FINAL Title V Air Operation Permit Revision
Permit No. 0570373-023-AV

## APPLICANT

The applicant for this project is City of Tampa – Wastewater Department. The applicant's responsible official and mailing address are: Eric A. Weiss, P.E., Director, City of Tampa – Wastewater Dept, Howard F. Curren AWT Plant, 2700 Maritime Blvd, Tampa, FL 33605.

## FACILITY DESCRIPTION

The applicant operates the Howard F. Curren AWTP, which is located at 2700 Maritime Boulevard, Tampa, FL 33605.

The regulated emissions units at this wastewater treatment plant consist of two sludge dryer trains, five sludge storage silos, two truck loading stations with three truck loading spouts, four emergency diesel generators, two natural gas fired generators, five digester gas fired generators, and a methanol storage tank. The sludge drying facility consists of two identical sludge dryer trains (No. 2 and No. 3) operating in parallel with separate but identical process and control equipment. The sludge stream from wastewater treatment is chemically treated then mechanically pressed with belt filter presses to raise the solids content from approximately 1-2% to around 20%. The sludge cake then moves via conveyor over belt scales to a wet storage bin. The sludge then goes to a pug mill where the water content is lowered further by mixing it with dry, recycled sludge from a recycle bin. From the pugmill, the sludge is fed into a natural gas fired rotary dryer, a settling chamber, and a Sweco screen for sizing. Oversized sludge particles go to a crusher and then to the recycle bin. Undersized sludge is sent directly to the recycle bin. The properly sized sludge is conveyed to the four sludge storage silos (Silo Nos. 2, 3, 4, and 5). From the four storage silos, the sludge is either loaded onto trucks at one of two loading stations (Station Nos. 1 and 2), directed to a fifth storage silo (Silo No. 6) with a dedicated loading spout, sent to the recycle bin, or routed back to the four main storage silos.

An alternate method of operation of Sludge Dryer Train Nos. 2 and 3 is the heat recovery mode. This mode utilizes the waste heat in the exhaust gases from Engine Nos. 1 and 2 to offset the heat normally generated by firing natural gas in a combustion chamber for the dryers. The exhaust gas from Engine 1 can only feed Sludge Dryer Train No. 3 and Engine 2 can only feed Sludge Dryer Train No. 2. Even though a different heat source is used in the heat recovery mode, the flow rate through each rotary dryer is the same as that under normal operations. Additional heat can be added to handle the varying moisture content of the sludge by the combustion of natural gas in the existing combustion chamber.

Particulate matter emissions from each sludge drying train are controlled with a cyclone and a venturi scrubber that includes a cyclonic separator. Volatile organic compound emissions are controlled with a natural gas fired regenerative thermal oxidizer operating in series with the particulate control devices. Emissions from each storage silo and truck loading station are controlled with fabric filters. Odors from the sludge drying building are controlled by two spray mist scrubbers which use a sodium hypochlorite and water solution. One scrubber operates at a time with the other serving as a back-up.

Electricity for the facility is normally supplied by Tampa Electric Company and the five digester gas generators (0.5 MW each). In addition, two natural gas fired generators can be used as standby emergency power as well as supplemental generation that will be dispatched to the grid for Tampa Electric Company. These generators have been identified as Engine Nos. 1 and 2. These emission units

are two identical Waukesha 16V-AT27GL engines, 4 stroke, spark ignition, each rated at 4,073 bhp, fired exclusively on natural gas, each coupled to a nominal 2.9 MW electrical generator. The maximum heat input rate is 27.2 MMBTU/hr (HHV) based on natural gas heating value of 1025 Btu/cf.

The five digester gas engines/generators are five identical Waukesha VHP-L7042 GU engines, 4 stroke spark ignition, rated at 670.5 bhp, fired exclusively on digester gas. The maximum heat input rate for each engine is 5.6 MMBtu/hr based on a digester gas heating value of 621 Btu/cf and a fuel flow rate of 9,000 cf/hr per engine. Also on site are four 3.2 MMBtu/hr Bryan Flexible Tube emergency boilers for the digester generