.
2. Control Device or Method Code(s): 99 – Miscellaneous Control Devices

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate: 52,195 million gallons per year		
3. Maximum Heat Input Rate: million Btu/hr		
4. Maximum Incineration Rate: pounds/hr tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment: This process operates continuously		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	2. Emission Point Type Code:	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: No VE emissions from this unit		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code:	6. Stack Height:	7. Exit Diameter:
8. Exit Temperature:	9. Actual Volumetric Flow Rate:	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate:	12. Nonstack Emission Point Height:	
13. Emission Point UTM Coordinates... Zone: East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment __ of __

1. Segment Description (Process/Fuel Type): Wastewater treatment (emission relates to million gallons treated).			
2. Source Classification Code (SCC): 5-01-007-01		3. SCC Units: million gallons wastewater processed.	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: 52,195.00	6. Estimated Annual Activity Factor:	
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:	
10. Segment Comment: The maximum annual rate is the plant design capacity of 143 mgd annual average daily flow.			
10. Segment Comment:			

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
VOC			**NS**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Volatile Organic Compounds	2. Total Percent Efficiency of Control:
3. Potential Emissions:	4. Synthetically Limited? ☐ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions:	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype: No VE all Fugitive	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	 Serial Number:
5. Installation Date:	6. Performance Specification Test Date:

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: B [ ] Previously Submitted, Date ______
2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: ______ [ ] Previously Submitted, Date ______
3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: ______ [ ] Previously Submitted, Date ______
4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: ______ [ ] Previously Submitted, Date ______
   [x] Not Applicable (construction application)
5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: ______ [ ] Previously Submitted, Date ______
   [x] Not Applicable
6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: ______
   Test Date(s)/Pollutant(s) Tested: ______

   [ ] Previously Submitted, Date: ______
   Test Date(s)/Pollutant(s) Tested: ______

   [ ] To be Submitted, Date (if known): ______
   Test Date(s)/Pollutant(s) Tested: ______

   [x] Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.
7. Other Information Required by Rule or Statute
   [ ] Attached, Document ID: ______ [x] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ____________ ☒ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ____________ ☒ Not Applicable	
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ____________ ☒ Not Applicable	

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☒ Attached, Document ID: ____________	
2. Compliance Assurance Monitoring ☒ Attached, Document ID: ____________ ☐ Not Applicable	
3. Alternative Methods of Operation ☐ Attached, Document ID: ____________ ☒ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: ____________ ☒ Not Applicable	
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☒ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   [x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [x] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

   1.2 MW Digester Gas Cogenerator No. 2

3. Emissions Unit Identification Number: 009

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 5-22-1992	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [ ] Yes [x] No

9. Package Unit:
   Manufacturer: Cooper Superior   Model Number: 16GTLB

10. Generator Nameplate Rating: 1.2 MW

11. Emissions Unit Comment: Four (4) 1.2 MW digester emission units are plant cogenerators that produce electricity and heat anaerobic digesters, equipped with lean-burn low-combustion technology to reduce NOx emission. Each generator is allowed to burn digester gas. Commercial operation began on May 22, 1992.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Miscellaneous Control Devices.

Cogenerator engines are equipped with pre-combustion chambers for lean burn combustion to reduce NOx emissions.

Digester Gas is scrubbed prior to combustion to lower H_2S concentration in digester gas and reduce SO_2 emissions.

2. Control Device or Method Code(s): 99 – Miscellaneous Control Devices

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1.	Maximum Process or Throughput Rate:
2.	Maximum Production Rate: 4.8 MW
3.	Maximum Heat Input Rate: 331,653.6 MMBTU/Year
4.	Maximum Incineration Rate: pounds/hr tons/day
5.	Requested Maximum Operating Schedule: 26,280 hours (combined) 24 hours/day 7 days/week 52 weeks/year 8,760 hours/year
6.	Operating Capacity/Schedule Comment: The maximum production rate is the total nominal power output of all cogeneration units (EU's 007, 009, 010, 011) combined. The maximum heat input rate of 331,653.6 MMBTU/Year is for all cogeneration units combined; and is based on a heat input requirement of 12.62 MMBTU/Hr @ 1,200 KW for 26,280 Hours of operation. The request maximum operating schedule of 26,280 hours/year is for all cogeneration combined. (8760 hours/unit)(3 units)= 26,280 hours for the four generators.

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: CG-2	2. Emission Point Type Code: 3

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:

Each generator is equipped with a horizontal exhaust stack with silencer.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code: H	6. Stack Height: 38 feet	7. Exit Diameter: 1.50 feet
8. Exit Temperature: 875 degrees F	9. Actual Volumetric Flow Rate: 10,259 acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): 565.2 North (km): 2,826.2	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment:

There are four identical stacks, one for each cogeneration engine, located on the north roof of the cogeneration building. Cogeneration unit #1 (EU 007) is the eastern most stack and cogeneration unit #4 (EU 011) is the western most stack.

Emission Point is representative for all 4 cogeneration units.

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment _1_ of _1_

<table>
<tr><td colspan="6">1. Segment Description (Process/Fuel Type):

Digester Gas Combustion (emission in lb per million cubic feet burned).</td></tr>
<tr><td colspan="3">2. Source Classification Code (SCC):
2-02-002-04</td><td colspan="3">3. SCC Units: Million Cubic Feet Burned (all gaseous fuels)</td></tr>
<tr><td colspan="2">4. Maximum Hourly Rate:</td><td colspan="2">5. Maximum Annual Rate:
474</td><td colspan="2">6. Estimated Annual Activity Factor:</td></tr>
<tr><td colspan="2">7. Maximum % Sulfur:</td><td colspan="2">8. Maximum % Ash:</td><td colspan="2">9. Million Btu per SCC Unit:
700</td></tr>
<tr><td colspan="6">10. Segment Comment: Maximum fuel consumption rate per unit is approximately 350 scfm.

Digester gas heating values vary between 650 BTU/scf to 730 BTU/scf. An average of 700 BTU/scf is used in the application. To determine the maximum annual rate, a generator heat input requirement 12.62 MMBTU/hr at full load (1,200 KW) was used.</td></tr>
</table>

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOx	99		EL
CO			NS
SO2	99		NS
PM10			NS
VOC			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NOX Nitrogen Oxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 7.60 lb/hour 99.9 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 7.6 lbs/hr Source : Existing Permit Limitation	7. Emissions Method Code: 0
8. Calculation of Emissions: Hourly Potential Emissions base on the existing NOx emission limitation of 7.6 lbs NOx/hr for single unit Annual Potential emission is total (7.6 lbs/hr NOx)(26,280 hrs/yr*)(1 ton/2000 lb) = 99.9 tons/yr	
9. Pollutant Potential Emissions Comment: *The maximum 7.6 lbs/hr emissions limit was established in permit no. 0250476-001-AV. The facility is requesting a limit on the hours of operation of the 4 machines of 26,280 hours instead of unlimited operations (35,040 hours), which are currently allowed.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO Carbon Monoxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 94.6 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 399 lb of CO emitted/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4

Calculation of Emissions:

Ton per year is based on annual fuel consumption of 474 MMCMCF @ 700 MMBTU/MMCF

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= CO emissions in lb/hr
(474.00 MMCF/yr)(399 lb of CO emissions/MMCF)(1ton/2000 lb)= 94.6 TPY

9. Pollutant Potential Emissions Comment:
Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2 Sulfur Dioxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 62.4 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 263.3 lb of SO_2 emissions/MMCF Source: Derived Emission Factor	7. Emissions Method Code: 2

Calculation of Emissions:

Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF:

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= SO_2 emissions in lb/hr
(474.00 MMCF/yr)(263.3 lb of SO_2 emissions/MMCF)(1ton/2000 lb)= 62.4 TPY

9. Pollutant Potential Emissions Comment:
Derived SO_2 Emission factor from plant data for 2003 average H_2S content of the scrubbed digester gas 98 grains/100 SCF
SO_2 Emission factor = (0.98 grains/ SCF) * (0.0648 g/grain) * (1000000 SCF/MMCF) * (mole H_2S/34 g) * (mole SO_2/ mole H_2S) * (64 g/mole SO_2) * (1 lb/ 454 g) = 263.3 lb/MMCF

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM_{10} Particulate Matter	2. Total Percent Efficiency of Control:
3. Potential Emissions: 4.77 tons/year	4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 20.11 lbs of PM_{10}/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4

Calculation of Emissions:

Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= PM_{10} emissions in lb/hr
(474.00 MMCF/yr)(20.11 lb of PM_{10} emissions/MMCF)(1ton/2000 lb)= 4.77 TPY

9. Pollutant Potential Emissions Comment:
Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Particulate Matter	2. Total Percent Efficiency of Control:
3. Potential Emissions: 27.49 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 116 lbs of VOC/MMCF Source SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4
Calculation of Emissions: Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF (Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= VOC emissions in lb/year (474.00 MMCF/yr)(116 lb of VOC emissions/MMCF)(1ton/2000 lb)= 27.49 TPY	
9. Pollutant Potential Emissions Comment: Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _1_ of _1_

1. Basis for Allowable Emissions Code: ESCPSD	2. Future Effective Date of Allowable Emissions: 1 year from effective permit
4. Allowable Emissions and Units: 100 TPY	4. Equivalent Allowable Emissions:
5. Method of Compliance: Monitoring of hourly operations and annual compliance testing of the units using approved EPA methods 7, 7E or 5. Sampling of the exhaust gas shall be via a rake probe placed into the engine exhaust outlet.	
6. Allowable Emissions Comment (Description of Operating Method): The facility will limit total annual hours of operation of the 4 units combined 26,280 hours.	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype: 20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40% Maximum Period of Excess Opacity Allowed: 2 min/hour	
4. Method of Compliance: Annual compliance verification by EPA Method 9.	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1.	Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [x] Attached, Document ID: B [ ] Previously Submitted, Date ______
2.	Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [x] Attached, Document ID: F [ ] Previously Submitted, Date ______
3.	Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [x] Attached, Document ID: G [ ] Previously Submitted, Date ______
4.	Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [x] Attached, Document ID: H [ ] Previously Submitted, Date ______ [ ] Not Applicable (construction application)
5.	Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) [x] Attached, Document ID: I [ ] Previously Submitted, Date ______ [ ] Not Applicable
6.	Compliance Demonstration Reports/Records [ ] Attached, Document ID: ______ Test Date(s)/Pollutant(s) Tested: ______ [x] Previously Submitted, Date: 15 July 2003 Test Date(s)/Pollutant(s) Tested: 2 July 2003 / NOx & VE [ ] To be Submitted, Date (if known): ______ Test Date(s)/Pollutant(s) Tested: ______ [ ] Not Applicable Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.
7.	Other Information Required by Rule or Statute [ ] Attached, Document ID: ______ [x] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ____________	☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ____________	☒ Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ____________	☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: __________	
2. Compliance Assurance Monitoring ☐ Attached, Document ID: __________	☐ Not Applicable
3. Alternative Methods of Operation ☐ Attached, Document ID: __________	☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: __________	☐ Not Applicable

5. Acid Rain Part Application
   - ☐ Certificate of Representation (EPA Form No. 7610-1)
     - ☐ Copy Attached, Document ID:_
   - ☐ Acid Rain Part (Form No. 62-210.900(1)(a))
     - ☐ Attached, Document ID:__________
     - ☐ Previously Submitted, Date:________
   - ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
     - ☐ Attached, Document ID:__________
     - ☐ Previously Submitted, Date:________
   - ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.)
     - ☐ Attached, Document ID:__________
     - ☐ Previously Submitted, Date:________
   - ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
     - ☐ Attached, Document ID:__________
     - ☐ Previously Submitted, Date:________
   - ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.)
     - ☐ Attached, Document ID:__________
     - ☐ Previously Submitted, Date:________
   - ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.)
     - ☐ Attached, Document ID:__________
     - ☐ Previously Submitted, Date:________
   - ☒ Not Applicable

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   [x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [x] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

   1.2 MW Digester Gas Cogenerator No. 3

3. Emissions Unit Identification Number: 010

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 5-22-1992	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [ ] Yes [x] No

9. Package Unit:
   Manufacturer: Cooper Superior Model Number: 16GTLB

10. Generator Nameplate Rating: 1.2 MW

11. Emissions Unit Comment:

    Four (4) 1.2 MW digester emission units are plant cogenerators that produce electricity and heat anaerobic digesters, equipped with lean-burn low-combustion technology to reduce NOx emission. Each generator is allowed to burn digester gas. Commercial operation began on May 22, 1992.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Miscellaneous Control Devices.

Cogenerator engines are equipped with pre-combustion chambers for lean burn combustion to reduce NOx emissions.

Digester Gas is scrubbed prior to combustion to lower H_2S concentration in digester gas and reduce SO_2 emissions.

2. Control Device or Method Code(s): 99 – Miscellaneous Control Devices

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate: 4.8 MW	
3. Maximum Heat Input Rate: 331,653.6 MMBTU/Year	
4. Maximum Incineration Rate: pounds/hr tons/day	
6. Requested Maximum Operating Schedule: 26,280 hours (combined) 24 hours/day 7 days/week 52 weeks/year 8,760 hours/year	
6. Operating Capacity/Schedule Comment: The maximum production rate is the total nominal power output of all cogeneration units (EU's 007, 009, 010, 011) combined. The maximum heat input rate of 331,653.6 MMBTU/Year is for all cogeneration units combined; and is based on a heat input requirement of 12.62 MMBTU/Hr @ 1,200 KW for 26,280 Hours of operation. The request maximum operating schedule of 26,280 hours/year is for all cogeneration combined. (8760 hours/unit)(3 units)= 26,280 hours for the four generators.	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: CG-3	2. Emission Point Type Code: 3
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Each generator is equipped with a horizontal exhaust stack with silencer.	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:	

5. Discharge Type Code: H	6. Stack Height: 38 feet	7. Exit Diameter: 1.50 feet
8. Exit Temperature: 875 degrees F	9. Actual Volumetric Flow Rate: 10,259 acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): 565.2 North (km): 2,826.2	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment:

There are four identical stacks, one for each cogeneration engine, located on the north roof of the cogeneration building. Cogeneration unit #1 (EU 007) is the eastern most stack and cogeneration unit #4 (EU 011) is the western most stack.

Emission Point is representative for all 4 cogeneration units.

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Digester Gas Combustion (emission in lb per million cubic feet burned).		
2. Source Classification Code (SCC): 2-02-002-04	3. SCC Units: Million Cubic Feet Burned (all gaseous fuels)	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: 474	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 700
10. Segment Comment: Maximum fuel consumption rate per unit is approximately 350 scfm. Digester gas heating values vary between 650 BTU/scf to 730 BTU/scf. An average of 700 BTU/scf is used in the application. To determine the maximum annual rate, a generator heat input requirement 12.62 MMBTU/hr at full load (1,200 KW) was used.		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOx	99		EL
CO			NS
SO2	99		NS
PM10			NS
VOC			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NOX Nitrogen Oxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 7.60 lb/hour 99.9 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 7.6 lbs/hr Source : Existing Permit Limitation	7. Emissions Method Code: 0

Calculation of Emissions:

Hourly Potential Emissions base on the existing NOx emission limitation of 7.6 lbs NOx/hr for single unit

Annual Potential emission is total
(7.6 lbs/hr NOx)(26,280 hrs/yr*)(1 ton/2000 lb) = 99.9 tons/yr

9. Pollutant Potential Emissions Comment:

*The maximum 7.6 lbs/hr emissions limit was established in permit no. 0250476-001-AV. The facility is requesting a limit on the hours of operation of the 4 machines of 26,280 hours instead of unlimited operations (35,040 hours), which are currently allowed.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO Carbon Monoxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 94.60 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 399 lb of CO emitted/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4

Calculation of Emissions:

Ton per year is based on annual fuel consumption of 474 MMCMCF @ 700 MMBTU/MMCF

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= CO emissions in lb/hr
(474.00 MMCF/yr)(399 lb of CO emissions/MMCF)(1ton/2000 lb)= 94.6 TPY

9. Pollutant Potential Emissions Comment:
Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2 Sulfur Dioxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 62.4 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 263.3 lb of SO_2 emissions/MMCF Source: Derived Emission Factor	7. Emissions Method Code: 2

8. Calculation of Emissions:

Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF:

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= SO_2 emissions in lb/hr
(474.00 MMCF/yr)(263.3 lb of SO_2 emissions/MMCF)(1ton/2000 lb)= 62.40 TPY

9. Pollutant Potential Emissions Comment:
Derived SO_2 Emission factor from plant data for 2003 average H_2S content of the scrubbed digester gas 98 grains/100 SCF
SO_2 Emission factor = (0.98 grains/ SCF) * (0.0648 g/grain) * (1000000 SCF/MMCF) * (mole H_2S/34 g) * (mole SO_2/ mole H_2S) * (64 g/mole SO_2) * (1 lb/ 454 g) = 263.3 lb/MMCF

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM_{10} Particulate Matter	2. Total Percent Efficiency of Control:
3. Potential Emissions: 4.77 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
9. Emission Factor: 20.11 lbs of PM_{10}/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4

Calculation of Emissions:

Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= PM_{10} emissions in lb/hr
(474.00 MMCF/yr)(20.11 lb of PM_{10} emissions/MMCF)(1ton/2000 lb)= 4.77 TPY

9. Pollutant Potential Emissions Comment:
Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Particulate Matter	2. Total Percent Efficiency of Control:
3. Potential Emissions: 27.49 tons/year	4. Synthetically Limited? [X] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 116 lbs of VOC/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4
8. Calculation of Emissions: Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF (Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= VOC emissions in lb/yeat (474.00 MMCF/yr)(116 lb of VOC emissions/MMCF)(1ton/2000 lb)= 27.49 TPY	
9. Pollutant Potential Emissions Comment: Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _1_ of _1_

1. Basis for Allowable Emissions Code: ESCPSD	2. Future Effective Date of Allowable Emissions: 1 year from effective permit
3. Allowable Emissions and Units: 100 TPY	4. Equivalent Allowable Emissions:
5. Method of Compliance: Monitoring of hourly operations and annual compliance testing of the units using approved EPA methods 7, 7E or 5. Sampling of the exhaust gas shall be via a rake probe placed into the engine exhaust outlet.	
6. Allowable Emissions Comment (Description of Operating Method): The facility will limit total annual hours of operation of the 4 units combined 26,280 hours.	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype: 20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40% Maximum Period of Excess Opacity Allowed: 2 min/hour	
4. Method of Compliance: Annual compliance verification by EPA Method 9.	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: B [ ] Previously Submitted, Date ______

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: F [ ] Previously Submitted, Date ______

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: G [ ] Previously Submitted, Date ____

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: H [ ] Previously Submitted, Date ______
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: I [ ] Previously Submitted, Date ______
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: __________
   Test Date(s)/Pollutant(s) Tested: ______________________________
   [x] Previously Submitted, Date: 15 July 2003
   Test Date(s)/Pollutant(s) Tested: 3 June 2003 / NOx & VE

   [ ] To be Submitted, Date (if known): __________
   Test Date(s)/Pollutant(s) Tested: ______________________________

   [ ] Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   [ ] Attached, Document ID: ____________ [x] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ________ ☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ________ ☒ Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ________ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: ________
2. Compliance Assurance Monitoring ☐ Attached, Document ID: ________ ☐ Not Applicable
3. Alternative Methods of Operation ☐ Attached, Document ID: ________ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: ________ ☐ Not Applicable
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:________ ☐ Previously Submitted, Date:________ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:________ ☐ Previously Submitted, Date:________ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:________ ☐ Previously Submitted, Date:________ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:________ ☐ Previously Submitted, Date:________ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:________ ☐ Previously Submitted, Date:________ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:________ ☐ Previously Submitted, Date:________ ☐ Not Applicable

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   [x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [x] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

   1.2 MW Digester Gas Cogenerator No. 4

3. Emissions Unit Identification Number: 011

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 5-22-1992	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [ ] Yes [x] No

9. Package Unit:
   Manufacturer: Cooper Superior Model Number: 16GTLB

10. Generator Nameplate Rating: 1.2 MW

11. Emissions Unit Comment: Four (4) 1.2 MW digester emission units are plant cogenerators that produce electricity and heat anaerobic digesters, equipped with lean-burn low-combustion technology to reduce NOx emission. Each generator is allowed to burn digester gas. Commercial operation began on May 22, 1992.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Miscellaneous Control Devices.

Cogenerator engines are equipped with pre-combustion chambers for lean burn combustion to reduce NOx emissions.

Digester Gas is scrubbed prior to combustion to lower H_2S concentration in digester gas and reduce SO_2 emissions.

2. Control Device or Method Code(s): 99 – Miscellaneous Control Devices

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate: 4.8 MW		
3. Maximum Heat Input Rate: 331,653.6 MMBTU/Year		
4. Maximum Incineration Rate: pounds/hr tons/day		
5. Requested Maximum Operating Schedule: 26,280 hours (combined)	24 hours/day 52 weeks/year	7 days/week 8,760 hours/year
6. Operating Capacity/Schedule Comment: The maximum production rate is the total nominal power output of all cogeneration units (EU's 007, 009, 010, 011) combined. The maximum heat input rate of 331,653.6 MMBTU/Year is for all cogeneration units combined; and is based on a heat input requirement of 12.62 MMBTU/Hr @ 1,200 KW for 26,280 Hours of operation. The request maximum operating schedule of 26,280 hours/year is for all cogeneration combined. (8760 hours/unit)(3 units)= 26,280 hours for the four generators.		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: CG-4	2. Emission Point Type Code: 3	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Each generator is equipped with a horizontal exhaust stack with silencer.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: H	6. Stack Height: 38 feet	7. Exit Diameter: 1.50 feet
8. Exit Temperature: 875 degrees F	9. Actual Volumetric Flow Rate: 10,259 acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate: dscfm	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 565.2 North (km): 2,826.2	14. Emission Point Latitude/Longitude… Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: There are four identical stacks, one for each cogeneration engine, located on the north roof of the cogeneration building. Cogeneration unit #1 (EU 007) is the eastern most stack and cogeneration unit #4 (EU 011) is the western most stack. Emission Point is representative for all 4 cogeneration units.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Digester Gas Combustion (emission in lb per million cubic feet burned).		
2. Source Classification Code (SCC): 2-02-002-04	3. SCC Units: Million Cubic Feet Burned (all gaseous fuels)	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: 474	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit: 700
10. Segment Comment: Maximum fuel consumption rate per unit is approximately 350 scfm. Digester gas heating values vary between 650 BTU/scf to 730 BTU/scf. An average of 700 BTU/scf is used in the application. To determine the maximum annual rate, a generator heat input requirement 12.62 MMBTU/hr at full load (1,200 KW) was used.		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOx	**99**		**EL**
CO			**NS**
SO2	**99**		**NS**
PM10			**NS**
VOC			**NS**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NOX Nitrogen Oxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 7.60 lb/hour 99.9 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 7.6 lbs/hr Source : Existing Permit Limitation	7. Emissions Method Code: 0

8. Calculation of Emissions:

Hourly Potential Emissions base on the existing NOx emission limitation of 7.6 lbs NOx/hr for single unit

Annual Potential emission is total
(7.6 lbs/hr NOx)(26,280 hrs/yr*)(1 ton/2000 lb) = 99.9 tons/yr

9. Pollutant Potential Emissions Comment:

*The maximum 7.6 lbs/hr emissions limit was established in permit no. 0250476-001-AV. The facility is requesting a limit on the hours of operation of the 4 machines of 26,280 hours instead of unlimited operations (35,040 hours), which are currently allowed.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO Carbon Monoxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 94.6 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 399 lb of CO emitted/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4
8. Calculation of Emissions: Ton per year is based on annual fuel consumption of 474 MMCMCF @ 700 MMBTU/MMCF (Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= CO emissions in lb/hr (474.00 MMCF/yr)(399 lb of CO emissions/MMCF)(1ton/2000 lb)= 94.6 TPY	
9. Pollutant Potential Emissions Comment: Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2 Sulfur Dioxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 62.4 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 263.3 lb of SO_2 emissions/MMCF Source: Derived Emission Factor	7. Emissions Method Code: 2

8. Calculation of Emissions:

Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF:

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= SO_2 emissions in lb/hr
(474.00 MMCF/yr)(263.3 lb of SO_2 emissions/MMCF)(1ton/2000 lb)= 62.4 TPY

9. Pollutant Potential Emissions Comment:
Derived SO_2 Emission factor from plant data for 2003 average H_2S content of the scrubbed digester gas 98 grains/100 SCF
SO_2 Emission factor = (0.98 grains/ SCF) * (0.0648 g/grain) * (1000000 SCF/MMCF) * (mole H_2S/34 g) * (mole SO_2/ mole H_2S) * (64 g/mole SO_2) * (1 lb/ 454 g) = 263.3 lb/MMCF

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM_{10} Particulate Matter	2. Total Percent Efficiency of Control:
3. Potential Emissions: 4.77 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 20.11 lbs of PM_{10}/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4
8. Calculation of Emissions: Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF (Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= PM_{10} emissions in lb/hr (474.00 MMCF/yr)(20.11 lb of PM_{10} emissions/MMCF)(1ton/2000 lb)= 4.77 TPY	
9. Pollutant Potential Emissions Comment: Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Particulate Matter	2. Total Percent Efficiency of Control:
3. Potential Emissions: 27.49 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
10. Emission Factor: 116 lbs of VOC/MMCF Source: SCC # 20200204 EPA FIRE VER 6.24	7. Emissions Method Code: 4

Calculation of Emissions:

Ton per year is based on the estimated annual fuel consumption of 474 MMCF @ 700 MMBTU/MMCF

(Annual Fuel consumption in MMCF)(emission factor in lb/MMCF)= VOC emissions in lb/year
(474.00 MMCF/yr)(116 lb of VOC emissions/MMCF)(1ton/2000 lb)= 27.49 TPY

9. Pollutant Potential Emissions Comment:

Emissions are calculated using a similar but different process in USEPA FIRE System for natural gas as no factors exist for digester gas.

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions _1_ of _1_

1. Basis for Allowable Emissions Code: ESCPSD	2. Future Effective Date of Allowable Emissions: 1 year from effective permit
Allowable Emissions and Units: 100 TPY	4. Equivalent Allowable Emissions:
5. Method of Compliance: Monitoring of hourly operations and annual compliance testing of the units using approved EPA methods 7, 7E or 5. Sampling of the exhaust gas shall be via a rake probe placed into the engine exhaust outlet.	
6. Allowable Emissions Comment (Description of Operating Method): The facility will limit total annual hours of operation of the 4 units combined 26,280 hours.	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype: 20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40% Maximum Period of Excess Opacity Allowed: 2 min/hour	
4. Method of Compliance: Annual compliance verification by EPA Method 9.	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: B [ ] Previously Submitted, Date ______

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: F [ ] Previously Submitted, Date ______

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: G [ ] Previously Submitted, Date ______

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: H [ ] Previously Submitted, Date ______
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: I [ ] Previously Submitted, Date ______
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: ______
   Test Date(s)/Pollutant(s) Tested: ______
   [x] Previously Submitted, Date: 15 July 2003
   Test Date(s)/Pollutant(s) Tested: 2 June 2003 / NOx & VE
   [ ] To be Submitted, Date (if known): ______
   Test Date(s)/Pollutant(s) Tested: ______
   [ ] Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   [ ] Attached, Document ID: ______ [x] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ____________	☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ____________	☒ Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______________	☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: __________	
2. Compliance Assurance Monitoring ☐ Attached, Document ID: _________	☐ Not Applicable
3. Alternative Methods of Operation ☐ Attached, Document ID: _________	☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: _________	☐ Not Applicable
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   [x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   [x] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

   2.5 MW Diesel Engine Generator No. 1 (B1), EMD model No. 20-645E4B

3. Emissions Unit Identification Number: 013

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 1-1-1980	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [ ] Yes [x] No

9. Package Unit:
   Manufacturer: Electro-Motive Division (EMD) Model Number: 20-645E4

10. Generator Nameplate Rating: 2.5 MW

11. Emissions Unit Comment:

    The existing emission units consists of three 3,600 hp diesel fueled internal combustion prime movers, each coupled to a 2,500 KW electrical generator.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Detailed Description:

Injection Timing: The standard injection timing on an EMD engine is 0 degrees before top dead center (BTDC). The injection timing has been retarded to 4 degrees after top dead center (ATDC).

Intercoolers: The intercoolers cool the combustion air before it enters the air box and the cylinders. The standard EMD intercooler is a 2-pass type heat exchanger. In order to achieve additional cooling and assist in NOx reduction, these engines have 4-pass intercoolers installed.

2. Control Device or Method Code(s): 099

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate: 100,050 MMBTU/yr		
4. Maximum Incineration Rate: pounds/hr tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8,760 hours/year

6. Operating Capacity/Schedule Comment:

The maximum heat input rate is for all standby generators combined (existing and proposed) and based on:
(725,000 Gal) * (138 MMBTU/1000 Gal) = 100,050 MMBTU/yr

The operation of all standby generators will be limited by a fuel consumption limitation of 725,000 gallons for all standby generators combined. (Emission units 013, 014, 015 and 2 new proposed).

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: EMD 1-3	2. Emission Point Type Code: 3	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: An enclosed generator with a vertical stack located on top of the enclosure.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: V	6. Stack Height: 21 feet	7. Exit Diameter: 2.3 feet
8. Exit Temperature: 735 °F	9. Actual Volumetric Flow Rate: 23,000 acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate:	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 584.959 North (km): 2,847.790	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Emission point is representative of all standby generators.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Diesel fueled internal combustion engines (emissions related to thousand gallons burned).		
2. Source Classification Code (SCC): 2-02-004-01	3. SCC Units: Thousand gallons burned (all liquid fuels).	
4. Maximum Hourly Rate: 0.18	5. Maximum Annual Rate: 725,000 gallons	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.05	8. Maximum % Ash:	9. Million Btu per SCC Unit: 138
10. Segment Comment: The maximum annual rate of 725,000 gallons is for all standby generators (emission units 013, 014, 015 plus 2 new additional units) combined.		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX	**99**		**EL**
SO2			**NS**
PM10			**NS**
VOC			**NS**
CO			**NS**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NO_X Nitrogen Oxides	2. Total Percent Efficiency of Control: 28
3. Potential Emissions: 107.55 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 2.15 lbs NOx / MMBTU Reference: Requested by applicant	7. Emissions Method Code: 0
8. Calculation of Emissions: (725,000 gals/yr) * (138 MMBTU/1000 gals) * (2.15 lbs NOx/MMBTU) * (1 ton/ 2000 lb) = 107.55 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: The applicant is proposing to replace the existing NOx emission limitation of 58 lbs NOx/hr with a heat input based limitation, which will limit operations of the standby generators through a fuel consumption limitation. Tons per year is base on proposed annual fuel consumption limitation of 725,000 gallons for all standby generators; and assumes that all 725,000 gallons is used by the EMD Model 20-645 E4B's (Emission units 013, 014 and 015 and not the proposed two additional standby generators EMD Model 20-645 F4B which have a emission factor of 2.75 lb/MMBTU).	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO Carbon Monoxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 42.05 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 116 lbs/1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (116 lbs CO/1000 gals) * (1 ton/ 2000 lb) = 42.05 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2 Sulfur Dioxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.5 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 6.9 lbs / 1000 gal Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (6.9 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.5 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM 10 Particle Mater 10	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.85 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 7.85 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (7.85 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.85 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Volatile Organic Compounds	2. Total Percent Efficiency of Control:
3. Potential Emissions: 4.97 tons/year	4. Synthetically Limited? [X] Yes [ ] No
7. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 13.7 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (13.7 lbs/1000 gals) * (1 ton/ 2000 lb) = 4.97 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: ESCPSD	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 2.15 lbs NOx / MMBTU	4. Equivalent Allowable Emissions:
5. Method of Compliance: Annual emission testing for NOx using EPA Method 7 or 7E of the exhaust gas via rack probe placed into engine exhaust (stack) outlet.	
6. Allowable Emissions Comment (Description of Operating Method	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation _1_ of _1_

1. Visible Emissions Subtype: 20	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40 % Maximum Period of Excess Opacity Allowed: 6 min/hour	
4. Method of Compliance: Annual opacity monitoring using EPA Method 9.	
5. Visible Emissions Comment: Exceptional conditions during deadline (emergency) start and initial loading until units reach normal operating conditions and temperatures.	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

<u>Continuous Monitoring System:</u> Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: N/A	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: B [ ] Previously Submitted, Date ______

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: F [ ] Previously Submitted, Date ______

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: G [ ] Previously Submitted, Date ______

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: H [ ] Previously Submitted, Date ______
[ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: I [ ] Previously Submitted, Date ______
[ ] Not Applicable

6. Compliance Demonstration Reports/Records
[ ] Attached, Document ID: ______
Test Date(s)/Pollutant(s) Tested: ______
[x] Previously Submitted, Date: 15 July 2003
Test Date(s)/Pollutant(s) Tested: 2 July 2003 / NOx & VE
[ ] To be Submitted, Date (if known): ______
Test Date(s)/Pollutant(s) Tested: ______
[ ] Not Applicable
Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
[ ] Attached, Document ID: ______ [x] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ____________	☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ____________	☒ Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ____________	☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: __________	
2. Compliance Assurance Monitoring ☐ Attached, Document ID: _________	☐ Not Applicable
3. Alternative Methods of Operation ☐ Attached, Document ID: _________	☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: _________	☐ Not Applicable
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:__________ ☐ Previously Submitted, Date:________ ☐ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

[x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

[x] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section: These emission units are plant emergency generators with retarded engine timing and aftercooling to control NOx emission. Each generator is allowed to burn No. 2 diesel fuel oil. Commercial operation began on January 1, 1980.
The two new generators utilize injectors with fixed timing, changing the fuel injection timing and using 4 pass combustion air aftercoolers to increase the cooling of the air.

3. Emissions Unit Identification Number: 013

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 1-1-1980	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [ ] Yes [x] No

9. Package Unit:
Manufacturer: Electro-Motive Division (EMD) Model Number: 20-645E4

10. Generator Nameplate Rating: 2.5 MW

11. Emissions Unit Comment: The existing emission units consists of three 3,600 hp diesel fueled internal combustion prime movers, each coupled to a 2,500 KW electrical generator.

Replacement of the existing radiators with remote radiators will commence upon approval.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Detailed Description:

Injection Timing: The standard injection timing on an EMD engine is 0 degrees before top dead center (BTDC). The injection timing has been retarded to 4 degrees after top dead center (ATDC).

Intercoolers: The intercoolers cool the combustion air before it enters the air box and the cylinders. The standard EMD intercooler is a 2-pass type heat exchanger. In order to achieve additional cooling and assist in NOx reduction, these engines have 4-pass intercoolers installed.

2. Control Device or Method Code(s): 099

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate: 100,050 MMBTU/yr		
4. Maximum Incineration Rate: pounds/hr tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8,760 hours/year

6. Operating Capacity/Schedule Comment:

The maximum heat input rate is for all standby generators combined (existing and proposed) and based on:
(725,000 Gal) * (138 MMBTU/1000 Gal) = 100,050 MMBTU/yr

The operation of all standby generators will be limited by a fuel consumption limitation of 725,000 gallons for all standby generators combined. (Emission units 013, 014, 015 and 2 new proposed).

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: EMD 1-3	2. Emission Point Type Code: 3
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: An enclosed generator with a vertical stack located on top of the enclosure.	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:	

5. Discharge Type Code: V	6. Stack Height: 21 feet	7. Exit Diameter: 2.3 feet
8. Exit Temperature: 735 °F	9. Actual Volumetric Flow Rate: 23,000 acfm	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate:	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: 17 East (km): 584.959 North (km): 2,847.790	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: Emission point is representative of all standby generators.	

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Diesel fueled internal combustion engines (emissions related to thousand gallons burned).		
2. Source Classification Code (SCC): 2-02-004-01	3. SCC Units: Thousand gallons burned (all liquid fuels).	
4. Maximum Hourly Rate: 0.18	5. Maximum Annual Rate: 725,000 gallons	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.05	8. Maximum % Ash:	9. Million Btu per SCC Unit: 138
10. Segment Comment: The maximum annual rate of 725,000 gallons is for all standby generators (emission units 013, 014, 015 plus 2 new additional units) combined.		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX	**99**		**EL**
SO2			**NS**
PM10			**NS**
VOC			**NS**
CO			**NS**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NO_X Nitrogen Oxides	2. Total Percent Efficiency of Control: 28
3. Potential Emissions: 107.55 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 2.15 lbs NOx / MMBTU Reference: Requested by applicant	7. Emissions Method Code: 0

8. Calculation of Emissions:

(725,000 gals/yr) * (138 MMBtu/1000 gals) * (2.15 lbs NOx/MMBTU) * (1 ton/ 2000 lb) = 107.55 TPY

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

The applicant is proposing to replace the existing NOx emission limitation of 58 lbs NOx/hr with a heat input based limitation, which will limit operations of the standby generators through a fuel consumption limitation.

Tons per year is base on proposed annual fuel consumption limitation of 725,000 gallons for all standby generators; and assumes that all 725,000 gallons is used by the EMD Model 20-645 E4B's (Emission units 013, 014 and 015 and not the proposed two additional standby generators EMD Model 20-645 F4B which have a emission factor of 2.75 lb/MMBTU).

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO Carbon Monoxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 42.05 tons/year	4. Synthetically Limited? [x] Yes [ ] No
7. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 116 lbs/1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (116 lbs CO/1000 gals) * (1 ton/ 2000 lb) = 42.05 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2 Sulfur Dioxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.5 tons/year	4. Synthetically Limited? [x] Yes [ ] No
7. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 6.9 lbs / 1000 gal Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (6.9 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.5 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM 10 Particle Mater 10	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.85 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 7.85 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (7.85 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.85 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

<u>Potential/Estimated Fugitive Emissions</u>

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Volatile Organic Compounds	2. Total Percent Efficiency of Control:
3. Potential Emissions: 4.97 tons/year	4. Synthetically Limited? [X] Yes [ ] No
7. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 13.7 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (13.7 lbs/1000 gals) * (1 ton/ 2000 lb) = 4.97 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: ESCPSD	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 2.15 lbs NOx / MMBTU	4. Equivalent Allowable Emissions:
5. Method of Compliance: Annual emission testing for NOx using EPA Method 7 or 7E of the exhaust gas via rack probe placed into engine exhaust (stack) outlet.	
6. Allowable Emissions Comment (Description of Operating Method)	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation _1_ of _1_

1. Visible Emissions Subtype: 20	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40 % Maximum Period of Excess Opacity Allowed: 6 min/hour	
4. Method of Compliance: Annual opacity monitoring using EPA Method 9.	
5. Visible Emissions Comment: Exceptional conditions during deadline (emergency) start and initial loading until units reach normal operating conditions and temperatures.	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: N/A	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: B [ ] Previously Submitted, Date ______

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: F [ ] Previously Submitted, Date ______

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: G [ ] Previously Submitted, Date ______

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: H [ ] Previously Submitted, Date ______
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: I [ ] Previously Submitted, Date ______
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: ______
   Test Date(s)/Pollutant(s) Tested: ______
   [x] Previously Submitted, Date: 15 July 2003
   Test Date(s)/Pollutant(s) Tested: 5 June 2003 / NOx & VE
   [ ] To be Submitted, Date (if known): ______
   Test Date(s)/Pollutant(s) Tested: ______
   [ ] Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   [ ] Attached, Document ID: ______ [x] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ____________	☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ____________	☒ Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ____________	☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: ____________	
2. Compliance Assurance Monitoring ☐ Attached, Document ID: ____________	☐ Not Applicable
3. Alternative Methods of Operation ☐ Attached, Document ID: ____________	☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: ____________	☐ Not Applicable
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   [x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   [x] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

3. Description of Emissions Unit Addressed in this Section: These emission units are plant emergency generators with retarded engine timing and aftercooling to control NOx emission. Each generator is allowed to burn No. 2 diesel fuel oil. Commercial operation began on January 1, 1980.
   The two new generators utilize injectors with fixed timing, changing the fuel injection timing and using 4 pass combustion air aftercoolers to increase the cooling of the air.

3. Emissions Unit Identification Number: 013

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 1-1-1980	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? [ ] Yes [x] No

9. Package Unit:
   Manufacturer: Electro-Motive Division (EMD) Model Number: 20-645E4

10. Generator Nameplate Rating: 2.5 MW

11. Emissions Unit Comment:
The existing emission unit consists of a 3,600 hp diesel fueled internal combustion prime mover, coupled to a 2,500 KW electrical generator.

Replacement of the existing radiators with remote radiators will commence upon approval.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Detailed Description:

Injection Timing: The standard injection timing on an EMD engine is 0 degrees before top dead center (BTDC). The injection timing has been retarded to 4 degrees after top dead center (ATDC).

Intercoolers: The intercoolers cool the combustion air before it enters the air box and the cylinders. The standard EMD intercooler is a 2-pass type heat exchanger. In order to achieve additional cooling and assist in NOx reduction, these engines have 4-pass intercoolers installed.

2. Control Device or Method Code(s): 099

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: 100,050 MMBTU/yr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: 24 hours/day 7 days/week 52 weeks/year 8,760 hours/year	
6. Operating Capacity/Schedule Comment: The maximum heat input rate is for all standby generators combined (existing and proposed) and based on: (725,000 Gal) * (138 MMBTU/1000 Gal) = 100,050 MMBTU/yr The operation of all standby generators will be limited by a fuel consumption limitation of 725,000 gallons for all standby generators combined. (Emission units 013, 014, 015 and 2 new proposed).	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: EMD 1-3	2. Emission Point Type Code: 3	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: An enclosed generator with a vertical stack located on top of the enclosure.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: V	6. Stack Height: 21 feet	7. Exit Diameter: 2.3 feet
8. Exit Temperature: 735 °F	9. Actual Volumetric Flow Rate: 23,000 acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate:	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): 584.959 North (km): 2,847.790	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment: Emission point is representative of all standby generators.		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Diesel fueled internal combustion engines (emissions related to thousand gallons burned).		
2. Source Classification Code (SCC): 2-02-004-01	3. SCC Units: Thousand gallons burned (all liquid fuels).	
4. Maximum Hourly Rate: 0.18	5. Maximum Annual Rate: 725,000 gallons	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.05	8. Maximum % Ash:	9. Million Btu per SCC Unit: 138
10. Segment Comment: The maximum annual rate of 725,000 gallons is for all standby generators (emission units 013, 014, 015 plus 2 new additional units) combined.		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX	99		EL
SO2			NS
PM10			NS
VOC			NS
CO			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NO_X Nitrogen Oxides	2. Total Percent Efficiency of Control: 28
3. Potential Emissions: 107.55 tons/year	4. Synthetically Limited? [x] Yes [ ] No
7. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 2.15 lbs NOx / MMBTU Reference: Requested by applicant	7. Emissions Method Code: 5

8. Calculation of Emissions:

(725,000 gals/yr) * (138 MMBTU/1000 gals) * (2.15 lbs NOx/MMBTU) * (1 ton/ 2000 lb) = 107.55 TPY

9. Pollutant Potential/Estimated Fugitive Emissions Comment:
The applicant is proposing to replace the existing NOx emission limitation of 58 lbs NOx/hr with a heat input based limitation, which will limit operations of the standby generators through a fuel consumption limitation.

Tons per year is base on proposed annual fuel consumption limitation of 725,000 gallons for all standby generators; and assumes that all 725,000 gallons is used by the EMD Model 20-645 E4B's (Emission units 013, 014 and 015 and not the proposed two additional standby generators EMD Model 20-645 F4B which have a emission factor of 2.75 lb/MMBTU).

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO Carbon Monoxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 42.05 tons/year	4. Synthetically Limited? [x] Yes [ ] No
9. Range of Estimated Fugitive Emissions (as applicable):	
10. Emission Factor: 116 lbs/1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (116 lbs CO/1000 gals) * (1 ton/ 2000 lb) = 42.05 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2 Sulfur Dioxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.5 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
9. Range of Estimated Fugitive Emissions (as applicable):	
10. Emission Factor: 6.9 lbs / 1000 gal Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (6.9 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.5 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions
Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM 10 Particle Mater 10	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.85 tons/year	4. Synthetically Limited? [x] Yes [ ] No
9. Range of Estimated Fugitive Emissions (as applicable):	
10. Emission Factor: 7.85 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (7.85 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.85 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Volatile Organic Compounds	2. Total Percent Efficiency of Control:
3. Potential Emissions: 4.97 tons/year	4. Synthetically Limited? [x] Yes [ ] No
11. Range of Estimated Fugitive Emissions (as applicable):	
12. Emission Factor: 13.7 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (13.7 lbs/1000 gals) * (1 ton/ 2000 lb) = 4.97 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: ESCPSD	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 2.15 lbs NOx / MMBTU	4. Equivalent Allowable Emissions:
5. Method of Compliance: Annual emission testing for NOx using EPA Method 7 or 7E of the exhaust gas via rack probe placed into engine exhaust (stack) outlet.	
6. Allowable Emissions Comment (Description of Operating Method	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation _1_ of _1_

1. Visible Emissions Subtype: 20	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40 % Maximum Period of Excess Opacity Allowed: 6 min/hour	
4. Method of Compliance: Annual opacity monitoring using EPA Method 9.	
5. Visible Emissions Comment: Exceptional conditions during deadline (emergency) start and initial loading until units reach normal operating conditions and temperatures.	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: N/A	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: B [ ] Previously Submitted, Date ____

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: F [ ] Previously Submitted, Date ____

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: G [ ] Previously Submitted, Date ____

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: H [ ] Previously Submitted, Date ____
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: I [ ] Previously Submitted, Date ____
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: ____
   Test Date(s)/Pollutant(s) Tested: ____
   [x] Previously Submitted, Date: 15 July 2003
   Test Date(s)/Pollutant(s) Tested: 2 July 2003 / NOx & VE
   [ ] To be Submitted, Date (if known): ____
   Test Date(s)/Pollutant(s) Tested: ____
   [ ] Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   [ ] Attached, Document ID: ____ [x] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ______________	☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ______________	☒ Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ______________	☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: ___________	
2. Compliance Assurance Monitoring ☐ Attached, Document ID: ___________	☐ Not Applicable
3. Alternative Methods of Operation ☐ Attached, Document ID: ___________	☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: ___________	☐ Not Applicable
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:________ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:________ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:________ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:________ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:________ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:________ ☐ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☒ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

   Solids Handling Processes

3. Emissions Unit Identification Number: 017

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 1956	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? ☐ Yes ☒ No

9. Package Unit:
   Manufacturer: Model Number:

10. Generator Nameplate Rating:

11. Emissions Unit Comment:
As per our current Title V air operating permit (0250476-001-AV), this emissions unit is unregulated. Solids handling processes consist of anaerobic digesters, biosolids thickening tanks, centrifuges, wet biosolids transport operations, biosolids drying beds, composting operations, dry biosolids transport operations, and dried biosolids storage. Biosolids management facilities at this plant also accept biosolids from the North District WWTP.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description: Detailed Description: Sludge dewatering building is ducted to odor control scrubbers.	
2. Control Device or Method Code(s): 99 – Miscellaneous Control Devices	

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1.	Maximum Process or Throughput Rate:		
2.	Maximum Production Rate: : 52,195 million gallons per year		
3.	Maximum Heat Input Rate: million Btu/hr		
4.	Maximum Incineration Rate: pounds/hr tons/day		
5.	Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6.	Operating Capacity/Schedule Comment:		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:		2. Emission Point Type Code:
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code:	6. Stack Height:	7. Exit Diameter:
8. Exit Temperature:	9. Actual Volumetric Flow Rate:	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate:		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Wastewater Treatment (emission related to million gallons treated).			
2. Source Classification Code (SCC): 5-01-007-99		3. SCC Units: Millions of Gallons	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: 52,195		6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:		9. Million Btu per SCC Unit:
10. Segment Comment: The Central District WWTP is permitted to treat 52,195 million gallons a year.			

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
VOC			NS

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Volatile Organic Compounds	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor:	7. Emissions Method Code:
8. Calculation of Emissions:	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype: No VE all Fugitive	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: N/A	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☒ Attached, Document ID: B ☐ Previously Submitted, Date ____

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ____ ☐ Previously Submitted, Date ____

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ____ ☐ Previously Submitted, Date ____

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ____ ☐ Previously Submitted, Date ____
   ☒ Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   ☐ Attached, Document ID: ____ ☐ Previously Submitted, Date ____
   ☒ Not Applicable

6. Compliance Demonstration Reports/Records
   ☐ Attached, Document ID: ____
   Test Date(s)/Pollutant(s) Tested: ____

   ☐ Previously Submitted, Date: ____
   Test Date(s)/Pollutant(s) Tested: ____

   ☐ To be Submitted, Date (if known): ____
   Test Date(s)/Pollutant(s) Tested: ____

   ☒ Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   ☐ Attached, Document ID: ____ ☒ Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ___________ ☒ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ___________ ☒ Not Applicable	
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ___________ ☒ Not Applicable	

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: ___________	
2. Compliance Assurance Monitoring ☐ Attached, Document ID: ___________ ☐ Not Applicable	
3. Alternative Methods of Operation ☐ Attached, Document ID: ___________ ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: ___________ ☐ Not Applicable	
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:_________ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:_________ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:_________ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:___________ ☐ Previously Submitted, Date:_________ ☐ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   ☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   ☒ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   ☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   ☒ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
Anaerobic Sludge Digesters Gas Flares

3. Emissions Unit Identification Number: 018

4. Emissions Unit Status Code: A	5. Commence Construction Date:	6. Initial Startup Date: 1956	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit? ☐ Yes ☒ No

9. Package Unit:
Manufacturer: Whessoe/Varec Model Number: 239 Series (10) & 249 Series (1)

10. Generator Nameplate Rating:

11. Emissions Unit Comment:
As per our current Title V air operating permit (0250476-001-AV), this emissions unit is unregulated. Emissions unit consists of digester gas flares. There are a total of 11 flares at the plant.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description: Flaring of raw anaerobic digester gas. Flares are operated under the following conditions: (1) the digester cluster safety (pressure relief) valve releases gas to the flare; or (2) monitoring devices detect H_2S in the cluster operations buildings; or (3) Cogeneration engines gas demand is low, or engines inoperative; there is inadequate capacity in the gas storage spheres at the time of flaring.
2. Control Device or Method Code(s): 23 - Flaring

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: 216,000 scf/hr		
2. Maximum Production Rate:		
3. Maximum Heat Input Rate:		
4. Maximum Incineration Rate: pounds/hr tons/day		
5. Requested Maximum Operating Schedule:	24 hours/day 52 weeks/year	7 days/week 8760 hours/year
6. Operating Capacity/Schedule Comment: The maximum throughput rate of 216,000 scf/hr is based on total capacity of all flares installed. (11 flares) (18,000 scf/flare) + (1 flare) (36,000 scf/hr) = 216,000 scf/hr These flares operate only when digester gas can not be used by cogeneration engines.		

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: Flares (Flare)	2. Emission Point Type Code: 3

3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking:

Vertical stack flare.

4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:

5. Discharge Type Code:	6. Stack Height: 28 ft	7. Exit Diameter: 1.7 ft
8. Exit Temperature:	9. Actual Volumetric Flow Rate: 335	10. Water Vapor: %

11. Maximum Dry Standard Flow Rate:	12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)

15. Emission Point Comment:

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment __ of __

1. Segment Description (Process/Fuel Type): Sewage treatment sludge digester gas flare			
2. Source Classification Code (SCC): 50100789		3. SCC Units: Million cubic feet processed	
4. Maximum Hourly Rate:	5. Maximum Annual Rate:		6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:		9. Million Btu per SCC Unit: 650
10. Segment Comment: Heating value of digester gas varies with volumes of CO_2 – CH_4 being generated by microbiologic activity			

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
SO2			**NS**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted:	2. Total Percent Efficiency of Control:
3. Potential Emissions:	4. Synthetically Limited? ☐ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code:
8. Calculation of Emissions:	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation __ of ____

1. Visible Emissions Subtype:	2. Basis for Allowable Opacity: ☐ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment:	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: B   [ ] Previously Submitted, Date ________

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: F   [ ] Previously Submitted, Date ________

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: ________   [ ] Previously Submitted, Date ________

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: H   [ ] Previously Submitted, Date ________
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: I   [ ] Previously Submitted, Date ________
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: ________
   Test Date(s)/Pollutant(s) Tested: ________
   [ ] Previously Submitted, Date: ________
   Test Date(s)/Pollutant(s) Tested: ________
   [ ] To be Submitted, Date (if known): ________
   Test Date(s)/Pollutant(s) Tested: ________
   [x] Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   [ ] Attached, Document ID: ________   [x] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☐ Attached, Document ID: ____________ ☒ Not Applicable	
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☐ Attached, Document ID: ____________ ☒ Not Applicable	
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: ____________ ☒ Not Applicable	

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☒ Attached, Document ID: ____________	
2. Compliance Assurance Monitoring ☐ Attached, Document ID: ____________ ☒ Not Applicable	
3. Alternative Methods of Operation ☒ Attached, Document ID: ____________ ☐ Not Applicable	
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: ____________ ☐ Not Applicable	
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☒ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   [x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   [x] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:

   2.865 MW Diesel Engine Generator # 4, Model Number: 20-645F4B

3. Emissions Unit Identification Number: Additional new unit described below.

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code:	8. Acid Rain Unit?
C			49	[ ] Yes [x] No

9. Package Unit:
   Manufacturer: Electro-Motive/ Electro-Motive Model Number: 20-645F4B

10. Generator Nameplate Rating: 2.865 MW

11. Emissions Unit Comment:

This emission unit consists of 4,000 Bhp diesel fueled internal combustion prime mover coupled to a 2,865 KW generator.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Detailed Description:

Injectors: The injectors used on these engines are called Constant Beginning Of Injection (CBOI) by EMD. A standard injector is designed so that as the engine load increases, the point at which fuel injection into the cylinder starts advances (happens further before top dead center). The CBOI injector has fixed timing and there is no advance based on engine load.

Injection Timing: The standard timing on an EMD engine is 0 degrees before top dead center (BTDC). In order to achieve the proper operation with the CBOI injectors, the timing on these engines is set for 1 degree BTDC.

Intercoolers: The intercoolers cool the combustion air before it enters the air box and the cylinders. The standard EMD intercooler is a 2-pass type heat exchanger. In order to achieve additional cooling and assist in NOx reduction, these engines have 4-pass intercooler.

2. Control Device or Method Code(s): 99 – Miscellaneous Control Devices

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: 103,500 MMBTU/ yr	
4. Maximum Incineration Rate:	
5. Requested Maximum Operating Schedule: 24 hours/day 52 weeks/year	7 days/week 8,760 hours/year
6. Operating Capacity/Schedule Comment: The maximum heat input rate is for all standby generators combined (existing and proposed) and based on: (725,000 Gal) * (138 MMBTU/1000 Gal) = 100,050 MMBTU/yr The operation of all standby generators will be limited by a fuel consumption limitation of 725,000 gallons for all standby generators combined. (Emission units 013, 014, 015 and 2 new proposed).	

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: EMD 4-5	2. Emission Point Type Code: 3	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Generators each with a vertical stack located on top of the enclosure structure.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: V	6. Stack Height: 23.3 feet	7. Exit Diameter: 2.3 feet
8. Exit Temperature: 635 °F	9. Actual Volumetric Flow Rate: 21,350 acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate:	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Diesel fueled internal combustion engines (emissions related to thousand gallons burned).		
2. Source Classification Code (SCC): 2-02-004-01	3. SCC Units: Thousand gallons burned (all liquid fuels).	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: 725,000 gallons	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.05	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: The maximum annual rate of 725,000 gallons/year is for all standby generators (emission units 013, 014, 015 and the 2 proposed units) combined.		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX	**99**		**EL**
SO2	**99**		**NS**
PM10			**NS**
VOC			**NS**
CO			**NS**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NO_X Nitrogen Oxides	2. Total Percent Efficiency of Control: 52
3. Potential Emissions: 137.57 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 2.75 lbs/MMBtu Reference: Requested by Applicant	7. Emissions Method Code: 0
8. Calculation of Emissions: (725,000 gals/yr) * (138 MMBtu/1000 gals) * (2.75 lbs NOx/MMBTU) * (1 ton/ 2000 lb) = 137.57 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO Carbon Monoxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 42.05 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 116 lbs/1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (116 lbs CO/1000 gals) * (1 ton/ 2000 lb) = 42.05 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2 Sulfur Dioxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.5 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 6.9 lbs / 1000 gal Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (6.9 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.5 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM 10 Particle Mater 10	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.85 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 7.85 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (7.85 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.85 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Volatile Organic Compounds	2. Total Percent Efficiency of Control:
3. Potential Emissions: 4.97 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 13.7 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (13.7 lbs/1000 gals) * (1 ton/ 2000 lb) = 4.97 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: ESCPSD	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 2.15 lbs NOx / MMBTU	4. Equivalent Allowable Emissions:
5. Method of Compliance: Annual emission testing for NOx using EPA Method 7 or 7E of the exhaust gas via rack probe placed into engine exhaust (stack) outlet.	
6. Allowable Emissions Comment (Description of Operating Method)	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: 20	2. Basis for Allowable Opacity: ☒ Rule ☐ Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40 % Maximum Period of Excess Opacity Allowed: 6 min/hour	
4. Method of Compliance: Annual opacity monitoring using EPA Method 9.	
5. Visible Emissions Comment: Exceptional conditions during deadline (emergency) start and initial loading until units reach normal operating conditions and temperatures.	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: N/A	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: B [ ] Previously Submitted, Date ______

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: F [ ] Previously Submitted, Date ______

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: G [ ] Previously Submitted, Date ______

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: H [ ] Previously Submitted, Date ______
[ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
[x] Attached, Document ID: I [ ] Previously Submitted, Date ______
[ ] Not Applicable

6. Compliance Demonstration Reports/Records
[ ] Attached, Document ID: ______
Test Date(s)/Pollutant(s) Tested: ______
[ ] Previously Submitted, Date: ______
Test Date(s)/Pollutant(s) Tested: ______
[x] To be Submitted, Date (if known): ______
Test Date(s)/Pollutant(s) Tested: Initial Compliance Demonstration Test for NOx emissions to be conducted upon completion of installation.
[ ] Not Applicable

Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
[x] Attached, Document ID: J [ ] Not Applicable

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☒ Attached, Document ID: K	☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☒ Attached, Document ID: L	☐ Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☒ Attached, Document ID: M	☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: ______	
2. Compliance Assurance Monitoring ☐ Attached, Document ID: ______	☐ Not Applicable
3. Alternative Methods of Operation ☐ Attached, Document ID: ______	☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: ______	☐ Not Applicable
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:______ ☐ Previously Submitted, Date:______ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:______ ☐ Previously Submitted, Date:______ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:______ ☐ Previously Submitted, Date:______ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:______ ☐ Previously Submitted, Date:______ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:______ ☐ Previously Submitted, Date:______ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:______ ☐ Previously Submitted, Date:______ ☐ Not Applicable	

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application for air permit. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised/renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. **The air construction permitting classification must be used to complete the Emissions Unit Information Section of this application for air permit.** A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air construction permitting and insignificant emissions units are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

   [x] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

   [ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

   [x] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

   [ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

3. Description of Emissions Unit Addressed in this Section:

   2.865 MW Diesel Engine Generator # 5, Model Number: 20-645F4B

3. Emissions Unit Identification Number: Additional new unit described below.

4. Emissions Unit Status Code:	5. Commence Construction Date:	6. Initial Startup Date:	7. Emissions Unit Major Group SIC Code: 49	8. Acid Rain Unit?
C				[ ] Yes [x] No

9. Package Unit:
   Manufacturer: Electro-Motive/ Electro-Motive Model Number: 20-645F4B

10. Generator Nameplate Rating: 2.865 MW

11. Emissions Unit Comment:

This emission unit consists of 4,000 Bhp diesel fueled internal combustion prime mover coupled to a 2,865 KW generator.

Emissions Unit Control Equipment

1. Control Equipment/Method(s) Description:

Detailed Description:

Injectors: The injectors used on these engines are called Constant Beginning Of Injection (CBOI) by EMD. A standard injector is designed so that as the engine load increases, the point at which fuel injection into the cylinder starts advances (happens further before top dead center). The CBOI injector has fixed timing and there is no advance based on engine load.

Injection Timing: The standard timing on an EMD engine is 0 degrees before top dead center (BTDC). In order to achieve the proper operation with the CBOI injectors, the timing on these engines is set for 1 degree BTDC.

Intercoolers: The intercoolers cool the combustion air before it enters the air box and the cylinders. The standard EMD intercooler is a 2-pass type heat exchanger. In order to achieve additional cooling and assist in NOx reduction, these engines have 4-pass intercooler.

2. Control Device or Method Code(s): 99 – Miscellaneous Control Devices

B. EMISSIONS UNIT CAPACITY INFORMATION

(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate:
2. Maximum Production Rate:
3. Maximum Heat Input Rate: 103,500 MMBTU/ yr
4. Maximum Incineration Rate:
5. Requested Maximum Operating Schedule: 24 hours/day; 7 days/week; 52 weeks/year; 8,760 hours/year
6. Operating Capacity/Schedule Comment: The maximum heat input rate is for all standby generators combined (existing and proposed) and based on: (725,000 Gal) * (138 MMBTU/1000 Gal) = 100,050 MMBTU/yr The operation of all standby generators will be limited by a fuel consumption limitation of 725,000 gallons for all standby generators combined. (Emission units 013, 014, 015 and 2 new proposed).

C. EMISSION POINT (STACK/VENT) INFORMATION
(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: EMD 4-5	2. Emission Point Type Code: 3	
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: Generators each with a vertical stack located on top of the enclosure structure.		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: V	6. Stack Height: 23.3 feet	7. Exit Diameter: 2.3 feet
8. Exit Temperature: 635 °F	9. Actual Volumetric Flow Rate: 21,350 acfm	10. Water Vapor: %
11. Maximum Dry Standard Flow Rate:	12. Nonstack Emission Point Height: feet	
13. Emission Point UTM Coordinates... Zone: 17 East (km): North (km):	14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)	
15. Emission Point Comment:		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type): Diesel fueled internal combustion engines (emissions related to thousand gallons burned).		
2. Source Classification Code (SCC): 2-02-004-01	3. SCC Units: Thousand gallons burned (all liquid fuels).	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: 725,000 gallons	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur: 0.05	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: The maximum annual rate of 725,000 gallons/year is for all standby generators (emission units 013, 014, 015 and the 2 proposed units) combined.		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
NOX	**99**		**EL**
SO2	**99**		**NS**
PM10			**NS**
VOC			**NS**
CO			**NS**

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: NO_X Nitrogen Oxides	2. Total Percent Efficiency of Control: 52
3. Potential Emissions: 137.57 tons/year	4. Synthetically Limited? [x] Yes [ ] No
5. Range of Estimated Fugitive Emissions (as applicable):	
6. Emission Factor: 2.75 lbs/MMBtu Reference: Requested by Applicant	7. Emissions Method Code: 0
8. Calculation of Emissions: (725,000 gals/yr) * (138 MMBtu/1000 gals) * (2.75 lbs NOx/MMBTU) * (1 ton/ 2000 lb) = 137.57 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment:	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: CO Carbon Monoxide	2. Total Percent Efficiency of Control:
3. Potential Emissions: 42.05 tons/year	4. Synthetically Limited? [x] Yes [ ] No
7. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 116 lbs/1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3

8. Calculation of Emissions:

(725,000 gals/yr) * (116 lbs CO/1000 gals) * (1 ton/ 2000 lb) = 42.05 TPY

9. Pollutant Potential/Estimated Fugitive Emissions Comment:

Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: SO_2 Sulfur Dioxides	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.5 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
7. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 6.9 lbs / 1000 gal Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (6.9 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.5 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: PM 10 Particle Mater 10	2. Total Percent Efficiency of Control:
3. Potential Emissions: 2.85 tons/year	4. Synthetically Limited? [x] Yes [ ] No
7. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 7.85 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (7.85 lbs/1000 gals) * (1 ton/ 2000 lb) = 2.85 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL/ESTIMATED FUGITIVE EMISSIONS

(Optional for unregulated emissions units.)

Potential/Estimated Fugitive Emissions

Complete for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

1. Pollutant Emitted: VOC Volatile Organic Compounds	2. Total Percent Efficiency of Control:
3. Potential Emissions: 4.97 tons/year	4. Synthetically Limited? ☒ Yes ☐ No
7. Range of Estimated Fugitive Emissions (as applicable):	
8. Emission Factor: 13.7 lbs / 1000 gals Reference: SCC 20200401 EPA FIRE VER 6.24	7. Emissions Method Code: 3
8. Calculation of Emissions: (725,000 gals/yr) * (13.7 lbs/1000 gals) * (1 ton/ 2000 lb) = 4.97 TPY	
9. Pollutant Potential/Estimated Fugitive Emissions Comment: Ton per year is based on annual fuel consumption of 725,000 gallons for all standby generators	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: ESCPSD	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: 2.15 lbs NOx / MMBTU	4. Equivalent Allowable Emissions:
5. Method of Compliance: Annual emission testing for NOx using EPA Method 7 or 7E of the exhaust gas via rack probe placed into engine exhaust (stack) outlet.	
6. Allowable Emissions Comment (Description of Operating Method)	

G. VISIBLE EMISSIONS INFORMATION

Complete if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: 20	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: 20 % Exceptional Conditions: 40 % Maximum Period of Excess Opacity Allowed: 6 min/hour	
4. Method of Compliance: Annual opacity monitoring using EPA Method 9.	
5. Visible Emissions Comment: Exceptional conditions during deadline (emergency) start and initial loading until units reach normal operating conditions and temperatures.	

H. CONTINUOUS MONITOR INFORMATION

Complete if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor ___ of ___

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: N/A	

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: B [ ] Previously Submitted, Date ______

2. Fuel Analysis or Specification (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: F [ ] Previously Submitted, Date ______

3. Detailed Description of Control Equipment (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: G [ ] Previously Submitted, Date ______

4. Procedures for Startup and Shutdown (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: H [ ] Previously Submitted, Date ______
   [ ] Not Applicable (construction application)

5. Operation and Maintenance Plan (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: I [ ] Previously Submitted, Date ______
   [ ] Not Applicable

6. Compliance Demonstration Reports/Records
   [ ] Attached, Document ID: ______
   Test Date(s)/Pollutant(s) Tested: ______
   [ ] Previously Submitted, Date: ______
   Test Date(s)/Pollutant(s) Tested: ______
   [x] To be Submitted, Date (if known): ______
   Test Date(s)/Pollutant(s) Tested: Initial Compliance Demonstration Test for NOx emissions to be conducted upon completion of installation.
   [ ] Not Applicable

   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute
   [x] Attached, Document ID: J [ ] Not Applicable

Additional Requirements for Air Construction Permit Applications

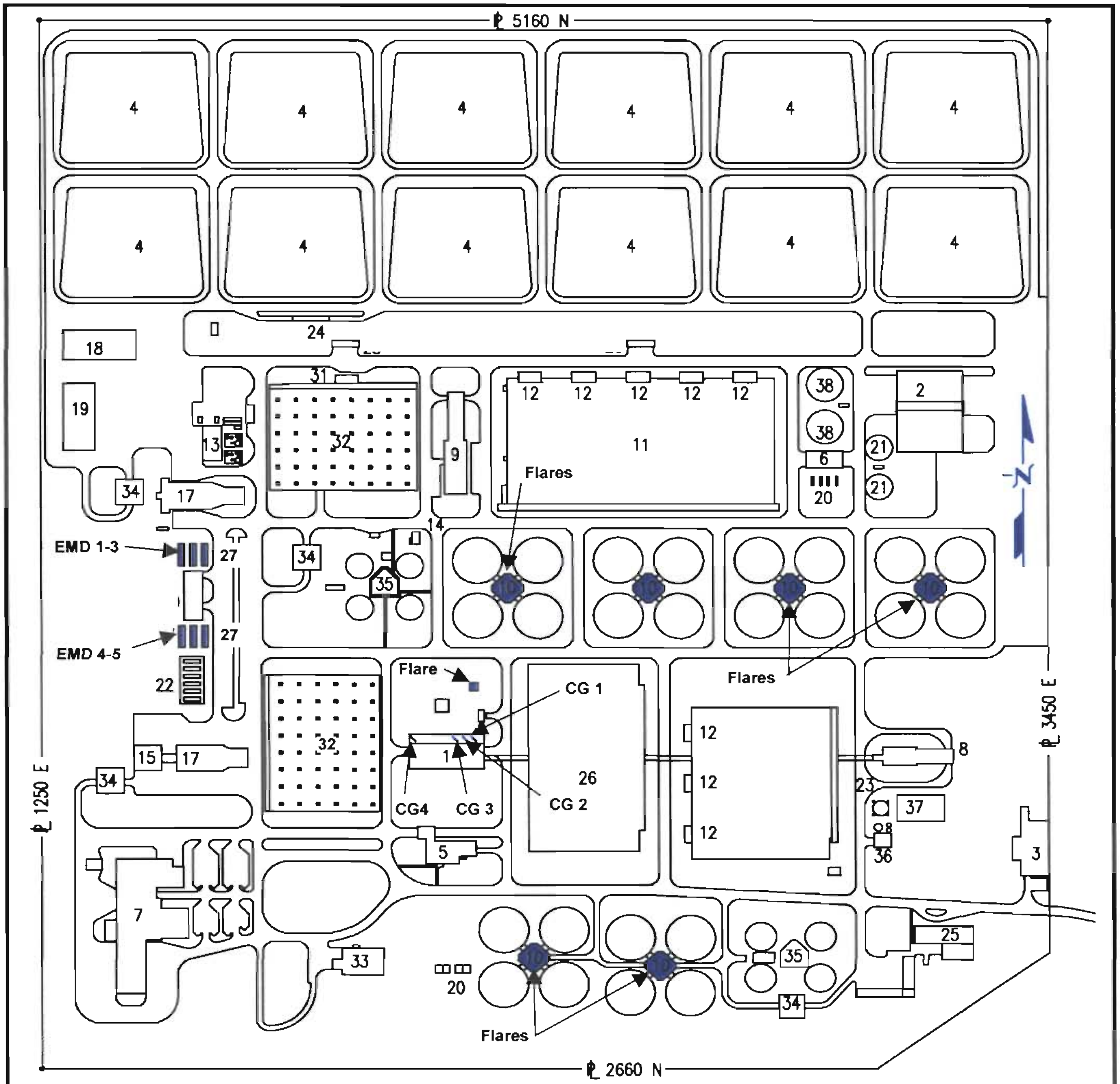
1. Control Technology Review and Analysis (Rules 62-212.400(6) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)) ☒ Attached, Document ID: K ☐ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rule 62-212.400(5)(h)6., F.A.C., and Rule 62-212.500(4)(f), F.A.C.) ☒ Attached, Document ID: L ☐ Not Applicable
3. Description of Stack Sampling Facilities (Required for proposed new stack sampling facilities only) ☒ Attached, Document ID: M ☐ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements ☐ Attached, Document ID: ____________
2. Compliance Assurance Monitoring ☐ Attached, Document ID: ___________ ☐ Not Applicable
3. Alternative Methods of Operation ☐ Attached, Document ID: ___________ ☐ Not Applicable
4. Alternative Modes of Operation (Emissions Trading) ☐ Attached, Document ID: ___________ ☐ Not Applicable
5. Acid Rain Part Application ☐ Certificate of Representation (EPA Form No. 7610-1) ☐ Copy Attached, Document ID:_ ☐ Acid Rain Part (Form No. 62-210.900(1)(a)) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Repowering Extension Plan (Form No. 62-210.900(1)(a)1.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ New Unit Exemption (Form No. 62-210.900(1)(a)2.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Retired Unit Exemption (Form No. 62-210.900(1)(a)3.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Compliance Plan (Form No. 62-210.900(1)(a)4.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Phase II NOx Averaging Plan (Form No. 62-210.900(1)(a)5.) ☐ Attached, Document ID:____________ ☐ Previously Submitted, Date:_________ ☐ Not Applicable

Additional Requirements Comment

Attachment A
Facility Plot Plan



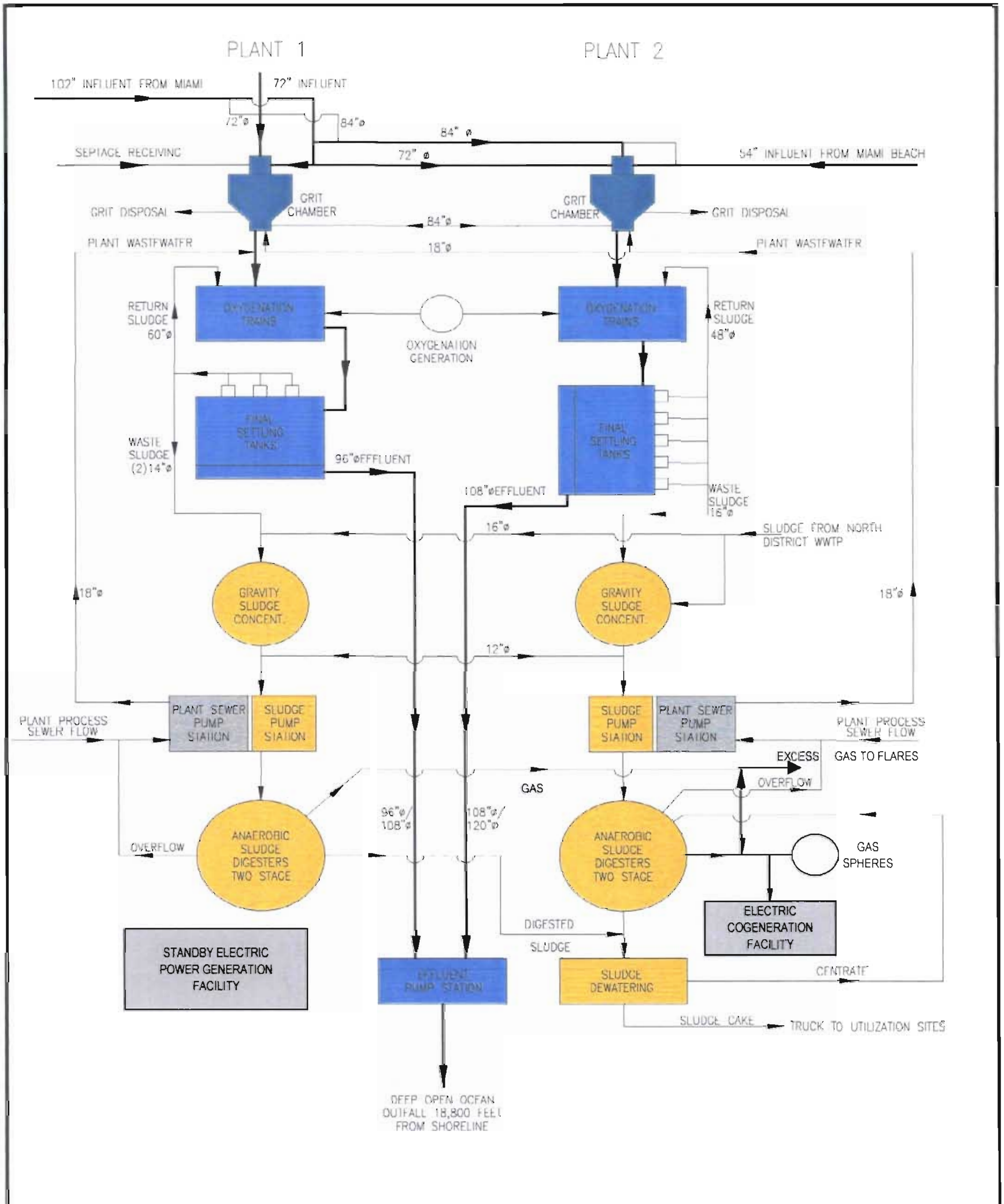
LEGEND

1. Cogeneration Bldg.
2. Dewatering Bldg.
3. Effluent Pump Station
4. Drying Beds (N.I.S.)
5. Maintenance Bldg. No. 1
6. Gas Compression Bldg.
7. Maintenance Bldg. No. 2
8. Chlorine Bldg. 1
9. Chlorine Bldg. 2
10. Digester Clusters
11. Final Settling Tanks
12. Pump Houses, Finals
13. Oxygen Plant Bldg.
14. Polymer Bldg.
15. Septage Unloading Bldg.
17. Screening & Grit Chambers
18. Sludge Storage Bldg. 1
19. Sludge Storage Bldg. 2
20. Digester Gas Scrubbers
21. Gravity Thickers
22. Fuel Storage
23. Potable Water Tower
24. Sludge Weigh Station
25. Administration Bldg.
26. Aeration Tanks
27. Standby Generators (Existing & Future)
31. Oxygenations Trains Control Building
32. Oxygenation Trains
33. Warehouse Storage Building
34. Air Scrubber Building
35. Potable Water Building
37. Potable Water Reservoir
38. Gas Storage Spheres

Central District Wastewater Treatment Plant
Facility Site Plan

Attachment A

Attachment B
Process Flow Diagram



SERVE • CONSERVE	**Central District Wastewater Treatment Plant Process Flow Diagram**	**Attachment B**

Attachment C
Precaution to Prevent Emissions of Unconfined Particle Matter

Attachment C

Precautions To Prevent Emissions of Unconfined Particulate Matter Central District Wastewater Treatment Plant

Due to the nature of activities conducted at Central District Wastewater Treatment Plant (WWTP), suppression of airborne particulate matter is extremely important. The Central District WWTP will take the following precautions to prevent the release of unconfined particulate matter:

- Paving and maintenance of roads, parking areas, and yards.
- Application of water or chemicals to control emissions from such activities as demolition of buildings, grading roads, construction, and land clearing.
- Application of asphalt, water, oil, chemicals, or other dust suppressants to unpaved roads, yards, open stock piles, and similar sources.
- Removal of particulate matter from buildings or work area to prevent particulate from becoming airborne.
- Landscaping or planting of vegetation.
- Use of hoods, fans, filters, and similar equipment to contain and or vent particulate matter.
- Confining abrasive blasting, where possible.

Attachment D
List of Emission Units and/or Activities that are
Consider Insignificant

The below listed emission units and/or activities are considered insignificant pursuant to Rule 62-213.430(6), F.A.C.

1. Grit Handling (grit collection & storage)
2. Sludge storage building
3. Sludge drying beds (Not in service)
4. Diesel fuel storage for emergency generators
5. Diesel fuel storage for vehicles
6. Unleaded gasoline fuel storage for vehicles
7. Maintenance (painting, vehicles, parts degreaser unit)
8. Laboratory. (hoods)
9. Diesel Driven Starting Air Compressor. (standby generators)

Attachment E
Identification of Applicable Requirement -Table 1
Compliance Report and Plan - Table 2

Attachment E / Table 1
Summary of Applicable Regulations - Administrative Requirements
Central District Wastewater Treatment Plant
Miami-Dade Water and Sewer Department

Citation	Content	Compliance Statement
40 CFR 61 Subpart M: NESHAP for Asbestos	Regulates control of asbestos during construction and demolition operations.	Rule will apply if facility conducts construction or demolition involving asbestos.
62- 4, FAC: Permits	Permit fees; exemptions; Consultation with FDEP; Standard for Issuing or Denial; Modifications; Renewals; Suspension and Revocation; Financial Responsibility; Transfer of Permits; Plant Operational Problems; and Permit Conditions.	Facility will meet requirements of this rule when submitting any permit applications. Applies to Title V permits, FESOP permits, construction permits, and any permit requiring PSD review.
62- 103 FAC: Rules of Administrative Procedure	Public notice of application and proposed agency action.	FDEP will issue public notice of proposed agency action for all Title V, FESOP, and construction permits prior to issuance.
62- 210, FAC: Stationary Sources - General Requirements	Construction and Operating Permits Required; Permit Exempt Sources; Public Notice Rules; Administrative Permit Correction; Annual Operating Reports; Emissions Estimates; Circumvention; Excess Emissions; Forms and Instructions.	Facility will meet the requirements of this rule for this Title V operating permit application, and will meet the requirements of this rule for any subsequent permit applications or amendments resulting from expansion or modification of the facility.
62- 212, FAC: Stationary Sources - Preconstruction Review	PSD Review; Nonattainment Area New Source Review; Source Reclassification	Facility is not subject to PSD review as part of this Title V permit application, but will go through PSD review if future expansion or modification exceeds PSD trigger levels. The provisions of nonattainment area new source review no longer apply.
62- 213, FAC: Operation Permits for Major Source of Air Pollution	Annual Operating License Fees; App Processing Fees; Permits/Permit Revisions; Changes w/o Revision; Immediate Implementation Pending Revision; Emissions Trading; Permit Apps; Permit Issuance, Denial, Revision; Permit Review; Permit Shield.	Facility is applying for a Title V operating permit and will meet the requirements of this rule.
62- 296, FAC: Stationary Sources - Emission Standards	Unconfined Emissions of PM; Objectionable Odor Prohibition; Emission Standards; RACT; NSPS; NESHAPs.	Facility will comply with applicable emission standards for its sources.
62- 297, FAC: Stationary Sources - Emissions Monitoring	Test Requirements; Procedures; Frequency; Stack Sampling Facilities; Determination of Process Variables; Test Reports; Exceptions and Approval of Alternate Procedures/Requirements.	Facility will submit emissions monitoring test reports for sources regulated by a standard under 62-296, FAC.

Attachment E / Table 2
Summary of Applicable Regulations and Compliance Status - Pollutants
Central District Wastewater Treatment Plant
Miami-Dade Water and Sewer Department

Source	Regulated Pollutant	Emission Standard/Requirement		In Compliance?	Compliance Demonstration	
		Citation[1]	Requirement		Method	Frequency
Entire Facility	Asbestos	40 CFR 61 Subpart M	Regulates control of asbestos during construction and demolition operations.	Yes	If necessary, implement an Asbestos Removal Plan.	As Needed
	Unconfined Emission Particle Matter	62 -296 .320(4)(c)	Must have effective measures or precautions to prevent emissions of unconfined emission particle matter.	Yes	Implement a formal Fugitive Dust Control Plan.	Continuous
	Odor	62 -296 .320(2)	It is prohibited to permit the discharge of air pollutants which cause or contribute to an objectionable odor.	Yes	Implement a formal Odor Control Plan.	Continuous
	SO_2	MD-24-17	Ambient air quality standards for SO_2 not to be exceeded more than once per year: 350 $\mu g/m^3$ (0.13 ppm - 3-hr); 110 $\mu g/m^3$ (0.04 ppm - 24-hr); and 25 $\mu g/m^3$ (0.007 ppm - annual arithmetic mean) .	Yes	Facility is not required to demostrate compliance with MD-DERM	NA
	PM_{10}	40 CFR 60.6	24-hr and annual average PM_{10} concentrations not to exceed 150 $\mu g/m^3$ and 50 $\mu g/m^3$ more than once per year.	Yes	Facility is not required to demostrate compliance with National Ambient Air Quality Standards (NAAQS).	NA
	CO	40 CFR 50.8	Maximum 1-hr CO concentration not to be exceeded more than once per year - 40 mg/m^3 (35 ppm); maximum 8-hr CO concentration not to be exceeded more than once per year - 10 $\mu g/m^3$ (9 ppm).	Yes	Facility is not required to demostrate compliance with NAAQS.	NA
	Ozone	40 CFR 50.9	Daily maximum 1-hr ozone concentration not to be exceeded more than once per year - 235 $\mu g/m^3$ (0.12 ppm).	Yes	Facility is not required to demostrate compliance with NAAQS.	NA
	NO_2	40 CFR 50.11	Annual arithmetic mean NO_2 concentration not to exceed 100 $\mu g/m^3$ (0.05 ppm).	Yes	Facility is not required to demostrate compliance with NAAQS.	NA
	Lead	40 CFR 50.12	Maximum quarterly arithmetic mean Pb concentration not to exceed 1.5 $\mu g/m^3$.	Yes	Facility is not required to demostrate compliance with NAAQS.	NA
	H_2S	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient H_2S concentrations not to exceed 140 $\mu g/m^3$, 33.6 $\mu g/m^3$, and 0.9 $\mu g/m^3$, respectively	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA

Attachment E / Table 2
Summary of Applicable Regulations and Compliance Status - Pollutants
Central District Wastewater Treatment Plant
Miami-Dade Water and Sewer Department

Source	Regulated Pollutant	Emission Standard/Requirement		In Compliance?	Compliance Demonstration	
		Citation[1]	Requirement		Method	Frequency
	Florida Air Toxics (includes Federal HAPs)	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient concentrations are established as guidelines not to be exceeded for 751 compounds designated as air toxics in Florida.	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA
Degreasers/Parts Cleaners	VOCs	40 CFR 63.T	Cold cleaning facilities must have a cover; be equipped to allow parts to drain; install controls if solvent volatility > 0.6 psi @ 100 F (water cover, freeboard > 0.7, or other system); label with operating requirements; store waste solvent in covered container to keep evaporation < 20%; close cover when not in use; drain for 15 seconds following use; minimize splashing during use.	Yes	Operate parts washer units in accordance with posted instructions.	Continuous
	VOCs	62 -296 .320(1)	It is prohibited to pump, handle, process, load, unload, or use in any process or installation, VOCs or organic solvents without applying existing known vapor emission control devices deemed necessary by FDEP.	Yes	Operate parts washer units in accordance with posted instructions.	Continuous
Digester Gas Fueled Cogeneration Engines	Opacity	62 -210 .700(1)	Excess emissions resulting from startup, shutdown, or malfunction of any source shall be permitted providing (1) best operational practices are adhered to and duration is minimized, but in not case exceeds 2 hours in any 24-hour period.	Yes	Practice proper combustion equipment maintenance.	Continuous
	Opacity	62 -296 .310(2)	Emissions from any source resulting in opacity greater than 20% prohibitited.	Yes	EPA Method 9	Annual
	NOx	62 -296 .570(4)(b)9.	Emissions of NOx from any emission source not regulated by a standard under parts 1 through 8 of this section [62-296.570(4)(b)] shall not exceed 0.5 lb/mmbtu heat input.	Yes	EPA Method 7	Annual
	H_2S	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient H_2S concentrations not to exceed 140 $\mu g/m^3$, 33.6 $\mu g/m^3$, and 0.9 $\mu g/m^3$, respectively	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA
	Florida Air Toxics (includes Federal HAPs)	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient concentrations are established as guidelines not to be exceeded for 751 compounds designated as air toxics in Florida.	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA

Attachment E / Table 2
Summary of Applicable Regulations and Compliance Status - Pollutants
Central District Wastewater Treatment Plant
Miami-Dade Water and Sewer Department

Source	Regulated Pollutant	Emission Standard/Requirement		In Compliance?	Compliance Demonstration	
		Citation[1]	Requirement		Method	Frequency
Digester Gas Flares	Opacity	62 -296 .310(2)	Emissions from any source resulting in opacity greater than 20% prohibitited.	Yes	External combustion of digester gas does not produce PM.	NA
	NOx	62 -296 .570(4)(b)9.	Emissions of NOx from any emission source not regulated by a standard under parts 1 through 8 of this section [62-296.570(4)(b)] shall not exceed 0.5 lb/mmbtu heat input.	No	EPA Method 7	Annual
	H_2S	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient H_2S concentrations not to exceed 140 $\mu g/m^3$, 33.6 $\mu g/m^3$, and 0.9 $\mu g/m^3$, respectively	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA
	Florida Air Toxics (includes Federal HAPs)	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient concentrations are established as guidelines not to be exceeded for 751 compounds designated as air toxics in Florida.	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA
Standby Generators	Opacity	62 -297 .340(1)(e)	Annual compliance testing for particulate matter emissions shall not be required for any fuel burning source that, during the federal fiscal year, does not burn liquid and/or solid fuel, other than during startup, for a total of more than 400 hours.	Yes	Cumulative hours of operation displayed on generators are recorded monthly.	Monthly
	Opacity	62 -210 .700(1)	Excess emissions resulting from startup, shutdown, or malfunction of any source shall be permitted providing (1) best operational practices are adhered to and duration is minimized, but in not case exceeds 2 hours in any 24-hour period.	Yes	Practice proper combustion equipment maintenance.	Continuous
	Opacity	62 -296 .310(2)	Emissions from any source resulting in opacity greater than 20% prohibitited.	Yes	Practice proper combustion equipment maintenance	Continuous
	NOx	62 -296 .570(4)(a)3.	Annual compliance testing while firing oil is unnecessary for units operating less than 400 hours per year.	Yes	Cumulative hours of operation displayed on generators are recorded monthly.	Monthly
	Florida Air Toxics (includes Federal HAPs)	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient concentrations are established as guidelines not to be exceeded for 751 compounds designated as air toxics in Florida.	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA

Attachment E / Table 2
Summary of Applicable Regulations and Compliance Status - Pollutants
Central District Wastewater Treatment Plant
Miami-Dade Water and Sewer Department

Source	Regulated Pollutant	Emission Standard/Requirement		In Compliance?	Compliance Demonstration	
		Citation[1]	Requirement		Method	Frequency
Liquid Processes	Odor	62 -296 .320(2)	It is prohibited to permit the discharge of air pollutants which cause or contribute to an objectionable odor.	Yes	Implement a formal Odor Control Plan.	Continuous
	H_2S	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient H_2S concentrations not to exceed 140 μg/m^3, 33.6 μg/m^3, and 0.9 μg/m^3, respectively	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA
	Florida Air Toxics (includes Federal HAPs)	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient concentrations are established as guidelines not to be exceeded for 751 compounds designated as air toxics in Florida.	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA
Solids Handling Processes	Odor	62 -296 .320(2)	It is prohibited to permit the discharge of air pollutants which cause or contribute to an objectionable odor.	Yes	Implement a formal Odor Control Plan.	Continuous
	H_2S	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient H_2S concentrations not to exceed 140 μg/m^3, 33.6 μg/m^3, and 0.9 μg/m^3, respectively	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA
	Florida Air Toxics (includes Federal HAPs)	Florida Air Toxics Working List Guidelines	Maximum 8-hr, 24-hr, and annual average ambient concentrations are established as guidelines not to be exceeded for 751 compounds designated as air toxics in Florida.	Yes	Facility is not required to demostrate compliance with Florida air toxics guideline concentrations.	NA
Roadway Traffic	Fugitive PM	62 -296 .320 (4)(C)	Emissions of unconfined particulate matter prohibited.	Yes	Implement a formal Fugitive Dust Control Plan.	Continuous

1 Federal citation from Chapter 40 of the U.S. Code of Federal Regulations (CFR). State of Florida regulations from Chapter 62 of the Florida Administrative Code.

Attachment F

Fuel Analysis and Specification

CH2M HILL Engineers Planners Economists Scientists

October 13, 1994

Mr. Mike Ridge, Manager
Environmental Engineering
South Florida Environmental Services
6821 Vista Parkway North
West Palm Beach, FL 33411

Dear Mr. Ridge:

Subject: Digester Gas Composition, Virginia Key, Black Point WWTPs

As you requested, the Heating Value of the scrubbed methane gas used at the Virginia Key and Black Point WWTPs is 700 BTU/SCF. The sources for this information are the Air Construction Permit Applications and supplementary information for the methane gas engines at the two plants. Attached is one of the sources.

If you have any questions, please call me at (305) 426-4008.

Sincerely,

CH2M HILL

Alvaro A. Linero 10/13

Alvaro A. Linero, P.E.
Environmental Engineer

MIA1001403E.WP5
cc: Bertha Goldenberg, P.E., MDWASD
Len Drago/DFB

MEMORANDUM TO: JOE TESSITORE
FROM: JOHN W. GREENLEAF, JR.

TABLE 2
DIGESTER GAS CHARACTERISTICS

	BEFORE SCRUBBING		AFTER SCRUBBING	
	Dr. Moore	Mr. Pascul	Dr. Moore	Mr. Pascul
*CH_4%	66.2	63.4	71.6	72.6
CO_2%	33.8	36.6	28.4	27.4
HHV BTU/SCF	617	N/A	703	N/A

*Note CH_4% - 100 - CO_2% assumed

TABLE 3
RAW GAS HYDROGEN SULFIDE LEVEL - GRAINS/100 SCF

MONTH	1976	1977	1978	1979	1980	1981
January	290	400	350	500	540	N/A
February	225	350	250	353	515	N/A
March	285	300	390	395	905	N/A
April	325	320	350	365	514	
May	305	305	310	600	N/A	
June	345	280	290	315	N/A	
July	255	348	290	360	N/A	
August	340	185	223	320	N/A	
September	285	285	260	435	245	
October	215	245	260	450	N/A	
November	310	400	285	470	N/A	
December	380	400	325	345	N/A	

TABLE 4
SCRUBBED GAS HYDROGEN SULFIDE LEVEL - GRAINS/100 SCF

MONTH	1976	1977	1978	1979	1980	1981
January	41.2	42	30	40	41	20
February	42	38	30	34	38	18.2
March	33.4	35	35	36	39	26
April	34	47	41	25	37	
May	34	41	35	33	37	
June	35	40	39	26	32	
July	30	35	35	25	32	
August	36	35	35	30	28	
September	38	25	40	30	30	
October	43	27	38	30	20	
November	37	33	40	30	20	
December	43	27	39	37	19	

CUSTOMER COPY - 2 **BEST AVAILABLE COPY**

EMERGENCY NUMBER CHEMTREC 1-800-424-

Coastal Refining & Marketing, I
A SUBSIDIARY OF THE COASTAL CORPORATION
The Energy People

INSERT FOLLOWING WHEN REQUIRED BY FEDERAL OR STATE LAWS OR REGULATIONS

ICC	IT	STATE PERMIT OR LICENSE	VEHICLE LICENSE NO.	STATE MFT FUEL TAX RATE

"...to certify that the above-named materials are properly classified, described, packaged, marked and labeled, and are in proper condition for transportation, according to the applicable regulations of the Department of Transportation."

"This is to also certify that the above-named materials are properly classified, described, packaged, marked, and labeled according to the applicable regulations of the Federal Trade Commission and the Environmental Protection Agency."

Shipper's imprint in lieu of stamp; not a part of Bill of Lading approved by the Interstate Commerce Commission.

Seller represents that in the production and manufacture of the goods and/or services covered by this invoice, it has fully complied with all the provisions of THE FAIR LABOR STANDARDS ACT OF 1938, as amended.

SEAL NOS.

LOADED FOR COASTAL BY ______ DATE 11-27-96

RECEIVED BY TRUCK DRIVER ______ DATE

RAIL SHIPMENTS REQUIRE RAILROAD BILL OF LADING

GOODS RECEIVED: ______

PURCHASER: ______

SHIPPER

TRUCK NO. 6112 TRLR NO. 6205

If this shipment moves in other than Shipper's vehicle, it shall be governed by (a) the contract between shipper and carrier is a contract carrier or (b) the terms of the applicable uniform bill of lading form prescribed in the current Motor Freight Classification, if carrier is a common carrier, provided that, if this is intrastate shipment by common c... state where bills of lading have been legally prescribed, this shipment shall be governed by the terms of applicab... lading.

SPECIAL TRUCK MARKINGS, LABELS OR PLACARDS OFFERED/APPLIED AS REQUIRED BY DEPARTMENT OF TRANSPORTATI...

CARRIER CERTIFIES THAT THE CARGO TANK SUPPLIED FOR THIS SHIPMENT IS A PROPER CONTAINER FOR THE TRANSPORTATION OF THIS COMMODITY

X

CUSTOMER	LOCATION	TERMINAL	DATE	TIME	CARRIER	BILL OF LADING
MIAMI1		PORT EVERGLADES	11-27-96	14:05:33	BOCO	00103463

Dest Code Meth Del CU FOB Order

PO

Carrier COASTAL REF & MKTG INC

Card Reference Numbers

Customer	Exchange	Carrier	DR/VI
023312		03547	0130

Charge To:

Deliver To:
MIAMI DADE WATER AND SEWR
PRESTON PLANT
1100 W 2 AVE
PO#S08135B
HIALEAH FL 33010

Prod	Description	Unit	Gross	Temp	API	Net
DIESEL FUEL, 3, NA1993 PGIII						
DSLS DIESEL 0.05%S MAX		GALS	07501.00	078.6	34.9	07436.30

THIS DIESEL FUEL DOES NOT CONTAIN VISIBLE EVIDENCE OF DYE.

19' - 20 1/4

RESPONDENT: COASTAL REFINING AND MARKETING, INC. E.P.A. REGISTRATION #4116
... GREENWAY PLAZA HOUSTON, TX 77046

BEST AVAILABLE COPY

Non-Negotiable Bill of Lading

MARATHON OIL COMPANY "Transferor" – 539 S. MAIN ST., FINDLAY, OH – EPA – RFG REG #5045

MATERIAL SAFETY DATA SHEET AVAILABLE FROM THE TERMINAL FOR THESE PRODUCTS ON REQUEST

CUSTOMER NOTICE – THE PRODUCT TRANSFER DOCUMENTS FOR THIS TRANSACTION INCLUDE OTHER DOCUMENTS WHICH MAY CONTAIN ADDITIONAL AND/OR CORRECTING REFORMULATED GASOLINE INFORMATION. IF IN CONFLICT, THE INFORMATION IN THE OTHER DOCUMENTS WILL CONTROL.

Form 50605-A REV. 9/95

SEE REVERSE SIDE FOR HAZARD WARNING INFORMATION & NOTES

DRIVER SIGNATURE:

ALL ITEMS SUBJECT TO CONDITIONS ON REVERSE SIDE HEREOF.

TRUCK SEAL NUMBERS:

SHIPMENT RECEIVED BY:

For Product Emergency
Spill, Leak, Fire, Exposure or Accident, CALL
CHEMTREC · Day or Night 800-424-9300

COPY 6

MARATHON OIL COMPANY "TRANSFEROR" - 539 S. MAIN ST., FINDLAY, OH - EPA-RFG REG #5045
*** CONVENTIONAL GASOLINES - THESE PRODUCTS DO NOT MEET THE REQUIREMENTS FOR REFORMULATED GASOLINES (RFG) AND MAY NOT B USED IN ANY RFG COVERED AREA. *** SHIPPED FROM: 1601 S.E. 20TH STREET, FT. LAUDERDALE, FL 33316

MARATHON OIL COMPANY
MARATHON OIL COMPANY "TRANSFEROR" - 539 S. MAIN ST., FINDLAY, OH - EPA-RFG REG #5045

DATE 02/25/97
NUMBER 549748-056
TIME IN 0601
TIME OUT 0614

SOLD TO (CONSIGNEE)

ARCTRA REFINING & MARKETING CO
[illegible]ELD OIL COMPANY
[illegible] FL

SHIPPED FROM	LOC CODE
FT. LAUDERDALE	0000692449

DATE SHIPPED	SHIPPED VIA
02/25/97	BILL FREIGHT UNKNOWN 3947 PENN TANK LINES

DESTINATION	CUSTOMER NUMBER	ITEM NUMBER
UNKNOWN FL	P130319000000000	

DRIVER	TRAILER	COMPANY	CUSTOMER P.O. AND RELEASE NUMBER	TRANSMITTED CUSTOMER AND RELEASE NUMBER
3129	41158	0554		
S [illegible]/PENN TK				

CARGO TANK COMPARTMENT PRODUCT DESCRIPTIONS	GROSS GAL.	NET GAL.	TEMP./API GR.	COMMENTS
* CONVENTIONAL GASOLINES - THESE PRODUCTS DO NOT MEET THE REQUIREMENTS FOR REFORMULATED USED IN ANY RFG COVERED AREA. *** SHIPPED FROM: 1601 S.E. 20TH STREET, FT. LAUDERDALE, FL 3				
OIL, 3, NA1993, PG III NO. 2 LOW SULFUR FUEL OIL, UNDYED *.05% MAXIMUM SULFUR, 40 CETANE MINIMUM*	5201	5165	075.0/036.2	
OIL, 3, NA1993, PG III NO. 2 LOW SULFUR FUEL OIL, UNDYED *.05% MAXIMUM SULFUR, 40 CETANE MINIMUM*	2300	2284	074.5/036.2	

EPA DETERGENT ADDITIVE REQUIREMENTS

BEST AVAILABLE COPY

Non-Negotiable Bill of Lading

MATERIAL SAFETY DATA SHEET AVAILABLE FROM THE TERMINAL FOR THESE PRODUCTS ON REQUEST

CUSTOMER NOTICE – THE PRODUCT TRANSFER DOCUMENTS FOR THIS TRANSACTION INCLUDE OTHER DOCUMENTS WHICH MAY CONTAIN ADDITIONAL AND/OR CORRECTING REFORMULATED GASOLINE INFORMATION. IF IN CONFLICT, THE INFORMATION IN THE OTHER DOCUMENTS WILL CONTROL.

orm 50605-A Rev. 11/97

SEE REVERSE SIDE FOR HAZARD WARNING INFORMATION & NOTES

DRIVER SIGNATURE:

ALL ITEMS SUBJECT TO CONDITIONS ON REVERSE SIDE HEREOF.

TRUCK SEAL NUMBERS:

SHIPMENT RECEIVED BY:

For Product Emergency
Spill, Leak, Fire, Exposure or Accident, CALL
CHEMTREC - Day or Night 800-424-9300

COPY 6

MARATHON ASHLAND PETROLEUM LLC, 539 S. MAIN STREET FINDLAY OHIO 45840 EPA 4265
*** CONVENTIONAL GASOLINES - THESE PRODUCTS DO NOT MEET THE REQUIREMENTS FOR REFORMULATED GASOLINES (RFG) AND MAY NOT BE USED IN ANY RFG COVERED AREA. *** SHIPPED FROM: 1601 S.E. 20TH STREET, FT. LAUDERDALE, FL 33316

DATE 08/14/01
NUMBER 549224-226
TIME IN 0940
TIME OUT 0955

SOLD TO (CONSIGNEE)

BP OIL COMPANY EX
MANSFIELD OIL CO (MNB)
DEST

SHIPPED FROM: FT LAUDERDALE TERMIN, 1601 SE 20TH ST FT LAUDERDALE FLA
LOC CODE: 0000499440

DATE SHIPPED: 08/14/01
SHIPPED VIA: BILL FREIGHT UNKNOWN, 3947 PENN TANK LINES

DESTINATION: UNKNOWN FL

CUSTOMER NUMBER: 2204134750000000

ITEM NUMBER:

DRIVER	TRAILER	COMPANY	CUSTOMER P.O. AND RELEASE NUMBER	TRANSMITTED CUSTOMER AND RELEASE NUMBER
11604	4650	0305		
LOUIE EIBER				

CARGO TANK COMPARTMENT PRODUCT DESCRIPTIONS	GROSS GAL.	NET GAL.	TEMP./API GR.	COMMENTS
NO2 LOW SULFUR,.05% MAX SULFUR,40 CETANE MIN,DYED DIESEL FUEL, NONTAXABLE USE ONLY,PN. PENALTY FOR TAXABLE USE				
FUEL OIL, 3, NA1993, PG III	2200 **	2172 **		Meter 19 Preset 2200 Code 072
137	2200	2172	88.1/033.6	100.0%
NO2 LOW SULFUR,.05% MAX SULFUR,40 CETANE MIN,DYED DIESEL FUEL, NONTAXABLE USE ONLY,PN. PENALTY FOR TAXABLE USE				
FUEL OIL, 3, NA1993, PG III	2800 **	2764 **		Meter 19 Preset 2800 Code 072
137	2800	2764	88.3/033.6	100.0%
NO2 LOW SULFUR,.05% MAX SULFUR,40 CETANE MIN,DYED DIESEL FUEL, NONTAXABLE USE ONLY,PN. PENALTY FOR TAXABLE USE				
FUEL OIL, 3, NA1993, PG III	520 **	513 **		Meter 19 Preset 520 Code 072
137	520	513	88.2/033.6	100.0%
		5449		

CONV GASOLINE / 7.8 RVP GASOLINE / CLEAR L.S. #2 / DYED L.S. #2 /
H.S. #2

(** - Batch Total)

Attachment G
Description of Control Equipment

STEWART & STEVENSON
DISTRIBUTED ENERGY SOLUTIONS
4516 HARRISBURG BLVD. • HOUSTON, TEXAS 77011-4016
(713) 923-2161 • (800) 527-3246
SALES & ADMINISTRATION FAX: (713) 923-0375 • SERVICE FAX: (713) 924-0610

STEWART & STEVENSON
CELEBRATING OUR FIRST CENTURY
1902 - 2002

July 18, 2003

To: Miami Dade Water and Sewer Department

Subject: Engine NOx emissions

Engine Model: 20-645F4B

Engine Manufacturer: Electromotive Diesel (EMD)

Engines Included: Serial Numbers
03-D1-1011 (South District)
03-D1-1007 (Central District)
03-D1-1010 (Central District)
03-A1-1035 (Orr Plant)

Engine Rating: 4000 BHP Continuous at 900 RPM based on ISO 3046/1 conditions

iew:

The specification from Miami Dade Water and Sewer Department included a maximum NOx output of 7.6 gram per BHP-Hr at full load. In order to meet this requirement, modifications to the standard 20-645F4B engines were required. The changes included utilizing injectors with fixed timing, changing the fuel injection timing and using 4 pass combustion air aftercoolers to increase the cooling of the air. As a result of these modifications, the NOx levels were substantially below the Miami Dade requirements when EMD tested the engines.

Conclusion

The NOx levels measured on these 4 engines was between 5.11 and 5.83 grams per BHP-hr. All engines exceed the Miami Dade requirements. Test results are attached.

Detailed Description:

Injectors. The injectors used on these engines are called CBOI injectors by EMD. This stands for constant beginning of injection. A standard injector is designed so that as the engine load increases, the point at which fuel injection into the cylinder starts advances (happens further before top dead center). The CBOI injector has fixed timing and there is no advance based on engine load.

2. Injection Timing. The standard timing on an EMD engine is 0 degrees before top dead center (BTDC). In order to achieve the proper operation with the CBOI injectors, the timing on these

engines is set for 1 degree BTDC.

3. Intercoolers. The intercoolers cool the combustion air before it enters the air box and the cylinders. The standard EMD intercooler is a 2-pass type heat exchanger. In order to achieve additional cooling and assist in NOx reduction, these engines have 4-pass intercooler.

Submitted by:

George R Mattiuzzi

Stewart & Stevenson Distributed Energy Solutions
George R. Mattiuzzi
Project Manager

Attachments: EMD Test Results

ELECTRO-MOTIVE

EMD TECHNICAL PAPER
40020885 Four Pass Aftercooler

The four pass aftercooler is an increased capacity aftercooler developed in response to the demands placed on the two pass aftercooler by greater combustion air flows required by the 710 engine series. In early testing of 710 engines equipped with the two pass aftercooler, it was found that the temperatures in the engine airbox (intake manifold) were higher than that of the 645 engine. The four pass aftercooler has improved heat transfer properties reducing the power assembly charging temperature (air box temperature at full load). It can be applied to 710G engines, 16 and 20 cylinder 645E and 645F engine series.

FEATURES

The four pass aftercooler attained greater thermal capacity due to the following improvements:

- **A water flow path which passes the water through the tube bundle 4 times**
- **A 50% increase in fin heat transfer area,** yielding improved heat transfer
- **A change in the fin material** from aluminium to copper further improving heat conductivity. Copper as utilized in the four pass aftercooler has 83% greater thermal conductivity (k)* than aluminum
- **An improvement in the aftercooler's side baffle** which assures that air is not permitted to leak around the core and escape cooling
- **Identical exterior dimensions** which allow the four pass to be installed in any application where either the P/N 9541961 or P/N 8365645 had been applied. The four pass aftercooler is field retrofittable to the 645 engine. (It can not be installed in place of the smaller p/n 8288974 unit.)

BENEFITS

With the above five improvements, the four pass aftercooler retains several advantages over it's two pass version including:

- **A reduction in airbox temperatures.** A 30-35 degree reduction in airbox temperature at the engine's rated horsepower has been measured; in the 710 engine, temperatures were restored to the levels attained in the 645 engine
- **Reduced Oxides of Nitrogen (NOx) emissions.** Previous test results have demonstrated a reduction in NOx emissions up to 15% at full horsepower
- **Fuel economy savings.** At full load, substituting the four pass aftercooler for the two pass has produced fuel savings measured from .75% to 1.5% for 710 engines and approximately .5% for 645 engines
- **Identical System Design, as a result of identical water capacity,** (approximately 85 gpm in the 16-710 engine) permits installation of the four pass aftercooler without alteration of the engine's cooling water pumps or piping circuit. This also assures that water flow to the engine's power assemblies is not altered by diversion of a greater quantity of water to the aftercoolers

ENGINE EMISSIONS

The four pass aftercooler lowers the airbox charge temperature, engine peak combustion temperatures and exhaust temperatures and therefore reduces NOx emissions from our engines. The NOx formation reactions are highly thermal sensitive, so an enhanced charge cooling is an effective way to reduce NOx emissions.

*ref. Keith, Frank, Principles of Heat Transfer, 2nd Ed., International Textbook Co., Scranton PA., 1965, p. 593

4-PASS-992

ENGINE FUEL ECONOMY

The application of aftercooling to a turbocharged Diesel engine is known to have advantages in the areas of fuel economy and in the emissions of oxides of nitrogen (NOx). The fuel economy advantages of the four pass aftercooler in the 710 engine series has shown to produce fuel economy improvements in the range of .75% to 1.5% at the engine's rated speed and load. When these improvements are applied to the annual fuel consumption of a locomotive, they will show an attractive return on the investment represented by the price premium of the four pass aftercooler over its two pass predecessor. The investment payback periods of the four pass aftercooler used in 645 and 710 engines have ranged from one to two years, depending on annual fuel consumption.

ERFORMANCE ADVANTAGE CONDITIONS

The four pass aftercooler provides superior performance over the two pass at the following conditions:

- High engine air flow rates, such as in the 710 engine series (particularly the 16 and 20 cylinder versions of the 710)
- Operating conditions which produce high air flows. For example:
  - At throttle settings six through eight. These are the conditions at which the turbocharger is operating "off the geartrain" and air flow rates and air compression ratios are highest
  - High ambient temperatures and/or high altitudes result in particularly high turbocharger discharge temperatures. Under these especially demanding conditions, the benefits of the four pass are even greater than that of the two pass

PRODUCT RELIABILITY

The superior construction of the four pass aftercooler makes it a reliable, high performance heat transfer product built to last. The four pass and two pass aftercoolers have identical major features of construction, such as retention of the reliable rolled mechanical bond between the aftercooler's red brass tubes and the tube bundle's header plates. This method of construction has proved reliable in the two pass aftercooler design and in the premium mechanically-bonded radiators.

CONCLUSION

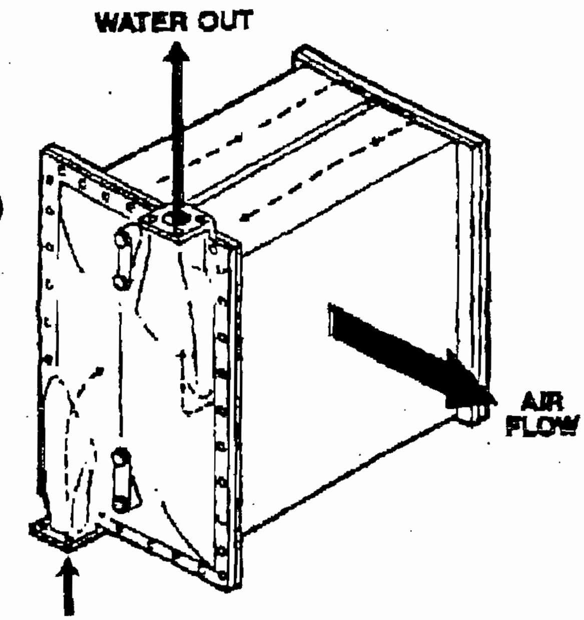
The value of the four pass aftercooler is evident in the areas of improved air box temperatures, engine emission reductions and improved fuel economy. Electro-Motive, in partnership with Young Radiator, has demonstrated their commitment to accepting and meeting the performance challenges of the rail industry. It is this partnership that continues to provide the best heat transfer products to the industry. The four pass aftercooler is the latest product of this commitment.

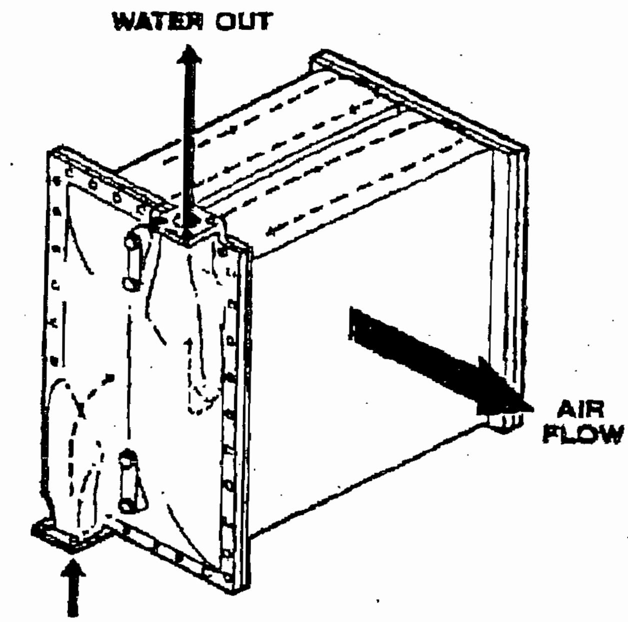
Note: A performance comparison of the four pass and two pass aftercooler depends on which particular engine it is installed in and on the power at which they are compared. EMD welcomes the opportunity to provide technical expertise to discuss individual railroad needs.

ELECTRO-MOTIVE

2-PASS AFTERCOOLER

4-PASS AFTERCOOLER
(Baffles not shown for clarity)





ELECTRO-MOTIVE
Electro-Motive Division
General Motors Corporation
LaGrange, IL 60525
270041 McCook, IL USA
Phone: (708) 387-6000
(708) 387-6686

Diesel Division
General Motors of Canada Limited
Box 5160, London, Ontario N6A 4N5
Telex: 064-5860 Canada
Telephone: (519) 452-5182
Fax: (519) 452-5380

4-PASS-992

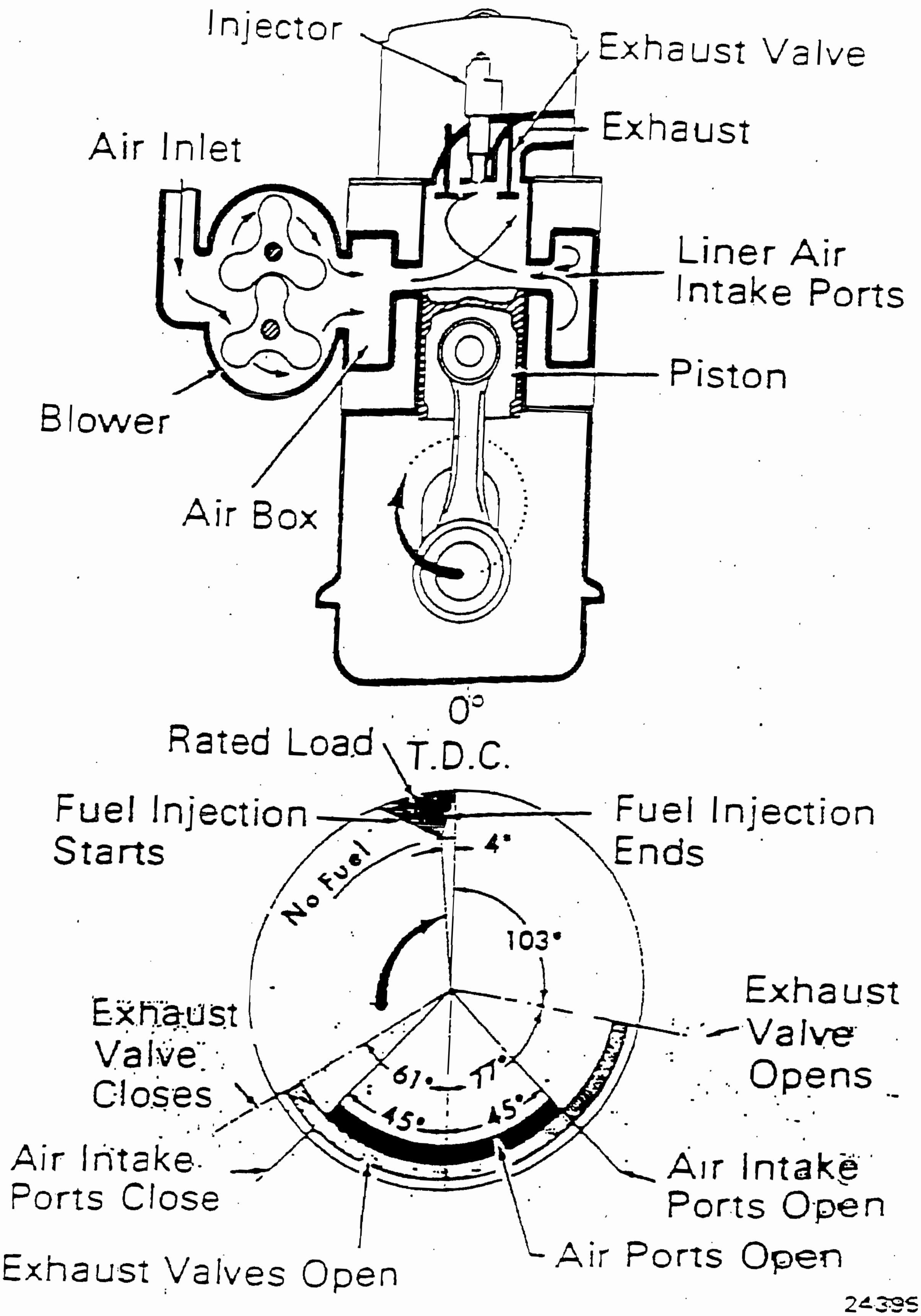


Fig.0-1 – Schematic Illustration Of

ELECTRO MOTIVE

Order # 20023614E1- Engine S/N 03D1-1007 - ESI/S&S/MIAMI DADE – VIRG KEYS/BLK PT - SE20F4B

Customer requested test information

Engine RPM	Engine load	Turbo RPM	Turbine inlet temp. ^{0}F	NOx emissions (GMS/BHP-HR)
900	100% of rated (4000 BHP)	20444	848.6	5.53
815	75% of rated (3000)	17106	766.0	N/A
720	60% of rated (2400)	14329	758.7	N/A
640	40% of rated (1600)	11476	620.9	N/A

Witnessed by:

Timothy J. Parten

Senior Project Engineer

Test Date: 4/17/2003

GM ELECTRO MOTIVE

Order # 20023614E2- Engine S/N 03D1-1010 - ESI/S&S/MIAMI DADE – VIRG KEYS/BLK PT - SE20F4B

Customer requested test information

Engine RPM	Engine load	Turbo RPM	Turbine inlet temp. ^{0}F	NOx emissions (GMS/BHP-HR)
900	100% of rated (4000 BHP)	20313	N/A	5.55
815	75% of rated (3000)	16898	N/A	N/A
720	60% of rated (2400)	14089	651.3	N/A
640	40% of rated (1600)	11482	617.2	N/A

Witnessed by:

Timothy J. Paulson

Senior Project Engineer

Test Date: 4/24/2003

Document No. 33-08266W

3/88

WHESSOE/VAREC

Whessoe/Varec, Inc.
10800 Valley View Street, Cypress, California 90630
Telephone (714) 761-1300 Fax (714) 952-2701

239 SERIES

WASTE GAS BURNER

INSTRUCTION MANUAL

239 SERIES
WASTE GAS BURNER

GENERAL

The VAREC 239 Series Waste Gas Burner is designed specifically for burning excess waste gas generated in the anaerobic digestion process. This waste gas is typically very "wet" with a low BTU value (between 550 and 600 BTU) and composed primarily of methane. The VAREC 239 Burner is designed to pass the waste gas through "curtain of flame" developed by the ring-type pilot. The waste gas is deflected across the pilot flame by an integral horizontal baffle. This baffle also mixes air with the waste gas to assist combustion. A shutter ring at the bottom of the burner stack can be manually adjusted to change the volume of air if the waste gas flow rate changes. The dual pilot lines in the larger models ensure that the pilot flame is distributed completely around the entire ring.

Note - Pilot orifices are suitable for low pressure digester (waste) gas or natural gas **only**. Pilot orifices are **not** suitable for propane or butane. Pilot gas supply to the burner should be constant. Recommended supply pressure for waste gas is 5" to 8" W.C. (107 to 203 mm W.C.) **at the pilot inlet.**

Secondary stacks (by others) should be installed on all 4-inch, 6-inch, and 8-inch burners for protection from wind which can cause an unstable pilot or waste gas flame. These secondary stacks should be self-supporting to avoid putting an excessive weight load or wind load on the 239A burner. Refer to drawing 20-05007 for recommended secondary stack construction.

In addition, the 4-inch, 6-inch, and 8-inch burners require electric pilot ignitors for safety of operation. VAREC manufactures several models of electric pilot ignition systems. These systems include Model 240, 240HOA, 241UV, and 242UV which are outlined in the Auxiliary Equipment section at the end of this Instruction Manual.

CONSTRUCTION

1. The burner is fabricated of carbon steel with a heat resistant cast iron pilot flame ring and cast iron ignition port cover. The pilot gas orifice fittings and orifices are 304 stainless steel.

2. The 2-inch, 3-inch, and 4-inch models are equipped with a single 1/2-inch NPT pilot line. The 6-inch and 8-inch models incorporate dual 1/2-inch NPT pilot lines. The burner pedestal is insulated internally and encloses the pilot gas line(s).

3. A covered pilot observation and ignition port and separate inspection port are provided on the burner stack.

4. A gasketed, separable mounting base is supplied for pre-installation on a concrete foundation or other suitable support.

INSTALLATION

1. Refer to installation drawing E-2323 to identify and/or locate the waste gas burner components.

CAUTION

Read these instructions thoroughly before installing the VAREC 239 Series Waste Gas Burner. This burner should be installed by personnel trained in the installation and operation of waste gas burners.

2. All connecting waste gas and pilot gas piping should be installed with a slight downward slope away from the burner. A drip trap MUST be installed at the lowest point. At installation sites where freezing may occur, install connecting waste gas and pilot gas piping below the frost line, and insulate any above ground piping.

3. Prepare connecting piping with appropriate pipe fittings. Provide for a single pilot line connection on 2-inch, 3-inch, and 4-inch burners and dual pilot connections on the 6-inch and 8-inch burners. See drawing E-2323 for location of pilot lines.

4. Install or erect a suitable support for the waste gas burner. A concrete base pad is recommended. Provide access for the waste gas and pilot gas lines as shown by dimension "B" on drawing E-2323. Install four (4) anchor bolts in the concrete support as shown on drawing E-2323. The separable mounting base may be used as a template to ensure proper anchor bolt location.

5. When a VAREC Model 52 Flame Check is specified and supplied, install it in the pilot gas line near its entry to the waste gas burner. See Instruction Manual, Document No. 33-08256W, for installation details.

6. If the VAREC Model 242UV Electric Pilot Ignition System is specified and/or supplied, refer to Instruction Manual, Document No. 33-08261W for location of pilot line solenoid valve. This valve may need to be installed in the connecting pilot piping before installing the 239 burner.

7. To install the waste gas burner, remove the gasketed, separable mounting base from the burner assembly. Slip the base plate over the four anchor bolts and install the anchor bolt nuts and washers, being certain to line up the waste gas pipe connection at the center of the base plate with the waste gas piping riser. Connect the 1/2-inch NPT pilot line(s). Ensure that the base plate is horizontal to allow the pedestal and burner stack to be mounted in a true vertical position, then tighten all anchor bolt nuts.

8. Check the burner assembly waste gas and pilot gas piping for dirt or debris which may have accumulated during site storage. Clear lines if necessary.

9. Place the mounting gasket on the base plate. Erect the burner pedestal and stack assembly onto the base plate.

NOTE

Ensure that the pilot line hole(s) are aligned in the gasket, base plate, and pedestal assembly. If not properly aligned, pilot will not operate.

10. Thread hex nuts into the burner base and tighten securely to seal the gasket. Verify that the pedestal and burner stack assembly are in the true vertical position.

11. If a secondary stack is specified and/or supplied, install at this time. Refer to drawing 20-05007 for recommended installation.

NOTE

Secondary stack should not be supported on waste gas burner.

12. If an electric pilot ignition system is specified and/or supplied, install in accordance with Instruction Manual. See the AUXILIARY EQUIPMENT section at the end of this manual to locate the appropriate installation documentation.

13. When electric pilot ignition is used, a ground strap must be installed from a base mounting bolt on the burner to earth ground to provide maximum spark at pilot ring.

OPERATION

1. To start-up the 239 burner, open the pilot gas line isolation valve to allow gas to purge out the pilot line. If an electric ignition system is installed, refer to that Instruction Manual for ignition procedure. If no electric ignition system is installed, ignite the pilot manually (with a torch or other device).

CAUTION

Personnel must use extreme caution when igniting the pilot manually. Be certain that no gas has collected in the area that could be ignited and cause a burst of flame. Personnel should stand well away from and upwind of the burner when lighting the pilot.

2. Once the pilot is established and waste gas is relieved to the burner for flaring, rotate burner air inlet shutter to adjust air-to-gas ratio for the most stable waste gas and pilot flame. Pilot flame should burn steadily on top of flame ring. Adjust pilot gas supply as necessary to properly position pilot flame. The waste gas flame will extend several feet above the top of the burner stack.

MAINTENANCE

1. Inspect the pilot orifice assembly and flame ring six (6) months after start-up, then inspect as often as experience indicates is necessary. When orifice or flame ring require cleaning, use only a stiff wire brush to clean the exterior surfaces. NOTE - Do not chip off coke residue.

2. Refer to appropriate Instruction Manual for maintenance of electric pilot ignition system if installed.

TROUBLESHOOTING

The following troubleshooting guide is intended to give general information on possible operation failures and causes. It is recommended that a VAREC service engineer be called to perform complicated troubleshooting and repair

SYMPTOM	POSSIBLE CAUSE
1. Pilot will not ignite	1. -Insufficient pilot gas supply -Poor quality pilot gas supply
2. Pilot fails after ignition	2. -Weak pilot blows out -Extreme fluctuations in gas supply pressure -Poor quality pilot gas supply
3. Waste gas flame burning down pedestal	3. -Secondary stack not installed or improperly installed -Waste gas flow capacity greater than burner rated capacity

AUXILIARY EQUIPMENT

The following electric pilot ignition and control systems are available for use with the 239 Series Waste Gas Burner. See the appropriate data sheet (PDS) for a full description of each system, and the appropriate Instruction Manual for installation, operation and maintenance information.

MODEL 240 - (PDS 240WT/Instruction Manual 33-08259W)
Manually Operated Electric Pilot Ignitor
MODEL 240HOA - (PDS 240HOA/Instruction Manual 33-XXXXX)
Manually Operated/Cycling Electric Pilot Ignitor
MODEL 241UV - (PDS 241WT/Instruction Manual 33-08260W)
Manual Start Electric Pilot Ignition with pilot flame monitoring and automatic pilot re-ignition.
MODEL 242UV - (PDS 242WT/Instruction Manual 33-08261W)
Automatic Start Electric Pilot Ignition with pilot flame monitoring and automatic pilot re-ignition. Intermittent operation based on waste gas pressure conserves pilot fuel.

REPLACEMENT PARTS

When ordering replacement parts specify VAREC Model 239 Waste Gas Burner and size. Identify replacement parts by description and part number where possible.

REFERENCE DRAWINGS

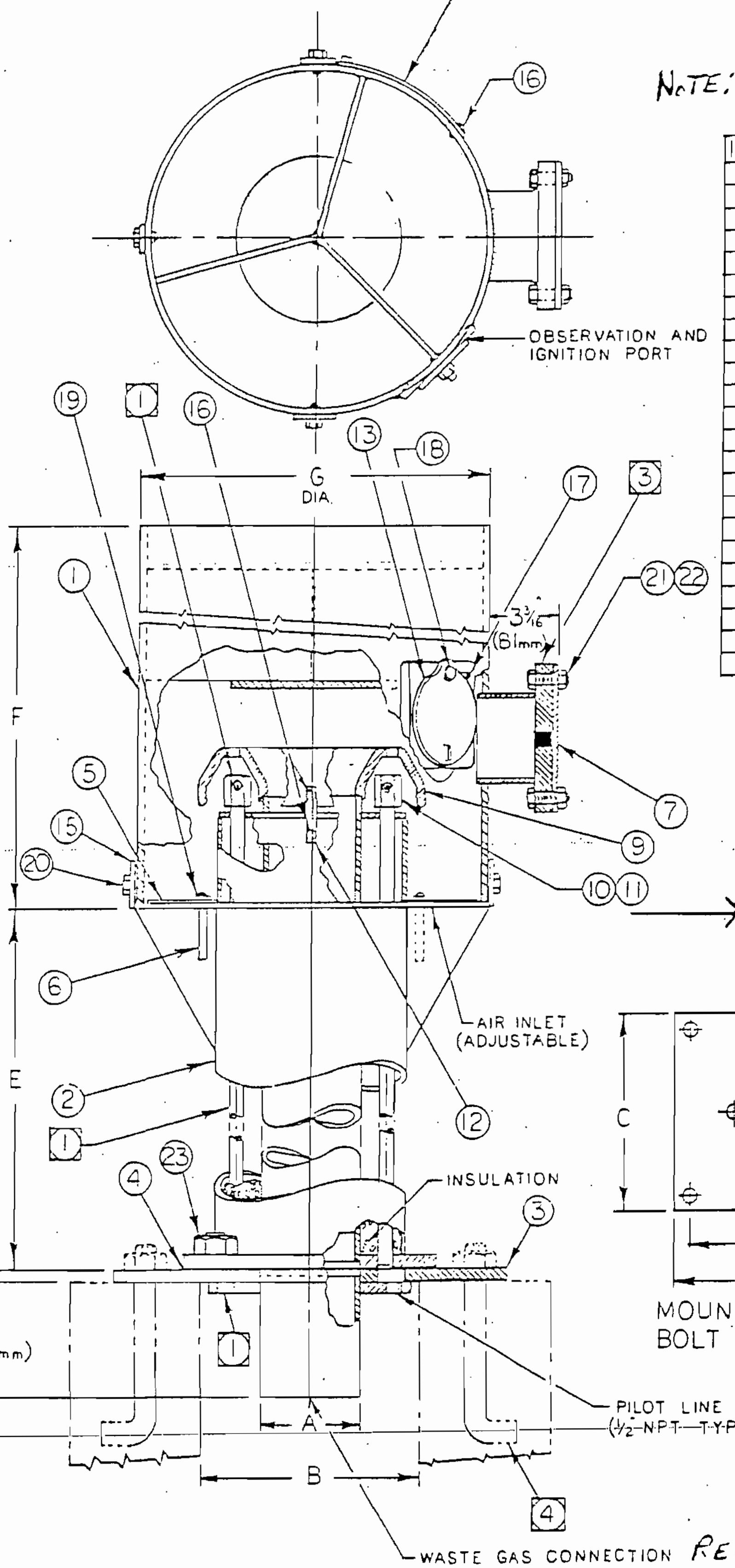
E-2323 Waste Gas Burner
20-05007 Secondary Stack Recommended Installation

BEST AVAILABLE COPY

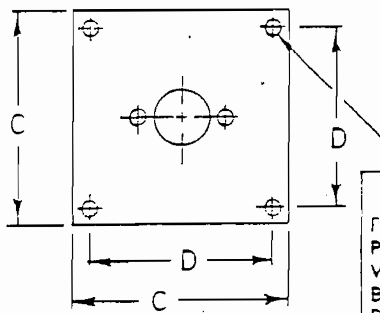
REV	ECO	DESCRIPTION	DATE	CHKD	APVD
A		ENG RELEASE			
B	84194	REDRAWN PER E.O.	8/06/87		
C	86008	REDRAWN PER E.O.	11/05/88		
D	88080	REVISED PER E.O.	12/21/89		

NOTE: PRESSURE DROP SHALL NOT EXCEED 1/2" W.C. AT FLOW RATE OF 18,000 SCFH OR LE

ITEM	DESCRIPTION	MATERIAL
1	BURNER STACK	STEEL
2	PEDESTAL	STEEL
3	MOUNTING BASE	STEEL
4	GASKET	COMPR. NON-ASB
5	SHUTTER	STEEL
6	SHUTTER HANDLE	STEEL
7	COVER PLATE	STEEL
8	DELETED	
9	PILOT FLAME RING	CAST IRON
10	PILOT ORIFICE FITTING	304 SS
11	ORIFICE	304 SS
12	GROUND BRACKET	316 SS
13	ACCESS COVER	CAST IRON
14	INSPECTION HOLE COVER	STEEL
15	CLIP	STEEL
16	HEX HD CAP SCR	304 SS
17	PIN	SS
18	HEX HD CAP SCR	STEEL
19	HEX JAM NUT	STEEL
20	HEX HD CAP SCR	STEEL
21	HEX HD CAP SCR	STEEL
22	HEX NUT	STEEL
23	HEX NUT	STEEL



SIZE (A)		B	C	D	E	F	G	H
~~2"~~	~~IN~~	~~8 3/4~~	~~17 1/2~~	~~14 1/2~~	~~68~~	~~20 1/4~~	~~12 3/4~~	~~1~~
	~~MM~~	~~222~~	~~444~~	~~368~~	~~1730~~	~~514~~	~~324~~	~~25~~
~~3"~~	~~IN~~	~~10~~	~~18 3/4~~	~~15 3/4~~	~~68~~	~~24 1/4~~	~~14~~	~~1~~
	~~MM~~	~~254~~	~~476~~	~~400~~	~~1730~~	~~616~~	~~356~~	~~25~~
~~4"~~	~~IN~~	~~11~~	~~20~~	~~17~~	~~68~~	~~24 1/2~~	~~16~~	~~1 1/4~~
	~~MM~~	~~279~~	~~508~~	~~432~~	~~1730~~	~~616~~	~~406~~	~~3[illegible]~~
6"	IN	13	22	19	96	32 1/4	20	[illegible]
	MM	330	559	483	2440	819	508	3[illegible]
~~8"~~	~~IN~~	~~15~~	~~24~~	~~21~~	~~96~~	~~48 1/4~~	~~24~~	~~1 1/4~~
	~~MM~~	~~381~~	~~610~~	~~533~~	~~2440~~	~~1229~~	~~610~~	~~32~~



MOUNTING BASE BOLT LOCATION

CERTIFIED CORRECT
FOR: POOLE & KENT Co.
PURCHASE ORDER: 94603-1-012
VAREC ORDER: 416440
BY: [signature]
DATE: 2-08-94

REFERENCE ONLY DOCUMENT

THIS DOCUMENT IS NOT SUBJECT TO REVISION CONTROL

REVISED 4-14-94 BB

Mkd. Item 6, BB

WT

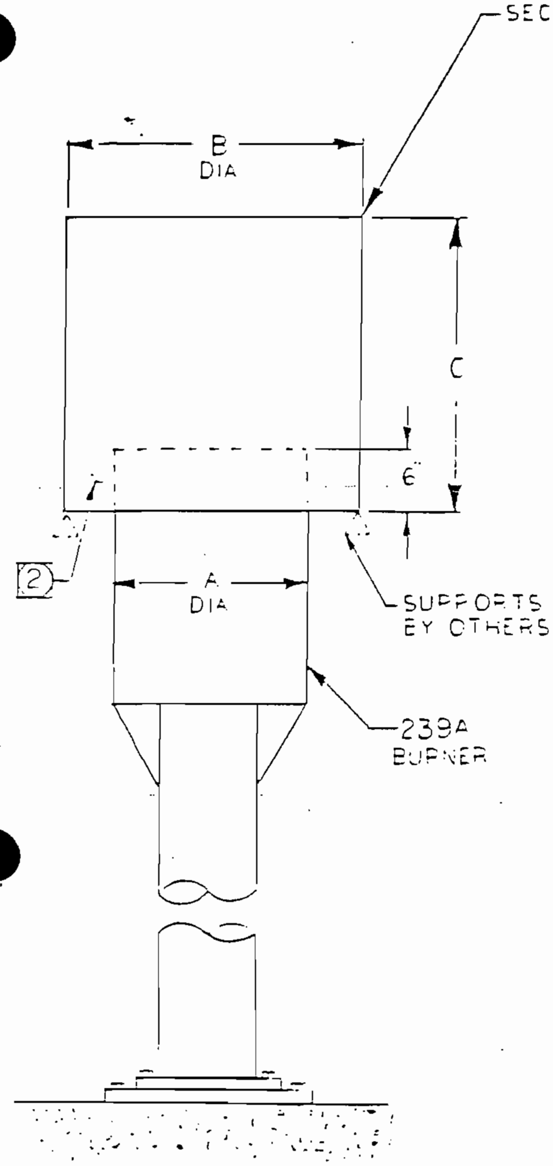
NOTES:
4. ~~USE 3/4" ANCHOR BOLTS FOR 2 & 3" SIZES.~~
USE 1" ANCHOR BOLTS FOR ~~4~~ 6 & ~~8~~ SIZES (BOLTS BY OTHERS).
3. MOUNTING FLANGE FOR ADDITION OF ELECTRICAL PILOT IGNITOR.
2. SECONDARY STACK (BY OTHERS) REQUIRED FOR ~~4~~ 6 & ~~8~~" SIZES. REF DWG. 20-05007.
1. NOT INCLUDED ON 2, 3, & 4 SIZES. DUAL PILOT ON 6" & ~~8~~" SIZES ONLY.

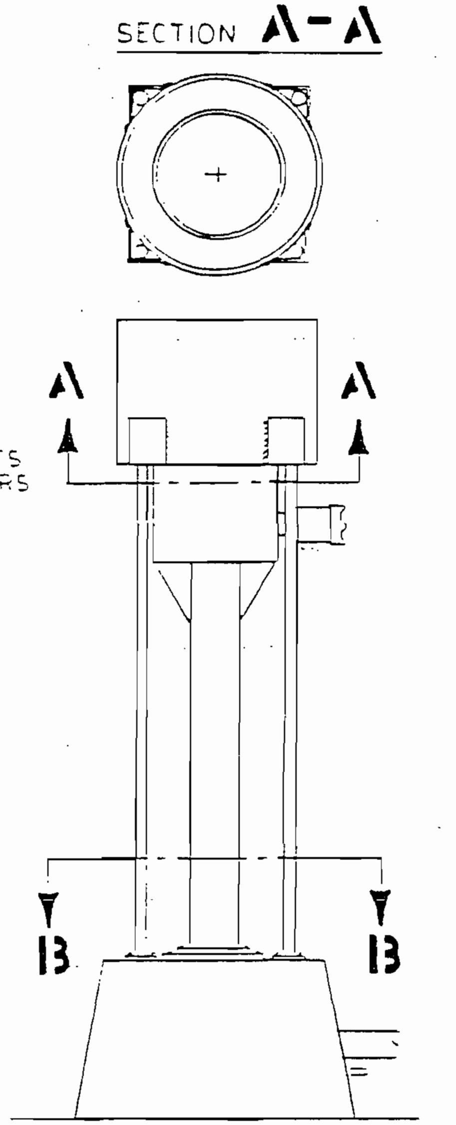
NOTES: S.S. TAG: REF. DWG M-2

FIGURE NUMBER	239A		Whessoe Varec, Inc. 10800 VALLEY VIEW STREET CYPRESS, CALIFORNIA 90630 (714) 761-1300 TELEX
DRFT	WHC	1/04/88	MODEL 239A WASTE GAS BURNER
CHKD	C. Stokes	1/29/88	
ENGR			
MFG			SIZE C · CODE IDENT NO 62783 · DWG NO E-2323 · REV D
APVD			SCALE NONE · PART NO · SHEET 1 OF 1

BEST AVAILABLE COPY

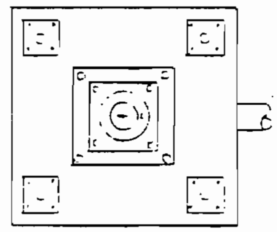
REV	ECO	DESCRIPTION	DATE	CHKD	APVD
A	33337	ENG RELEASE	9/30/83		
B	86208	REDRAWN PER ECO	1/7/88		





TYPICAL SUPPORT INSTALLATION

DIMENSIONS				
SIZE		A	B	C
2"	IN	12 3/4	18	22
	MM	324	457	559
3"	IN	14	20	24
	MM	356	508	610
4"	IN	16	24	30
	MM	406	610	762
6"	IN	20	30	42
	MM	508	762	1067
8"	IN	24	36	54
	MM	610	914	1372



SECTION B-B

REFERENCE ONLY
DOCUMENT
THIS DOCUMENT IS ~~NOT~~ SUBJECT
TO REVISION CONTROL

CERTIFIED CORRECT
FOR: POOLE & KENT Co.
PURCHASE ORDER: 94663-1-012
VAREC ORDER: 416440
BY: [signature]
DATE: 2-08-94

3. MATERIAL: LIGHT GAGE STAINLESS STEEL OR LIGHT GAGE LOW CARBON STEEL RECOMMENDED.

2. FREE AREA BETWEEN STACKS TO BE AT LEAST 20% GREATER THAN AREA OF BURNER STACK.

1. SECONDARY STACK NOT TO BE SUPPORTED ON BURNER.

NOTES:

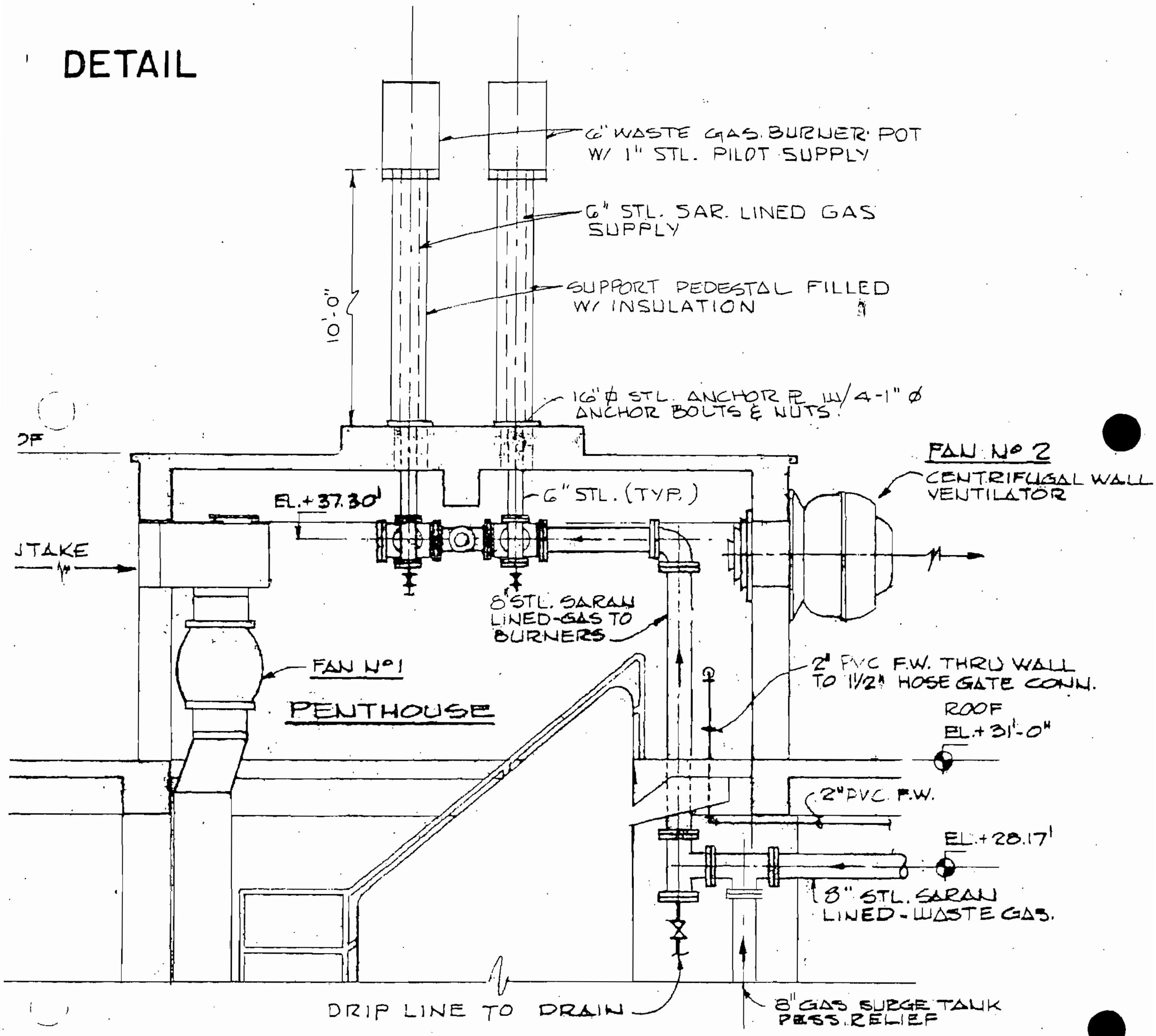
REF ITEM 6, 8

WT

FIGURE NUMBER	239		Whessoe Varec, Inc. 10800 VALLEY VIEW STREET CYPRESS CALIFORNIA 90630
DRWN	WHC	1/7/88	SECONDARY STACK MODEL 239A RECOMMENDED INSTALLATION
CHKD	[signature]	1/13/88	
ENGR			
MFG			SIZE C · CODE IDENT NO 62783 · DWG NO 20-05007 · REV B
APVD			SCALE NONE · SHEET 1 OF 1

BEST AVAILABLE COPY

DETAIL



SECTION (K) SCALE: 1/4"=1'-0"

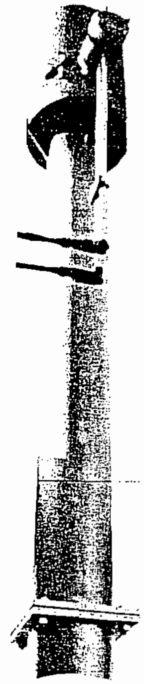
VAREC®

239A SERIES

WASTE GAS BURNER

PDS 239WT
4/92

- "Curtain of Flame" Ring-Type Pilot
- 304SS Pilot Orifices
- Insulated Pedestal Protects Pilot Lines
- Separable Mounting Base



INTRODUCTION

The VAREC 239A Series Waste Gas Burner is designed for burning excess waste gas generated in the anaerobic digestion process to reduce the potential odor nuisance from venting directly to the atmosphere. This burner is suitable for burning low volumes of waste gas which is typically very "wet", with a low BTU value (between 550 and 600 BTU), and composed primarily of methane.

OPERATION AND FEATURES

The VAREC 239A Burner is designed to ignite the waste gas by passing it through a "curtain of flame" developed by the ring-type pilot. The pilot gas mixes with air at the pilot ring and the pilot flame burns on top of the ring. The waste gas is deflected across the pilot flame by an integral baffle. A manually adjustable shutter is provided at the bottom of the burner stack to change the available air volume should the waste gas flow rate fluctuate.

Dual pilot lines in the larger models are located 180° apart to distribute the pilot flame around the entire ring. The burner pedestal is insulated internally, enclosing the pilot line(s) and waste gas piping. A gasketed, separable mounting base is included for pre-installation on a concrete foundation or other suitable support. A covered pilot observation and ignition port with separate inspection port are provided on the burner stack.

A low pressure natural gas pilot supply is recommended with the VAREC 239A Burner. Since Waste Gas is typically moist and dirty with fluctuating pressure and BTU value, it may not provide the reliable pilot flame necessary when using an automatic pilot ignition and monitoring system. The Model 239A Waste Gas Burner is not suitable for a propane or butane pilot gas supply.

AUXILIARY EQUIPMENT

Flame Check, Model 52: Recommended for field installation in the pilot gas piping just upstream of the burner to protect from possible flashbacks generated in the pilot line. See PDS 52WT for details.

Electric Pilot Ignitor: Recommended for all burners for improved operator safety. VAREC manufactures several ignition systems. These systems are described in data sheets PDS 240WT, PDS 240HOA, PDS 241WT, and PDS 242WT.

Secondary Stacks (by others): "Self-supporting" secondary stacks should be specified for field installation on all 4", 6", and 8" burners to protect from winds which can cause an unstable pilot and/or waste gas flame. Consult VAREC for details.

SPECIFICATIONS

Sizes: 2", 3", 4", 6" and 8"

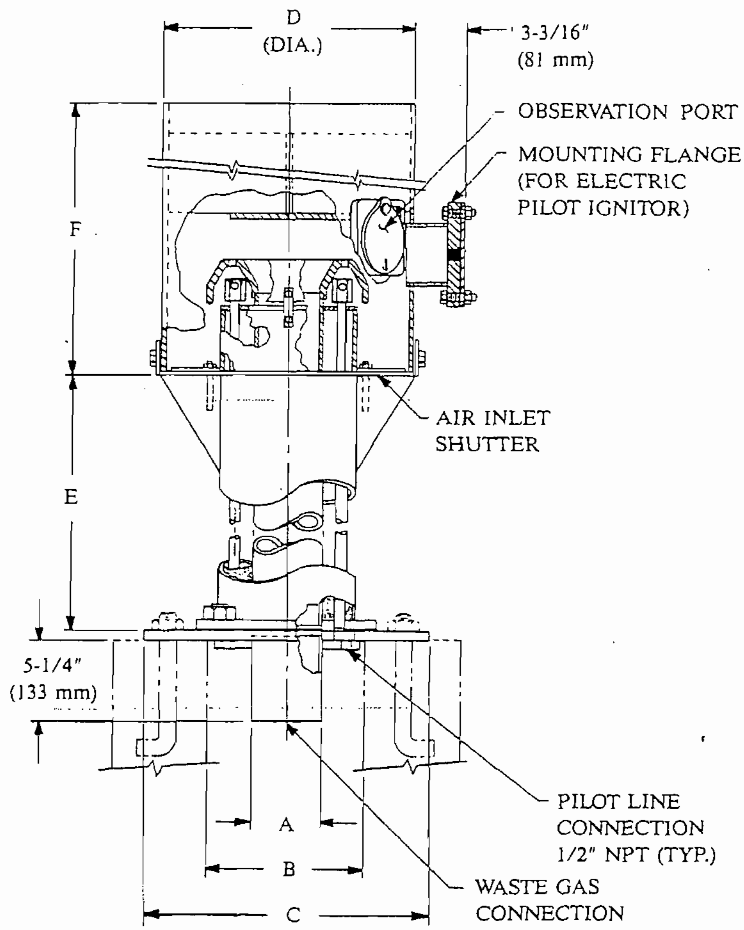
Connections:
Waste Gas — Nominal pipe size/weld connection
Pilot Gas — Single 1/2" NPT (2" through 4" sizes)
Dual 1/2" NPT (6" and 8" sizes)

Mounting: Concrete pad or other suitable support

Waste Gas:
Composition: Primarily methane
BTU Value: 550 to 600
Maximum Inlet Pressure: 20" WC (508 mm WC)

Material:
Burner — Fabricated carbon steel
Pilot Flame Ring — Heat resistant cast iron
Pilot orifice/fittings — 304 stainless steel
Observation/Ignition Port — Cast iron

DIMENSIONAL DRAWING



Installation, mounting arrangement, and dimensions are preliminary general information not to be used for construction. Certified drawings are available.

SIZE CODE	02	03	04	06	08
A	**2** 50	**3** 75	**4** 100	**6** 150	**8** 200
B	**8 3/4** 222	**10** 254	**11** 279	**13** 330	**15** 381
C	**17 1/2** 444	**18 3/4** 476	**20** 508	**22** 559	**24** 610
D	**12 3/4** 324	**14** 356	**16** 406	**20** 508	**24** 610
E	**68** 1730	**68** 1730	**68** 1730	**96** 2440	**96** 2440
F	**20 1/4** 514	**24 1/4** 616	**24 1/4** 616	**32 1/4** 819	**48 3/8** 1229
SHIPPING WEIGHT	**465** 211	**590** 268	**700** 318	**860** 391	**1500** 682

Inches and lb in bold, mm and kg in light

BURNING CAPACITY

Flow stated in air at 60°F and 14.7 PSIA at 1/2" WC (13 mm WC) pressure drop, at sea level. For capacities at higher site elevations, consult factory.

SIZE	FT3/HR	M3/HR
2"	1,850	52
3"	4,025	114
4"	7,875	223
6"	20,100	569
8"	33,475	948

Note: Flow stated in SCFH air can be corrected for waste gas at other specific gravities and temperatures. (See Technical Section)

ORDERING INFORMATION

239A	WASTE GAS BURNER	
	Code	**Size (Select One)**
	02	2"
	03	3"
	04	4"
	06	6"
	08	8"
239A	06	(EXAMPLE)

(Example: 6" Waste gas burner.)

WHESSOE VAREC

Whessoe Varec, Inc.
10800 Valley View Street
Cypress, California 90630

Telephone (714) 761-1300
Fax (714) 952-2701

WHESSOE
VAREC

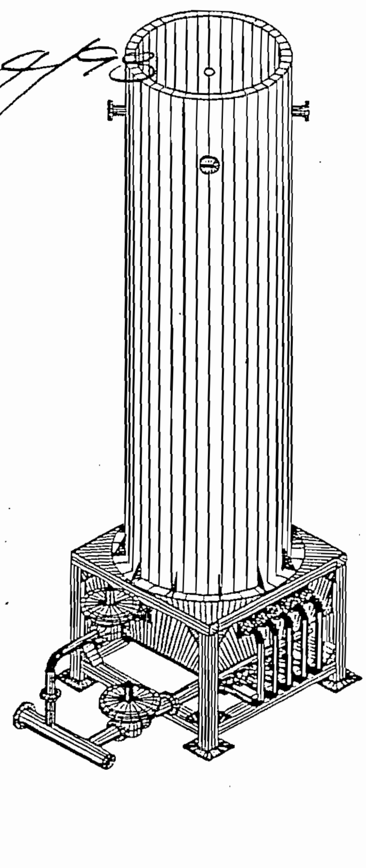
MIAMI DADE

249 Series Biogas Ground Flare

INSTALLATION, OPERATION AND MAINTENANCE MANUAL

REVIEWED BY:
FELIX EQUITIES, INC.

BY ______ DATE 7/24/98



MODEL: 249-36-6-34-6

SERIAL NO.: SPC114423

VAREC PROJECT NO.: 114423

Table Of Contents

TABLE OF APPENDICES

Certificate of Conformance and Equipment and Workmanship Warranty

This certificate, herewith confirms that the biogas ground flare, numbers as listed below, supplied by Whessoe Varec Inc., conforms to the design and quality control specifications and standards in accordance with the contract.

Model No.: 249-36-6-34-6

Serial No.: SPC114423

WARRANTY TERMS AND LIMITATIONS

Whessoe Varec Inc., warrants for a period not in excess of 18 months from the date of reporting the readiness to ship and install, or 12 months from the date of installation and completion of the performance tests, WHICHEVER OCCURS FIRST, the design, construction and materials of our product to be of adequate quality and free from defects in materials and workmanship. Whessoe Varec's sole obligation, under this Warranty is limited to repairing or furnishing, without charge, Calgary Alberta any parts found to be defective under normal and proper use. The Purchaser shall give the Company not more than 5 working days written notice of such defects. The Company will not be responsible for damages of any nature, resulting from the above stated Warranty or from any defect in our products, either in materials, design or construction arising from the improper use of the supplied products. The Company does not guarantee against abrasion, corrosion or erosion.

THE ABOVE STATED WARRANTY, WHICH IS GIVEN EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PARTICULAR PURPOSE, CONSTITUTES THE ONLY WARRANTY MADE BY THE SELLER.

Warranties on equipment not of the Company's manufacture are limited to the Terms of Warranty issued by our suppliers.

1. SUMMARY

The following manual describes and provides instructions for installation, operation and maintenance of Whessoe Varec Inc.'s, 249 Series Ground Flare Model Number 249-36-6-34-6, Serial Number SPC114423.

The information contained in this manual supports the design, guarantee and specifications for the 249 series Biogas Ground Flare supplied a general arrangement drawing of the ground flare is located in the I.O.M.

Also enclosed are the operation and maintenance instructions for system components not fabricated by Whessoe Varec. Where required or different from factory standards, specific instructions for pressure and other settings, operation and maintenance are included.

Information relative to Whessoe Varec Inc. and its subcontractors' conformance to the bid contract is available upon request. The Ground Flare has been fully inspected by Whessoe Varec Inc., who acknowledge that the ground flare system fully conforms to the design specifications and drawings prepared by Whessoe Varec, and certifies herewith that the design specifications and fabrication drawings were produced to comply with the contract, and the complementary design and quality control specifications in accordance with the "Equipment and Workmanship Warranty" section of the contract. Whessoe Varec will fully honor the stated warranty effective Actual ship date (to be updated)- date of readiness for shipping of the equipment. A copy of the Certificate of Conformance and Warranty conditions is included in this manual.

Whessoe Varec Inc. ____________________________

2. Equipment Description and Specifications

2.1. General

The ground flare, 249-36-6-34-6, is designed to destroy, by way of combustion, the polluting components of the BIOGAS specified in the bid specifications.

The design capacity of the flare is as follows:

Maximum BIOGAS flow	36,000	ft^3/hr	1020	m^3/hr
Minimum BIOGAS flow	6,000	ft^3/hr	170	m^3/hr
Sulfur components as H_2S of total volume	0.01 % of total volume			
Minimum guaranteed disctruction removal efficiency (DRE) of combustible component	99.5	%	99.5	%

2.2. System Specifications

2.2.1. Complete Ground flare System

Parameter Description	Qty	U of M	Qty	U of M
Stack OD	6.0	ft	1,829	mm
Stack ID	5.3	ft	1,600	mm
Combustion chamber height	34.	ft	10,363	mm
Substructure height	6.	ft	1,829	mm
Total weight	22,490	lbs	10,201	kg

2.2.2. Combustion Chamber Conditions

	Imp	Imp	SI	SI
Parameter Description	Qty	U of M	Qty	U of M
Stack OD	6.0	ft	1,829	mm
Wall thickness (steel)	.38	in	10	mm
Length	34.	ft	10,363	mm
Minimum residence time in the combustion chamber at maximum flow rate: .9 seconds	1,450	°F	787	°C

2.2.3. Refractory specifications:

Modules.................HTA
Modules.................HTA HDHC
Manufacturer.................Premier

Parameter Description	Imp Qty	Imp U of M	SI Qty	SI U of M
Maximum working temperature	2,700	°F	1,481	°C
Module thickness	4.0	in	102	mm

2.3. Surface Preparation and Coating

Painting according to specification. (Paint specifications are in the Appendices Section of the I.O.M.)

External Preparation........... Near white blast, 1.5 to 2 mils profile, SP10
Dampney Thermolux 245 primer...1.5 to 2 mils
Dampney Thermolux 230 top coat (GREY)..................................2 mils
Internal Coating..Bitumastic

3. INSTALLATION

3.1. Concrete Foundation Details

A reinforced concrete pad foundation shall be designed and provided by others. The ground flare specifications are as follows:

Height	39.5	ft	12,040	mm
Combustion chamber ID	5.3	ft	1,606	mm
Wind moment at 150 mph (STP)	472,228	ft lbs	65,288	Kg m
Total weight	22,490	lbs	10,201	kg
Total number of anchor bolts	16	ea	16	ea
Maximum allowable bolt stress	14	ksi		

Note: Foot print does not include the manifold extending from the ground flare.

The concrete foundation shall be large enough to enclose anchors for all legs, piping and BP valves. The footprint layout is included in GA drawing The anchor bolts, may be preinstalled in the foundation and positioned in the locations indicated on this drawing. The Civil engineer may elect to install a bonded/insert anchor bolt to be installed after the foundation pad is complete.

All bolts shall be supplied and installed in compliance with the instructions and specifications provided by the project Civil engineer.

3.2. Piping Supports

The piping supports, locations and anchor patterns are identified on the general arrangement drawings.

3.3. Back Pressure Regulator (BPV) Supports

The BPV(s) where supplied are supported by the piping and connection flanges. There are no individual supports required for the valves. This permits ease of removal and maintenance.

3.4. Structural Supports

The load of the Ground Flare structure is carried on four legs, each c/w a foot plate. The locations and hole patterns for anchoring of the legs are shown on the general arrangement drawings. I.O.M.

3.5. Site Preparation

The piping and valve supports supplied, shall be installed during the installation of the flare in accordance with good piping practices. The concrete foundation pad should be cleaned of all debris and the holes for the anchor bolts drilled in the correct locations required for securing the manifold supports.

3.6. Ground Flare Assembly

The ground flare is shipped in three segments. The combustion chamber, support structure and wind box are shipped as one unit. The local control panel is shipped as a separate piece for installation by the electrical contractor. The manifold is shipped separately and must be installed by the general contractor prior to connection of the sludge gas piping.

3.7. Ground Flare Preparation for Erection

To ensure safe transport, the ground flare has been equipped with shipping braces and components have been packaged for protection. All shipping materials should be removed prior to the erection of the flare. The ground flare should be inspected for damage during transport and/or loose components. The burners located within the wind box have been secured for transport, an internal inspection of the burner compartment should be completed prior to erection. The best way to accomplish this is while the flare is in the horizontal position. Access can be gained via the flare exit, through the barrel, to inspect the burners.

3.8. Ground Flare Erection

The combined mass of the ground flare requires one crane for the erection and installation of the flare. The support legs are designed to withstand lateral loading, the lifting lugs are designed to carry the entire load for installation. The flare must be rigged from the upper two lifting lugs for the placement of the flare. Lift the unit vertically and move it into location, in the correct orientation over the anchor bolts. The orientation of the ground flare has been predetermined by the location of the inlet manifold piping.

1. *Designate one individual as the lift supervisor, this person must be experienced in the work to be performed and will be responsible for the entire lift procedure.*

2. *Ensure that the crane lifting the ground flare is rated for the entire lifting conditions under which the lift is to be completed, i.e. the crane must be able to lift the maximum weight of the flare at full extension and the angle required for placement.*

3. *Rope and secure the designated lifting area and insure only persons experienced and required are within the area during the lift.*

4. *Complete the lift and placement of the flare.*

Do not allow the rigging to be disconnected until the base of the flare has been secured with the anchor bolts. If the anchor pad is out of level, the foot plates must be shimmed and bonded to align the ground flare in a true vertical position.

3.9. Piping and Valve Assembly

All the gas distribution piping below the burners has been fully assembled and secured prior to shipment. When the ground flare has been erected, the back pressure regulators if not preinstalled on the manifold, and (where required) shall be installed by removing the spool pieces shipped with the inlet manifold. Ensure the BPV(s) are installed to the flat-faced flanges in the location indicated on the GA drawings.

Note: Do not over tighten the flange bolts on the 386 BPV, do not connect 386 BACKPRESSURE REGULATORS to raise face flanges.

3.10. Biogas Supply

The main burners are supplied through two zones, one 4 inch and one 6 inch connected to the main header. A 12 inch ANSI 150 # raised face flange is provided at inlet end of the manifold for connecting the Varec 450 series Flame trap assembly to the digester gas feed pipe. The flare will require the field installation of one 6 inch 386 backpressure regulator. This is to be installed on Zone 2 as indicated on the general arrangement drawing.

The biogas and LPG pilot valve trains are installed on the flare complete with the required valves, flame arresters, regulators and gauges. The digester and LPG gas supplies should be piped and connected by the contractor to the appropriate valve trains.

3.11. Electrical Installation

The control panel(s) and the electrical devises on the flare are rated for a general-purpose area classification. The area classification of the flare is often classified as Nema 7. This is a in conflict with the fact that the flare is an open flame and an ignition source and cannot be located in a Class 1 or Class 2 area. The ignition assembly is a sparking device, which is designed to create flame, as well the scanning system is supplied to verify flame is present. The components on the flare are not energized until a safe Trial for Ignition is initiated, therefore these devices need not be rated explosion proof

The Nema 4x electrical control panel, has been shipped separately from the flare. This panel is to be installed in the location indicated on the site drawings. The field and control wiring for the ground flare shall be installed and terminated to the appropriate junction boxes and terminals on the flare. The selected control panel location should be a minimum of three meters from the side of the flare. The preferred location is adjacent to the side of the flare opposite the inlet manifolds. This location is preferred because of its proximity to the inlet manifolds and this area must be left unobstructed in order to remove the combustion air inlet dampers.

All field wiring and wiring methods utilized for connections to the flare must be completed in compliance with the National Electrical Code and/or Local Authority.

3.12. Refractory

3.12.1. The refractory utilized in the ground flare consists of ceramic fiber, silica modules. This system has been selected to meet the requirements of the specifications. The modules are individually fastened by way of a stainless steel stud welded to the interior wall of the combustion chamber. The modules are 12 in. x 12 in. x 4 in. thick and have a density of 10 lbs/cu ft. The temperature rating for the module is 2700□F The use of the modules permit the ground flare to be thermally shocked in a cold start-up situations without damage to the lining. The lower (first) 10 ft. of the combustion chamber is supplied with a HTA HDHC MODULE, this is a high density, high compression module which is capable of withstanding operating temperatures up to2850□F and is the best available product for application in the high radiant heat zone of the flame front. The interior wall of the combustion chamber shell has been coated with a bitumastic corrosion coating to minimize dew point corrosion of the combustion chamber shell.

4. OPERATION

The ground flare supplied by Whessoe Varec Inc. has been designed to operate as a standby flare capable of handling either intermittent or continuous combustion conditions.

The operation of the ground flare is designed to ensure full destruction of the combustible components of the biogas.

THE TEMPERATURE PROCESS CONTROLLER HAS BEEN PROGRAMMED PRIOR TO SHIPMENT. A COPY OF THIS PROGRAM IS INCLUDED IN THIS MANUAL. UNDER NO CIRCUMSTANCES SHALL THIS PROGRAM BE MODIFIED WITHOUT THE EXPRESS WRITTEN CONSENT OF WHESSOE VAREC INC. CHANGING THIS PROGRAM WILL NULLIFY AND VOID ALL WARRANTY. The only exception to the above is that the process temperature set-point value may be changed to permit manual temperature control for start-up. The process set point must then be returned to the normal operating set point of 1600F.

4.1. Theory of Operation

1. When the *Hands-Auto (H.A.)* selector switch is in the *Auto* position, and upon receiving an external permissive to start the flare, a start relay is energized.

2. The pilot gas selector switch will be in either the LPG or Biogas position.

3. On demand, a Trial for Ignition (TFI) will be started. During the TFI the selected propane or digester gas pilot solenoid valves are opened and the ignition transformer is energized creating a spark at the pilot burner at the same time as the selected pilot supply valve opens.

4. The pilot is ignited and proved by the U.V. scanner. The flame safeguard (FSG) will control the length of the TFI. The TFI will last for 10 seconds.

5. The U.V. scanner will continue to site and verify the flame within the combustion chamber.

6. Should the UV fail to verify flame a "Flame Failure" alarm will be annunciated and the flare ESD valve will close and pilot will shut down.

7. The inlet ESD valve will fail closed in the event of a *Flame Failure*.

8. In the event of a high temperature alarm only the main ESD valve will close, the pilot will remain on.

9. The self check U.V. scanner is equipped with an internal shutter which continuously closes the site aperture once every three seconds and continuously

verifies that the U.V. scanner is not sensing a runaway U.V. condition, it then returns to the actual flame verification.

10. Once the flame proven conditions have been satisfied the flare will be in a standby position and the ESD inlet valve will be permitted to open.

11. When the Control valve opens, gas is delivered to the burner manifold the combustion air dampers are in the open position for a three minute time delay bypassing the *Low Temperature* alarm.

12. The temperature will increase in the combustion chamber during this time delay and the combustion air dampers will modulate closed or open to maintain the temperature set point for the ground flare.

13. Once the normal gas flows to the flare have been established the combustion air dampers will continue to modulate the excess cooling air to maintain normal operating conditions. If the volume of gas available or the specific heat of the gas enriches or diminishes, the temperature controller will react and modulate the dampers as required.

14. Once the low temperature alarm time delay has timed out and provided the flare is within the normal operating temperature range, no alarms will be enunciated.

15. Should the exit temperature of the flare decrease to 1200□ F the "Low Temperature Alarm" will be activated.

16. If the temperature increases to 2000□ F a "High Temperature Alarm" will be annunciated. **(This alarm condition requires that the flare shut down and determines the problem with temperature control system.).**

17. The control panel is equipped with a UPS (uninterrupted power source), should the normal power supply be interrupted, the UPS will maintain the operation of the flare and the control system.

18. The UPS will continue to supply power for operation until the battery has been exhausted. Should the UPS fail, an alarm status shall be enunciated to the clients monitoring system

    As a result of complete power failure , the dedicated ESD valve UPS will be activated to drive the ESD valve to a closed position.

19. A second flame monitor is used on the flare which sights only main burner flame. This is active after the system start is initiated and the control panel is on, this will detect any flame in the flare after the system is shut down. If the flare is supposed to be off and flame is indicated the source of the gas leakage or bypass must be corrected.

4.2. Digester Gas Control

This ground flare utilizes a two-stage burner system to permit the combustion of the varying gas flows anticipated during normal operation. The second stage is controlled by the 386 BPV located on the second zone manifold. This enables the ground flare to meet the turn down requirements of the specifications. The ground flare is started from a remote signal that enables the combustion control panel to initiate start up. When the start up is successfully completed the ESD control valve is permitted open, permitting the flow of biogas to the flare.

The biogas pilot is a BFB-800, 8-inch broad flame burner. The burner is designed for an average heat release of 800,000 BTU's per hour, this size of flame and the flame characteristics developed, permit a smooth and consistent light off of the main burner zone(s). This burner has also been selected because of the excellent ultraviolet performance required for reliable flame supervision of biogases.

The propane pilot is connected to the BFB 800 stainless steel pilot burner, the propane consumption is controlled at 100,000 BTUs per hour. This pilot valve train operates with orifice pressure of approximately 2 PSI

4.3. Zone 1 Burners

Zone 1 consists of a central burner runner across the middle of the combustion chamber, this is a 4 inch manifold containing 4 BFBA burner heads. The flow capacities can be obtained from the burner curves enclosed in this manual.

4.4. Zone 2 Burners

Zone 2 consists of single 6-inch manifold with 3-inch connectors that split the flow to both sides of the combustion chamber. The Zone consists of 16 BFBA burner heads. The flow capacities for Zone 2 can be obtained from the burner curves enclosed in this manual.

4.5. Test Ports

Four test ports are provided on each ground flare. The test ports are spaced at 90□ around the stack, at a distance equal to ½ of the exit diameter from the exit. (Test procedures and testing are the responsibility of the owner.)

Located near one test port a Type K thermocouple for process temperature control and a fixed flue gas sample tube and tubing system piped to near grade level. This permits sampling of the products of combustion by use of a vacuum pump and analyzer at ground level.

5. MAINTENANCE

5.1. Burner Maintenance

It is recommended that a procedure be established and implemented to inspect the ground flare burners and piping at regular intervals not exceeding six months. An immediate inspection is required if the ground flare appears to be operating abnormally or deviates significantly from the process control set points.

Burner components that are corroded or deformed in any way should be replaced. Burner problems are usually indicated when there is a substantial change in the normal flame pattern that can be observed through the sight ports.

5.2. Flame Safeguard Testing

The following steps should be taken to test the flame safeguard system. **This procedure should be performed frequently but under no circumstances should the time frame between testing exceed three months.**

1. Turn off the power to the flare.
2. Close the manual gas valves for both the biogas and LPG pilot supplies.
3. Allow the flare to completely shut down and visually ascertain that all flame has been extinguished.
4. Turn the *Hand/Auto* switch to the *Hand* position.
5. Push the *Lamp Test* button and verify that all pilot lights are operational.
6. Push the *System Start* button and permit the flare to start.
7. Permit the TFI to expire, during this time frame view the pilot burner and listen for ignition spark.
8. Since the gas supply has been isolated the flame safeguards should be in a *Flame Failure* condition, verify that this has taken place.
9. Turn the selector switch to the *Off* position, then reset the flame failure conditions.
10. Open the propane pilot gas supply and repeat the TFI.
11. Verify that the propane pilot ignites and the scanner verifies that flame.
12. Test the flame signal strength at the amplifier by measuring the voltage strength as per the manufacturer's information. This should be in the vicinity of 10 volts DC.

13. Turn off the control panel and permit all flame to extinguish.
14. Open the biogas pilot supply valve and select this valve train on the panel.
15. Turn power "On" and repeat the start-up procedure , allow the pilot to ignite and to be verified by the flame safeguards.
16. Go to the flare and remove U.V. scanner at the swivel union and return to the control panel and verify the system is in "Flame Failure" alarm.
17. Turn the power off to the flare, replace the U.V. scanner in the same sighting alignment as before removal.
18. Restart the flare and reinstate it to normal operating conditions.

5.3. Temperature Indication and Control

The flare temperature is measured at the test port by way of a type "K" thermocouple positioned in the products of combustion flow stream, this signal is transmitted to the temperature process controller and temperature alarm controllers located in the control panel. The operating temperature of the ground flare is controlled by the modulation of the combustion air inlet dampers located at the base of the wind box. The temperature controller has a process set-point value of 1600□F and the air dampers are controlled by a 4-20 mA signal to the damper drive. The air dampers are modulated in a floating position to permit the correct levels of excess air to be drawn through the ground flare to cool the combustion process to the predetermined temperature set-point. As the volumes of gas decrease or increase the heat released from the combustion process will be automatically be cooled to the process set point.

5.4. Ignition System Maintenance

A drawing of the ignition assembly(s) is located in the appendix section of the I.O.M.

The ignition assembly is located on the combustion chamber of the ground flare. Before maintenance or inspection is commenced, lock out and tag the local control panel and disconnect the high voltage lead from the ignition transformer to prevent the possibility of electrical shock.

The assembly is attached to the combustion chamber of the flare. They may be removed for inspection or repair during the operation of the flare. If the flare is in operation, disconnect the power source to the ignition system before attempting to remove the ignition assembly from the flare.

It is recommended that the ignition system be inspected at the same time as the burner maintenance is performed.

Any visible accumulation of dust/dirt/rust should be removed, as it may prevent proper ignition of the pilot flame. In addition, if it is evident that the ignition rod is out of alignment or loose, it should be re-aligned or tightened. Caution should be exercised when tightening the ceramic locking gland nut with only sufficient tension to hold the kanthal ignition rod securely in place.

Do not over tighten the ceramic gland as temperature expansion may cause cracking of the porcelain.

The ceramic insulator surrounding the ignition rod should also be inspected to ensure that it is not cracked. If the ceramic insulator is broken, it must be replaced.

6. SYSTEM TROUBLESHOOTING

6.1. Pilot Flame or Ignition Failure

If visual inspection verifies that the pilot burner has not ignited during startup, the following shall be inspected:

1. Check that the pilot burner gas supply valve is open.
2. Check that the pilot gas solenoid is energizing and opening. This can be verified by reading pilot gas pressure downstream of the solenoid.
3. Look through sight plug and try to determine visually if an ignition spark is being generated, the ignition spark itself can usually be heard while viewing the pilot assembly.
4. Check that the ignition rod is properly aligned in the pilot burner flame path.
5. Check that the ignition rod is properly connected to the ignition system and transformer.
6. Check that the ignition rod ceramic insulator is not cracked or grounded (if cracked, then replace with new)
7. If no spark is detected, use a meter to ascertain that the ignition transformer is being energized during the Trial for Ignition

NOTE: Any other problems should be addressed directly with Whessoe Varec Service Division.

6.2. High Temperature Alarms

The primary cause for high temperature alarm condition is an insufficient volume of excess air being permitted to enter the combustion chamber. This usually occurs when the dampers fail to modulate open, usually a result of the damper actuator or the damper linkage failing to respond to the output signal from the temperature controller.

The failure to modulate the actuator and/or dampers may originate from the process temperature controller, check to verify that a proper 4-20 mA signal is available from the controller. (The controller is equipped with a manual 4-20 mA output feature for this purpose.) If there is not, the cause is usually a change in the set-point program within the controller. Check that all program set points are initiated as per Whessoe Varec's initial inputs.

Another cause for high temperature readings would be loose connections on the thermocouple field wiring or a burned out (open contacts) on the thermocouple.

6.3. Low Temperature Alarms

The primary cause of low temperature alarm conditions is the oversupply of excess air to the combustion chamber. This usually occurs as a result of the ineffective control of the combustion air by the modulation of the dampers.

Any one or combination of the following conditions may cause this:

1. Response time of the temperature controller.
2. Faulty thermocouple or temperature indication.
3. Faulty 4-20 mA field wiring or loose connections on the controllers.
4. Damaged dampers whereby the damper blades cannot be completely closed.
5. Damaged or incorrect adjustment or loose damper linkage.
6. Incorrect temperature controller program installation parameters.

7. COMPONENTS AND CATALOG CUTS

When ordering replacement parts, please refer to the part numbers as noted in the following list. When ordering parts from Whessoe Varec, the parts may be referenced on the P&IDs.

	PART DESCRIPTION	SUPPLIER	PART NUMBER	NOTES
A	VERI-FLAME SAFEGUARD & CONFIGURATION DATA SHEET	ECLIPSE	5602-22	U.V., PURGE CONTROLLER
	FSG BASE	ECLIPSE	5602-10-1	EXPOSED TERMINAL BASE
	U.V. SCANNER	ECLIPSE	5602-90A	90 DEGREE UV SCANNER
	UV S/C SCANNER	ECLIPSE	5602-91	SELF CHECK SCANNER
	PEEK A FLAME	ECLIPSE	SERIES 7000	MODULE C/W BASE
	IGNITION TRANSFORMER	ECLIPSE	612-6A020E	120/6000 VAC, 50 /60Hz
B	1/2" NPT SOLENOID VALVE	ASCO	EF8215 B20/120	PROPANE PILOT SUPPLY
	1" NPT SOLENOID VALVE	ASCO	EF8215 B50-120	DIGESTOR PILOT SUPPLY
C	IGNITION ASSEMBLY	DCC	IAXP-24	XP IGNITION SYSTEM
	UV MOUNT	DCC	DCUVMP1	UV SCANNER ENCLOSURE
	SWIVEL UNION	DCC	DCSWU1-2	1" X 2" MIP SS SWIVEL UNION
	VALVE UPS	DCC	DCC-JA-0498	1500 WATT VALVE UPS

	SITE GLASS	DCC	LSP-51-09	2"MIP FUSED LENS SITE GLASS
	PILOT BURNER	DCC	BFB 800	8" BROADFLAME BURNER
	MAIN BURNERS	DCC	BFBA 1200	12 BROADFLAME BURNER
	BFBA BURNER TRACK	DCC	BFBA-T49	49" SS BURNER TRACK
	BFBA BURNER TRACK	DCC	BFBA -T37	37" SS BURNER TRACK
	BFBA BURNER TRACK	DCC	BFBA -T13	13" SS BURNER TRACK
D.	PRESSURE REGULATOR	FISHER	67-410	1/4" NPT LPG PILOT GAS REGULATOR
E	DAMPER MOD. MOTOR	HONEYWELL	M9185D4008	MOTOR, DAMPER DRIVE
	4-20 mA INTERFACE	HONEYWELL	221508A	INTERFACE MODULE
	TRANSFORMER	HONEYWELL	198162AA	120/208/240 VAC TRANSFORMER
	DAMPER LINKAGE CRANK ARM	HONEYWELL	221455A	
	NEMA 4 CONTROLLER COVER	HONEYWELL	30757215-001	
	TEMP. CONTROLLER	HONEYWELL	UDC 200C-2-00F-2C000	UDC200C-00F-2C-0000 4-20mA,2-ALARMS 120/208/240 VAC 50/60 Hz
	CONFIGURATION DATA SHEET C/W ALARM SETPOINTS			
F	AIR INLET DAMPER	WESTVENT.	PBSS-4L6	36 X 48 ,SS, HIGH TEMP BEARINGS
G	PUSHBUTTON SWITCH	AB	800T-A1-D1	MOMENTARY PUSHBUTTON N.C
	PUSHBUTTON SWITCH	AB	800T-A6-D2	MOMENTARY PUSHBUTTON N
	TWO POSITION SWITCH	AB	800T-H2A	ON-OFF SWITCH, 1-N.O. CONTACT
	TWO POSITION SWITCH	AB	800T-H2B	H-A SWITCH, 2-N.O.-N.C. CONTACT
	PILOT LAMP	AB	800T-Q10	FULL VOLTAGE120 V AC/DC
	LENS	AB	800T-N26G	GREEN LENS
	LENS	AB	800T-N26W	WHITE LENS
	LENS	AB	800T-N26R	RED LENS
H	TIME DELAY RELAY	OMRON	H3CR-H8L-AC120S	DELAY ON ENERGIZE RELAY
	TIME DELAY RELAY	OMRON	H3CR-A8-AC100/-240S	DELAY ON DE-ENERGIZE RELAY
	RELAY BASE T/D	OMRON	P2CFO8	BASE 8-PIN D-RAIL MOUNT
	RELAY 2-POLE	OMRON	LY2NAC120	2-POLE RELAY, NEON INDICATOR
	BASE 2-POLE RELAY	OMRON	PTF08AE	RELAY BASE FOR 2-POLE
	RELAY 3-POLE	OMRON	LY3NAC240	3-POLE RELAY. NEON INDICATOR
	BASE 3-POLE RELAY	OMRON	PTF11A	RELAY BASE FOR 3-POLE
	RELAY 4-POLE	OMRON	LY4NAC240	4-POLE RELAY, NEON INDICATOR
	BASE 4-POLE RELAY	OMRON	PTF14AE	RELAY BASE FOR 4-POLE
I	CIRCUIT BREAKER	WEIDMULLER	91296.8	BREAKER MCB 10A 2 POLE
	TERMINAL BLOCK	WEIDMULLER	12836	TERM BLOCK SAK4/32 PLY
	END SECTION	WEIDMULLER	11796	END SECTION AP PLY
	END BRACKET	WEIDMULLER	20616	END BRACKET EWK1 PLY
	PARTITION	WEIDMULLER	13016	PARTITION TW PLY
	T/C TERMINAL BLOCK	WEIDMULLER	91022.3	"K" THERMOCOUPLE BLOCK
J	THERMOCOUPLE	ATS	CPTAA-2-K-08-24	CERAMIC 3/4"NPT, DUPLEX TY

				"K"
K	SYSTEM UPS	BEST-FORTRESS	L1 1420B UPS	1400 WATT UPS
L	ESD VALVE	TRICENTIC	150801-GXSSTNC	8" WAFER BUTTERFLY VALVE
M	VALVE ACTUATOR	KEYSTONE	F777-44-151	
N	PAINT SPECIFICATION	DAMPNEY	THERMOLUX 245/230	HIGH HEAT GRAY
O	CERAMIC FIBRE MODULE	PREMIER	HTA & HDHC	4" THICK 10 AND 12 # MODULES
	INTERNAL CORROSION COATING	PREMIER	3171	HT MASTIC
P	CONTROL PANELS	HAMMOND	1418-N4-SS-S12	NEMA 4X, 36 X 48
Q	BALL VALVES	APOLLO		½ AND 1" BALL VALVES
R	CERAMIC FIBRE BLANKET	PREMIER		10 POUND DENSITY

Attachment H
Procedure for Startup and Shutdown

Cogeneration Engines

BEST AVAILABLE COPY

B. AUTOMATIC (REMOTE STARTING LOGIC) STARTING SYSTEM

The Starting System section of the panel controls the starting events once the crank signal is sent to the panel. When the engine is running, the starting system sustains the control signals to the ignition ground switch, and to the Fuel Valves.

SEQUENCE OF EVENTS - STARTING

The starting sequence consists of three parts:

Purging, Starting, and Running. See Figure B-1 for reference.

The Purging Cycle begins as soon as the crank signal is sent to the starter motor control valve and the panel CONNECTION 16. The engine begins to crank to expel fuel from the cylinders and exhaust system before the ignition is turned on. The purge timer is to be set for 10 seconds.

During this cycle, the ignition system is grounded, the Start Fuel Valve is closed, and the Run Fuel Valve is in the vent position.

The Starting Cycle begins when the timer "times out" and the engine has been purged.

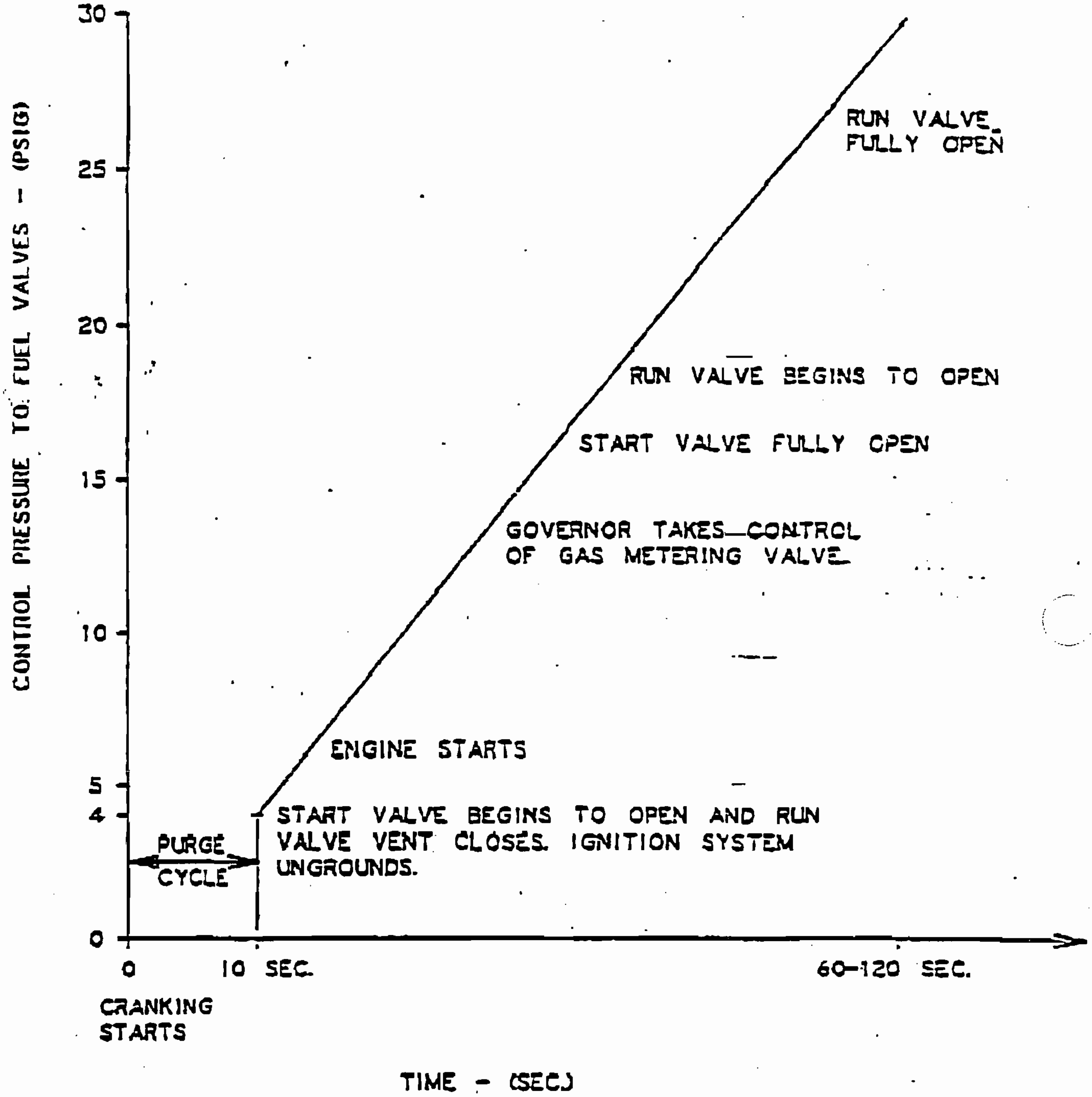
The following then occurs:

- Ignition system is ungrounded.
- Run Fuel Valve shuttles from the vent to the closed position.
- Start Fuel Valve begins to open at a controlled rate, gradually increasing the gas manifold pressure.

When there is sufficient fuel in the pre-chamber and main combustion chamber, the engine will start and begin to accelerate to idle speed. When the Start Fuel Valve is almost fully open, the governor will begin controlling engine speed by positioning the gas metering valve.

When the engine reaches 150-200 RPM, a run confirm pressure signal must be sent to CONNECTION 3 (CP) to maintain activation of the starting sequence upon loss of signal from CONNECTION 16 (CP).

The Running Cycle begins as the Run Fuel Valve opens, and is complete when the valve is fully open.



SEQUENCE OF STARTING EVENTS

FIGURE B-1

SEQUENCE OF EVENTS - STOPPING

The engine will continue to run until the Permissive Supply (CONN. 8) is removed or the run confirm signal (CONN. 3) is lost. In either case, the following events occur:

- Start Fuel Valve closes.
- Run Fuel Valve shuttles to vent.
- Ignition system grounds after 10-20 seconds.

OPERATION

Operationally, this section of the panel has three segments: Inputs, Adjustments, and Outputs. See Figure B-2 for reference.

The INPUTS are:

Control Air Supply	- a permissive from the unit control shutdown circuitry.
Engine Cranking Signal	- initiates starting sequence in conjunction with cranking motor actuation.
Run Confirm Signal	- sustains the control signals to the fuel valves and ignition for continued running operation.
Ignition Ground	- signal pressure ungrounds the ignition system; loss of pressure grounds the system (CONNECTION 7).
Fuel Valves' Control Signal	- This is a multi-function signal. It controls the opening rate of the Start Fuel Valve, and the three-position Run Fuel Valve. Loss of pressure will cause the engine to stop (CONNECTION 6).

(See Figure B-3)

Emergency Generators

Procedures for Startup
Standby Generators All Models
South District Wastewater Treatment Plant
Miami-Dade Water and Sewer Department

There are two types of startup procedures that can be followed depending on the scenario requiring power standby power production. These procedures are: normal baseload/peaking startup and deadline startup. These procedures are discussed briefly in the following paragraphs. The standby generators at the South District WWTP are all started with compressed air startup, each generator has a dedicated compressed air tank and all generators are be able to startup simultaneously.

Normal Baseload / Peaking Startup

The normal baseload / peaking startup procedure is followed under circumstances where the facility is given advance notice that power will be curtailed, or in the event that the facility proactively decides to startup the generators to protect against emergency power loss: This procedure is initiated manually. Upon startup, each engine is allowed to run 10 minutes at idle setting to warm-up, followed by 15 seconds of acceleration, 10 to 20 seconds of synchronization, and 10 to 30 seconds to accept load. When each unit synchronizes to bus, the load breaker closes and the unit provides electricity to the plant. The total procedure takes approximately 11 minutes to come on-line.

Deadline Startup

The deadline startup procedure is followed under circumstances where the facility is not given advance notice that power will be curtailed (emergency power loss). This procedure is initiated automatically by the plant control systems when the plant loses power. Upon startup, the units remain at idle for up to 5 seconds, accelerate for approximately 10 seconds, synchronize for approximately 5 seconds, and accept load. When each unit synchronizes to bus, the load breaker closes and the unit provides electricity to the plant. The total procedure usually takes less than 60 seconds.

Excess Emissions

Excess emissions that typically occur during startup generally consist of elevated hydrocarbon (HC), carbon monoxide (CO), and particulate (PM) emissions as a result of cold combustion temperatures and reduced load conditions. As the units warm up and accept load, emissions of these pollutants will decrease. Emissions of nitrogen oxides (NOx) will mirror the other pollutants increasing as the engines warm up and accept load. Since limitations in the permit application are based on generator power output (kW-hr), emissions resulting from startup of the generators are not accounted for in monitoring, recordkeeping, and reporting. However, emissions that occur during this period are not expected to be significant (low NOx emissions due to engine warm-up and relatively short duration of emissions of other pollutants).

BEST AVAILABLE COPY

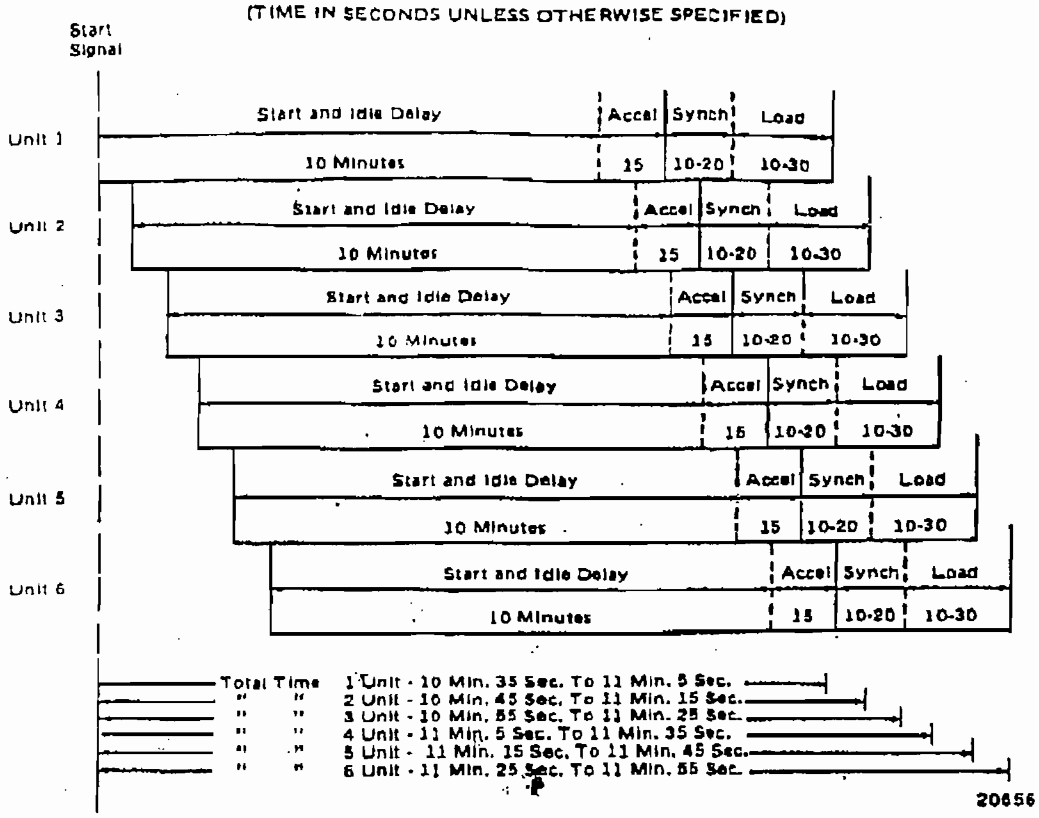


Fig. 1-3 – Starting Time Of Power Plant (Normal Start Peaking Duty)

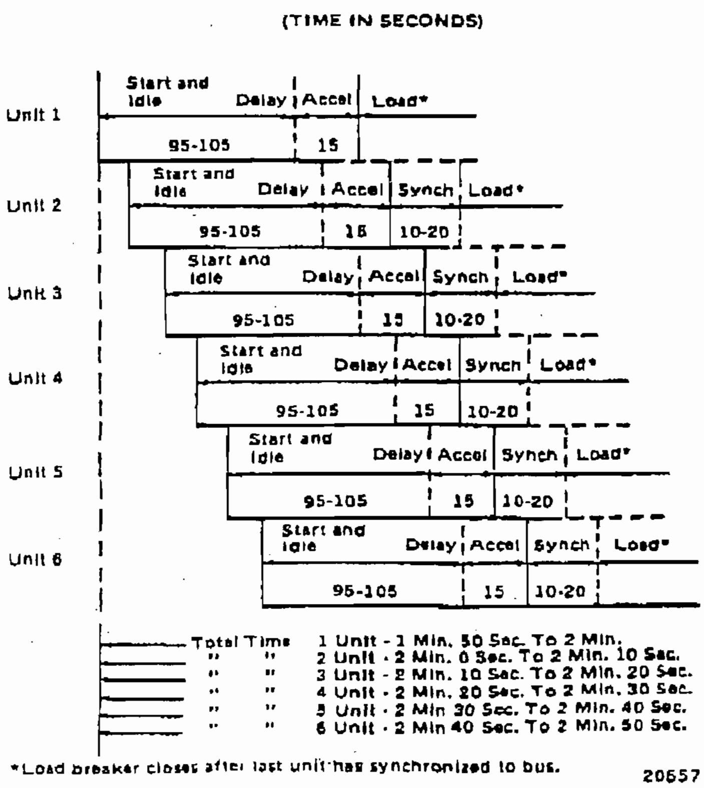


Fig. 1-4 – Starting Time Of Power Plant (Deadline Start) plug may be removed from immersion heater temperature control switch (TC) until water is added to the engine cooling system. Be sure to install plug when the filling operation has been completed.

12. Check tension of vee belt drive on radiator cooling fan. Check belt tension by applying a perpendicular force of 10 to 13 lbs to each belt at mid-point of belt span, refer to Fig. 4-1. The vee belt should deflect 7/16" when the force is applied, otherwise adjustment is required. It is recommended that Vee Belt Tension Indicator 8396624 be used for making the check.

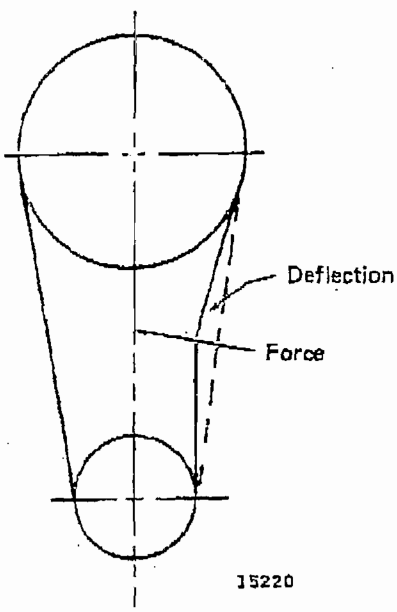


Fig. 4-1 – Checking "V" Belt Tension

Adjust tension of vee belt as follows:

a. Loosen nuts on two bolts holding pillow block assembly to pillow block pedestal assembly.

b. Loosen nut on pillow block adjusting screw.

c. Adjust pillow block adjusting bolt for required vee belt tension. To increase tension, adjust bolt clockwise. To decrease tension, adjust bolt counterclockwise.

NOTE: When tension decreases to minimum value, readjust to maximum value. It may be necessary to elongate the slots in the pillow block pedestal assembly in order to adjust vee belt tension to the maximum value. If it is necessary to elongate the slots, the upper slot should be elongated downward 3/4" and the lower slot should be elongated downward 3/8".

d. After vee belt tension is adjusted, tighten the nuts that were loosened in Steps a and b.

PRECAUTIONS BEFORE STARTING ENGINE FOR THE FIRST TIME

It is recommended that the following checks be made immediately before starting the engine for the first time.

1. Unit manual selector switch should be in the OFF position.
2. Circuit breaker should be in test or disconnect position.
3. Make sure that all necessary fuses are in their proper position. Static exciter fuses should be removed to prevent generator excitation at this time. The electrical tests of the generator will be made when the unit is ready for the phase rotation check.
4. Battery charger should be in operation.
5. Proper positioning of all switches.
6. Check all valves for proper position.
7. Lube oil level.
8. Coolant level.
9. Governor oil level.
10. Tightness of all handhole and oil filter covers.
11. Overspeed trip lever in set position.
12. Lubricate turbocharger, by operating lube oil circulating pump, before starting engine.

After these checks are completed, place unit master selector switch in IDLE position and start engine manually from engine control panel, then make the following checks:

1. Lube oil pressure should be over 30 psi.

BEST AVAILABLE COPY

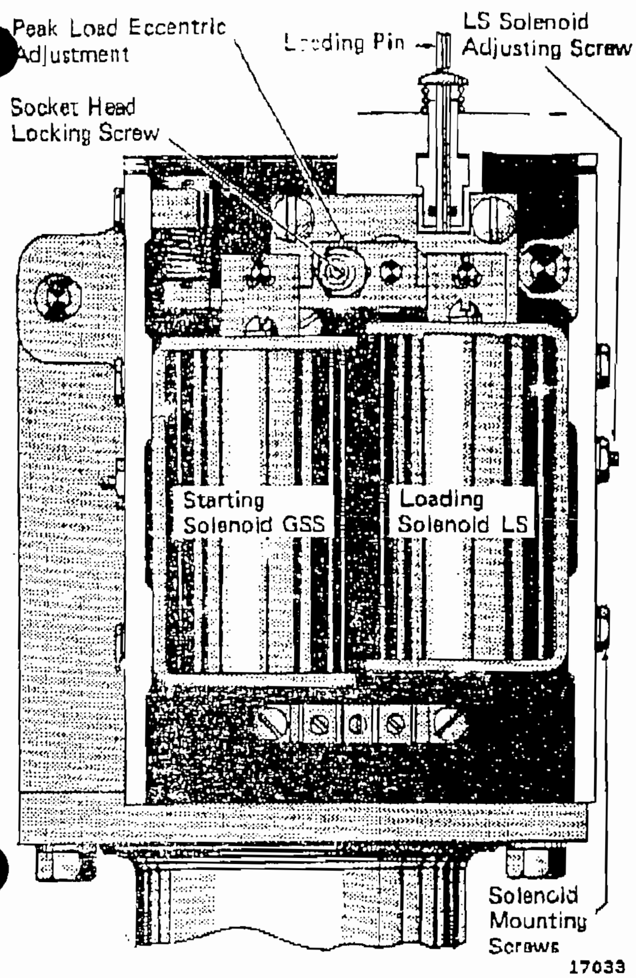


Fig. 4-2 EBG-10 Actuator - 3 Position Rack Limiter

of one hour before changing the rack stop settings. This allows all engine and governor parts to reach their respective operating temperatures. All adjustments should be made with the unit operating at its normal KVAR load.

SINGLE RACK STOP

The rack stop is adjusted by loosening the locknut on the 1/4" rack stop cap screw. Turning the cap screw in will cause load to decrease and backing out the cap screw will cause load to increase. Since the rack stop only acts to limit fuel, the engine should be manually operated with the governor control switch adjusted so that the electric governor is calling for a kilowatt load higher than the desired rack stop setting. Adjust the rack stop to limit the kilowatt output to a value which corresponds with outside air temperature as shown on the Temperature-Kilowatt graph, Fig. 4-3. Recheck rack stop setting by reducing kilowatts with the governor control switch and then increasing load until limited by the rack stop.

THREE POSITION RACK LIMITER

This device consists of two solenoids with interconnecting linkage which limits fuel depending on the solenoids energized, Fig. 4-2. Access to the rack stop solenoids and eccentric nut is gained by removing the front coverplate from the solenoid housing. The GSS solenoid need not be checked or adjusted when making the summer-winter rack adjustments.

Proper sequence must be used when checking and adjusting rack stops. The first setting to be made is the eccentric limit, with the LS solenoid de-energized.

The LS setting can then be made with little change on the eccentric setting. If the eccentric is changed, the LS solenoid must be energized and its setting checked and reset if necessary.

Prior to starting the engine, loosen the socket-head screw which is used to lock the eccentric nut in place and then lightly snug it up so it will not be so difficult to unlock when the engine is under load. In making the eccentric adjustment, hold the hexagonal portion of the eccentric nut with an open or box wrench and use an Allen wrench to loosen the locking screw. Care should be exercised when making adjustments since lifting the governor linkage can cause the unit to go to "no fuel" and trip off on reverse power. Make adjustment by turning the hexagonal portion and then lock with the Allen screw.

Should the LS solenoid require adjustment, loosen its four solenoid mounting screws and solenoid adjusting screw locknut. These screws should be loosened only enough to allow movement of the solenoid when the solenoid adjusting screw is rotated. The adjusting screw is connected to an eccentric lobe which vertically positions the solenoid.

Kilowatt values to which the eccentric and LS solenoid rack stops are set are dependent upon power unit application. These values vary according to whether the unit is intended for baseload-peaking operation or peaking-maximum deadload operation. Adjustment procedures for these two applications follow.

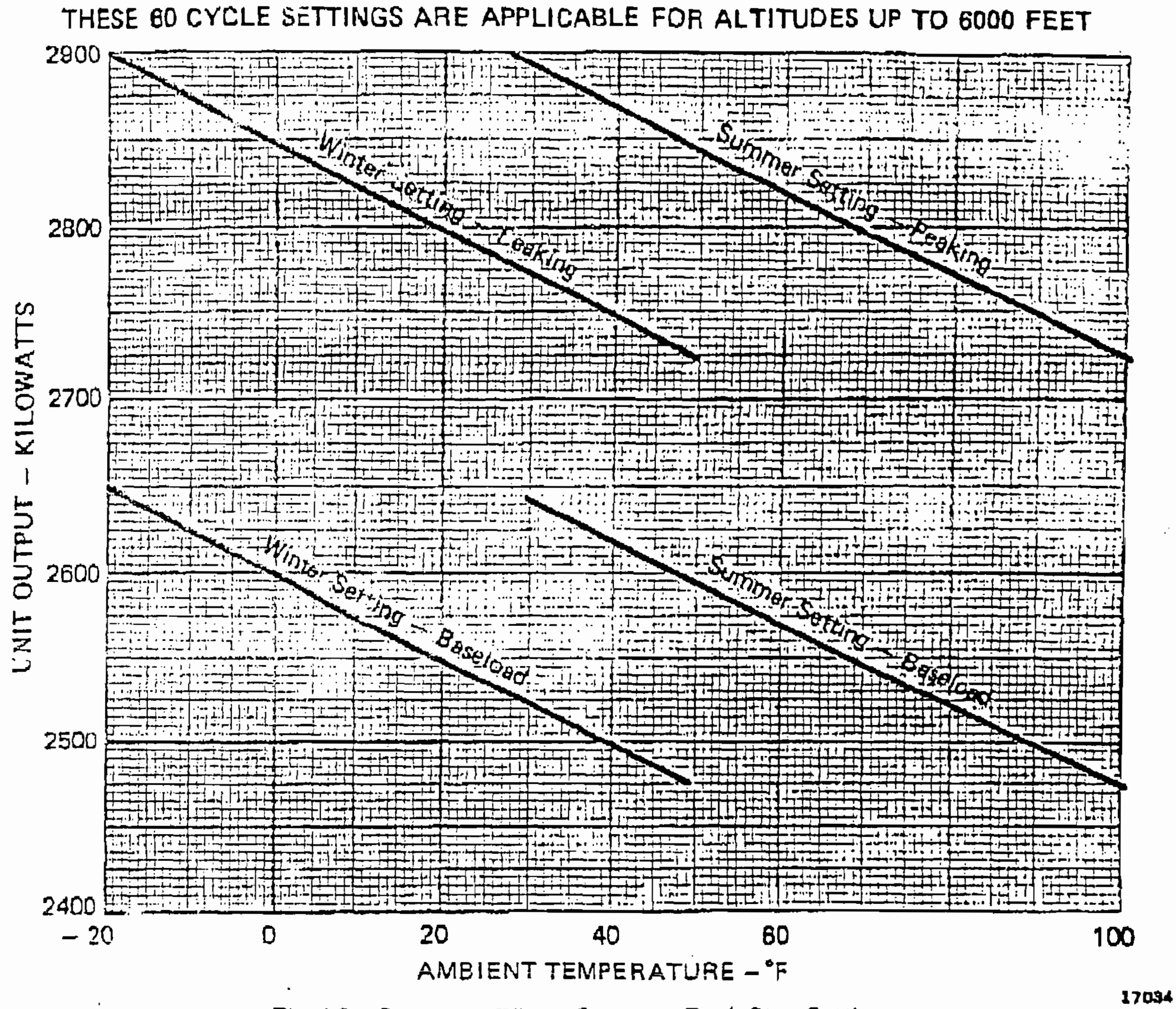


Fig. 4-3 – Summer - Winter Governor Rack Stop Settings

BASELOAD-PEAKING OPERATION

For those units which operate in baseload-peaking operation, the eccentric nut is adjusted to limit fuel at the base load rating, and the LS solenoid is used to limit fuel at the peaking rating.

ECCENTRIC ADJUSTMENT

Manually operate the unit with the baseload-peaking switch in the Peaking position. This energizes the LS solenoid which overrides the eccentric limit. Load the engine to about 100 KW above the baseload value corresponding with outside air temperature as shown on the temperature kilowatt graph, Fig. 4-3, and return baseload-peaking switch to Baseload position. Load will now drop to the eccentric limit. The eccentric limit should then be adjusted to the baseload KW value indicated on the graph and locked in place with the Allen screw. Check the adjustment by first reducing KW with the governor control switch and then running the load up against the eccentric limit.

LS SOLENOID ADJUSTMENT

Manually operate the unit with the baseload-peaking switch in the Peaking position. This will energize the LS solenoid. If the maximum load attainable with the governor control switch is above the peaking value corresponding to the outside air temperature as shown on the graph, adjust the solenoid to limit KW to the value specified on the graph. Check repeatability of the adjustment by reducing load with the governor control switch and the increasing load until limited by the LS solenoid. After making the final LS setting, recheck the eccentric setting.

If the peaking value of KW called for on the graph cannot be attained with the governor control switch, the load may be limited by either the LS solenoid or possibly the upper limit cam of the motor-operated pot in the EG governor box. The EG governor box is located in the generator compartment electrical cabinet.

Carefully place a jumper wire between terminals 25A-R5 (GS wire) and 25A-R6 (GT wire) in the engine room electrical cabinet. When adding the jumper use caution to ensure that the GS or GT circuit is not accidentally connected or touched to adjacent 120 V DC terminals. This jumper short circuits the governor transducer circuit from the EGA governor box which has the effect of electrically calling for a full fuel governor setting. This electrical signal, while canceling any limitations which might be imposed by the upper limit cam, is overridden by the LS solenoid.

Make a preliminary adjustment of the LS solenoid to limit load at approximately 100 KW above the peaking value shown on the temperature graph. Very carefully remove the GS-GT jumper and load the engine with the governor control switch to approximately 50 to 100 KW above the peaking value shown on the temperature graph. If this value of KW cannot be attained loosen the upper limit cam and rotate it down and away from the cam switch roller. The upper limit cam is the far left cam on the horizontal camshaft in the motor-operated pot assembly of the EG box. It should now be possible to increase load with the governor control switch to the temperature graph peaking value. With load at the desired peaking value, rotate the cam upward against the cam switch roller and tighten while maintaining a light pressure against the switch roller.

CAUTION: To prevent damage to the motor-operated potentiometer, ensure that its upper limit cam prevents the device from driving to the rotational limit of its potentiometer.

Load the engine with the governor control switch to approximately 50 to 100 KW above the desired peaking value and then adjust the LS solenoid to limit load to the peaking value called out on the graph. After the solenoid is properly adjusted, tighten the solenoid adjusting locknut and the four mounting screws. If too much slack was present in the mounting screws, the KW load may shift when the screws are tightened. Check repeatability of the adjustment by reducing load with the governor control switch and then increasing load until limited by the LS solenoid. After making the final LS setting, recheck the eccentric limit setting.

PEAKING-MAXIMUM DEADLOAD OPERATION

Units intended for peaking-maximum deadload operation have the eccentric limit set for their peaking rating and the LS solenoid set for a 0.77" to 0.79" rack.

ECCENTRIC ADJUSTMENT

Manually operate the unit and load the unit to about 100 KW above the peaking value corresponding with outside air temperature as shown on the Temperature-Kilowatt graph, Fig. 4-3. The eccentric may now be adjusted to the peaking KW value indicated on the graph and locked in place with the socket-head screw.

If the unit cannot be loaded to 100 KW above the value specified in the graph, loading is probably being limited by either the eccentric limit or the motor-operated pot upper limit cam in the EG governor box. The EG governor box is located in the generator compartment electric cabinet.

The eccentric limit can be overriden by energizing the LS solenoid. Care must be exercised that the deadline circuitry associated with the LS solenoid is not energized at this time. The circuitry of each unit should be checked, however, on most units this can be done by removing the XHS wire at terminal board 25A-R7 in the engine compartment electrical cabinet, and jumpering from terminal board 25A-R1 (UP wires) to terminal board 25A-R7. If the engine can now be loaded with the governor control switch to about 100 KW above the peaking value specified in the graph, remove the wire jumper installed between terminal boards 25A-R1 and 25A-R7. This de-energizes the LS solenoid and load will drop to the eccentric limit value. The eccentric may now be adjusted to the peaking KW value indicated on the graph and locked in place with the Allen screw. If, however, the load still cannot be raised to about 100 KW above the specified peaking value with the LS solenoid energized, loosen the upper limit cam and rotate it down and away from the cam switch roller. The upper limit cam is the far left cam on the horizontal camshaft in the motor-operated pot assembly of the EG box. It should now be possible to increase load with

Attachment I
Operation and Maintenance Plan

This Page Intentionally Left Blank

4.5 GENERATOR

WARNING

Always use caution when working around electrical equipment. Serious injury to personnel or damage to equipment could occur

CAUTION

Follow the manufacturer's recommendations to properly maintain equipment.

For complete details on the lubrication of the Baylor generator, refer to the Baylor Generator Instruction Manual located in Chapter 6 of this manual. Refer to Chapter 1, Section 2 of this manual for specifications on the lubricant used.

4.6 ANCILLARY EQUIPMENT

For complete details on the lubrication of equipment and systems of the generator set, refer to the applicable vendor data in Chapter 6 of this manual.

4.7 LUBRICATION SCHEDULE

NOTE

The following Lubrication Schedule form has been included as an example and/or reproducible copy for use by attending service personnel. Additional components should be added by maintenance personnel on-site.

LUBRICATION

4.1 OVERVIEW

WARNING

Always use caution when working around rotating equipment. Serious injury to personnel or damage to equipment could occur.

WARNING

Lubricate only when the equipment is shut down, isolated, and tagged "Out of Service."

This section contains instructions for the lubrication of the diesel engine generator set fabricated by Stewart & Stevenson Services. For convenience, lubrication details in this section pertain to major components supplied by others so that the service technicians have a single, abbreviated source for interval lubrication of the generator set as a unit. For complete details on a certain component, refer to the vendor data sets contained in Chapter 6 of this manual.

4.2 LUBRICATION BENEFITS

4.2.1 **Best Performance** Your generator set is ensured of its best performance and reliability when a scheduled preventive maintenance program is followed. A small cost and effort expended for a preventive maintenance program yields improved performance, efficiency, and reliability.

4.2.2 **Benefits** These benefits are realized by:

a. Understanding the nature of lubrication as a part of preventive maintenance.

b. Following the lubrication and preventive maintenance schedule that has been established.

4.2.3 **Intended Use** This generator system is intended for emergency use at times of utility power failure. Preventive maintenance that includes lubrication is the key to any standby service generator set. A program of regular lubrication can assure the ready availability of the generator sets in emergency situations. A complete log of all lubrication, as part of maintenance and repairs, should be kept to help pinpoint future problem areas.

This Page Intentionally Left Blank

Table 2.5 Unit Troubleshooting (Cont)

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
12. Low oil pressure (Cont).	d. Improper oil viscosity.	d. Drain crankcase and refill with oil of proper viscosity.
	e. Internal engine fault.	Refer to Engine Service Manual.
13. Engine overheats.	a. Air inlet blocked.	a. Remove blockage.
	b. Cooling air fan defective.	b. Test/replace cooling air fan.
	c. Generator set overloaded.	c. Reduce load.
	d. Defective high engine temperature switch.	d. Test/replace switch.
	e. Loose or defective V-belt.	e. Adjust/replace V-belt.
	f. Coolant loss	f. Replenish coolant.
14. Frequency fluctuates.	a. Erratic engine operation.	a. Refer to Engine Service Manual
	b. Defective frequency meter.	b. Test/replace hertz meter.

Table 2.5 Unit Troubleshooting (Cont)

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
7. Engine does not develop full power.	a. Cylinder misfiring.	a. Refer to malfunction 6.
	b. Exhaust pipe or muffler restricted.	b. Clean or replace exhaust pipe, muffler, or turbocharger screen.
	c. Defective fuel oil injector(s).	c. Refer to Engine Service Manual..
8. Engine knocks.	a. Oil picked up by airstream.	a. Refer to Engine Service Manual.
	b. Low coolant temperature.	b. Refer to Engine Service Manual.
	c. Defective fuel oil injector(s).	c. Refer to Engine Service Manual.
	d. Improper grade of fuel oil.	d. Check for fuel oil contamination. Drain fuel oil tank. Change fuel oil filters. Service with clean fuel oil of proper grade.
9. Black or gray smoke in exhaust.	a. Dirty air filter.	a. Service air filter.
	b. Generator set overloaded.	b. Reduce load to rated level.
	c. Defective fuel oil injector(s).	c. Refer to Engine Service Manual.
	d. Improper grade of fuel oil.	d. Check for fuel oil contamination. Drain fuel oil tank. Change fuel oil filters. Service with clean fuel oil of proper grade.
10. Blue smoke in exhaust.	Faulty lube oil control.	Refer to Engine Service Manual.
11. White smoke in exhaust.	Misfiring cylinders.	Refer to Engine Service Manual.
12. Low oil pressure.	a. Low oil level.	a. Add oil to proper level on dipstick.
	b. Defective low oil pressure switch.	b. Test/replace switch.
	c. Clogged oil filter.	c. Service oil filter.

Table 2.5 Unit Troubleshooting (Cont)

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
4. Engine starts correctly, but stops when START switch is released.	a. Defective STOP switch	a. Test/replace switch
	b. Defective or low oil pressure	b. Test/replace switch.
	c. Defective high engine temperature switch.	c. Test/replace switch.
	d. Defective wiring.	d. Notify direct support.
	e. Defective low fuel oil level switch.	e. Test/replace switch.
5. Engine stops suddenly.	a. Protective device tripped.	a. Check fault indicator for malfunction indication. Refer to the appropriate maintenance section.
	b. Fuel oil support exhausted.	b. Refill fuel oil tank.
	c. Air lock in fuel oil supply line.	c. Bleed fuel oil system. Tighten any loose fuel oil line connections.
	d. Obstruction in fuel oil line.	d. Service fuel oil system.
	e. Water in fuel oil.	e. Drain fuel oil tank. Service fuel oil system with clean fuel oil.
	f. Defective engine-protective device.	f. Test replace engine protective device.
6.Engine runs roughly or misfires.	a. Improper grade or contaminated fuel oil.	a. Check for fuel oil contamination. Drain fuel oil tank. Change fuel oil filters. Service with clean fuel oil of proper grade.
	b. Dirty air filter.	b. Service air filter.
	c. Obstruction in fuel oil line.	c. Clean or replace fuel oil supply line.
	d. Defective fuel oil injector(s).	d. Refer to Engine Service Manual.

Table 2.5 Unit Troubleshooting

MALFUNCTION	PROBABLE CAUSE	CORRECTIVE ACTION
1. Starting aid does not operate.	a. Defective switch	a. Test/replace switch.
	b. Defective solenoid.	b. Replace solenoid.
	c. Defective wiring.	c. Refer to wiring diagram.
2. Engine fails to crank.	a. Improper starting procedure.	a. Perform starting procedure according to Operation section.
	b. Defective starter switch.	b. Test/replace starter switch.
	c. Defective starting circuit or break in starting circuit wiring.	c. Refer to wiring diagram.
	d. Defective starter assembly.	d. Defective starter assembly.
3. Engine cranks but fails to start.	a. Improper starting procedure.	a. Perform starting procedure as outlined in Operation Section.
	b. Low or no fuel oil supply.	b. Service fuel oil tank.
	c. Water in fuel oil, contaminated or incorrect grade of fuel oil.	c. Service fuel oil filter/water separator. Drain tank of fuel oil and clean/service with clean, proper grade of fuel oil.
	d. Air in fuel oil lines.	d. Bleed fuel oil system. Tighten any loose fuel oil supply line connections.
	e. Obstruction in fuel oil supply line.	e. Clean fuel oil supply lines by flushing with clean fuel oil.
	f. Defective fuel oil pump.	f. Test/replace fuel oil pump.

TABLE 2.4 AIR START SYSTEM

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Loss of input air.	Air supply not connected	Reconnect air supply through flexible connector at skid.
Low air pressure at pressure gauge.	Clogged input line	Remove obstruction.
Low air pressure at starter motor.	Clogged air filter	Clean or replace element.
	Faulty air relay valve	Repair or replace valve.
	Faulty ball valve	Repair or replace ball valve.
	Faulty lubricator	Repair or replace lubricator.
Air pressure normal but still won't start.	Worn Bendix mechanism	Replace Bendix mechanism.

2.3 UNIT TROUBLESHOOTING

2.3.1 **Introduction** This section provides information useful in diagnosing and correcting unsatisfactory operation or failure of the generator set and its components. Common malfunctions that may occur are listed in Table 2.5. Each malfunction stated is followed by a list of probable causes of the trouble. Corrective action recommended is described opposite each probable cause. This table does not list all malfunctions; refer to the manufacturer's literature in Chapter 6 for more specific and detailed troubleshooting information.

WARNING

Always use caution when working around electrical equipment. Serious injury to personnel or damage to equipment could occur.

TABLE 2.3 LUBRICATION SYSTEM

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Low lube oil delivery pressure at engine lube oil manifold during engine operation.	Clogged oil strainer	Clean or replace strainer element. Replace filters.
	Faulty main lube oil pump	Repair or replace pump.
	Clogged oil line	Remove obstructions.
Low piston cooling oil pressure during engine operation.	Clogged oil strainer	Clean or replace strainer element. Replace filters.
	Faulty piston cooling pump	Repair or replace pump.
	Clogged oil line	Remove obstructions.
Low oil pressure to lube oil manifold and turbocharger during pre-lube operation.	Clogged "Y"-type strainer	Clean strainer element. Replace filters.
	Faulty circulating pump or soak-back pump	Repair faulty pump.
Low oil pressure to lube oil manifold during pre-lube operation.	Malfunction in solenoid valve	Repair or replace solenoid valve.
	Faulty ball valve or check valve	Replace valve. Replace filter.
Low oil pressure at turbocharger during pre-lube operation.	Clogged strainer	Clean strainer element.
	Faulty check valve	Replace faulty check valve.
	Faulty relief valve	Replace faulty relief valve. Replace turbocharger filter.
Excessively high pressure at lube oil manifold and turbocharger during pre-lube operation.	Faulty relief valve	Replace relief valve.

CAUTION

Use only specified fluid types. Do not mix fluids.

TABLE 2.1 FUEL OIL SYSTEM

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Fuel oil not reaching engine	Malfunctioning check valve	Replace check valve.
	Faulty engine-driven fuel oil pump	Replace fuel oil pump, as outlined in Chapter 6 of this manual.
	Clogged filters and/or strainers	Clean strainers and/or replace filter elements.
Low fuel oil pressure at engine	Refer to "Fuel oil not reaching engine"	
Excessively high fuel oil pressure at engine	Faulty return line check valve	Replace check valve.
	Clogged return line	Clear obstructions from return line.
Fuel oil not reaching fuel oil tank during refill operation	Faulty solenoid valve	Replace fuel oil solenoid valve.
	Faulty fuel oil level switch	Replace fuel oil level switch.
	Faulty fuel oil transfer pump	Check pump motor switch starter for "ON" position.
	Clogged fuel oil strainer	Clean strainer.

TABLE 2.2 COOLING SYSTEM

PROBLEM	PROBABLE CAUSE	CORRECTIVE ACTION
Excessively high temperatures in system	Faulty thermostatic valve	Replace thermostatic valve.
	Faulty jacket water cooler	Check fan belt for tightness. Check motor starter switch for "ON" position. Clean core and tubes if dirty.
	Faulty water pump	Repair or replace water pump, as outlined in Chapter 6 of this manual.
	Clogged lube oil cooler	Disassemble and clean lube oil cooler.

TROUBLESHOOTING

2.1 DEFINITION

WARNING

For your own protection, do not use substitute parts without the approval of Stewart & Stevenson Services.

CAUTION

If the operator has ANY QUESTIONS about the safe use or maintenance of the generator set, ASK THE SUPERVISOR - NEVER GUESS - ALWAYS CHECK.

Troubleshooting can be defined as the act of locating a trouble or defect in the equipment. Various troubleshooting techniques have been developed, but all pertinent data is used to locate a defect.

WARNING

Do not wear loose clothing, unbuttoned shirts, or neckties while working on moving equipment.

CAUTION

Follow the manufacturer's recommendations to maintain equipment properly.

2.2 ENGINE

The troubleshooting tables provided in this section (Tables 2-1 through 2-4) are intended to serve as a guide by which the technician can locate a malfunctioning component in an assembly or system. The engine manual, located in Chapter 6 of this manual, is devoted entirely to troubleshooting the engine and turbocharger. Chapter 1, Section 2 of this manual gives specifications and capacities of the engine systems that may be helpful in determining a problem.

This Page Intentionally Left Blank

1.12 ENGINE TUNE-UP

There is no scheduled interval for performing an engine tune-up. As long as the engine performance is satisfactory, no tune-up should be needed. Minor adjustments in the valve and injector operating mechanisms, governor, etc., should only be required periodically to compensate for normal wear on the parts. For complete details on tune-up procedures, refer to EMD 645 Series Turbo Marine Engine Maintenance Manual, in Chapter 6 of this manual.

1.13 CONTROLS AND INDICATORS

There is no set schedule interval for inspecting and cleaning the control panels, gauges, and switches. With the DC potential disconnected, the control cabinet and panels should be blown out with air and/or wiped clean, inside and out. A light coat of a corrosion-preventive spray solution is recommended on unpainted/untreated surfaces. A non-oil base cleaner/lubricant spray is recommended, as an oil base spray will eventually fog the glass covers on the gauges/indicators, making them unreadable.

During the cleaning process, a visual inspection should be made of any loose components, terminal screws, and soldered connections. This inspection is especially beneficial for the skid-mounted local control panels and electrical enclosures that are constantly exposed to vibration from the engine. In addition, inspect the vibration absorbing neoprene panel and cabinet mounts for elasticity and resiliency. If hardened or cracked, replace immediately.

Refer to the applicable vendor manuals in Chapter 6 of this manual for complete details.

1.14 CORROSION CHECK

Treating for corrosion before it becomes a problem is a necessary, ongoing process. A weekly inspection for corrosion damage consists of thoroughly cleaning and preserving or lubricating all exposed metal surfaces. The generator set is sealed with several coats of industrial sealant paint but this protective shell can breakdown at vibration sensitive areas or places exposed to extreme heat for long periods of operation. Inspection for signs of rust should always be conducted and ongoing during the course of routing maintenance procedures.

When the unit is not in service, every precaution should be taken against corrosion. For further storage details, refer to Chapter 3, Section 3 of this manual.

een/trap must be maintained according to the following procedure:

a. Inspect the adapter and trap screen assembly between the rear expansion joint and the chamber assembly for the condition of the screen.

b. Check exhaust manifold base flange bolts for proper tightness.

For a detailed description of the exhaust manifold assembly, refer to the EMD 645 Series Engine Maintenance Manual and EMD 645/710 Operating Manual in Chapter 6 of this manual.

1.10 AIR START SYSTEM

1.10.1 General The air start system components should be checked periodically for loose connections and/or corrosion. Repair or replace, if necessary.

1.10.2 Air Starter The air starting motors require no scheduled maintenance. The airline lubricator is the only component on the engine skid that requires scheduled maintenance. If equipped, the lubricator in the air line to the starting motors should be checked regularly for oil, refilled, and adjusted when necessary. Oil is added to the lubricator through a filler cone at the top of the bowl on the lubricator. Use of a clean, high quality grade of an SAE No. 10 oil is recommended for ambient temperatures between 60-120 °F (16-49 °C).

ment procedure for the inline lubricator is as follows, (disregard if not equipped):

a. Inspect the air start motor exhaust for excessive oil, as air is moving through system.

b. Adjust needle valve on the lubricator assembly to permit only one or two drops of oil per second when the air is moving. The adjustment ratio is approximately two (2) drops of oil per turn of the needle valve.

c. Re-inspect air exhaust.

1.10.3 Strainer The strainer in the air line should be checked and cleaned of any debris regularly. If strainer becomes clogged prematurely, check air tanks and connections for possible leaks.

For complete details on maintaining the engine mounted air start components, refer to EMD 645 Series Engine Maintenance Manual and EMD 645/710 Operating Manual in Chapter 6 of this manual. For details on the air start motor, refer to the manual in Chapter 6 of this manual.

1.11 GENERATOR

For complete servicing procedures, refer to the Baylor Generator Instruction Manual in Chapter 6 of this manual.

It is not recommended or practical to attempt any reconditioning of the turbocharger in the field. It is recommended that it be returned to EMD for service. However, if this is not possible, refer to the EMD 645 Series Engine Maintenance Manual for details on the removal and installation procedures for the turbocharger.

1.9.2 Air Box Drains Accumulation of liquids from the engine air box is removed through drain holes in the base rails of the crankcase which are aligned with pipes located on each side of the oil pan at the front of the engine. Both pipes connect to the main drain flange mounted on the oil pan. The flange places pressures from each pipe in opposition in order to prevent excessive loss of air from the box.

The air box drains should be cleaned as follows:

a. Disconnect external piping connected to the drain flange.

b. Remove the drain flange from the oil pan and clean with brush and solvent.

c. Remove air box hand-hole covers nearest the drain holes.

d. Feed cleaning tool into the drain hole in the base rail, turning it and using a "rodding" motion to loosen carbon and sludge from inside the drain pipes.

e. Once both drains have been completely cleared, flush piping with fuel oil or similar solvent to remove loose debris and residue.

f. Mount drain flange to oil pan, reconnect external piping and reinstall air box hand-hole covers.

WARNING

Always use caution when working around electrical equipment. Serious injury to personnel or damage to equipment could occur

CAUTION

Follow the manufacturer's recommendations to properly maintain equipment.

1.9.3 Exhaust Manifold

The exhaust manifold is made up of chamber assemblies, expansion joints, and an adapter assembly. The expansion joints are used between chamber assemblies and between the adapter and screen assembly and the turbocharger, to compensate for expansion and contraction of the manifold due to temperature changes. The adapter assembly contains a stainless steel screen and trap to prevent entry of foreign objects/debris.

BEST AVAILABLE COPY

...de of the tubes should be inspected periodically and cleaned as necessary. Removal of access plugs allows visual inspection and, if necessary, the use of mechanical tube cleaners. Tapered plugs that are removed for tube inspection or cleaning should be replaced in the same hole. Should tapered plugs develop leaks, additional tightening is normally all that is required. Thread dope may be used if tightening alone is not sufficient. If shoulder type plugs develop leaks, the gaskets should be replaced immediately. The repair of tube leaks depends on the location of the leak. If the leak occurs in the tube wall, it is usually most practical to use tapered tube sealing pins to plug both ends of the tube. When numerous tubes have become plugged and performance is affected, re-tubing will be necessary. If leaks develop in the tube-to-tube sheet joints, the tubes may either be plugged off or re-rolled. If re-rolling is attempted, care must be used in selection of the proper tube expander for the size and gauge of the tube being rolled.

CAUTION

If it is ever necessary to re-roll the tubes, care must be taken with this procedure. Do not over-roll as this will weaken the tube.

The unit's operating technician should be aware of operating conditions and note when the coolant temperature gauge reading begins to rise as the operating time for the unit progresses. The radiator coil should be cleaned well in advance of the coolant temperature safety warning initiation.

A daily inspection should be made of the liquid level glass at the coolant inlet of the radiator. Be sure the coolant is the proper level before operating the unit.
For complete details on the radiator and related assemblies, refer to the vendor data/manuals supplied with the equipment.

1.9 AIR INTAKE AND EXHAUST SYSTEMS

1.9.1 Turbocharger The turbocharger assembly is primarily used to increase engine horsepower and provide better fuel oil economy through utilization of the exhaust gases. The turbocharger is a single stage turbine with a connecting gears train that is driven by the engine gear train.

Inspect the mountings, intake, and exhaust ducting and connections for tightness and possible leaks. Check the oil inlet and outlet lines for leaks and corrosion causing restrictions to the oil flow. Check for unusual noises or vibrations and, if excessive, remove the turbocharger assembly and correct the cause (starting with the gaskets). For complete details on the turbocharger, refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.

WARNING

Turbocharger service should ONLY be performed by qualified personnel.

CAUTION

Follow the manufacturer's recommendations to properly maintain equipment.

Allow system to cool down before opening filler cap. System under pressure could cause severe injury. Partially open the filler cap to relieve pressure prior to complete removal of the cap.

CAUTION

If the cooling system of a hot engine has been drained, do not fill until the engine cools. A sudden change in temperature may cause damage to the engine.

Make a visual check for cooling system leaks. Inspect all of the cooling system hoses at least once every 700 hours of operational service for signs of deterioration. Replace the hoses if necessary.

Refer to EMD 645 Series Engine Maintenance Manual and EMD 645/710 Operating Manual, found in Chapter 6 of this manual for servicing details.

1.8.3 Flushing and Refilling Radiator Clean the cooling system every 1000 hours of operational service. Use a good radiator cleaning solution designated as an inner coil cleaner/flushing agent and use in accordance with the instructions on the container. After the cleaning operation, flush the cooling system with soft water, adding a good grade of rust inhibitor or high boiling point type antifreeze. Refer to EMD 645 Series Turbo Marine Engine Maintenance Manual in Chapter 6 of this manual for complete details.

Refer to EMD Maintenance Instructions for details on the specifications of the cooling system and coolant selections.

With the use of a proper antifreeze or rust inhibitor, this interval may be lengthened to every six (6) months if no corrosion is evident before this. The length of the interval will depend upon an inspection for rust and other deposits on the internal walls of the cooling system. When a thorough cleaning of the cooling system is required, it should always be reverse flushed for maximum cleansing effect on the coolant galleries and lines.

1.8.4 Coolant Analysis Take a sample of the coolant at least every 2100 hours of operating time, and have a complete analysis run to determine needed additives

1.8.5 Radiator Inspect the exterior of the radiator core every 700 hours and, if necessary, clean it with a quality grease solvent that is designated for use as a coil cleaner. Direct the solvent through the fin assembly in the opposite direction of the normal airflow. Dry with compressed air in the same manner.

WARNING

Do not use fuel oil, kerosene or gasoline as a solvent.

It may be necessary to clean the radiator more frequently if the unit is being operated in an extremely dusty or caustic environment.

j. Swing the hinge bolts into place and tighten the hold-down nuts to EMD specifications of 60 ft-lbs (81 Nm).

NOTE

Approved pleated paper elements have a red casing.

1.7.6 **Bypass Valve Assembly** The filter bypass valve assembly should be checked periodically or whenever improper oil circulation is suspected.

1.7.7 **Cleaning** Operation of the valve assembly cannot be effectively checked on the unit. It is recommended that qualified spare assemblies be available for exchange with the assembly in use. If a spare is not available, the valve assembly should be removed from the filter housing and cleaned of sludge and varnish by washing in solvent. The assembly should be carefully inspected after cleaning. If the poppet stem or valve body guide is worn, these pieces should be replaced.

1.7.8 **Location** The bypass valve is located between the inlet and outlet compartments. The current valve is mounted on the separator plate within the filtering compartment.

For complete details, refer to EMD Marine Propulsion Operating Manual in Chapter 6 of this manual.

Lube Oil Cooler Service the lube oil cooler at intervals specified in the Engine Maintenance Inspection/Check Schedule at the beginning of this section.

1.8 COOLING SYSTEM

The cooling system consists of three separate systems: a remote mounted expansion tank, a plate type lubricating oil heat exchanger, and a water cooling system including engine driven water pumps and Alfa Laval watermaker assembly with incorporated sterilizer for fresh water disinfection. These systems require differing types of maintenance for optimum performance.

The following procedures and principles are generalized for all radiator/heat exchanger equipment.

1.8.1 **Coolant Level** Check the coolant level weekly. The water level should not be allowed to go below the applicable "LOW" mark. Under the normal operating conditions, there should be no need to add coolant to the sealed cooling system except at extended intervals. However, this does not mean that the cooling system should not be checked on a weekly basis.

A clear tube low water indicator is mounted on the water expansion tank on the accessory rack.

1.8.2 **Filling System** The cooling system is filled through the filler opening at the top of the expansion tank. Add coolant as necessary. Do not overfill.

CAUTION

Lubricating oil may be poured into the strainer housing through the opening having the square cover.

CAUTION

If the round covers are removed from the strainer housing while the engine is running, hot oil under pressure will flow out of the opening and possibly cause personal injury.

For lube oil system capacities, refer to EMD <u>645 Series Engine Maintenance Manual</u> in Chapter 6 of this manual.

1.7.3 **<u>Draining Lubricating Oil</u>** To drain the lubricating oil, it is first necessary to open both valves located under the square filler cover of the strainer housing. The front valve drains the oil from the lube oil filter into the engine sump and rear valve drains the oil from the strainer into the engine sump.

CAUTION

After draining and refilling the lube oil system it is imperative that the strainer housing be filled with oil before starting the engine. Failure to do this may result in serious engine damage.

1.7.4 **<u>Lubricating Oil Filter</u>** The lube oil filter is equipped with threaded holes that are piped internally to the inlet and outlet oil compartments. If the ½" NPT pipe plugs are removed and replaced with gauges, the oil filter inlet and outlet oil pressure can be monitored to determine the condition of the filter elements.

Periodic pressure readings will help prevent undue engine wear by indicating when filter element plugging and bypass are about to occur. Oil filter element replacement should be made as determined by scheduled pressure monitoring of the oil filter tank pressure. The replacement interval as determined by laboratory analysis of the lube oil can dictate earlier replacement of the elements.

NOTE

Readings must be taken with the lube oil temperature at least 150 °F (66 °C). Adequate water temperature will assure adequate oil temperature.

Readings should be taken with the engine at rated speed and load. The manufacturer's recommends that the filter elements be renewed if filter tank differential pressure reaches outlet/inlet pressures of 1.37 bar psi). Tank pressure readings can be taken with engine speed at idle, but readings taken at rated ...ed are more reliable.

To change the elements, refer to the following procedure:

NOTE

Do not overtighten the filter body to the assembly as leaking may occur.

a. To change a filter while the engine is running, move the filter selector lever to the letter representing the opposite filter.

b. Unscrew and discard elements. Use strap wrench if necessary.

c. Apply a new filter to the filter head and tighten until the neoprene gasket is sealed.

d. With the engine running, move the selector lever to the position of the filter that was changed and check for leakage.

For complete details, refer to EMD 645/710 Operating Manual in Chapter 6 of this manual.

1.6.3 Manual Priming Pump The fuel oil priming pump is manually operated and located on the accessory rack. No scheduled maintenance is required. If the pump is not operating properly, it can be disassembled for inspection. Remove the crank, and then separate the shell from the lid and inspect for problems. For complete details, refer to EMD 645/710 Marine Propulsion Operating Manual in Chapter 6 of this manual.

1.6.4 Electric Priming Pump The electric fuel oil priming pump is also located on the engine rack. The electric fuel oil priming pump does not require routine maintenance under normal operating conditions. Proper maintenance of the fuel, storage, and delivery systems prevent problems in the manual and electric fuel oil priming pumps.

1.7 LUBRICATING OIL SYSTEM

1.8.1 Lubricating Oil Level Engine oil level should be checked with the engine hot and running at idle speed. A dipstick extends from the side of the oil pan into the oil pan sump. The dipstick should show a level between LOW and FULL. The oil level with the engine stopped should be above the FULL mark.

CAUTION

After draining and refilling the lube oil system, it is imperative that the strainer housing be filled with oil before starting the engine. Failure to do this may result in serious engine damage.

1.7.2 Adding Lubricating Oil Oil may be added with the engine running or stopped; however, the FULL level of oil on the dipstick is determined with the engine hot and running at idle speed. If the oil pan is overfilled with the engine stopped, oil will run out between the crankshaft and oil pan at the flywheel.

Ancillary Equipment Maintenance Ancillary equipment includes the systems that support the diesel engine and generator. Consult the vendor documentation in Chapter 6 for maintenance details and schedules on the pieces of equipment that support the generator set.

1.5.5 Information For details on the engine, refer to the EMD vendor manuals in Chapter 6 of this manual. For details on the generator, refer to the Baylor manual in Chapter 6 of this manual. Maintenance information for the auxiliary systems of this generator set can be found in Chapter 6 of this manual.

1.6 FUEL SYSTEM

1.6.1 Leak Check Make a visual check for evidence of fuel leaks at the fuel oil tank, lines and interconnections. A major cause of poor starting or power loss is the result of clogged filter element or a fuel oil system air leak. If your unit will not prime, fails to hold a prime, check that the lid and drain are properly tightened. Next, check all fitting connections and ensure none of the fuel oil lines are pinched or clogged with contaminants. If the remote fuel oil tank is equipped with an in-tank strainer assembly, check it for potential clogging.

CAUTION

Follow the manufacturer's recommendations to properly maintain equipment.

A major cause of poor starting or power loss is the result of clogged filter element or a fuel system air leak. If your unit will not prime, fails to hold a prime, or if air bubbles are present, check all fitting connections and ensure none of the fuel oil lines are pinched or clogged with contaminants. If the remote fuel oil tank is equipped with an in-tank strainer assembly, check it for potential clogging.

CAUTION

Follow the manufacturer's recommendations to properly maintain equipment.

1.6.2 Fuel Filters Each filter is a disposable type that is screwed directly to a common head. The filter is a pleated paper type around a metal perforated tube providing 1100 sq. in. filtering area. A tapered cock-type control valve in the head assembly directs the flow of fuel oil to either or both filters. One filter can be cut out of service to permit replacement without stopping the engine. The inlet and outlet connections are located in the head assembly.

The flow of fuel oil is directed and regulated by the position of the control valve. Centering the control valve lever or placing it in the "BOTH" position allows for use of both filter elements. When it is necessary to change filters, the flow of fuel oil can be directed through one filter while changing the other one. Move the control lever to the "L" or "R"; left or right position, depending on which filter is to be replaced. The position chosen, left or right, will determine which filter is replaced. The right position is for changing the left filter and the left position is for changing the right filter.

Table 2.2 Engine Maintenance Inspection/Check Schedule (Cont)

Inspection Check Recommended	Inspection Frequency	Remarks/Reference
Starting Motors	Every 8400 hours	Disassemble, clean, inspect and lubricate. Refer to Ingersoll Rand manual in Chapter 6 of this manual.
Fuel Pump	Every 16000 hours	Replace coupling spider. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Soak Back Pump	Every 16000 hours	Replace coupling spider. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Engine Components	Every 16000 hours	Perform the following procedures. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual: • Replace cylinder assemblies • Replace injectors • Inspect and qualify connecting rod bearings • Inspect and qualify piston cooling tubes • Check rocker arms, arm bushings, and cam followers • Check lash adjusters • Check exhaust valve timing
Engine Components	24000 hours	Perform the following procedures. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual: • Install new thrust collars • Install new lower main bearings Replace water pump seals and worn parts
Turbocharger	24000 hours	Replace unit. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Cooling System	24000 hours	Replace flexible coupling seals. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Heat Exchanger	24000 hours	Inspect, clean, and test. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Fuel Pump	32000 hours	Replace unit. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Soak Back pump	32000 hours	Replace unit. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Engine components	48000 hours	Perform the following procedures. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual: • Replace oil pumps • Replace lower liner inserts • Inspect injector control linkage; replace links, seals and bearings if necessary.
Engine	96000 hours	Replace unit.

Table 2.2 Engine Maintenance Inspection/Check Schedule (Cont)

Inspection Check Recommended	Inspection Frequency	Remarks/Reference
Expansion Tank Pressure Cap	Every 2800 hours	Replace unit.
Exhaust System	Every 3500 hours	Remove exhaust manifold to turbocharger adapter assembly and clean screen and trap box. Check for cracks and leaks. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Lubricating Oil	According to Lube Oil Analysis	Change engine-lubricating oil. Evaluation of engine oil condition should dictate the frequency of this item. Type of service, oil and filter element quality, and condition of the engine will influence the frequency of the oil change. Refer to EMD Propulsion Operating Manual in Chapter 6 of this manual. Refer to EMD Maintenance Instruction 1760 in Chapter 6 of this manual. Clean oil suction screens, scavenging oil screens, oil pan, and filter housing when changing lubricating oil. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Engine Components	Every 4200 hours	Replace the following components. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual: • Top deck covers (check latches) • Cylinder head grommets inlet and outlet seals • Lower liner seals
Engine Components	Every 8400 hours	Perform the following procedures. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual: • Qualify injectors • Check injector timing and rack length • Check engine speed • Check overspeed trip • Remove and clean oil separator element • Check pressure drop • Inspect crankshaft damping device • Remove, clean, inspect and replace if necessary: - Soak back check valve - Soak back oil pressure relief valve in filter head - Soak back filter bypass valve - Turbo oil filter check valve
Exhaust System	Every 8400 hours	Inspect manifold sections for possible cracking of leg baffles or expansion joints and replace if necessary. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.
Lube Oil Filter	Every 8400 hours	Remove oil filter bypass valve, clean, inspect and replace if necessary. Refer to EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual.

Table 2.2 Engine Maintenance Inspection/Check Schedule (Cont)

Inspection Check Recommended	Inspection Frequency	Remarks/Reference
Generator Set	Every 50 hours	Inspect for corrosion on all exposed surfaces and treat if necessary. Refer to EMD Maintenance Instructions in Chapter 6 of this manual.
Lube Oil Circulating Pump	Every 50 hours	Check for proper operation. Refer to EMD 645 Series Turbo Marine Engine Maintenance Manual in Chapter 6 of this manual.
Immersion Heater	Every 50 hours	Check for proper operation. Refer to Watlow vendor data in Chapter 6 of this manual.
Intake Air Filter	Every 50 hours	Check restriction filter minder for proper differential pressure. Replace if necessary. Refer to Farr vendor data in Chapter 6 of this manual.
Generator	Every 50 hours	Clean housing, ventilation screens; inspect for loose or damaged windings, insulation and mounting components and check for any signs of moisture. Refer to Baylor Generator Instruction Manual in Chapter 6 of this manual.
Turbocharger Filter	Every 100 hours	Replace element. Refer to EMD Marine Propulsion Operating Manual in Chapter 6 of this manual.
Lube Oil Strainer	Every 100 hours	Clean strainer screen. Refer to EMD Marine Propulsion Operating Manual in Chapter 6 of this manual.
Generator Bearings	Every 100 hours	Inspect for excessive leakage of oil or grease and lubricate if necessary. Refer to Baylor Generator Instruction Manual in Chapter 6 of this manual.
Lube Oil Filter	Every 350 hours	Check lube oil pressure at filter input with engine at rated rpm and replace filter elements if tank pressure so indicates. Refer to EMD Marine Propulsion Operating Manual in Chapter 6 of this manual.
Fuel Filter (EMD)	Every 350 hours	Check fuel pressure with engine at rated rpm with gauge connected to filter input side and change filter elements if pressure is greater than 50 psi (345 kPa). Refer to EMD Marine Propulsion Operating Manual in Chapter 6 of this manual.
General Inspection	Every 350 hours	Check the following components of the engine assembly. Refer to EMD 645 Series Turbo Marine Engine Maintenance Manual in Chapter 6 of this manual: • Inspect air box • Inspect crankcase • Inspect crankshaft and connecting rods • Inspect pistons and piston rings • Inspect cylinder liners • Inspect cylinder head mechanism at operating temperature

1.5.2 Guideline Because operating requirements for this generator set will vary from standby to weekly operation, this maintenance program should be used as a guideline in conjunction with an ongoing oil analysis program.

1.5.3 Maintenance Schedule Table 1.2 summarizes recommended inspection, checks and maintenance procedures for the major pieces of equipment. The service and scheduled maintenance instructions that follow have been developed to ensure satisfactory engine operation and economical maintenance costs. Preventive maintenance is necessary to ensure reliable equipment operation with minimal down times.

The following information is furnished only as a guide for a preventative maintenance program, actual programs should be established by the operating personnel for the installation site.

NOTE

Refer to the EMD 645 Series Engine Maintenance Manual in Chapter 6 of this manual for detailed engine maintenance procedures.

Table 1.2 Maintenance Inspection/Check Schedule

Inspection Check Recommended	Inspection Frequency	Remarks/Reference
General Conditions	Daily	Check for general appearance and integrity of unit. Inspect for leaks in the cooling, fuel, lube oil, exhaust and air start systems.
Lube Oil Level	Daily	Check oil level in pan and add oil if required. Refer to EMD Marine Propulsion Unit Operating Manual in Chapter 6 of this manual.
Engine Coolant	Daily	Check coolant level and add coolant at expansion tank if required. Refer to EMD Marine Propulsion Operating Manual in Chapter 6 of this manual.
Fuel Supply	Daily	Check fuel supply.
Air Start System	Daily	Drain Condensate from lines and tanks. Refer to EMD Marine Propulsion Operating Manual in Chapter 6 of this manual.
Governor	Daily	Check oil level and add oil if required. Refer to EMD Marine Propulsion Operating Manual I in Chapter 6 of this manual.
Engine Lubrication	50 hours initially and 100 hours thereafter	Take lube oil sample for analysis in a certified laboratory. Monitor for suitability of oil for continued use according to Specifications, Section 2 of this chapter. Refer to EMD Maintenance Instructions in Chapter 6 of this manual.

1.4.3 Servicing The action of maintaining the proper amounts (levels) of lubricating grease, oil, coolant, fuel oil, etc. Servicing also encompasses replacing or cleaning filter elements, as well as performing minor repair work. An example of minor mechanical repair work is replacing a gasket or seal, etc. An example of minor electrical repair work is replacing a light bulb or fuse, etc. Minor repair work can be accomplished by operator-level personnel and by use of this manual. While performing maintenance on equipment, refer to the specific equipment service manuals supplied in Chapter 6.

1.4.4 Treating for Corrosion This necessary, ongoing process consists of thorough cleaning, lubrication, and assurance of protective finish integrity. Generator sets located where high humidity or high temperatures are prevalent require extra awareness.

1.5 SCHEDULED MAINTENANCE

1.5.1 Maintenance Intervals Table 1.1 is intended as a guide for establishing a preventative maintenance schedule. The intervals, indicated on the table, represent time measured in elapsed hours of operation for a generator set being used for prime power. A generator set, which is standby power for emergency usage in the event of normal electrical power failure, accumulates little actual operating time. A time schedule should be established at the operator's discretion depending on the individual workloads and environmental constraints for their unit. Generally, the following schedule may be used for generator sets according to hours operated or elapsed time.

TABLE 1.1 Maintenance Intervals

Items Marked Under Interval of Hours of Operation	Perform Instead Every
8	week
50	month
100	2 months
150	3 months
200	4 months
350	6 months
500	10 months
700	12 months
1400	24 months
2100	36 months
2800	48 months

Perform preventive maintenance on items daily, weekly or when the hourmeter registers the recommended scheduled hours of operation.

1.2.3 **Intended Use** If a generator system is intended for emergency use at times of utility power failure, preventive maintenance is the key to standby service of the generator set. A program of regular preventive maintenance can assure the ready availability of the generator set in emergency situations. A complete log of all maintenance and repairs should be kept to help pinpoint future problem areas. Corrective action can then be taken to prevent breakdowns during operation of the generator sets.

Major mechanical or electrical repairs should be referenced in the EMD 645 Series Turbo Marine Engine Maintenance Manual and the Baylor Generator Instruction Manual in Chapter 6 of this manual.

1.3 NATURE OF PREVENTIVE MAINTENANCE

1.3.1 Preventive Maintenance should be preventive in nature, whereby potential failures are detected and corrected before they cause the equipment to break down.

1.3.2 Awareness The nature of preventive maintenance demands operator awareness of the generator set's operation. Awareness demands consciousness of abnormalities such as knocks or smoke. Awareness also demands knowing the generator set's equipment capabilities and perceiving the equipment's service needs. Being aware can also be described as being watchful, or being alert.

1.3.3 Degree of Awareness The degree to which awareness of the generator set's operation is necessary depends upon the extent of the generator set's automatic sensors, controls, and indicators.

1.3.4 Promptly Corrected Regardless of the method and manner of detection, the potential failure should be promptly corrected, in order to prevent a shutdown or a breakdown. The corrective actions taken or the service rendered constitute preventive maintenance.

CAUTION

If the operator has ANY QUESTIONS about the safe use or maintenance of the generator set, ASK THE SUPERVISOR - NEVER GUESS - ALWAYS CHECK.

1.4 ACTIONS

1.4.1 Preventive The nature of preventive maintenance calls for actions which will prevent major repair work. These actions can be performed at an operator level, and can usually be categorized into (1) adjusting, (2) servicing, and (3) treating for corrosion. All preventive actions should be referenced in the specific equipment manuals in Chapter 6.

1.4.2 Adjusting The action of correcting misalignments, testing for the proper set points (calibrating), and tightening loose components.

SERVICING

1.1 OVERVIEW

WARNING

Always use caution when working around rotating equipment. Serious injury to personnel or damage to equipment could occur.

WARNING

Always use caution when working around electrical equipment. Serious injury to personnel or damage to equipment could occur

WARNING

Clean or service only when the equipment is shut down, isolated, and tagged "Out of Service."

This section contains instructions for the care and recommended maintenance of the diesel engine generator set fabricated by Stewart & Stevenson Services.

1.2 MAINTENANCE BENEFITS

1.2.1 **Best Performance** Your generator set is ensured of its best performance and reliability when a scheduled preventive maintenance program is followed. A small cost and effort expended for a preventive maintenance program yields improved performance, efficiency, and reliability.

1.2.2 **Benefits** These benefits are realized by:

a. Understanding the nature of preventive maintenance.

b. Following the lubrication and preventive maintenance schedule that has been established.

This Page Intentionally Left Blank

TABLE OF CONTENTS (Cont)

MAINTENANCE

TABLE OF CONTENTS

Emergency Generators

MAINTENANCE OPERATION	DAILY	WEEKLY	MONTHLY	SEMI-ANNUALLY	ANNUALLY OR AS NEEDED
EXHAUST SYSTEM					
CHECK WASTEGATE VALVE ASSEMBLY (SEALS, ACTUATOR, COUPLING, TUBING)			●		
CHECK FOR EXHAUST LEAKS	●				
OBSERVE COLOR OF EXHAUST GAS	●				
CHECK PYROMETER CALIBRATION				●	
CHECK EXHAUST BACKPRESSURE (OR IMMEDIATELY AFTER SEVERE BACKFIRE)				●	
VISUALLY INSPECT THERMOCOUPLES				●	
FUEL GAS SYSTEM					
CHECK FOR GAS LEAKS	●				
CHECK FUEL GAS PRESSURES	●				
INSPECT FUEL FILTERS			●		
CONDUCT FUEL GAS ANALYSIS					●
INSPECT/CLEAN PRE-CHAMBER PILOT GAS SUPPLY SYSTEM (CHECK VALVES, TUBING, ORIFICE, FILTER)	NORMALLY PERFORMED SEMIANNUALLY, BUT MAY REQUIRE ADDITIONAL ATTENTION IF INDIVIDUAL CYLINDER TEMPERATURES WARRANT.				
GOVERNOR SYSTEM					
CHECK SPEED VS. SIGNAL PRESSURE CALIBRATION ON PG STYLE GOVERNORS				●	
CHECK LUBE OIL LEVEL IN GOVERNOR	●				
CHECK THROTTLE CONNECTIONS AND BEARINGS FOR FREE MOVEMENT (IF APPLICABLE)		●			
CHECK CONDITION OF GOVERNOR LINKAGE LUBRICATE BALL ENDS			●		
DRAIN, FLUSH, REFILL GOVERNOR OIL SUPPLY AS NEEDED				●	
IGNITION AND CONTROL SYSTEM					
CHECK IGNITION GROUND SWITCH CALIBRATION				●	
CHECK ALTERNATOR, PRIMARY WIRE HARNESS COIL TERMINALS, HIGH TENSION WIRES, SPARK PLUG CONNECTORS			●		
REPLACE SPARK PLUGS AS NEEDED			●		
CHECK ALTERNATOR BEARING GREASE FITTING (IF APPLICABLE)			●		
CHECK IGNITION TIMING (VERIFY TIMING VS. SPEED FOR CleanBurn)			●		

MAINTENANCE OPERATION	DAILY	WEEKLY	MONTHLY	SEMI-ANNUALLY	ANNUALLY OR AS NEEDED
INTAKE SYSTEM					
CHECK AIR MANIFOLD TEMP.	●				
CHECK FOR LEAKAGE	●				
CHECK CONDITION OF AIR CLEANER ELEMENTS, CHANGE AS NEEDED		●			
CHECK INTAKE PIPING FOR CLEANLINESS (AND INTERCOOLER IF APPLICABLE)					●
LUBRICATING SYSTEM					
CHECK LUBE OIL LEVEL	●				
CHECK FOR OIL LEAKS	●				
CHECK LUBE OIL PRESS. AND TEMP.	●				
TAKE ENGINE OIL SAMPLE FOR ANALYSIS			●		
CHANGE ENGINE OIL AND OIL FILTER ELEMENTS (INSPECT CRANKCASE FOR WEAR METALS)	OIL FILTER ELEMENTS SHOULD BE CHANGED AT 1000 HR. INTERVALS OR WHEN A DIFFERENTIAL PRESSURE OF 15 TO 20 PSI HAS BEEN REACHED. THE ENGINE OIL SHOULD BE CHANGED AT 1000 HOUR INTERVALS OR AT THE RECOMMENDATION OF A REPUTABLE OIL ANALYSIS COMPANY.				
REPLACE "O" RINGS ON L.O. COOLER (IF APPLICABLE)					●
MECHANICAL/OPERATING SYSTEM					
CHECK FOUNDATION BOLT TORQUES				●	
CHECK BOLT TORQUES FOR MAIN AND CONNECTING ROD BOLTS, FLYWHEEL AND DRIVE COUPLING BOLTS				●	
CHECK ENGINE-COMPRESSOR COUPLING EQUIPMENT FOR ALIGNMENT				●	
INSPECT IGNITION DRIVE GEARS, CHECK GEAR BACKLASH				●	
CHECK GOVERNOR DRIVE GEAR LASH				●	
CHECK GEAR LASH AND GEAR CONDITION OF LUBE OIL PUMP DRIVE				●	
REMOVE AND INSPECT BEARINGS, SHAFT SEALS OF WATER AND LUBRICATING OIL PUMPS					●
CHECK THRUST BEARING CLEARANCES (CAMSHAFT AND CRANKSHAFT)					●
BOUNCE CHECK MAIN AND CONNECTING ROD BEARINGS USING A DIAL INDICATOR					●

MAINTENANCE OPERATION	DAILY	WEEKLY	MONTHLY	SEMI-ANNUALLY	ANNUAL OR AS NEEDED
POWER CYLINDER					
CHECK CYLINDER TEMPERATURES	●				
CHECK ALL POWER CYLINDER COMPRESSION PRESSURES				●	
CHECK CONDITION OF PISTON SKIRTS AND LOWER PART OF CYLINDER LINERS				●	
MAKE INTERNAL INSPECTION OF ALL POWER CYLINDERS WITH A BORESCOPE INSERTED THROUGH THE SPARK PLUG HOLE, CHECK CONDITION OF EXHAUST AND INLET VALVES				●	
STARTER SYSTEM					
CHECK FOR GAS OR AIR LEAKAGE	●				
CHECK OIL LEVEL OF STARTER LUBRICATOR	●				
CHECK LUBRICATOR STRAINERS		●			
CLEAN AND FILL LUBRICATOR BOWL WITH A 10W NON-DETERGENT OIL (AS NEEDED)		●			
TURBOCHARGER (WHEN APPLICABLE)					
CHECK BLOWER WHEEL FOR CLEANLINESS				●	
CHECK TURBOCHARGER FOR VIBRATION		●			
INSPECT FOR OIL LEAKAGE AND LOW PRESSURE	●				
INSPECT COOLANT INLET AND OUTLET LINES FOR LEAKS	●				
INSPECT BLOWER BEARING, INCLUDING THRUST COLLAR (COOPER TURBO)				●	
INSPECT TURBINE BEARING					●
VALVE TRAIN					
LISTEN FOR UNUSUAL NOISES	●				
CHECK ENGINE VALVE CLEARANCE			●		
REMOVE COVERS AND INSPECT CAMSHAFT DRIVE CHAIN FOR TIGHTNESS AND ALIGNMENT				●	

BEST AVAILABLE COPY

The following schedule outlines minimum requirement which may be enlarged upon as conditions or experience warrants.

The time intervals are to be used as guidelines under normal conditions. Varying conditions or applications may indicate less or more time between intervals of maintenance.

MAINTENANCE OPERATION	DAILY	WEEKLY	MONTHLY	SEMI-ANNUALLY	ANNUALLY OR AS NEEDED
CONTROLS					
CHECK AIR-FUEL CONTROL PANEL CALIBRATION				●	
CHECK AIR-LOAD AND PNEUMATIC AIR-FUEL PANELS FOR RUNNING ON PROPER LINE	●				
CHECK ELECTRONIC AIR-FUEL PANEL L.E.D.'S FOR PROPER OPERATION	●				
CHECK STARTING SYSTEM CONTROL CALIBRATION				●	
CHECK INSTRUMENT AIR OR GAS SUPPLY QUALITY		●			
PERFORM SAFETY SHUTDOWN SYSTEM TESTS				●	
CHECK CALIBRATION OF ALL THERMOMETERS AND PRESSURE GAUGES				●	
COOLANT SYSTEM					
CHECK JACKET WATER LEVEL	●				
CHECK FOR COOLANT LEAKS	●				
CHECK JACKET WATER TEMPERATURE	●				
INSPECT WATER PUMP DRIVE BELTS (IF APPLICABLE)			●		
TAKE COOLANT SAMPLE FOR ANALYSIS OR AS RECOMMENDED BY COOLANT SUPPLIER				●	
CRANKCASE					
CHECK CRANKCASE VACUUM	●				
CLEAN ENGINE CRANKCASE BREATHER				●	
CHECK "OVERPRESSURE" RELIEF VALVE					●

Cogeneration Engines

Attachment J
Additional Information
Notice of Permit Revision
Engine Data
Generator Drawings

Department of Environmental Protection

Jeb Bush
Governor

Southeast District
400 N. Congress Avenue, Suite 200
West Palm Beach, Florida 33401

David B. Struhs
Secretary

November 13, 2003 ELECTRONIC CORRESPONDENCE

NOTICE OF PERMIT REVISION

Mr. John W. Chorlog, Jr., P.E.
Miami-Dade Water and Sewer Department
P.O. Box 330316
Miami, FL 33233-0316
Email: JWCHO01@miamidade.gov

RE: Application for Minor Permit Revision to Wastewater Facility Permit, Miami-Dade Central District WWTF Permit FLA024805, for the installation of Stand-By Generators Nos. 4 & 5. DEP Application No. FLA024805-018-DW1/MR

Dear Mr. Chorlog:

The Department has reviewed your application, received at this office on October 14, 2003, to revise Permit Number FLA024805 for the referenced facility modifications. The request for permit revision is hereby approved in accordance with Section 403.087, Florida Statutes, subject to the following conditions:

1. The following generators will be added to the existing bank of standby generators:

Manufacturer	No.	Motor specifications	Generator Specifications	Capacity [kW]
Steward & Stevens, Inc.	No. 4	4,000-bhp EMD Model 20-645F4B IC	2,865-kW continuous-rated electric generator	2,865
Steward & Stevens, Inc.	No. 5	4,000-bhp EMD Model 20-645F4B IC	2,865-kW continuous-rated electric generator	2,865

All other applicable conditions included in the original permit remain unchanged. This Notice of Permit Revision shall become a part of the permit and must be attached to the original permit.

The Department's proposed agency action shall become final unless a timely petition for an administrative hearing is filed under sections 120.569 and 120.57 of the Florida Statutes before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) under sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received by the clerk) in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000.

Petitions by the applicant or any of the parties listed below must be filed within fourteen days of receipt of this written notice. Petitions filed by any persons other than those entitled to written notice under section 120.60(3) of the Florida Statutes must be filed within fourteen days of publication of the notice or within fourteen days of receipt of the written notice, whichever occurs first.

Under section 120.60(3) of the Florida Statutes, however, any person who has asked the Department for notice of agency action may file a petition within fourteen days of receipt of such notice, regardless of the date of publication.

The petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. The failure of any person to file a petition or request for mediation within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under sections 120.569 and 120.57 of the Florida Statutes. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with rule 28-106.205 of the Florida Administrative Code.

A petition that disputes the material facts on which the Department's action is based must contain the following information:

(a) The name, address, and telephone number of each petitioner; the name, address, and telephone number of the petitioner's representative, if any; the Department permit identification number and the county in which the subject matter or activity is located;
(b) A statement of how and when each petitioner received notice of the Department action;
(c) A statement of how each petitioner's substantial interests are affected by the Department action;
(d) A statement of all disputed issues of material fact. If there are none, the petition must so indicate;
(e) A statement of facts that the petitioner contends warrant reversal or modification of the Department action;
(f) A concise statement of the ultimate facts alleged, as well as the rules and statutes which entitle the petitioner to relief; and
(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take.

A petition that does not dispute the material facts on which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by rule 28-106.301.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any such final decision of the Department have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

In addition to requesting an administrative hearing, any petitioner may elect to pursue mediation. The election may be accomplished by filing with the Department a mediation agreement with all parties to the proceeding (i.e., the applicant, the Department, and any person who has filed a timely and sufficient petition for a hearing). The agreement must contain all the information required by rule 28-106.404. The agreement must be received by the clerk in the Office of General Counsel of the Department at 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000, within ten days after the deadline for filing a petition, as set forth above. Choosing mediation will not adversely affect the right to a hearing if mediation does not result in a settlement.

As provided in section 120.573 of the Florida Statutes, the timely agreement of all parties to mediate will toll the time limitations imposed by sections 120.569 and 120.57 for holding an administrative hearing and issuing a final order. Unless otherwise agreed by the parties, the mediation must be concluded within sixty days of the execution of the agreement.

If mediation results in settlement of the administrative dispute, the Department must enter a final order incorporating the agreement of the parties. Persons seeking to protect their substantial interests that would be affected by such a modified final decision must file their petitions within fourteen days of receipt of this notice, or they shall be deemed to have waived their right to a proceeding under sections 120.569 and 120.57. If mediation terminates without settlement of the dispute, the Department shall notify all parties in writing that the administrative hearing processes under sections 120.569 and 120.57 remain available for disposition of the dispute, and the notice will specify the deadlines that then will apply for challenging the agency action and electing remedies under those two statutes.

This action is final and effective on the date filed with the Clerk of the Department unless a petition (or request for mediation) is filed in accordance with the above. Upon the timely filing of a petition (or request for mediation) this order will not be effective until further order of the Department.

Any party to the order has the right to seek judicial review of the order under section 120.68 of the Florida Statutes, by the filing of a notice of appeal under rule 9.110 of the Florida Rules of Appellate Procedure with the Clerk of the Department in the Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida, 32399-3000; and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within 30 days from the date when the final order is filed with the Clerk of the Department.

Executed in West Palm Beach, Florida.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

11/13/03

Linda A. Horne, P.G. — Date
Water Facilities Administrator
Southeast District

LAH/TP/tvv: FLA024805-018-DW1/MR

ec: Richard M. O'Rourke, Miami-Dade Water & Sewer Department, ROROU@miamidade.gov
Ernesto Perez, P.E., Miami-Dade County, perezer@miamidade.gov
Todd Brown, DEP/CEP, todd.brown@dep.state.fl.us
Huy Tran, DEP/CEP, huy.tran@dep.state.fl.us

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF PERMIT REVISION and all copies were e-mailed before the close of business on November 13, 2003 to the listed persons.
(Date)

FILING AND ACKNOWLEDGMENT

FILED, on this date, under section 120.52(7), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Clerk: Kitani Bgay — Date: 11/13/03

ENGINE DATA

[illegible] MODEL	S8E4C		S12F4B		S16F4B		S20F4B	
ENGINE MODEL	8-645E4C		12-645F4B		16-645F4B		20-645F4B	
Rated RPM	750	900	750	900	750	900	750	900
BHP - continuous	1200	1525	2140	2550	2850	3400	3600	4000
KW - continuous	865*	1090*	1530*	1825*	2040*	2435*	2580**	2865*
BMEP - nominal PSI	123	130	146	145	146	145	147	136
Torque @ cont. BHP lb.-ft.	8400	8900	14985	14880	19960	19840	25210	23342
Piston speed ft./min.	1250	1500	1250	1500	1250	1500	1250	1500
LUBRICATING OIL SYSTEMS								
Lube pressure flow GPM	88	105	131	157	154	185	191	229
Lube piston cooling flow GPM	41	48	55	66	77	92	91	109
Lube scavenging flow GPM	171	205	232	279	325	390	325	390
FUEL OIL SYSTEMS								
Fuel supply pump - capacity GPM	1.8	2.1	3.8	4.5	3.8	4.5	3.8	4.5
Fuel supply pump - suction lift-max. ft.	12	12	12	12	12	12	12	12
AIR AND EXHAUST SYSTEMS								
Intake air at 14.7 psi-90°F CFM	3100	4250	6525	7640	8000	9225	10100	10725
Exhaust temperature °F	740	665	680	650	680	685	620	635
Exhaust volume @ exh. temp. CFM	6800	8650	13520	15430	16550	19200	19825	21350
Exhaust back pressure (total system) maximum allowable in. H_2O	5	5	5	5	5	5	5	5
Air intake (total system) suction-max. clean filters in. H_2O	6	6	6	6	6	6	6	6
COOLING WATER SYSTEMS								
Total engine water flow GPM	440	525	665	800	890	1070	980	1100
Pressure rise across engine water pump (Total system pressure drop) PSI	29±2	42±2	30±3	43±4	37±2	53±3	41±2	52±2
Allowable pressure drop for external piping & cooling equipment PSI	8	8	8	8	8	8	8	8
Raw water flow (with EMD available extra heat exchangers) Min. Flow — 100°F max. GPM	165	320	365	550	500	600	795	975
Min. Flow — 90°F max. GPM	130	240	280	415	400	600	580	740
Min. Flow — 80°F max. GPM	110	185	225	360	300	500	465	560
Max. raw water flow GPM	650	650	590	590	600	600	975	975
Heat exchanger raw water Δ P @ max. flow PSI	5.0	5.0	5.3	5.3	3.4	3.4	5.4	5.4

*With EMD AB21-24 Generator
**Based on Generator at 96% efficiency

Brake Specific Fuel Consumption and Lube Oil Use

MODEL S

750 RPM Continuous Rating
100% Load

UNIT	8E1	12E1	16E1	8E4C	12F4B	16F4B	20F4B
Fuel LB/BHP-HR	0.378	0.378	0.377	0.360	0.345	0.342	0.341
Lube Oil GAL/HR	0.26	0.39	0.52	0.26	0.39	0.52	0.66

MODEL S

900 RPM Continuous Rating
100% Load

UNIT	8E1	12E1	16E1	8E4C	12F4B	16F4B	20F4B
Fuel LB/BHP-HR	0.395	0.393	0.393	0.350	0.339	0.342	0.346
Lube Oil GAL/HR	0.43	0.64	0.85	0.43	0.64	0.85	1.06

Rating Condition:
- 90°F intake air temperature
- 28.25 in. Hg barometric pressure
- 19,620 BTU/LB HHV fuel [API 36]

Specific or guaranteed BSFC should be requested from EMD stating:
- Fuel Heating Value
- Altitude
- Maximum Temperature
- Penalty
- Method of Testing
- If maximum deadload pick-up is involved
- If chrome liners are to be applied

MIAMI-DADE WATER AND SEWER DEPARTMENT

3575 SOUTH LE JEUNE ROAD MIAMI, FLORIDA 33146-2221

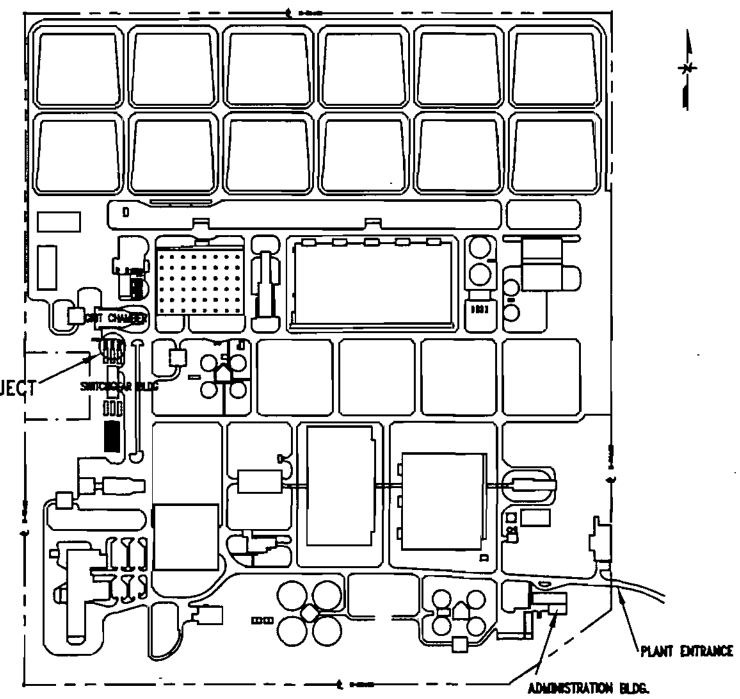
SERVE • CONSERVE

CENTRAL DISTRICT WASTEWATER TREATMENT PLANT

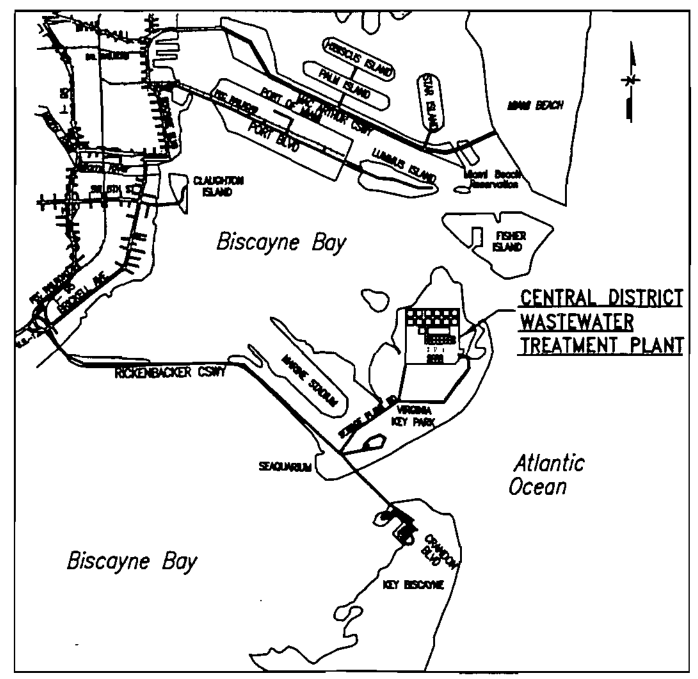
3851 RICKENBACKER CAUSEWAY MIAMI, FLORIDA 33149

NEW REMOTE RADIATORS FOR EMERGENCY GENERATORS No. 1, 2 AND 3

E.R. 47557



SITE PLAN
SCALE: 1" = 300'



LOCATION PLAN
N.T.S.

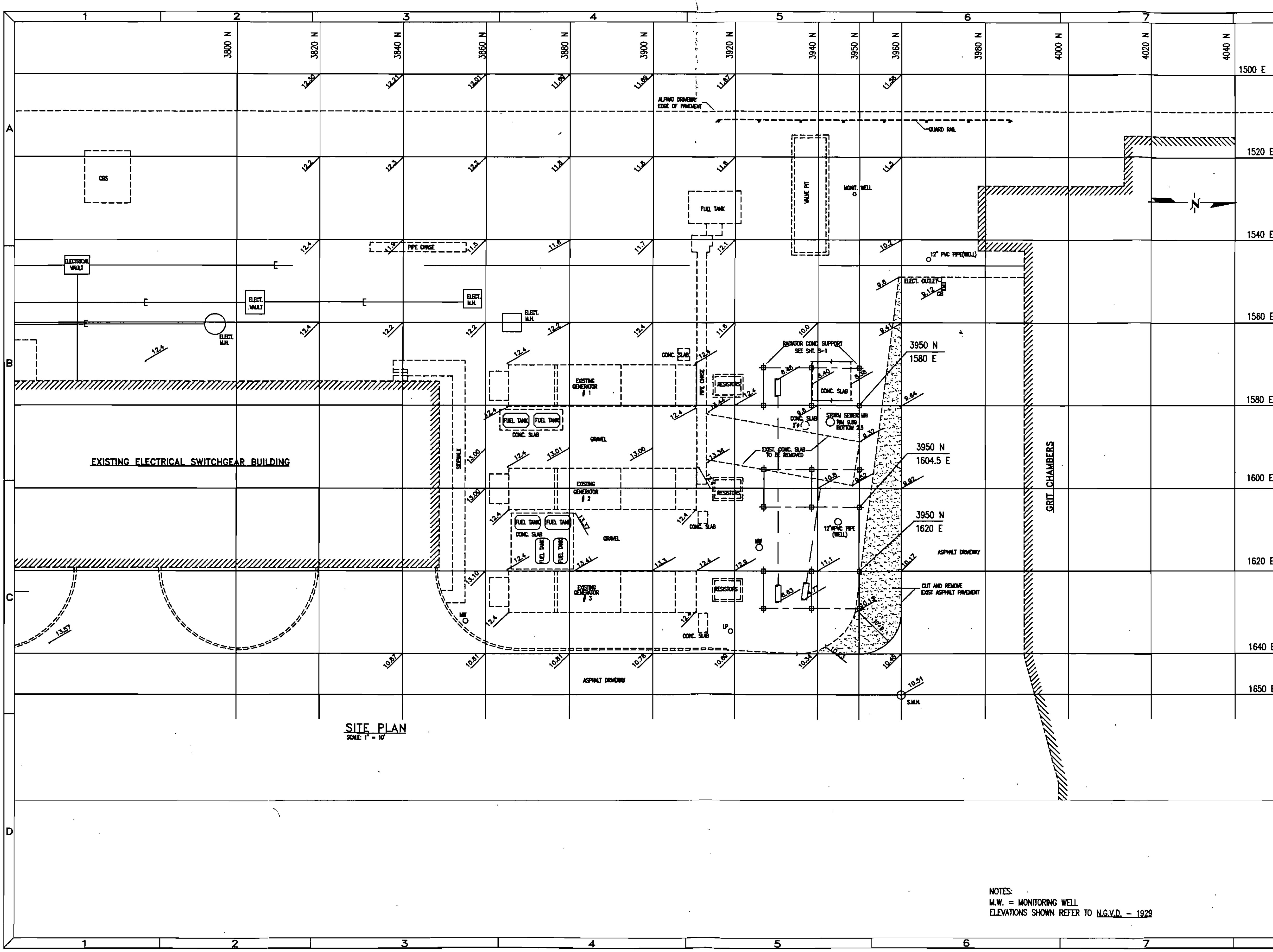
S16-R54-T42

INDEX

Mechanical Engineer
State of Florida - License No. 49380
3575 S. Le Jeune Rd. Miami, FL 33146
WASD (305) 665-7471
Date:

DRAWING ISSUED				
REVISION	No.	DESCRIPTION	DATE	BY
REVIEW 30 %	A			
REVIEW 70 %	B			
REVIEW 100 %	C		11/21/03	ST
PERMIT	∅			

APPROVED BY :	APPROVED BY :	FINAL CHECK BY :	DSG: S. TORRES
CHIEF, ENGINEERING DIV.	MGR., ENGINEERING DESIGN	PROJECT MGR.	DRN: S. TORRES
FILE NAME: 47557C01.DWG	ER: 47557	SHEET C-1	
SCALE: NTS	DATE: NOV. 21,2003	DWG. No. S-17282-A	



SITE PLAN
SCALE: 1" = 10'

NOTES:
M.W. = MONITORING WELL
ELEVATIONS SHOWN REFER TO N.G.V.D. – 1929

SERVE · CONSERVE

MIAMI–DADE WATER AND SEWER DEPARTMENT

ENGINEERING DIVISION
3575 SOUTH LE JEUNE ROAD
MIAMI, FLORIDA 33146–2221

MIAMI–DADE

CENTRAL DISTRICT WASTEWATER TREATMENT PLANT
3851 RICKENBACKER CAUSEWAY MIAMI, FLORIDA 33149
NEW REMOTE RADIATORS
FOR EMERGENCY GENERATORS No. 1, 2, AND 3
ER–47557

SITE PLAN

DRAWING ISSUED

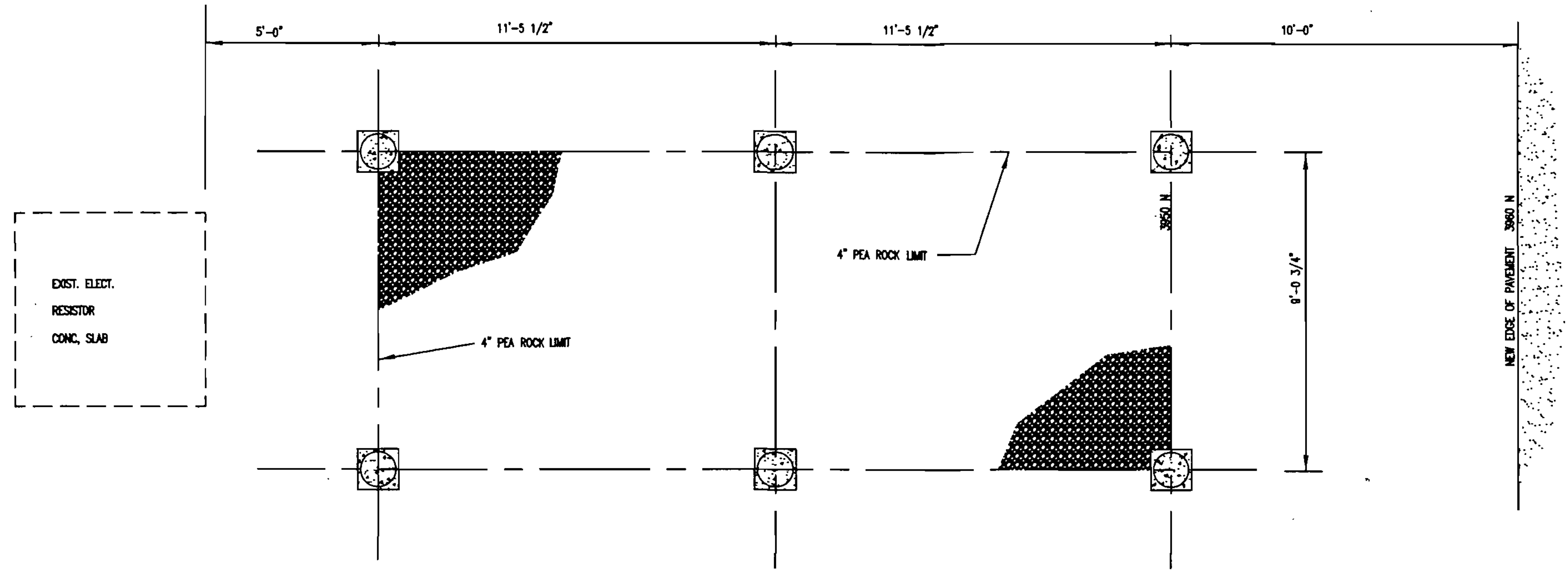
REVISION	No.	DESCRIPTION	DATE	BY
REVIEW 30 %	A			
REVIEW 70 %	B			
REVIEW 100 %	C		10/21/[illegible]	F.S.
PERMIT	#			

APPROVED

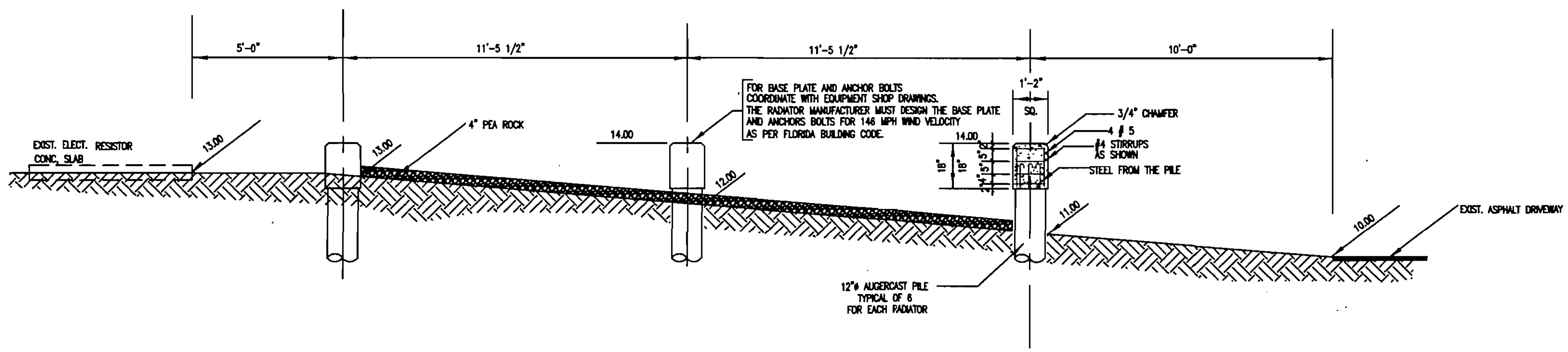
CHIEF, ENG'G. DIV. :
MGR.,ENG'G. DSNG. :
PROJ. MGR. :
DESIGNED : J.R. CHECKED : J.R.
DRAWN : S.T./L.S. FINAL CHECK BY : F.F.

FRANCISCO JOSE FUENTES P.E.
Civil Engineer
State of Florida – License No. 33132
3575 S. Le Jeune Rd. Miami, FL 33146
WASD (305) 665–7471
Date:

ER No. : 47557
FILE NAME : 47557C02.DWG
DATE : FEB. 09, 2004 SCALE : AS NOTED
SHEET C–2
DWG. No. S–17283–A



RADIATOR CONCRETE SUPPORT PLAN
SCALE: 1/2"=1'-0"



LONGITUDINAL SECTION
SCALE: 1/2"=1'-0"

SERVE · CONSERVE

MIAMI-DADE WATER AND SEWER DEPARTMENT

ENGINEERING DIVISION
3575 SOUTH LE JEUNE ROAD
MIAMI, FLORIDA 33146-2221

MIAMI-DADE

CENTRAL DISTRICT WASTEWATER TREATMENT PLANT
3851 RICKENBACKER CAUSEWAY MIAMI, FLORIDA 33149
NEW REMOTE RADIATORS
FOR EMERGENCY GENERATORS No. 1, 2, AND 3
ER-47557

RADIATORS SUPPORT-PLAN AND SECTION

DRAWING ISSUED

REVISION	No.	DESCRIPTION	DATE	BY
REVIEW 30 %	A			
REVIEW 70 %	B			
REVIEW 100 %	C		10/21/03	JR
PERMIT	#			
△				

APPROVED

CHIEF, ENG'G. DIV. :

MGR. ENG'G. DSNG. :

PROJ. MGR. :

DESIGNED : J.R.	CHECKED : J.R.
DRAWN : S.T.	FINAL CHECK BY : F.F.

FRANCISCO JOSE FUENTES P.E
Civil Engineer
State of Florida - License No. 33132
3575 S. Le Jeune Rd. Miami, FL 33146
WASD (305) 665-7471
Date:________

ER No. : 47557

FILE NAME : 47557S01.DWG

DATE : NOV. 21, 2003 | SCALE : AS NOTED

SHEET S-1

DWG. No. S-17284-A

STRUCTURAL GENERAL NOTES

E.R. 47557

1. Unless otherwise noted (u.o.n.) on Drawings or in the Specifications, the following General Structural Notes shall apply to this Project.
2. If any errors or omissions appear on the Drawings, Specifications or other documents, the Contractor shall notify the Engineer in writing of such omissions or errors prior to proceeding with any work which appears in question. In the event of the Contractor's failure to give such notice, he shall be held responsible for the results of any such errors or omissions and the cost of rectifying the same.
3. Do not conceal any work until required information is recorded. All locations for future connections or tie-ins shall be left unburied and uncovered until the Department's surveying forces obtain and record the as-built information.

STRUCTURAL DESIGN CRITERIA:

1. This design complies with the requirements of the Florida Building Code and other referenced codes and specifications. All referenced codes and specifications shall be latest edition at time of permit.
2. Wind load criteria:
   a. Basic wind velocity = 146 mph at a height of 30 feet.

Note: Wind Loads shall comply with the "Florida Building Code 2001" and the "Design Loads For Buildings And Other Structures" (ASCE 7-98 Section 6) - All wind pressures, including calculated uplift shall be modified by the corresponding use and shape factors, including those required for the Coastal Building Zone, if applicable.

See Plans for additional loading information.

Railing and stair railing to comply with F.B.C.

FOUNDATIONS:

1. Augercast Piles (Shop drawings required)
   a. Foundations are designed to bear on 12 inches diameter augercast piles with an allowable compression capacity of tons and a tension capacity of 15 tons. See specifications for other requirements. Notify Engineer of any discrepancy in pile bearing capacity before proceeding with the work.
   b. Unless otherwise noted, piles shall be reinforced with 4#5 vertical bars and # 3 circular ties @ 12 inches center to center. Centralizers (spacing devices) shall be attached to individual bars at one-third points.
   c. Minimum pile length from top of pile to tip elevation shall be 35 ft.
   d. Grout shall have a minimum compression strength of 4,000 psi at 28 days.
   e. Piles to be designed and installed in accordance with the South Florida Building Code.
   f. Pile augering, grout injection equipment and augercast procedure to be submitted for review by the Engineer.
   g. Augercast pile contractor shall have a minimum two (2) years of successful experience in this field.
   h. Top of grade beams to be at same elevation as top of pile caps (u.o.n.).
   i. Unless otherwise noted, all top of pile caps to be a minimum of 1'- 4" below the bottom of concrete slab on grade, or minimum of 1'- 0" below the finish grade, whichever is lower.

CONCRETE:

1. Submit shop drawings for Engineer's approval prior to construction.
2. Concrete design and reinforcement in accordance with "Building Code Requirements for Reinforced Concrete" (ACI 318) and with "Details and Detailing of Concrete Reinforcement" (ACI 315).
3. All concrete work in accordance with "Standard Specifications for Structura; Concrete" (ACI 301). Production of concrete, delivery, and placing to be in accordance with "Hot Weather Concreting" (ACI 305R-89) and "Cold Weather Concreting (ACI 306R & 306.1). Concrete for sanitary structures shall also comply with the recommendations of ACI 350R, "Enviromental Engineering Concrete Structures."
4. Concrete curing shall be done through water couring method and shall comply with ACI-305-2.2 latest edition.
5. No admixtures permitted without the review and approval of Engineer.
6. For all concrete to be placed in slabs (including slabs on grade),the slump shall not exceed 4-inches. No waivers of this requirement shall be considered. Slump for other concrete shall not exceed 5-inches. except for pumped concrete containing water reducing admixtures or tremie concrete, in which case slump shall not exceed 6-inches.
7. All concrete to be regular weight with a minimum design compressive strength of 4000 p.s.i. at 28 days, with minimum 6 bags of cement (Type 2) in each cu.yd. and maximum 0.45 water/cement ratio or, as shown on the Drawings.
8. Maximum size of coarse aggregate shall be: Slabs, walls and Beams: 3/4-inch (No. 67); All other: 1-inch (No. 57) but no more than 75% of minimum clear spacing between individual reinforcing bars, wires or prestressing tendons or ducts.
9. Contractor is responsible for the adequacy of forms, shoring and reshoring and for safe practice in their use and removal. Contractor to maintain a minimum of two floors 100% shored and two floors 50% shored.
10. Placing of concrete in all reinforced columns and walls shall be in equal lifts. Concrete shall be placed through "elephant trunk" tubular chutes located such that the free air drop of the mix does not exceed five feet.
11. Specified expansion bolts shall be of the size indicated and of the maximum embedment length into the concrete. Expansion bolts and accessories shall be stainless steel deep wedge type of chemical adhesive anchor, as specified. Lead shields are not acceptable. Expansion bolts or chemical adhesive anchors shall NOT be substitutes for specified embedded anchor bolts without the Engineer's approval.
12. For protection of concrete surfaces exposed to raw sewage, wastewater sludge and their gaseous emissions, in open or closed structures, see specifications.
13. Samples for strength test shall be as follows: Obtain and mold three (3) specimens for each 50 cubic yards, or fraction thereof, of each class of concrete placed each day or as directed by the Engineer.
14. Immediately after completion of placement and finishing, cure concrete continuously for minimum 7 days by ponding or continuous sprinkling or application of other acceptable moisture retaining covering subject to the approval of the Engineer.
15. Secondary concrete toppings where specified over structural slabs or slabs-on-grade shall be as follows:
    a. Regular weight concrete topping shall have a design strength of 4,000 p.s.i. at 28 days, with minimum 6-1/2 bags of cement (Type II) in each cubic yard of concrete, 3/8-inch maximum size of aggregate and maximum 0.45 water/cement ratio.
    b. Lightweight insulating concrete shall have a minimum compressive strength of 300 psi at 28 days, an oven dry density of 41+/- 3 pcf a wet density at point of placement of 44 pcf +/- 3 pcf and a thermal conductivity ("k" value) of 0.45 at 25 pcf.
    c. Concrete topping shall be minimum 2-inches thick over substrate and sloped as shown on drawings. Provide construction joints as detailed.
    d. New slabs to receive topping shall be finished by brushing surface with a coarse wire broom to remove laitance and scratch surface, and water cured only continuously for a minimum of 3 days. Prior to placement of topping, dampen slab and scrub into the roughened surface a coat of bonding grout consisting of one part cement to part fine sand, mixed to the consistency of thick cream; do not allow to set or dry before topping is applied. Place topping, consolidate and finish as specified.
    e. Existing slabs to receive topping shall be clean of all contaminants preventing bond. Scarify existing surface to a minimum 1/4-inch amplitude. Prior to placement of toping, dampen slab and scrub into the roughened surface a coat of bonding grout consisting of one part cement to one part fine sand, mixed to the consistency of thick cream; do not allow to set or dry before topping is applied. Place topping,consolidate and finish as specified in the specifications.

REINFORCING STEEL:

1. Submit shop drawings for reinforcing steel for Engineer's review prior to fabrication.
2. To be domestic, new billet steel conforming to the latest ASTM, A615 grade 60 specifications, fabricated in accordance with Manual of Standard Practice of the CRSI and placed in accordance with ACI 315, and ACI Manual of Standard Practice.
3. Column and wall reinforcement: dowels to be same size and number as verticals above. Lap 36 bar diameter or minimum of 18-inches, whichever is greater. Provide rigid templets for dowel location. Provide standard hooks for all vertical non-continuous reinforcement, typical unless otherwise noted. Provide minimum 2-feet hooks at corners for all horizontal exterior wall reinforcing and standard hooks for horizontal interior wall reinforcing.
4. All dowels for columns and walls to be secured in position prior to concreting. Drilling or pushing the dowels into position in wet concrete is not permitted.
5. Concrete cover to reinforcing steel, unless otherwise detailed on Drawings:
   a. Footings. including piling caps: 3"
   b. Columns: 1-1/2" to ties, or minimum 2" when exposed to sewer, water or soil
   c. Beams: 1-1/2" to stirrups or minimum 2" when exposed to sewer, water or soil.
   d. Walls: exterior face exposed to weather =1-1/2". Interior face=1"
   e. Interior structural slabs: 3/4"
   f. Exposed structural slabs: 1-1/2" for top reinforcing and 1" for bottom reinforcing.
   g. Slabs on grade:(measured from top of slab.) 4" & 6" slabs = 2", 8" slabs = 3"
6. Minimum clear spacing between reinforcing bars: (db = bar diameter)
   a. Beams: db ≥ 1-inch
   b. Columns: 1.5 db ≥ 1 1/2-inches.
   c. Where parallel reinforcement is placed in two or more layers, bars in the upper layers shall be placed directly above bars in the bottom layer with a clear distance between layers not less than 1 inch.
   d. All reinforcing placed that does not comply with the minimum clear spacing specified in "a","b" and "c" above, will be rejected.
7. Slab, beam and wall reinforcement shall be placed in accordance with the reinforcing diagrams and lapped as shown on plans or a minimum of 40 bar diameters for tension, 30 bar diameters for compression but never less than 18-inches, whichever is greater. Bottom bars spliced only at supports, top bars spliced only at mid-span. All top bars hooked at non-continuous edges (u.o.n.). All hooks to be standard 90 degree or 180 degree hooks as required (u.o.n.).
8. Reinforcement splices:
   a. Splices in slabs, columns and beams must be done as shown on plans.
   b. Reinforcement splices in straight or circular walls shall be staggered at least 24 inches in either direction:
      * Horizontally (plan view) between splices in parallel mats.
      * Vertically (elevation) between splices in the same mat.

   No splice shall be continuous with the next one, horizontally or vertically.
9. Additional reinforcement: provide additional corner bars bent with minimum 30-inches legs each way at corners in outer faces of all walls to match all horizontal bars not detailed with a hooked end. Additional top bars, not shown on drawings, shall be used as required to hold in position main top reinforcement.
10. Bottom reinforcement is shown on drawings with dashed lines. Top reinforcement shown on drawings with solid lines.
11. The Contractor shall inform the rebar detailer of his proposed rebar support method and construction sequences. All support items and splices required shall be so detailed and provided.
12. Bar lengths shown on Drawings include the hook length. This length is shown to indicate to the Contractor the closest accuracy in bar length and placing of same. It is the responsibility of the Contractor to verify this length with structural drawings and actual field conditions and to furnish the final bar detailing on the corresponding shop drawings. Contractor shall bring all discrepancies to the attention of the Engineer.
13. Mechanical connections of reinforcing bars:
    a. All mechanical connections shown in details or specified shall be threaded type, complying with all latest ACI, CRSI and ASTM requirements for a tension type splice.
    b. Provide and place the reinforcing required for future connection with a threaded steel sleeve and an internal plastic coupler protector on the future connection end of sleeve.
    c. Comply with all Specifications and manufacturer's recommendations for the rebar end preparation, coupler protection, clearances and placing so as to make the future connection possible.
    d. No welded type splices shall be used.
    e. Contractor to submit shop drawings with all technical data related to the selected mechanical connection for Engineer's review.

STRUCTURAL AND MISCELLANEOUS STEEL

1. Submit shop drawings and calculations for Engineer's review prior to fabricntion. The submittal shall include the project identity, the loading and design criteria; framing plan and connection details; list the design criteria and loading. Specify all member sizes, bracing anchorage, connections, truss locations and other necessary temporary and permanent fabrication and erection information.
2. All structural steel to be domestic ASTM. A36 (Fy=36 ksi), designed in accordance with the latest AISC. "Specification for the Design, Fabrication and Erection of Structural Steel for Buildings" and the AISC Code of Standard Practice.
3. Steel tubes to be domestic steel conforming to ASTM. A500 Grade B (Fy=46 ksi).
4. High strength bolts to be ASTM A325, double hot-dipped galvanized, unless otherwise specified. Provide matching high strength nuts and washers.
5. All structural steel, tubing, anchors and anchor bolts shall be double hot-dip galvanized after fabrication.
6. All stainless steel shall conform to AISI Type 316 and Type 316L where welding is required.
7. All welding to be in accordance with AWS Latest "Structural Welding Code - Steel", (ANSI /AWS D1.1). Rustproof all field welds and surrounding area with two (2) coats of zinc based paint.
8. All connections shall be as shown and indicated on drawings.
9. Splice locations, other than shown on drawings, to be reviewed by Engineer.
10. Steel beams bearing on walls to have angle anchors and/or bearing steel plates, as shown on the drawings.
11. Shop coat all structural steel with Rustoleum "769" red primer or approved equal prior to installation.

ENGINEER'S REVIEW OF SHOP DRAWINGS

1. The review by the Engineer; of drawings, data and samples submitted by the Contractor will cover only general conformity to the Drawing and Specifications. The Engineer's review will not constitute an approval of dimensions, quantities, and details of the material, equipment, device, or item shown. The review of drawings and schedules will be general, and shall not be construed:
   a) As permitting any departure from the Contract requirements.
   b) As relieving the Contractor of responsibility for any errors, including details, dimensions, and materials.
   c) As approving departures from details furnished by the Engineer, except as otherwise provided herein.
2.- Approval shall not relieve the contractor of the responsibility for details of design, correct dimensions for proper fitting, capacity, performance, construction, or any other requirement of the contract.
3.- Shop drawings shall be dated and signed by the contractor and by the supplier before submitting to the Engineer. Non compliance will cause rejection without reviewing.
4.- Five copies of shop drawings are required for WASD files in addition to the amount of copies required by the contractor. Non compliance will cause rejection without reviewing.
5.- See specs, section 01340 for further shop drawing requirements.
6.- When submitting concrete mix shop drawings the contractor shall indicate clearly where the concrete mix will be used.

MISCELLANEOUS:

1. All elevations shown on drawings refer to National Geodetic Vertical Datum of 1929 (N.G.V.D.-29)
2. Construction joints, other than those shown on drawings, are subject to the approval of the Engineer.
3. Coordinate exact size and location of concrete equipment pads, pipes, pipe encasement, wall pipe sleeves, corbels, pipe supports and other miscellaneous items to be placed prior to pouring concrete, with mechanical and electrical drawings and manufacturer's reviewed shop dwg.
4. No conduits, pipes, sleeves or any other item shall be embedded in concrete along, through or under any beam,column,footing,grade beam, slab, wall or any other structural member without the prior approval of the Engineer. Shop drawings shall be submitted prior to any work to obtain the corresponding Engineer's approval. When approved, placing shall comply with ACI.-318, Section 6.3
5. When placing hangers to support pipes or any other equipment no drills or shots to secure fasteners are permitted in any concrete joist of double tee stem: those hangers shall be placed on the slab on top of the joist or the flange slab of the double tees
6. Superimposed loads due to construction equipment or materials above poured in place concrete, prestressed double tees and prestressed concrete or steel joists, floor or roof decks, shall not exceed the design superimposed loads. Shop drawings shall be submitted for engineer's approval showing the amount and location of such loads prior to placing them over the deck.
7. ALL PHASES OF CONCRETE CONSTRUCTION, INCLUDING MATERIALS, FOUNDATIONS, CAST-IN-PLACE AND PRECAST CONCRETE, REINFORCING STEEL, MASONRY, FORM WORK AND ALL OTHER RELATED PROCEDURES AND MATERIALS SHALL COMPLY WITH THE MOST STRINGENT ALLOWED TOLERANCES OF ACI-301 AND ACI-117 STANDARDS. (LATEST EDITION).

   ALSO THEY SHALL COMPLY WITH THE LATEST APPLICABLE ACI STANDARD, SPECIAL PUBLICATION OR COMMITTEE REPORT AS SHOWN OR MENTIONED ON THE "ACI MANUAL OF CONCRETE PRACTICE."

   NON COMPLIANCE WITH THESE STANDARDS WILL CAUSE FULL REJECTION OF ANY WORK DONE.

SERVE · CONSERVE

MIAMI-DADE WATER AND SEWER DEPARTMENT

ENGINEERING DIVISION
3575 SOUTH LE JEUNE ROAD
MIAMI, FLORIDA 33146-2221

METRO-DADE

CENTRAL DISTRICT WASTEWATER TREATMENT PLANT
3851 RICKENBACKER CAUSEWAY MIAMI, FLORIDA 33149
NEW REMOTE RADIATORS
FOR EMERGENCY GENERATORS No. 1, 2 AND 3
E.R. 47557

STRUCTURAL GENERAL NOTES

DRAWING ISSUED

REVISION	No.	DESCRIPTION	DATE	BY
REVIEW 30 %	A			
REVIEW 70 %	B			
REVIEW 100 %	C		10/21/03	JR
PERMIT	#			

APPROVED

CHIEF, ENG'G. DIV. :

MGR.,ENG'G. DSNG. :

PROJ. MGR. :

DESIGNED : J.R. CHECKED: J.R.

DRAWN : S.T. FINAL CHECK BY : F.F.

FRANCISCO JOSE FUENTES P.E.
Civil Engineer
State of Florida - License No. 33132
3575 S. Le Jeune Rd. Miami, FL 33146
WASD (305) 665-7471
Date:

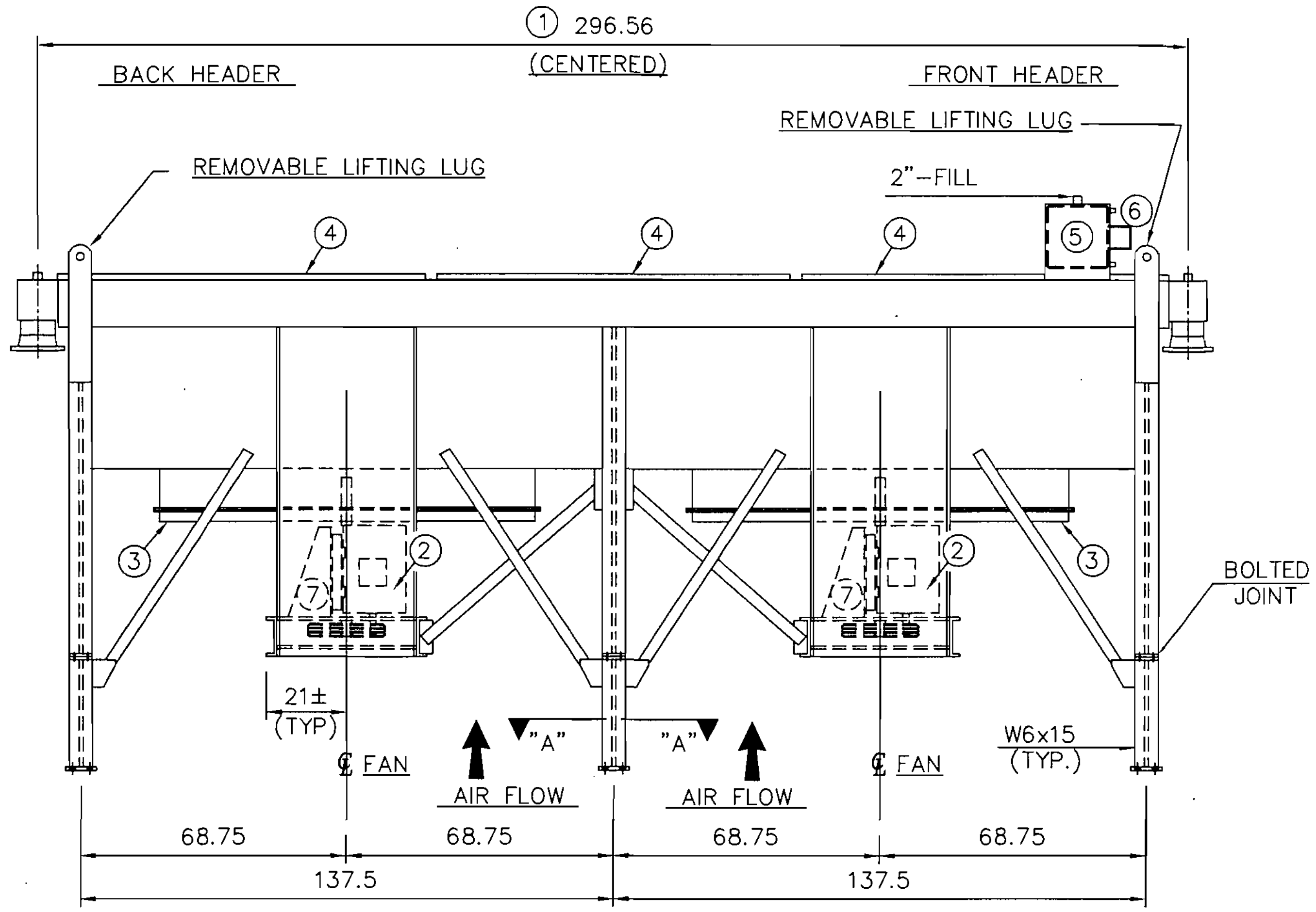
ER No. : 47557

FILE NAME : 47557S02.DWG

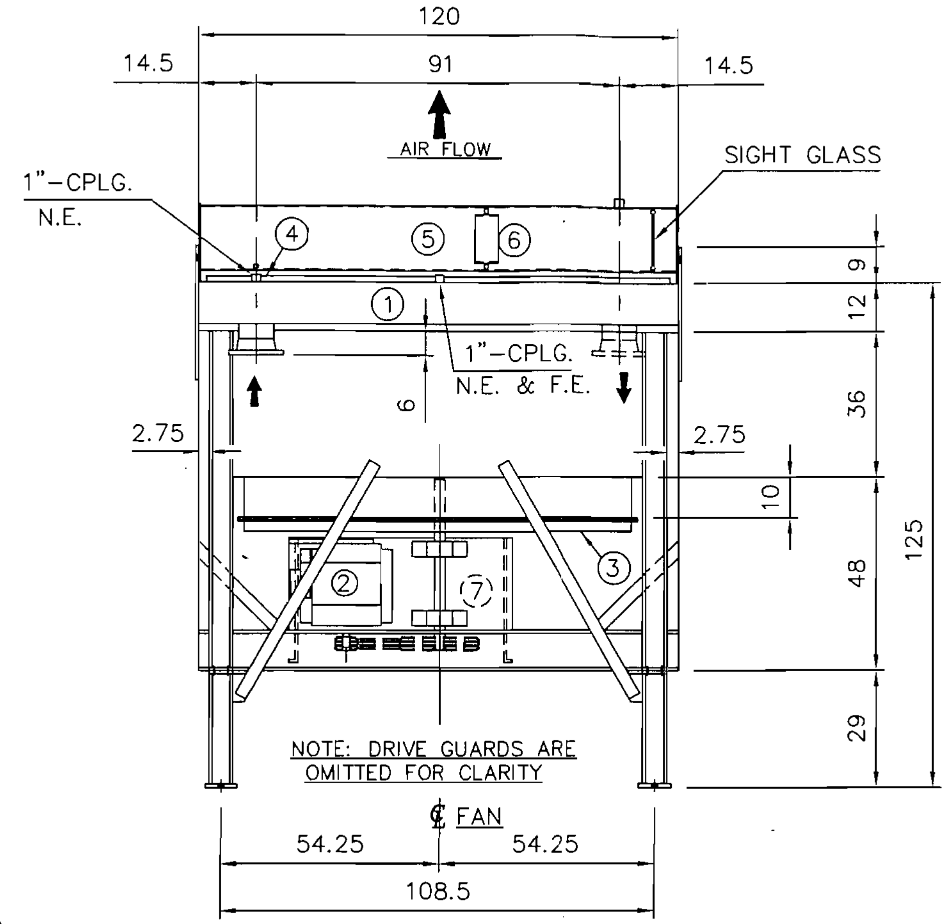
DATE : NOV. 21,2003 SCALE : N.T.S.

SHEET S-2

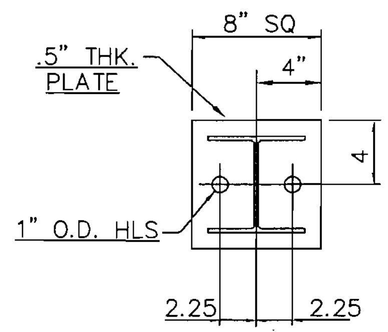
DWG. No. S-17285-A



SIDE ELEVATION



FRONT HEADER END VIEW



SECTION "A-A"
(6-PLACES)

PLAN VIEW OF FAN ROTATION

PLAN VIEW OF FAN ROTATION

RELEASED

FABRICATION OF THIS ORDER HAS BEGUN

NOTE:
SPREADER BARS REQUIRED FOR LIFTING
ESTIMATED DRY WEIGHT: 16,700#

① EJW (176.5 GAL.)(ASME STAMP)
D.P. 75 P.S.I. @ 300/50 °F.
NOZZLES 8"-150 R.F.

② (2) 20 HP, 1800 RPM, 3 PH, 60 HZ, 230/460 V, TEFC MOTOR

③ (2) FAN GUARDS (WITH ACCESS)

④ HAILGUARD

⑤ 16" SQ. SURGE TANK (124 GAL. CAP.) (TEST MOUNTED, & SHIPPED LOOSE)

⑥ LOW LEVEL ALARM

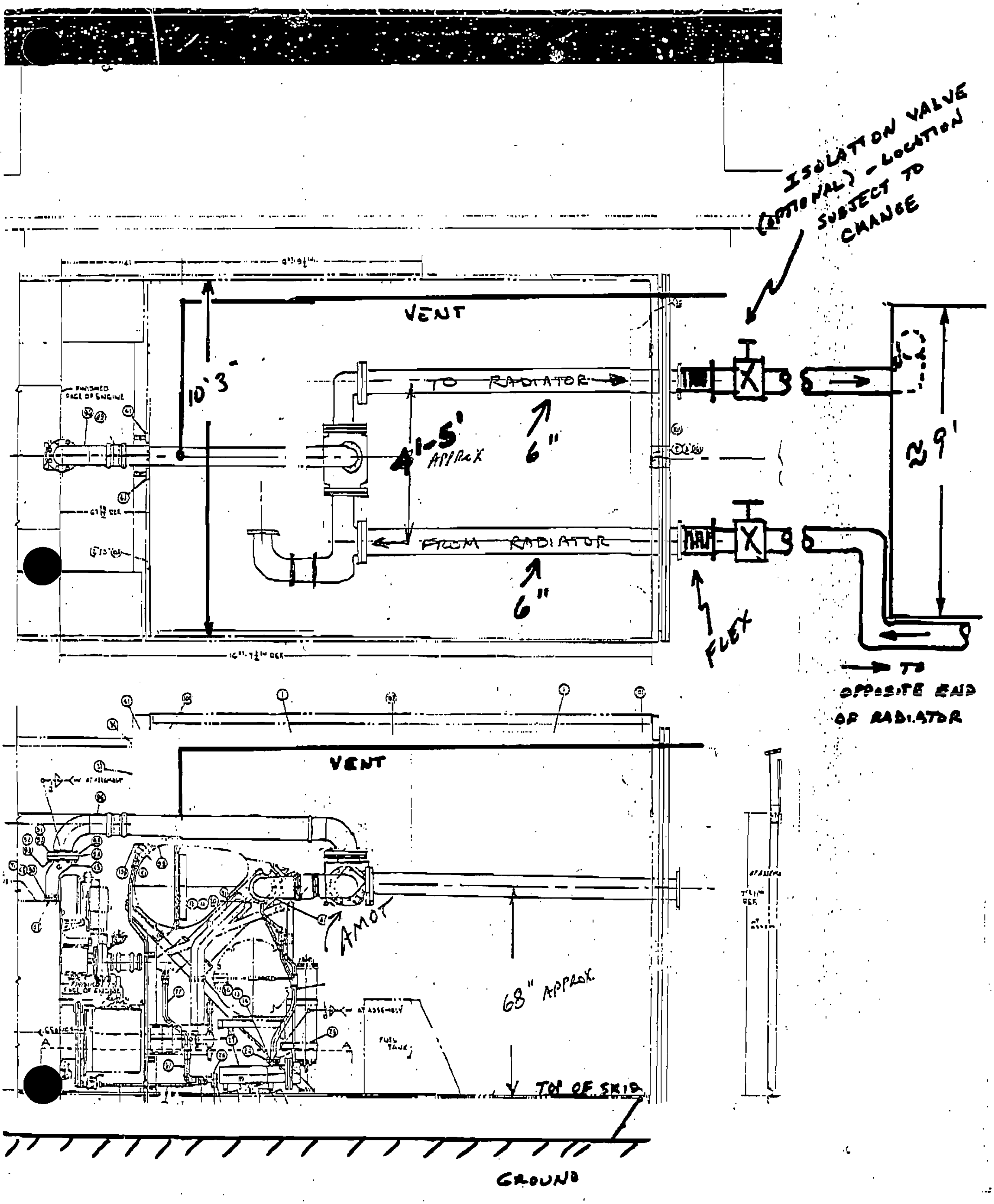
⑦ (2) VIBRATION SWITCHES

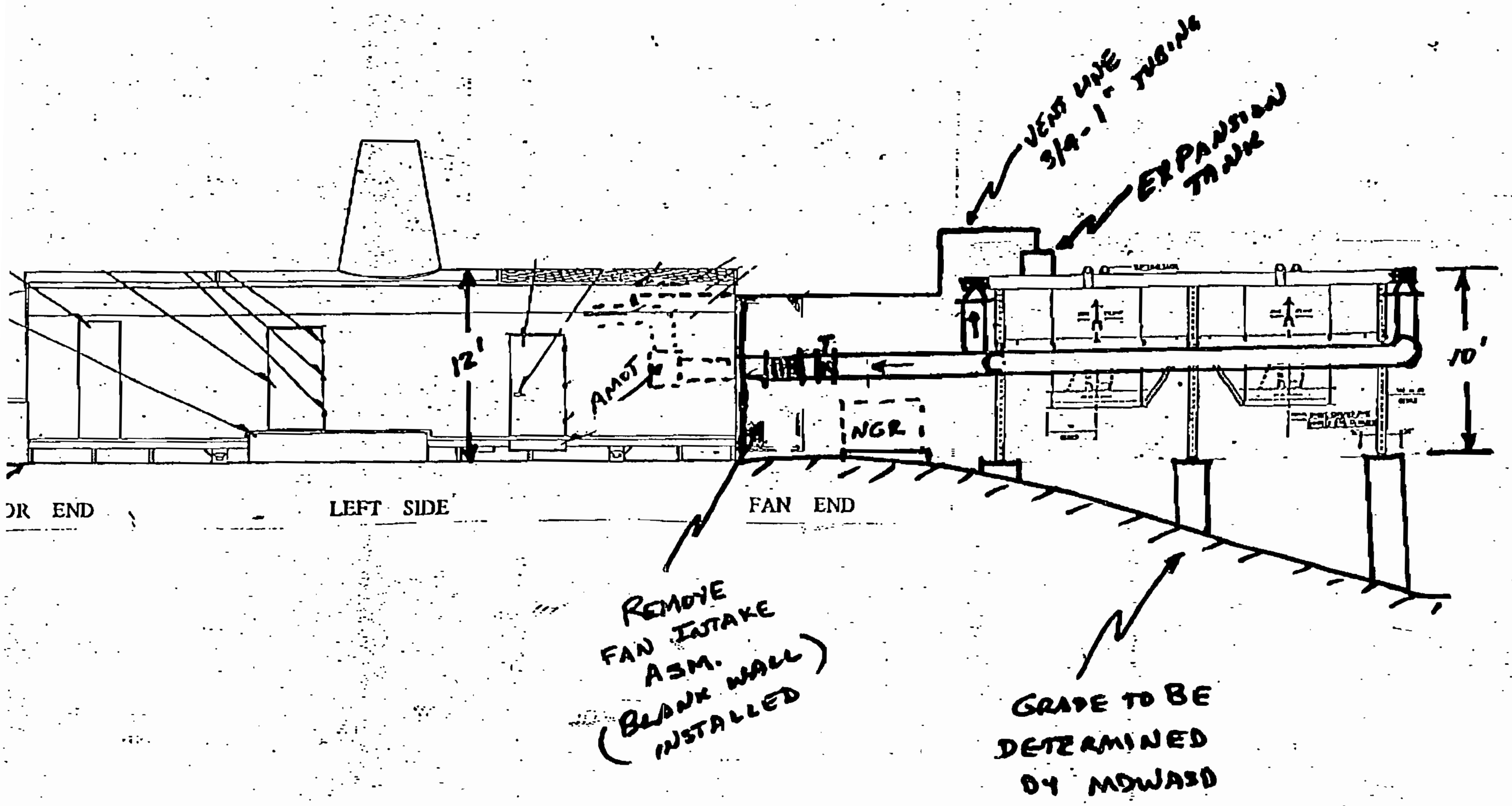
TAG: PO#REQ A-87016

AIR-X-CHANGERS	
CERTIFIED FOR JOB:	037639
BY: RDO	DATE: 08/28/03
CUSTOMER:	ENGINE SYSTEMS INC.
P.O. NO.:	56290

REV.	DESCRIPTION	BY	DATE	APP'D

REF DWGS	AIR-X-CHANGERS TULSA, OKLAHOMA MODEL 96-2Z		
	BY: GGH	CHKD:	
	DATE: 8/23/03	DATE:	
	SCALE:	DWG # CRT	REV. 0
	JOB: 037639		


ISOLATION VALVE (OPTIONAL) - LOCATION SUBJECT TO CHANGE
VENT
10'3"
TO RADIATOR
FROM RADIATOR
1'-5" APPROX
6"
6"
≈9'
FLEX
TO OPPOSITE END OF RADIATOR
VENT
AMOT
68" APPROX.
TOP OF SKID
GROUND



MDWASD - VIRGINIA KEY RADIATOR

NOTE: IF NEUTRAL GROUNDING RESISTOR MOVED, RADIATOR CAN BE MOVED CLOSER TO GENERATOR UNIT.

ZONE	LTR	REVISION DESCRIPTION	DATE	APPROVED
	A	REVISED PER ECN NO. G2621	10/22/02	BMR
	B	REVISED PER ECN NO. G2657	12/18/02	BMR
	C	REVISED PER ECN NO. G2664	01/08/03	BMR

DESIGN DATA AND LIMITATIONS (PARAMETERS ARE BASED ON F4B ENGINE PERFORMANCE AT RATED SPEED):

1- COOLANT (30% EG, 70% FRESH WATER MIXTURE) FLOW RATE: 1100 GPM
2- ALLOWABLE PRESSURE DROP FOR EXTERNAL PIPING AND COOLING EQUIPMENT: 8 PSI
3- EXHAUST GAS FLOW RATE: 23,350 ft^3/min AT 880 °F.
4- MAXIMUM EXHAUST GAS PIPING BACK PRESSURE: 5 INCHES OF H_2O (SILENCER ?P = 3")
5- COMBUSTION INTAKE AIR FLOW RATE: 10,725 ft^3/min AT MAX 90 °F AMBIENT.
6- TOTAL AIR INTAKE SUCTION-MAX. CLEAN FILTER: 6 H_2O.
7- NO. 2 DIESEL FUEL FLOW TO ENGINE: 4.5 GPM
8- APPROX. FUEL RETURN FLOW RATE: 1.2 GPM (BASED ON 0.86 FUEL SPECIFIC GRAVITY AND 19,620 BTU/LB HHV)
9- FUEL PUMP MAX SUCTION LIFT CAPACITY: 12 FEET
10- MAXIMUM STATIC HEAD ON FUEL SYSTEM: 18 FEET (APPROX. 5.5 PSI).

REQUIRED UTILITIES:

1- JACKET WATER IMMERSION HEATER: 230-460, 3 PH, 60 HZ, 15 KW
2- 125 VDC TURBO LUBE OIL BACKUP PUMP, AND FUEL OIL PRIMING PUMP.
3- SOAK BACK PUMP/MOTOR: 230-460, 3 PH, 60 HZ, 3/4 HP
4- LUBE OIL CIRCULATING PUMP/MOTOR: 230-460, 3 PH, 60 HZ, 1 HP
5- STARTING SYSTEM: MINIMUM 110 PSIG, MAXIMUM 250 PSIG (SET PRESSURE REGULATOR TO 90 PSIG) AND A MINIMUM FLOW RATE OF APPROX. 28.23 FT^3/SEC (WITH THE IMMERSION HEATER APPLIED).

UNIT ESTIMATED WEIGHT:

DRY: 111,086 LBS (50,388 KG)
WET: 121,552 LBS (55,136 KG) (INCLUDING 250 GALLONS OF DIESEL FUEL)

UNIT PERFORMANCE:

1- UNIT MAXIMUM OUTPUT: 2865KW @900 RPM, 90°F AMBIENT
2- NOISE LEVEL OF 65 dBA MEASURED AT A DISTANCE OF 100 FEET IN A FREE FIELD FROM THE ENCLOSURE.
3- ENCLOSURE DESIGNED TO MEET 150 MPH WIND LOAD IN ALL DIRECTIONS.
4- BASE DESIGNED IS EQUIPED WITH LUBE OIL DRIP PAN AND 3"HIGH LIQUID SPILL CONTAINMENT AROUND THE ENGINE AND ACCESSORY RACK.

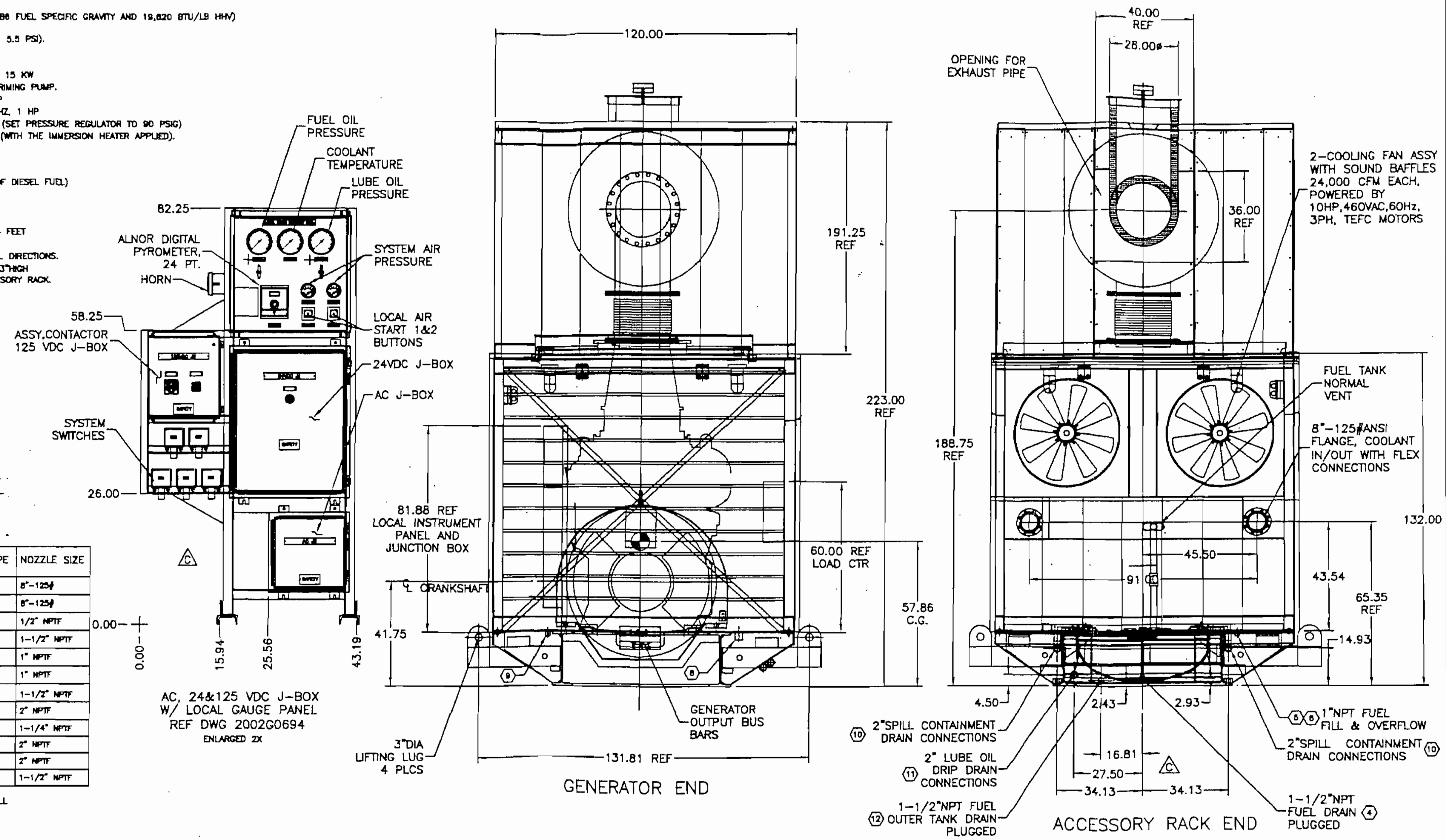
REFERENCE DRAWINGS:

1- 2002G0709 - SCHEMATIC, LUBE OIL SYSTEM
2- 2002G0710 - SCHEMATIC, DIESEL FUEL SYSTEM
3- 2002G0711 - SCHEMATIC, COOLING SYSTEM
4- 2002G0712 - SCHEMATIC, STARTING AIR SYSTEM
5- 2002G0713 - SCHEMATIC, INTAKE AIR-EXHAUST SYSTEM
6- 2002G0688 - SPECIFICATIONS & OUTLINE DRAWING, ATTENUATED, ALUMINUM ENCLOSURE
C 7- 2002G0886 - INSTALLATION DRAWING, EMD SE20-645F4B
8- 2002G0694 - ASSEMBLY, CONTACTOR & ENGINE J-BOX WITH ACCESSORY SWITCHES

NOZZLE SCHEDULE

CONN. NO.	SERVICE FOR	QTY	NOZZLE TYPE	NOZZLE SIZE
1	COOLANT RETURN FROM RADIATOR	1	FF FLANGE	8"-125#
2	COOLANT TO RADIATOR	1	FF FLANGE	8"-125#
3	VENT CONNECTION	1	PIPE COUPLING	1/2" NPTF
4	DIESEL FUEL OIL DRAIN	1	PIPE COUPLING	1-1/2" NPTF
5	FUEL OIL RETURN TO MAIN TANK	1	PIPE COUPLING	1" NPTF
6	DIESEL OIL FROM MAIN TANK	1	PIPE COUPLING	1" NPTF
7	LUBE OIL DRAIN	1	FEMALE PIPE	1-1/2" NPTF
8	STARTING AIR INLET (MAX 250 PSIG)	2	FEMALE PIPE	2" NPTF
9	ENGINE WATER DRAIN (WITH VALVE)	1	FEMALE PIPE	1-1/4" NPTF
10	SPILL CONTAINMENT DRIP DRAIN	2	PIPE COUPLING	2" NPTF
11	DRIP PAN DRAIN	1	PIPE COUPLING	2" NPTF
12	FUEL OUTER TANK DRAIN	1	PIPE COUPLING	1-1/2" NPTF

CONTRACTOR TO UTILIZE SUITABLE FLEXIBLE CONNECTIONS FOR ALL INTERFACE POINTS IF NOT SUPPLIED BY S&S.



ENGINE	EMD SE20-645F4B	DIESEL GENERATOR SET-2865KW
GENERATOR	BAYLOR/NOW 6855XNV-229A	MIAMI DADE ORR PLANT WWTP, MIAMI DAE COUNTY FLORIDA
RADIATOR	AIR-X-EXCHANGERS 96-2Z	CUSTOMER P.O. NO.APWS0200709
MUFFLER	MAXIM-MT41 142-8A11117	S&S QUOTE REF NO. QS#0101247
BASE	S&S 2002G0693	
ENCLOSURE	S&S 2002G0898	

C	C	C	C	REV	REV STATUS OF SHEETS
4	3	2	1	SHEET	

WEIGHTS
STRESS
MATERIALS & PROCESS
MANUFACTURING ENGRG
QUALITY ASSURANCE
ADDITIONAL APPROVALS DATE

SO 1171776
PART DASH NO. | QTY REQD PER ASSY | NEXT | FINAL | NEXT ASSY | USED ON | APPLICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS .XX ± .08 .XXX ± .010
ANGULAR ± 1°
DO NOT SCALE DRAWING
TREATMENT
FINISH
SIMILAR TO | ACT WT | CALC WT -

CONTRACT NO.

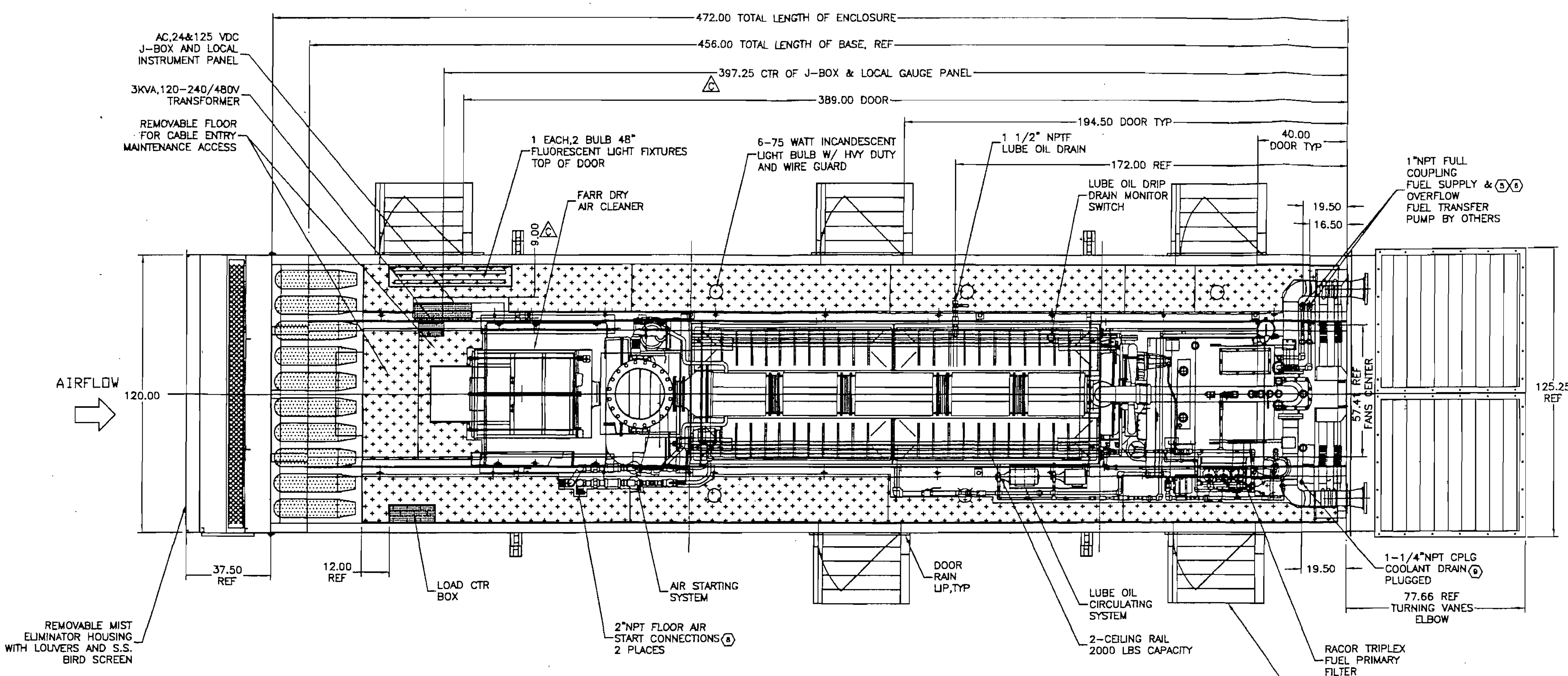
		DATE
DRAWN	BMRAMIREZ	09/10/2002
CHECK	G MATTIUZZI	09/10/2002
DESIGN	BMRAMIREZ	09/10/2002
DESIGN ACTIVITY	T ROBERTSON	09/10/2002
CUSTOMER		

STEWART & STEVENSON SERVICES
P.O. BOX 1637, HOUSTON, TEXAS, 77251

TITLE GEN. ARRANGEMENT DRAWING ATTENUATED, EMD SE20-645F4B 2865 KW GEN SET

SIZE D | FSCM NO. 81381 | DWG NO. 2002G0688 | REV. C
SCALE 3/64 | RELEASE DATE | SHEET 1 OF 4

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REVISED PER ECN NO. G2821	10/22/02	BMR
	B	REVISED PER ECN NO. G2857	12/18/02	BMR
	C	REVISED PER ECN NO. G2864	01/08/03	BMR



TOP VIEW
ENCLOSURE AND SILENCER NOT SHOWN FOR CLARITY

WEIGHTS		
STRESS		
MATERIALS & PROCESS		
MANUFACTURING ENGRG		
QUALITY ASSURANCE		
ADDITIONAL APPROVALS	DATE	

PART DASH NO.	NEXT / QTY REQD PER ASSY	FINAL	NEXT ASSY	USED ON
				SO 1171776
APPLICATION				

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES
DECIMALS .XX ± .06 .XXX ± .010
ANGULAR ± 1°
DO NOT SCALE DRAWING
TREATMENT
FINISH
SIMILAR TO | ACT WT | CALC WT —

CONTRACT NO.	DATE
DRAWN BMRAMIREZ	09/10/2002
CHECK G MATTIUZZI	09/10/2002
DESIGN BMRAMIREZ	09/10/2002
DESIGN ACTIVITY T ROBERTSON	09/10/2002
CUSTOMER	

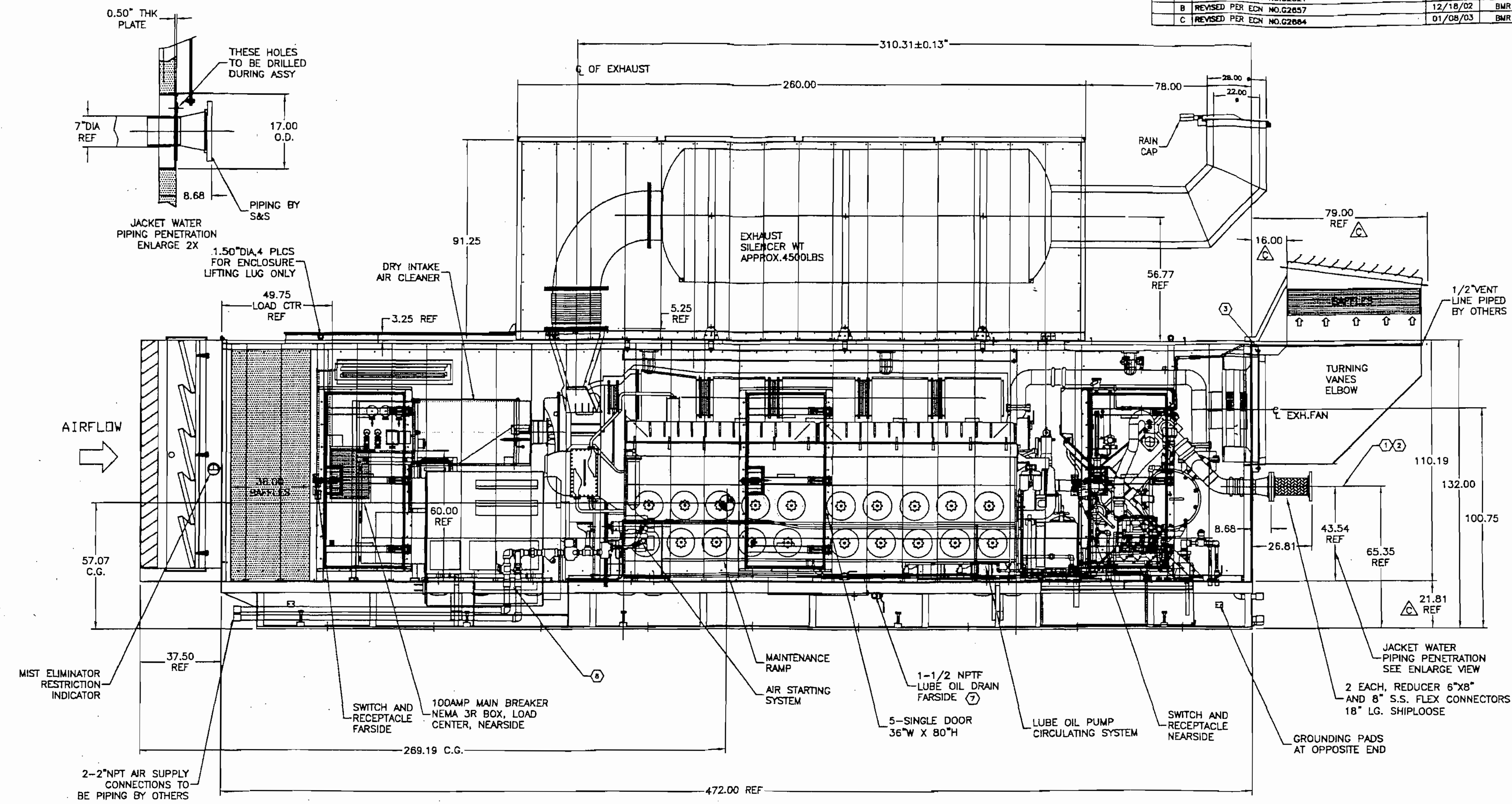
STEWART & STEVENSON SERVICES
P.O. BOX 1637, HOUSTON, TEXAS, 77251

TITLE GEN. ARRANGEMENT DRAWING ATTENUATED, EMD SE20-645F4B 2865 KW GEN SET

SIZE	FSCM NO.	DWG NO.	REV.
D	81381	2002G0688	C

SCALE 3/64 | RELEASE DATE | SHEET 3 OF 4

ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	REVISED PER ECN NO.C2621	10/22/02	BMR
	B	REVISED PER ECN NO.C2657	12/18/02	BMR
	C	REVISED PER ECN NO.C2684	01/08/03	BMR



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES: DECIMALS .XX ± .06, .XXX ± .010; ANGULAR ± 1°
DO NOT SCALE DRAWING

SO 1171776

	NAME	DATE
DRAWN	BMRAMIREZ	09/10/2002
CHECK	G MATTIUZZI	09/10/2002
DESIGN	BMRAMIREZ	09/10/2002
DESIGN ACTIVITY	T ROBERTSON	09/10/2002

STEWART & STEVENSON SERVICES
P.O. BOX 1637, HOUSTON, TEXAS, 77251

GEN. ARRANGEMENT DRAWING
ATTENUATED, EMD SE20-645F4B
2865 KW GEN SET

SIZE D | FSCM NO. 81381 | DWG NO. 2002G0688 | REV. C

SCALE 3/64 | SHEET 2 OF 4

CDWWTP Digester gas handling - 2003

Month	Plant Flow MG	Gas Prod.; MMscf	Gas Used; MMscf	H2S grains /100cf Scrubbed	H2S grains /100cf Plant 1 Raw	H2S grains /100cf Plant 2 Raw	H2S grains /100cf Raw Average	Percent H2S Removal
JAN	2697	44.439	30.740	98	273	300	286	66%
FEB	2427	42.044	28.454	96	267	302	284	66%
MAR	3065.9	47.536	30.793	95	280	317	299	68%
APR	2922	44.560	26.127	96	273	305	289	67%
MAY	3568.1	46.712	27.740	104	292	318	305	66%
JUN	3750	43.005	29.049	100	276	293	285	65%
JUL	3112.4	44.752	27.419	99	280	290	285	65%
AUG	3499.9	49.776	30.763	98	282	303	292	66%
SEP	4146.9	48.304	30.092	95	270	294	282	66%
OCT	4955	45.616	28.718	98				
NOV	3831	47.679	28.449	101				
DEC	2930.4	45.083	29.905	93				
TOTAL	**40905.6**	**549.507**	**348.249**					
AVERAGE	**3408.8**	**45.792**	**29.021**	**98**	**277**	**302**	**290**	**66%**

Average Gas Production 1.343E-02 MMscfF/MG

REVISED EMISSION CALCULATIONS FOR VIRGINIA KEY METHANE COMBUSTION ENGINES

NO_x EMISSIONS

DIGESTOR GAS PROPERTIES

Based on testing data of Dr. Moore and Mr. Pascul as shown in attached Table 2

% CH_4 (Average after scrubbing) = 72.1

% CO_2 (Average after scrubbing) = 27.8

HHV BTU/SCF = 617 (Pre-scrubbing)

703 (Post-scrubbing)

Use HHV BTU/SCF = 700

H_2S = 31 grains/100 SCF

ENGINE SPECIFICATIONS AND PERFORMACE

4 Digestor Combustion Units

Electrical Output - 1200 KW

Generator Efficiency - 95%

Fuel Requirement = 7450 BTU/BHP-hr

Fuel Heating Value 700 BTU/SCF

A) Fuel Gas Flow Required (For Single Unit)

$$BHP_{in} = \frac{(1.341)(1200)}{(0.95)} = 1694$$

$$BTU/hr = (7450)(1694) = 12.62 \times 10^6$$

$$\text{Fuel Gas Flow} = (12.62 \times 10^6)\ \frac{BTU}{hr}\ \frac{SCF}{(700)\,BTU}$$

$$= 18{,}026\ SCF/hr = 300.5\ SCFM$$

Attachment K
Control Technology

Control Technology Review and Analysis

1 General

Under PSD regulations, a new or modified "major source" is required to apply BACT for any pollutant emitted in "major" or "significant" amounts. The proposed standby generator has the potential to emit NOx in amounts which would require a BACT analysis if the unit is allowed to operate without any restrictions, however since the proposed unit will be subject to operational restrictions that limit NOx emissions below signification amounts a BACT analysis is not required for this pollutant.

The purpose of this review is to demonstrate that the air pollution control measures proposed to be used is reasonably consistent with the representative BACT being utilized at other facilities as defined by Section 169 of the CAA:

> "An emission limitation (including a visible emissions standard) based on the maximum degree of reduction of each pollutant subject to regulations under the Act which would be emitted from any proposed major stationary source or major modification, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, economic impacts and other costs, determines is achievable for such source or modifications through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment of innovative fuel combination techniques for control technology resulting in emissions of any pollutant which will exceed the emissions allowed by any applicable standard under 40 CFR Parts 60 and 61. If the EPA determines that technological or economic limitations on the application of measurement methodology to a particular emission unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirements for the application of best available control technology. Such standard shall, to the degree possible, set forth the emissions reduction achievable by implementation of such design, equipment, work practice or operation, and shall provide for compliance by means which achieve equivalent results."

Both FDEP and EPA have indicated that demonstration of BACT as described must follow a "top-down" approach. The "top-down" process requires that all available control technologies be ranked in descending order of control effectiveness. This process ensures that the BACT demonstration considers the most stringent level of control technology available. That control option is established as BACT, unless it can be demonstrated that energy, environmental, or economic impacts justify a conclusion that the most stringent technology is not achievable. The next most stringent alternative is then considered. The process continues until the BACT level under consideration cannot be eliminated by any substantial or unique economic or environmental objectives.

The purpose of this appendix is to demonstrate that the proposed emission control systems and methods will be representative of BACT for this type of installation. To facilitate the demonstration, information obtained from the EPA's RACT/BACT/LAER Clearinghouse (RBLC) database for large internal combustion engines burning fuel oil or diesel was reviewed and is presented in Table K. The following paragraphs summarize the control-technology options available for large diesel engines, and the proposed BACT for NOx.

2 Nitrogen Oxides

NOx is formed during the fuel combustion process in the presence of atmospheric nitrogen. Nitrogen and oxygen dissociate into their atomic states under high temperature and pressure conditions present inside combustion engines. Atomic oxygen and nitrogen quickly react with each other to form seven different oxides of nitrogen: nitric oxide (NO), nitrogen peroxide (NO2), nitrogen trioxide (NO3), nitrous oxide (N2O), nitrogen anhydride (N2O3), N2O4 and N2O5. Only NO and NO2 are formed in significant quantities, and NO accounts for approximately 95 percent of total NOx emissions. NO is eventually converted to NO2 in the atmosphere.

2.1 Selective Catalytic Reduction

The review of the U. S. EPA RACT/BACT/LAER database indicates that the top method of controlling emissions of NOx from large diesel engines is selective catalytic reduction (SCR) with oxidation catalyst. A tabulation of the database, provided in Table K, indicates that SCR has been applied to large diesel engines at several facilities in several states. Vermont has two facilities (VT-0013 and VT-0014) with SCR installed; one at a saw mill in North Clarenton, VT and another at a ski resort in Ludlow, VT. In both cases; there was no regulatory basis for the use of SCR. In California, Manson Construction Company (CA-0868) 1605 Pier "D" St. in San Diego, CA proposed to use SCR and Ross Island Sand and Gravel (CA-0733), of the Port of Stockton, Stockton, CA was permitted to use SCR in a 685 hp Cummins diesel-fired IC engine serving a deep water dredge. Both of these determinations of were made on portable sources by regional Air Quality Boards and were respectively BACT-other and LAER. Massachusetts has two facilities, (MA-0023 and MA-0029) with SCR installed. However at the Dighton Power Associate, LP (MA-0023) in Dighton, MA, SCR is apparently only utilized to control the emissions from the 110 MW natural gas fired turbine and not on a diesel engine fire pump limited to only 300 hours of operation a year and NOx emission rate of 4.41 lbs/MMbtu. Similarly at the Sithe Mystic Development LLC (MA-0029) in Charleston, MA, SCR is apparently only utilized to control the emissions from the 2 natural gas fired turbines and not on the 1500 kW emergency diesel generator limited to a NOx emission rate of 37.44 lbs/hr or 6.5 g/bhp-hr. In Pennsylvania, two facilities in Philadelphia, (PA-0096 and 0097) use SCR. Both the Southwest Water Treatment Plant (PA-0096) and the Northeast Water Treatment Plant (PA-0097) in Philadelphia, PA have SCR installed on eleven 1156 kW and seven 1635 kW diesel fueled generator sets used for peaking power at the respective facilities, these units cannot operate more than 250 hours a year and emit more than 2.0 g/bhp-hr of NOx. At the time, Philadelphia, PA was in an ozone transport nonattainment region where new and modified facilities were required to comply with local regulations that limit NOx emissions through the imposition of reasonably achievable control technology (RACT) or lowest achievable emission rate (LAER). The SCR at these facilities was specifically installed to comply with a locally-mandated emission limit of 2 grams NOx per horsepower-hour (hp-hr). As such; it is more representative of LAER than BACT. Because SCR has been installed at only one locality and under conditions that effectively required the use of LAER for NOx emission control, the use of SCR is considered to exceed what would be considered BACT for MDWASD's diesel fueled standby generator engines.

The SCR process reduces NOx emissions by injecting ammonia (NH3) into the exhaust stream, where the NH3 and NOx react in the presence of a catalyst to form water and nitrogen:

NOx Conversion:

$$4\ NO + 4\ NH_3 \text{ -----> } 4\ N_2 + 6\ H_2O$$
$$6\ NO_2 + 8\ NH_3 \text{ -----> } 7N_2 + 12\ H_2O$$

The catalyst reactor is usually a honeycomb configuration consisting of either a ceramic or metal substrate with the active catalyst coating. Several types of catalysts are available, including vanadium oxides, titanium oxides, or precious metals. Zeolite catalysts are also available in which the catalyst is distributed uniformly throughout the extruded crystalline reactor structure. Because SCR requires the injection of ammonia upstream of the reactor, an ammonia injection system and storage facilities are required.

The presence of higher oxygen concentrations in the exhaust of lean-burn engines (all diesel engines) makes SCR applicable. SCR applies most effectively to natural-gas-fired lean-burn engines with constant load carrying operation. NOx emission reduction levels from SCR typically range from 75 percent to 95 percent without any corresponding increase in hydrocarbon (HC) or CO emissions, and NH3 concentrations in the exhaust between from 20 to 30 parts per million (ppm). Backpressure on the engine increases by approximately 2 to 4 inches water with installation of SCR. A small, 0.5 percent increase in BSFC is associated with the 4-inch backpressure, and power output is estimated to decrease by approximately2 percent for turbocharged engines.

Fuel characteristics and engine duty cycle may reduce the effectiveness of SCR technology. Contaminants present in diesel fuel and engine lube oils, including sulfur, phosphorus, and ash, can poison or mask the surface of the catalyst and reduce or terminate its activity. Fuel sulfur, which oxidizes to SO2 during combustion, is oxidized to SO2 in some catalysts and reacts with NH3 to form ammonium sulfate and ammonium bisulfate salts. These salts form a coating over the catalyst surface, reducing its effectiveness. Particulate emissions from diesel engines also mask or foul surfaces of the catalyst.

Because exhaust temperature and NOx emissions depend on engine power output, variable load applications may also cause exhaust temperatures and NOx concentrations that pose a problem for SCR. Under varying load situations, off-stoichiometric quantities of NH3 are injected into the exhaust, leading to either reduced NOx reduction efficiency or the release of unreacted NH3 in the exhaust (commonly called "ammonia slip"). Because the South District WWTP standby generators, operating solely to supply all the power demands of a major wastewater treatment facility, they will be accommodating fluctuations in load, as major equipment is energized and de-energized; this poses a significant disadvantage to the application of SCR. Exhaust temperatures, which fluctuate significantly under varying load conditions, may not be within the temperature range for optimum catalyst performance. Because of these technical problems, SCR is not well-suited for the standby generators and is not representative of BACT under these conditions.

2.2 Combustion Control - Fuel Injection Timing /Combustion Air Precooling

The next most stringent method of controlling emissions of NOx is a combination of fuel injection timing modifications and pre-cooling of combustion air. As shown in Table K, this combination of NOx emission control technologies is the second most stringent technology applied to diesel engines.

In a diesel engine, injection of fuel into the cylinder starts the combustion process. Retarding the timing of fuel injection until the piston is in its downward motion increases the volume of the combustion chamber, which reduces combustion temperature and pressure, subsequently reducing the formation of NOx. However, IR generally increases black smoke and cold smoke (white smoke during start up) emissions, as well as increasing exhaust temperatures. The increase in exhaust temperatures affect turbocharger performance and may be detrimental to exhaust valve life. A small increase in BSFC (2 percent) and a significant increase in particulate emissions (25 percent) usually result from the application of IR alone to diesel engines. To counteract this problem, it has been demonstrated that the installation of a device to cool the combustion air upstream of the cylinder alleviates most of the negative side effects of IR.

In large bore diesel engines equipped with a turbocharger, the combustion air precooler consists of a heat exchanger located downstream of the turbocharger, and is typically referred to as an aftercooler. Cooler air box temperatures reduce bulk combustion temperature, which reduces NOx formation. Because cooler air is denser, the cylinders are charged with a greater mass of air that generally helps reduce emissions of unburned HC, CO, and particulate matter. Manufacturer's test results of the 20E4 and 20F4B series-engines have shown that installation of four-pass aftercoolers piped to the engine's cooling system reduce uncontrolled emissions of NOx and PM-10 by up to 10 percent while slightly lowering BSFC (0.5 to 1.0 percent). Tests have also shown that combining a 4-degree IR with the installation of a four-pass aftercooler will reduce NOx emissions by 28.0 percent, PM-10 emissions by 7.0 percent, and BSFC by 0.7 percent. Documentation of the aftercooler technology is included in Attachment J.

According to the Alternative Control Techniques Document - NOx Emissions from Reciprocating Internal Combustion Engines (EPA, July 1993), the cost effectiveness for application of IR to a diesel engine that operates continuously is approximately $500 per ton of NOx emissions reduction. According to cost estimates provided by equipment manufacturers to Miami-Dade WASD, most of the cost may be offset by the addition of turbocharger/aftercooling that provides additional NOx reduction without increasing BSFC (there may actually be a slight decrease in BSFC). Depending on system performance, maintenance requirements, and fuel consumption, the cost-effectiveness of this technology is approximately $50/ton.

Table K

Summary of NOx Control Technology Determinations for Large Stationary Diesel Engines as of 12/15/2003

	Permit 80 Date	Process	Pollutant	Primary Emissions	Control Description	Percent Efficiency	Basis
	80 7/26/1993	Generator, Wartsilla #2& #6	NO2	135 lb/hr	3 Degree Timing IR	66	BACT-PSD
AK-0026	7/26/1993	Generator, Transportable	NOx	26.3 lb/hr	Restricted to 3,000 Hrs/Yr	0	BACT-PSD
AK-0026	7/26/1993	Generator, Caterpillar# 1, #2 & #3	NOx	71.1 lb/hr	Restricted to 1,690,000 kW-hr	0	BACT-PSD
AK-0028	6/21/1996	6.5 mW Power Generation, Diesel	NO2	632.6 tons/yr	Limit Operating Hours; Aftercoolers	0	BACT-PSD
AK-0029	6/27/1996	3.4 mW Power Generation, Diesel	NO2	427 tons/yr	Aftercoolers	0	BACT-PSD
AK-0030	6/21/1996	6.5 mW Power Generation, Diesel	NO2	632.6 tons/yr	Limit Operating Hours; Aftercoolers	0	BACT-PSD
AK-0031	6/27/1996	3.4 mW Power Generation, Diesel	NO2	427 tons/yr	Aftercoolers	0	BACT-PSD
AK-0033	12/10/1999	2 - 200 Hp, Diesel, 9 Gal/hr Caterpillar IC Engine; 2 - 188 kW Diesel, Cummins/Onan IC Engine; 2 - 50 kW Diesel, 9 Gal/hr Detroit IC Engine; 2 - 150 kw Diesel, Caterpillar 3208TA IC Engine; 2 - 250 kw Diesel, Caterpillar 3406 IC Engine	NOx	0.031 lb/hp-hr	Permit Limits are in Lb/Hp-Hr	0	BACT-PSD
AK-0034	5/8/2000	Diesel IC Engines	NOx	21.9 lb/hr	Lean Burn / Low NOx Package	0	BACT-PSD
AK-0035	6/4/1998	Wartsila 12V46 Diesel IC Engine	NOx	9.5 g/bhp-hr	Low NOx Design, 2 Degrees FITR, Turbocharged / Intercooled.	0	BACT-PSD
AR-0040	12/29/2000	2 - 600 kW Diesel Generators	NOx	14 g/bhp-hr	Clean fuel, Combustion Control	0	BACT-PSD
CA-0562	6/18/1993	953 bhp Engine	NOx	6.6 g/bhp-hr	Turbo/Aftercooler,4 Deg Timing IR	40	BACT-OTH
CA-0586	6/15/1993	Generator, Diesel	NOx		4 Degree Timing IR	0	BACT-OTH
CA-0733	8/2/1996	Diesel-fired Cummins IC engine serving deep water dredge consuming 16.10 Gal/hr	NOx	28.8 lb/day	Selective Catalytic Reduction (SCR) with Ammonia injection. Low Sulfur Diesel Fuel (0.05% by WT)	85	LAER
CA-0868	3/22/1999	Four (4) Caterpillar IC Engines 3516B DITA rated at 2,600 Bhp	NOx	6.22 g/bhp-hr	SCR Proposed		BACT-OTHER
CA-0892	9/24/1999	IC Engine, Compression Ignition, Portable	NOx	7 g/bhp-hr	Turbocharger and Intercooler		BACT-PSD
CA-0927	8/17/1999	IC Engine, Compression Ignition, Diesel	NOx	5.4 g/bhp-hr	Turbocharger and Intercooler with timing retarded by 4 degrees from standard. Low Sulfur Diesel Fuel (0.05% by WT)		BACT-PSD
FL-0148	3/17/1999	3 - Diesel Generators	NOx	58 lb/hr	Injection timing retardation and cooling of combustion air		BACT-PSD
FL-0158	7/15/1999	4 - Diesel Fuel Generators	NOx	4.12 lb/MMBtu	Fuel injection timing retardation and turbocharger aftercooling	28	BACT-PSD

Table K

Summary of NOx Control Technology Determinations for Large Stationary Diesel Engines as of 12/15/2003

80	Permit Date	Process	Pollutant	Primary Emissions	Control Description	Percent Efficiency	Basis
HI-001	11/25/1991	7.86 mW Diesel Engine Generators (4)	NOx	590 ppmvd	Variable IR Turbo/Aftercooler	18.6	BACT-PSD
HI-0016	11/8/1995	2.2 mW Diesel Engine Generators (3)	NOx	656 ppmvd	Timing IR; Intake Air Cooling	0	BACT-PSD
HI-0017	5/4/1996	2.2 mW Diesel Engine Generators (3)	NOx	656 ppmvd	Timing IR; Intake Air Cooling	0	BACT-PSD
IA-0058	4/10/2002	Emergency Generator / Fire Pump	NOx	22.69 lb/hr	Retarded Ignition Timing (3-4 Degrees)	0	BACT-PSD
IA-0058	4/10/2002	Fire Pump	NOx	2.55 lb/hr	Retarded Ignition Timing (3-4 Degrees)	0	BACT-PSD
IA-0060	7/23/2002	Emergency Generator	NO2	10.61 lb/hr	GCP, Timing Retard	0	BACT-PSD
IA-0060	7/23/2002	Fire Pump	NO2	3.8 lb/hr	GCP, Timing Retard	0	BACT-PSD
LA-0122	8/14/2001	1100 Hp Auxiliary Diesel Generators No. 1 & No. 2	NOx	34 lb/hr	Preventative Maintenance	0	BACT-PSD
LA-0122	8/14/2001	587 Hp Administration Building Diesel Generator	NOx	18.1 lb/hr	Preventative Maintenance	0	BACT-PSD
LA-0122	8/14/2001	2 - 775 Hp Caterpillar Back-up Diesel Air Compressors	NOx	38.6 lb/hr	Preventative Maintenance	0	BACT-PSD
MA-0023	10/6/1997	1.5 MMBtu/Hr Engine, Diesel, Fire Pump	NOx	4.41 lb/MMBtu	Dry Low NOx Combustion Technology with SCR add-on NOx Control	0	BACT-PSD
MA-0029	9/29/1999	1500 kW IC Engine, Emergency Diesel Generator	NOx	37.44 lb/hr	SCR		BACT-PSD
MN-0022	3/1/1995	2.7 MMBtu/Hr Diesel Fire Pump	NOx	5.0 lb/hr	Timing IR; Turbo/Aftercooling	0	BACT-PSD
MN-0022	3/1/1995	2.7 MMBtu/Hr Diesel Emergency Fire Pump	NOx	1.85 lb/MMBtu	Limited to Burn Diesel 150 Hr/Yr.	0	BACT-PSD
NY-0044	6/6/1995	3000 kW Generator, Emergency	NOx	2.6 lb/MMBtu		0	LAER
NY-0047	9/1/1992	1.3 MMBtu/Hr Diesel Fire Pump	NOx	1.3 lb/MMBtu	Lean Burn Engine	0	BACT-OTH
NY-0072	12/10/1994	22.00 MMBtu/Hr Diesel Generator	NOx	1.166 lb/MMBtu	No Controls	0	BACT-OTH
NY-0072	12/10/1994	1.5 MMBtu/Hr Fire Pump	NOx	4.25 lb/MMBtu	No Controls	0	BACT-OTH
*OH-0254	1/18/2001	600 kW Emergency Diesel-fired Generator	NOx	12.4 lb/hr	Low Sulfur Fuel, Combustion Control		BACT-PSD
OK-0070	6/13/2002	750 kW Diesel Engine, Backup Generator	NOx	3.01 lb/MMBtu	Engine Design and Limitation of Hours		BACT-PSD
OK-0072	5/6/2002	1818 Hp Diesel Engine, Emergency Generator	NOx	0.024 lb/bhp-hr	Engine Design		BACT-PSD
PA-0083	5/3/1991	1135 kW Diesel Generators (2)	NOx	36 lb/hr each		0	OTHER
PA-0096	10/15/1992	1156 kW Diesel Engines (11)	NOx	2.0 g/bhp-hr	Selective Catalytic Reduction	80	BACT-OTH
PA-0097	10/15/1992	1635 kW Diesel Engines (7)	NOx	2.0 g/bhp-hr	Selective Catalytic Reduction	80	BACT-OTH
PA-0154	8/21/1996	6250 Hp Engine, Diesel, Test Cells No. 1 through 5	NOx	492.2 ton/yr	Engine Retard, Split Cooling, Electronic Fuel Injection, Depending on Engine	0	LAER
PA-0158	6/19/2000	2 MW Diesel Engines	NOx	20.8 lb/hr	Johnson Mather QXH1020-145 SCR and 3 Degree Ignition Retard, Hourly limit for each engine, Annual for all Five Engines.	60	BACT-OTHER
*PR-0005	3/2/2000	5000 kW Auxiliary Diesel Generator	NO2	168 lb/hr	Good Combustion Control		BACT-PSD

Table K

Summary of NOx Control Technology Determinations for Large Stationary Diesel Engines as of 12/15/2003

80	Permit Date	Process	Pollutant	Primary Emissions	Control Description	Percent Efficiency	Basis
SC-0027	7/15/1992	400 kW Diesel Generator, Emergency	NOx	13.1 lb/hr		0	BACT
SC-0064	5/23/2002	2000 kW Generator, Emergency, Diesel Fuel	NOx	59.5 lb/hr	Clean Fuel (Low Sulfur Diesel), Good Combustion Practices		BACT-PSD
VA-0191	1/28/1993	3 - 1200 kW Diesel Generators	NOx	137.3 lb/hr	Turbo / Aftercooler	0	BACT-OTH
VA-0204	12/3/1993	1600 kw Generator, Engine, 5	NOx	45.4 ton/yr	Retard Timing 6 Degrees; Fuel Spec 0.20 % S Fuel Oil	0	NSPS
VA-0207	7/30/1993	748,000 Gal/yr Generators, Diesel, 6	NOx	33.2 lb/hr	Retarding the Timing by 5 Degrees	21.7	NSPS
VA-0207	7/30/1993	748,000 Gal/Yr Diesel Generators (6)	NOx	33.2 lb/hr	5 Degree Timing IR	21.7	NSPS
VA-0218	5/16/1994	1600 kW Engine Generators (5)	NOx	35.4 lb/hr	Retard Timing 6 Degrees; Fuel Spec 0.20 % S Fuel Oil		NSPS
VA-0218	5/16/1994	1500 kW Emergency Generator	NOx	45.5 ton/yr	Retard Timing 6 Degrees	0	NSPS
VT-0013	6/8/2000	1023 Hp Electric Generation - Caterpillar 3412C	NOx	1.7 lb/hr	SCR with Oxidation Catalyst. No Regulatory Basis; Limit Based on Manufacturer's Guarantee.	90	OTHER
VT-0014	9/5/2000	1480 Bhp Generator, Fuel Oil	NOx	1.6 g/bhp-hr	SCR Oxidation Catalyst with Urea Injection, No Regulatory Basis	85	RACT
WI-0083	11/23/1994	Diesel Generator, Back-Up	NOx	67.5 lb/hr	Low Sulfur (0.05%) Diesel Fuel	0	BACT-PSD
WI-0174	9/20/2000	3.5 MMBtu/hr Diesel Engine, Generator (4)	NOx	15.44 lb/hr	Good Combustion Practices. Fuel < 0.05 % by Wt. Sulfur.		BACT-PSD
WI-0174	9/20/2000	3.8 MMBtu/hr Diesel Engine, Emergency Fire Pump	NOx	16.76 lb/hr	Good Combustion Practices. The use of Diesel Fuel having a Sulfur Content of 0.05% by Wt., Equipment Usage Limits.		BACT-PSD

Attachment L
Good Engineering Practice Stack Height Analysis

Demonstration of Good Engineering Practices (GEP) Stack Height

Section 123 of the Clean Air Act established requirements for regulations to be developed to insure that the degree of emission limitation required for the control of any air contaminant under an applicable State Implementation Plan is not affected by that portion of any stack height which exceeds "Good Engineering Practice"(GEP), or by any other dispersion technique.

Section 123 originally defined "Good Engineering Practice" with respect to stack heights as a stack which does not exceed 2.5 times the height of the source, unless greater height is ". . . necessary to insure that emissions from the stack do not result in excessive concentrations of any air pollutant in the immediate vicinity of the source as a result of atmospheric downwash, eddies, and wakes which may be created by the source itself, nearby structures, or nearby terrain obstacles . . ." . In 1982 the EPA refined that definition by federal regulation to mean 2.5 times the height of the source for stacks in existence on January 12, 1979. For stacks in existence after January 12, 1979, GEP formula height is defined as the height of the source plus 1.5 times the lesser of the height, width or projected width of a nearby structure. Section 123 also restricts the credit allowed for the effects of other dispersion techniques.

The final regulation became effective on August 7, 1985.

Under the new rules, any stack which is shorter than 65 meters is exempt from designing the stack according to Good Engineering Practice. For stacks which are taller than 65 meters, GEP stack height must be demonstrated as outlined in the definition of GEP. This demonstration may be made by using the formula height, or by means of a fluid model or field study which establishes the GEP height as the height required to ensure that "emissions from a stack do not result in excessive concentrations of any air pollutant as a result of atmospheric downwash, wakes, or eddy effects created by the source itself, nearby structures or nearby terrain features." (40 CFR 51.100(ii)(2-3)

Stacks built before January 12, 1979 and taller than 65 meters may be designed using the 2.5H formula if the source owner/operator can demonstrate the formula was used in designing and building the stack.

Stack heights in existence on or before December 31, 1970 are not subject to the August 7, 1985 Federal Regulation unless modifications have been made. Also, coal fired steam electric generating units subject to the provisions of Section 118 of the Clean Air Act, which commenced operation before July 1, 1957, and whose stacks were constructed under a construction contract awarded before February 8, 1974, are not subject to this rule.

Because the proposed stack height of 6 meters is less than 65 meters it is exempt from designing the stack according to Good Engineering Practice.

Attachment M
Description of Stack Sampling Facilities

Description of Stack Sampling Facilities
Superior 16GTLB Engines
Central District Wastewater Treatment Plant
Miami-Dade Water and Sewer Department

Inside Diameter:	17 inches
Orientation:	Horizontal (outside building on roof)
Height Above Structure:	approximately 5 ft
Height Above Grade:	approximately 20 ft
Means of Access:	Stairway inside building leads to first level of roof where silencers and stacks extend horizontally outward from the wall. The first level roof is equipped with railing.
Sampling Ports:	The stacks are not equipped with sampling ports. The applicant proposes to conduct sampling through a "rake probe", which composites exhaust gas collected at several points across the stack diameter. The rake probe is inserted into the end of the stack.

Description of Stack Sampling Facilities
(3) EMD 20E4 Generator Sets
Central District Wastewater Treatment Plant
Miami-Dade Water and Sewer Department

Inside Diameter:	33 inches
Orientation:	Vertical
Height Above Enclosure:	approximately 10 ft
Height Above Grade:	approximately 21 ft
Means of Access:	The enclosure structures are not equipped with permanent ladders for rooftop access. To conduct sampling, an extension ladder must be obtained from the plant maintenance staff.
Sampling Ports:	The stacks, which extend approximately 10 feet above the top of the enclosure, are not equipped with sampling ports. Each engine is equipped with a vertically-mounted silencer. There is insufficient stack length downstream of the silencers to comply with the requirements of 62-297.310(6)c, FAC. The applicant proposes to conduct sampling through a "rake probe", which composites exhaust gas collected at several points across the stack diameter. The applicant requests the use of temporary stack sampling facilities, as required by 62-297.310(6)b, FAC, in lieu of permanent stack sampling facilities.

Description of Stack Sampling Facilities
South District Wastewater Treatment Plant
Miami-Dade Water and Sewer Department

(4) EMD 20E4 Generator Sets

Inside Diameter:	21 inches
Orientation:	Vertical
Height Above Enclosure:	approximately 8 ft
Height Above Grade:	approximately 21 ft

(1) EMD 16G4A Generator Set

Inside Diameter:	21 inches
Orientation:	Nearly-Vertical
Height Above Enclosure:	approximately 6 ft
Height Above Grade:	approximately 19 ft

(1) EMD 20F4 Generator Set (Proposed)

Inside Diameter:	21 inches
Orientation:	Nearly-Vertical
Height Above Enclosure:	approximately 5 ft
Height Above Grade:	approximately 17 ft

Sampling Access and Methodology:

Means of Access: The enclosure structures are not equipped with permanent ladders for rooftop access. To conduct sampling, an extension ladder must be obtained from the plant maintenance staff.

Sampling Ports: The stacks, which extend approximately 8 feet above the top of the enclosure, are not equipped with sampling ports. Each engine is equipped with a vertically mounted silencer. There is insufficient stack length downstream of the silencers to comply with the requirements of 62-297.31 0(6)c, FAC. The applicant proposes to conduct sampling through a "rake probe", which composites exhaust gas collected at several points across the stack diameter. The applicant requests the use of temporary stack sampling facilities, as required by 62-297.310(6)b. FAC, in lieu of permanent stack sampling facilities.

Attachment N
Verification of Risk Management Plan Submission to EPA

Facility Name: Central District Wastewater Treatment Plant Miami, FL 33149
Parent Company: Miami-Dade Water and Sewer Department
Risk Management Plan (RMP) Facility ID: 1000 0009 4293
U.S. EPA Submission Receipt Date: 06/21/1999

EXECUTIVE SUMMARY

Chlorine is the most commonly used substance for disinfecting treated wastewater. The Miami-Dade Water & Sewer Department (MDWASD) Central District Wastewater Treatment Plant (WWTP) also uses chlorine (for chlorination) for disinfecting treated wastewater to provide safe water discharges to the environment. Storing and handling large quantities of chlorine can create hazardous situations. The Central District WWTP takes safety obligations in storing and using chlorine as seriously as it takes care in treating wastewater. The Central District WWTP also produces digester gas and stores it for on-site use as fuel.

The Central District WWTP chlorine and digester gas handling processes are subject to the U.S. Environmental Protection Agency (EPA) Risk Management Program Rule. This rule requires submission of a Risk Management Plan (RMP). An integral part of the RMP is a summary of policies and procedures followed to safely operate the facility, including a description of the possible consequences in case of an accident and the actions, which will be taken, by the facility in an event of an emergency.

- The following information is specifically required in the RMP Executive Summary:
    - Accidental release prevention and emergency response policies.
    - General facility and regulated substances information.
    - Offsite consequence analysis results.
    - Summary of the accidental release prevention program and chemical-specific prevention steps.
    - Five-year accident history summary.
    - Emergency response program summary.
    - Planned changes to improve safety.

The above information for the Central District WWTP chlorine and digester gas systems are provided below.

Accidental Release Prevention and Emergency Response Policies

The MDWASD accidental release prevention policy involves a unified approach that integrates proven technology, trains staff in operation and maintenance practices, and uses tested and proven management system practices. All applicable procedures of the EPA's Prevention Program are adhered to, including key elements such as training, systems management, and emergency response procedures.

The MDWASD emergency response policy involves the preparation of emergency response plans for hazardous materials which are tailored to each facility and to the emergency response services available in the community, and is in compliance with the EPA Emergency Response Program Requirements. Central District WWTP has prepared an Emergency Response Plan for the treatment plant to facilitate coordination and emergency planning with offsite response officials and facilities in the event of an emergency. Central District WWTP has an excellent record in preventing accidents from occurring.

General Facility and Regulated Substance Information

The MDWASD Central District WWTP is located on Virginia Kay in Miami, Florida. The Central District WWTP has two separate liquid treatment trains that are referred to as Plant 1 and Plant 2 and are rated at 60 mgd and 83 mgd, respectively. The facility stores chlorine and digester gas which are regulated toxic substances under RMP rule. The two chlorine systems (for Plant 1 & 2) supply approximately 7,400 pounds of chlorine per day to the wastewater effluent and the non-potable water system.

At Plant 1, chlorine is delivered in one-ton containers to the storage area of the Central District WWTP chlorine building. The chlorine building is divided into a covered chlorine storage area and a chlorinator room. The one-ton containers contain liquid chlorine under pressure. The storage area in Plant 1 is equipped to store up to 32 (cylinders) tons of chlorine. The maximum quantity of chlorine present at the Central District Plant 1 WWTP at any given time exceeds the listed threshold quantity in the EPA rule. It also exceeds the listed threshold quantity in the federal Occupational Safety and Health Administration (OSHA) Process Safety Management (PSM) Standard.

The pressure from the container forces liquid chlorine through the tubing and into the manifold system. Downstream of the manifold system, there is a pneumatically actuated automatic shut-off valve. Pressing one of the automatic shut-off switches can manually close the shut-off valve. The valve will also close automatically when the chlorine sensor senses a leak. The liquid chlorine flows through the automatic shut-off valve to the evaporators. At the evaporators the liquid chlorine is heated and converted into chlorine gas. The gas then flows from the evaporator to the chlorinator. The chlorinators are used to control the feed rate of the chlorine gas. The chlorinators are equipped with a gas rotameter and a v-notched orifice for controlling the feed rate. Injection of the chlorine into the plant water produces the concentrated solution that flows through piping to various injections points in the treatment process.

The Plant 1 chlorination process of the Central District WWTP is also provided with a number of safety features to protect the employees and the surrounding community. The two important safety features are (1) automatic shut-off valves and (2) chlorine leak detection and alarm system. The automatic shut-off valves are located immediately downstream of the chlorine containers. Therefore, if a leak occurs anywhere in the system the chlorine source can be isolated and the flow of chlorine can be stopped. The automatic shutoff valves are operated either automatically due to the detection of chlorine leak by the chlorine sensors or manually by pushing a switch. Emergency shutoff switches are located inside the chlorine storage room and in the chlorinator room.

The leak detection system consists of chlorine gas sensors located in both the chlorinator room and the storage area. The leak detection system is set to activate the alarms and safety processes when a chlorine concentration of 0.5 ppm or higher is detected. When the leak detection system detects a leak, audible and visual alarms (both local and in the control room) are activated and the automatic shut-off valves closed.

At Plant 2, chlorine is delivered in one-ton containers to the storage area of Central District WWTP chlorine building. The chlorine building is divided into a covered chlorine storage area and a chlorinator room. The one-ton containers contain liquid chlorine under pressure. The chlorine storage area in Plant 2 is equipped to store up to 46 (cylinders) tons of chlorine. The maximum quantity of chlorine present at the Central District Plant 2 WWTP at any given time exceeds the listed threshold quantity in the EPA rule. It also exceeds the listed threshold quantity in the federal Occupational Safety and Health Administration (OSHA) Process Safety Management (PSM) Standard.

The pressure from the container forces liquid chlorine through the tubing and into the manifold system. Downstream of the manifold system, there is a pneumatically actuated automatic shut-off valve. Pressing one of the automatic shut-off switches can manually close the shut-off valve. The valve will also close automatically when the chlorine sensor senses a leak. The liquid chlorine flows through the automatic shut-off valve to the evaporators. At the evaporators the liquid chlorine is heated and converted into chlorine gas. The gas then flows from the evaporator chlorinator. The chlorinators are used to control the feed rate of the chlorine gas. The chlorinators are equipped with a gas rotameter and a v-notched orifice for controlling the feed rate. Injection of the chlorine into the plant water produces the concentrated solution that flows through piping to various injections points in the treatment process.

The Plant 2 chlorination process of the Central District WWTP is also provided with a number of safety features to protect the employees and the surrounding community. The two important safety features are (1) automatic shut-off valves and (2) chlorine leak detection and alarm system. The automatic shut-off valves are located immediately downstream of the chlorine containers. Therefore, if a leak occurs anywhere in the system the chlorine source can be isolated and the flow of chlorine can be stopped. The automatic shutoff valves are operated either automatically due to the detection of chlorine leak by the chlorine sensors or manually by pushing a switch. Emergency shutoff switches are located inside the chlorine storage room and in the chlorinator room.

The leak detection system consists of chlorine gas sensors located in both the chlorinator room and the storage area. The leak detection system is set to activate the alarms and safety processes when a chlorine concentration of 0.5 ppm or higher is detected. When the leak detection system detects a leak, audible and visual alarms (both local and in the control room) are activated and the automatic shut-off valves closed.

The Central District WWTP also produces waste activated sludge (WAS) which requires additional treatment prior to disposal. In addition, the Central District WWTP also receives a mixture of primary sludge/WAS from the North District WWTP. The sludge treatment process is divided into two trains from secondary clarifiers through anaerobic digestion. One train is associated with Plant 1 at the Central District WWTP and receives WAS from the Plant 1 secondary clarifiers. The Plant 2 train receives WAS from the Plant 2 secondary clarifiers in addition to the North District WWTP sludge. After anaerobic digestion, the sludge treatment processes are combined into a single process train. The sludge streams are first conditioned with polymer and fed to gravity thickeners. The sludge, from the thickeners, is then pumped to two-stage anaerobic digesters for stabilization. The gas produced by the digestion process is compressed, scrubbed to remove hydrogen sulfide and stored on-site in compressed gas spheres. There are two 80 feet diameter spheres. The digester gas is used to power engine driven blowers and electric generators. Electricity generated by burning the digester gas is used to power some of the plant equipment. Waste heat from the gas-powered engines is used to heat the primary digesters. The maximum quantity of digester gas present at the Central District WWTP at any given time exceeds the listed threshold quantity in the EPA rule. It also exceeds the listed threshold quantity in the federal Occupational Safety and Health Administration (OSHA) Process Safety Management (PSM) Standard.

A perimeter fence and security gates surround the Central District WWTP. The plant operates three shifts with employees onsite 24 hours per day, 365 days per year.

The Central District WWTP is provided with a backup emergency power generator that supplies power to the entire facility.

Offsite Consequence Analysis Results

The offsite consequence analysis includes consideration of two chlorine and two digester gas release scenarios, identified as "worst-case release scenario" and "alternative release scenario". The first scenario is defined by EPA, which states that "the owner or operator shall assume that the maximum quantity in the largest vessel is released over 10-minutes," due to an unspecified failure. The alternative scenario is defined as "more likely to occur than the worst-case release scenario".

Chlorine is the only regulated toxic substance stored and handled at the Central District WWTP, which is subject to the RMP rule. Thus, chlorine was selected for the worst-case release scenario. Only passive or administrative controls are allowed under this scenario to reduce off-site impacts. The scenario used for the Central District WWTP is the rupture of a single one-ton chlorine container resulting in the release of 2,000 pounds of chlorine over a 10-minute duration. There are no passive or administrative controls at the Central District WWTP for the chlorine containers; thus, the chlorine release rate will be 200 lbs./min.

The released liquid chlorine is assumed to form a denser-than-air cloud consisting of chlorine vapor and liquid droplets (aerosols) and then disperse in the atmosphere. The distance to the toxic endpoint was estimated using the EPA's RMP*Comp software (version 1.06). The toxic endpoint selected by EPA rules for chlorine is 3 ppm, which is the Emergency Response Planning Guideline Level 2 (ERPG-2). The toxic endpoint was conservatively set by EPA to ensure public notification and that local emergency response planning takes into account the greatest possible impacted area surrounding the release point. EPA-mandated meteorological conditions, namely atmospheric Stability Class F, wind speed of 1.5 meter per second, highest daily maximum temperature (77 deg F), and average relative humidity (50%) were used for the worst-case release scenario analysis. The results of the dispersion analysis indicated that the worst-case release scenario has offsite impacts.

Digester gas containing methane is the only regulated flammable substance stored and handled at the Central District WWTP, which is subject to the RMP rule. Thus, digester gas was selected for the worst-case release scenario. Only passive or administrative controls are allowed under this scenario to reduce off-site impacts. The scenario used for the Central District WWTP is the rupture of one digester gas sphere of 80 feet in diameter resulting in the release of 25,468 pounds of digester gas. There are no passive or administrative controls at the Central District WWTP for the digester gas storage spheres.

The released digester gas is assumed to form a vapor cloud and a detonation occurs. A yield factor of 10 percent of TNT-equivalency model is used to determine the distance to the endpoint. The distance to the endpoint is defined as the distance over which a minimum pressure of 1 psi occurs from the pressure wave formed by the detonation. The distance to the endpoint was estimated using the EPA's RMP*Comp software (version 1.06). The results of the analysis indicated that the worst-case release scenario has offsite impacts.

RMP rules require that a scenario which results in offsite toxic endpoint distance and is more likely to occur than the worst-case scenario should be selected as the alternative release scenario for each regulated toxic and flammable substance, unless no such scenario exists. Unlike the worst-case scenario, the alternative release scenario may consider "active" mitigation such as automatic shutoff valves, excess flow valves, and containment with scrubbers. Active mitigation is defined as requiring mechanical, electrical, or human input.

The alternative release scenarios must consider the facility accident history and/or failure scenarios identified in the process hazard analysis. A review of the past five-year accident history data for the chlorination and digester gas facilities pursuant to these rules indicated that there were no chlorine or digester gas releases, which could have resulted in offsite (outside the Central District WWTP boundary) toxic or flammable endpoint distances. Similarly, no credible accident scenario was identified from the process hazard analysis, which would reach offsite. Thus, an acceptable/credible alternative release scenario had to be selected based on expert judgment.

The alternative release scenarios selected for the chlorine and digester gas processes are summarized below:

The chlorine alternative release scenario selected involves the release of chlorine from a pigtail (1/4" diameter) rupture that occurs during the connection of the chlorine container to the chlorination process. The normal response of the operator is to shut-off the container valve. However, the operator may become incapacitated, leaving the valve open. It is assumed that approximately 15 to 30 minutes would be required for the emergency response team to respond to the accident. In the meantime, all of the chlorine in the container would have been released. The chlorine release rate from the one-ton container was estimated at 150 pounds per minute; thus, the whole container would be emptied in about 13 minutes. No passive mitigation was considered for the estimation of chlorine release rate. However, human input in closing the shut-off valve was taken into account as an active mitigation, which will reduce the quantity of chlorine release to the atmosphere.

The chlorine alternative release scenario toxic endpoint distance was also estimated using the RMP*Comp (version 1.06) software. Toxic endpoint for chlorine is 3 ppm. EPA suggested typical meteorological conditions used were Stability D, wind speed of 3.0 meter per second, average air temperature of 77 deg F, and average relative humidity of 50 percent. The results of the dispersion analysis indicated that the chlorine alternative release scenario has offsite impacts.

The digester gas alternative scenario selected represents an event, which actually occurred at the Central District WWTP. The scenario involves the release of digester gas (consisting of 65% methane) from a pressure relief valve installed on the 80 feet diameter storage sphere. It is assumed that the valve vents to the atmosphere when the pressure in the sphere is 10% above the design value of 40 pound per square inch gauge (psig), at a pressure of 44 psig. The release rate of digester gas was estimated at 1560 pounds per minute (lb/min). It is assumed that the tank vents for 15 minutes with a methane release rate of 1012 lb/min for a total release of 15,180 lbs of methane. The alternative release scenario also assumes that a vapor cloud fire (flash fire) may result from the dispersion of the cloud of flammable vapor and ignition of the cloud following dispersion. Such a fire could flash back and could represent a severe heat radiation hazard to anyone in the area of the cloud. The flammable endpoint is characterized by the lower flammability limit (LFL) of the substance. No passive or active mitigation systems were considered. The distance to the endpoint was estimated using the EPA's Offsite Consequence Analysis

Guidance document. The results of the analysis indicated that the digester gas alternative release scenario has no offsite impacts (flammable endpoint does not extend beyond the facility boundary).

Finally, no chlorine or digester gas releases that could have caused safety or health hazard (no deaths, injuries, property or environmental damage, evacuations, or sheltering in place) occurred at the Central District WWTP during the last five years.

Summary of the Accidental Release Prevention Program and Chemical-Specific Prevention Steps

Central District WWTP is in compliance with Federal and State Process Safety Management requirements. Central District WWTP accidental release prevention program is based on the following key elements:

- Detailed management system.
- Comprehensive process safety information that is readily available to staff, emergency responders, and contractors.
- Comprehensive preventive maintenance program.
- Performance of process hazard analysis of equipment and procedures with operation and maintenance staff participation and review.
- Use of state-of-the-art process and safety equipment.
- Use of accurate and effective operating procedures, written with the participation of the operators.
- Training of the operators and maintenance staff.
- Implementation of an incident investigation program.

Chemical-specific prevention steps include availability of self-contained breathing apparatus (SCBA) for chlorine, personnel protective equipment for digester gas, awareness of the hazardous and toxic properties of digester gas and chlorine, presence of chlorine and digester gas detectors and alarms, and automatic shutoff device on the chlorine storage.

Process and Chemical Safety Information

Comprehensive chemical data have been assembled to include regulatory reporting and action thresholds, health hazard, and chemical exposure limitations, as well as detailed physical properties of chlorine and digester gas. This information includes chlorine and digester gas background information and MSDS sheets.

Equipment safety information was meticulously compiled on the chlorine and digester gas processes. Specifications for chlorine and digester gas processes are collected and provided in one place for easy reference. Details such as maximum intended inventory; safe upper and lower temperatures; safe upper and lower pressures; and codes and standards used to design, build, and operate the processes are on file at the facility.

Process Hazard Analysis

In 1997 and 1999, detailed Process Hazard Analysis (PHA) was conducted for the chlorine and digester gas systems equipment and procedures, respectively. To further assess the integrity of the chlorine and digester gas systems for the preparation of this RMP, checklists were used to assess the overall general condition of the chlorine and digester gas systems operation and maintenance, including human factors that affect personnel performance and system integrity. The PHA(s) will be updated again within a five-year period or whenever there is major change in the processes. A list of the recommended actions was developed to further improve the chlorine and digester gas safety and staff is currently evaluating these recommendations. Staff will document the completion of recommended actions.

Operating Procedures

MDWASD Central District WWTP has prepared written operating procedures that provide instructions or steps for safely conducting activities relating to the chlorine and digester gas processes. They are consistent with the chlorine and digester gas Process Safety Information. Written operating procedures include: initial startup, normal operations, emergency shutdown, normal shutdown, and start up after emergency shutdown. In addition, Central District WWTP developed Standard Operating Procedures (SOPs) for the following steps in the chlorination process: receipt of chlorine delivery, chlorine cylinder change, and chlorine release/spill response. Operating procedures will be developed and put in place prior to any new process equipment coming on line or changes made in the handling of chlorine and digester gas equipment, and reconfiguration of the facilities.

Training

Central District WWTP employees presently involved in operating or maintaining the chlorine and digester gas processes are trained in an overview of the processes and the applicable operating and maintenance procedures. Central District WWTP ensures that each employee newly assigned to the processes, is trained and tested to be competent in the operating procedures listed pertaining to their duties. Each employee (presently involved in operating the chlorine and digester gas process) has been trained to receive the required knowledge, skills, and abilities to safely carry out the duties and responsibilities, including chlorine and digester gas emergency response, as provided in the operating procedures.

Refresher training is provided every three years or less to each employee operating the covered process to ensure that the employee understands and adheres to the current operating procedures. In addition, the Central District WWTP ensures that operators are trained in any updated or new procedures prior to startup of a process after a major change as indicated in their Management of Change procedures.

The Central District WWTP prepares and retains records of initial and refresher training, provides certification of the records, which includes the identity of the employee, the date of training, and the signature of the person (s) administering the training.

Contractors

MDWASD Central District WWTP has procedures and policies in place that specify the information required to be provided to the contractors performing work on the chlorine and digester gas processes, the training requirements for contractor employees, and mechanism to obtain assurance from contractors that they have informed their employees of the appropriate safety rules. MDWASD Central District WWTP is required to provide information and explanations concerning the hazards and processes and obtain and evaluate information regarding the contractor's safety program.

Pre-Startup Safety Review and Mechanical Integrity Program

MDWASD Central District WWTP has procedures in place to ensure that a pre-startup safety review is conducted prior to starting up a new covered process or after shutdown event, or prior to starting up modifications to the chlorine and digester gas processes that require a MOC procedure implementation.

Hot Work Permits and Management of Change

The Central District WWTP requires employees and contractors to employ safe work practices when performing "hot work" in, on, or around the covered process. The Central District WWTP uses a permitting program to ensure that hot work is conducted safely on or near a process involving chlorine and digester gas.

Internal Compliance Audits

Internal compliance audits will be conducted every 3 years to verify compliance with the programs and procedures contained in the RMP. The Central District WWTP will assemble an audit team that will include personnel knowledgeable in the Risk Management Program rule and in the process. This team will evaluate whether the prevention program satisfies the requirements of the Risk Management Program rule and whether the prevention program is sufficient to help ensure safe operation of the process. The results of the audit will be documented, recommendations resolved, and appropriate enhancements to the prevention program will be implemented.

Incident Investigation

The Central District WWTP investigates all incidents that could reasonably have resulted in a catastrophic release (serious injury to personnel, the public, or the environment) so that similar accidents can be prevented. An investigation team is assembled and the investigation is initiated within 48 hours of the incident. The results of the investigation are documented, recommendations are resolved, and appropriate process enhancements are implemented. Information found during the investigation is reviewed by affected staff and added or used to revise operating and maintenance procedures.

Five-year Accident History Summary

No chlorine or digester gas releases that could have caused safety or health hazard (deaths, injuries, property or environmental damage, evacuations, or sheltering in place) occurred at the Central District WWTP during the last five years.

Emergency Response Program Summary

The Central District WWTP is a first responder, plant employees respond to chlorine and digester gas accidental releases. Depending on the severity of the accidental release, external resources such as the City of Miami Fire Department may be solicited to aid in handling chlorine or digester gas release. As part of the emergency response program, the Central District WWTP has developed and implemented an emergency action plan for the purpose of protecting public health and the environment.

The emergency response plan has been coordinated with local response agencies (City of Miami Fire Department). The main elements of the emergency response plan are: (1) chlorine and digester gas response flow chart, responsibilities of various personnel at the facility, duties of on-scene incident commander, site response team, and site safety representative, (2) details of emergency recognition and prevention at the facility, (3) procedures for planning and coordination with off-site emergency response organizations, and (4) details of the training program for all employees involved with the chlorine and digester gas processes.

Planned Changes to Improve Safety

Numerous changes to improve safety (recommended actions) were previously identified for the chlorine and digester gas process in 1997 and 1999, respectively, for chlorination and digester gas systems equipment and procedures when Process Safety Management (PSM) Plans were prepared. All of these recommended actions have been evaluated for implementation as required.

Attachment O
Requested Changes to Current Title V Air Operating Permit

Requested Changes to Current Central District WWTP
Facility ID: 0250476
Title V Air Operating Permit

1. MDWASD requests that condition A.1.of Section III, Subsection A, be replaced with the following; "The maximum allowable rates for NOx for Units No. 007, 009, 010 and 011 shall not exceed 7.6 pounds per hour (lb/hr.) each."

2. MDWASD request that the following condition be added to Section III, Subsection A; "The combined hours of operation for Units No. 007, 009, 010 and 011 shall not exceed 26,280 hours in any consecutive 12-month period."

MDWASD is requesting the these changes to account for the change from unlimited operations of the cogeneration units to limited

3. MDWASD requests that condition B.1.of Section III, Subsection B, be replaced with the following; "Emissions of NOx from each of the model 20-645E4 engines (emission units 013, 014, 015) shall not exceed 2.15 lb./MMBtu. Emissions of NOx from each of the model EMD 20-645F4B engines (emission units 019, 020) shall not exceed 2.75 lb./MMBtu. "

MDWASD is requesting this revision to account for the change to a heat input NOx emission limitation and to add the proposed standby generator unit limitations.

4. MDWASD requests that condition B.6.of Section III, Subsection B, be replaced with the following; "The combined maximum heat input rate to Units Nos. 013, 014, 015, 019 and 020 shall not exceed 100,050 million Btu per year (MMBtu/yr)."

5. MDWASD requests that condition B.7.of Section III, Subsection B, be replaced with the following; "The maximum No. 2 diesel fuel oil consumption allowed to be burned in units Nos. 013, 014, 015, 019 and 020 is 725,000 gallons per year. If the fuel consumption of all emission units combined does not exceed 525,000 gallons of diesel fuel at the end of any consecutive 12-month period; the owner or operator may make and maintain records of the diesel fuel consumption for these emission units once every seven (7) days instead of at the end of each day in which any of one of these emission units are operated."

6. MDWASD requests that condition C.14.of Section III, Subsection C, be deleted in its entirety and this condition be added to Subsection B of Section IIII; "The owner or operator shall make and maintain daily records of diesel fuel consumption for these emission units at the end of each day. From the daily records of diesel fuel usage the permittee shall record and maintain a rolling 365-day total of the amount of fuel consumed by the engines. This rolling 365-day total record shall be updated each day. If the fuel consumption of all emission units combined does not exceed 525,000 gallons of diesel fuel at the end of any consecutive 365-day period; the owner or operator may make

and maintain records of the diesel fuel consumption for these emission units once every seven (7) days instead of at the end of each day in which any of one of these emission units are operated. These records shall be used to demonstrate compliance with the fuel limitation in condition B.7. Within ten days of the end of each month, the owner or operator shall make records of the monthly diesel fuel consumption from the daily records, and make records of the consecutive 12-month diesel fuel consumption."

MDWASD is requesting these revisions because the daily recording of fuel consumption on days which the emission units are not operated and fuel is not consumed is unnecessary for the reasonable monitoring to demonstrate compliance with the annual fuel consumption limitation. The 12-month fuel consumption total of 525,000 gallons requested to allow for the alternative weekly monitoring schedule will provide the FDEP with the reasonable assurance that will allow for the continuous full load operations of all these emission units over 2 weeks before approaching the annual fuel consumption limitation of 725,000 gallons.

{Permitting note: At 100% engine load, each model 20-645E4 engine has a fuel consumption of approximately 196.4 gallons per hour, and each model 20-645F4B engine has a fuel consumption of approximately 197.1 gallons per hour, based on a heat input of 27.1 MMBtu/hr and 27.2 MMBtu/hr, respectively, and a 36-degree API diesel fuel higher heating value of 19,640 Btu/lb. and density of 7.034 lb./gal.}

7. MDWASD requests that condition B.8.of Section III, Subsection B, be replaced with the following; "Compliance with the allowable limiting standards for NOx in B.1 shall be demonstrated each federal fiscal year (October 1-September 30) by an annual compliance test using EPA Method 7 or 7E, as described in 40 CFR 60, Appendix A (1997 version), adopted by reference in Rule 62-204.800, F.A.C., and adopted in Rule 62-297.401, F.A.C. Sampling of the exhaust gas shall be via a rake probe placed into the engine exhaust outlet."

8. MDWASD requests that condition B.9.of Section III, Subsection B, be replaced with the following; "The fuel shall be monitored for the sulfur content using ASTM D4294 Method (or equivalent). The owner or operator may comply with this requirement by receiving records from the fuel supplier that indicate the fuel delivered is Low Sulfur No. 2 oil or Low Sulfur No. 2 Diesel fuel oil."

MDWASD is requesting this revision because fuel oil classified as Grade Low Sulfur No. 2-D under ASTM D 975-03 meets the sulfur limit of specific condition B.2. ASTM D 975-03 standard should provide the FDEP with the adequate reasonable assurance as required by Rule 62-4.070 F.A.C.

Attachment P
Compliance Assurance Monitoring / Statement of Compliance

Department of Environmental Protection

Division of Air Resources Management

STATEMENT OF COMPLIANCE - TITLE V SOURCE

Facility Owner/Company Name: Miami-Dade Water and Sewer Department

Site Name: Central District Wastewater Treatment Plant County: Miami-Dade

Title V Air Operation Permit No.: 0250476-001-AV

REPORTING PERIOD	REPORT DEADLINE*
January 1, through December 31, of 2003 (year)	February 29, 2004

*See Rule 62-213.440(3)(a)2, F.A.C. (Annually, within 60 days after the end of each calendar year.)

COMPLIANCE STATEMENT (Check only one of the following three options)

X **A.** This facility was in compliance with all terms and conditions of the Title V Air Operation Permit and, if applicable, the Acid Rain Part, and there were no reportable incidents of deviations from applicable requirements associated with any malfunction or breakdown of process, fuel burning or emission control equipment, or monitoring systems during the reporting period identified above.

____ **B.** This facility was in compliance with all terms and conditions of the Title V Air Operation Permit and, if applicable, the Acid Rain Part; however, there were one or more reportable incidents of deviations from applicable requirements associated with malfunctions or breakdowns of process, fuel burning or emission control equipment, or monitoring systems during the reporting period identified above, which were reported to the Department. For each incident of deviation, the following information is included:

1. Date of report previously submitted identifying the incident of deviation.
2. Description of the incident.

____ **C.** This facility was in compliance with all terms and conditions of the Title V Air Operation Permit and, if applicable, the Acid Rain Part, EXCEPT those identified in the pages attached to this report. For each item of noncompliance, the following information is included:

1. Emissions unit identification number.
2. Specific permit condition number.
3. Description of the requirement of the permit condition.
4. Basis for the determination of noncompliance (for monitored parameters, indicate whether monitoring was continuous, i.e., recorded at least every 15 minutes, or intermittent).
5. Beginning and ending dates of periods of noncompliance.
6. Identification of the probable cause of noncompliance and description of corrective action or preventative measures implemented.
7. Dates of any reports previously submitted identifying this incident of noncompliance.

STATEMENT OF COMPLIANCE - TITLE V SOURCE

RESPONSIBLE OFFICIAL CERTIFICATION

I, the undersigned, am the responsible official as defined in Chapter 62-210.200, F.A.C., of the Title V source for which this document is being submitted. With respect to all matters other than Acid Rain program requirements, I hereby certify, based on the information and belief formed after reasonable inquiry, that the statements made and data contained in this document are true, accurate, and complete.

(Signature of Title V Source Responsible Official) February 25, 2004 *(Date)*

Name: John W. Chorlog, Jr., P.E. Title: Assistant Director, Wastewater

DESIGNATED REPRESENTATIVE CERTIFICATION (only applicable to Acid Rain source)

I, the undersigned, am authorized to make this submission on behalf of the owners and operators of the Acid Rain source or Acid Rain units for which the submission is made. I certify under penalty of law that I have personally examined, and am familiar with, the statements and information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the statements and information are to the best of my knowledge and belief true, accurate, and complete. I am aware that there are significant penalties for submitting false statements and information or omitting required statements and information, including the possibility of fine or imprisonment.

(Signature of Acid Rain Source Designated Representative) *(Date)*

Name: Title:

{Note: Attachments, if required, are created by the responsible official or the designated representative, as appropriate, and should consist of the information specified and any supporting records. Additional information may also be attached by the responsible official or designated representative when elaboration is required for clarity. This report is to be submitted to both the compliance authority (DEP district or local air program) and the U.S. EPA (U.S. EPA Region 4, Air and EPCRA Enforcement Branch, 61 Forsyth Street, Atlanta GA 30303).}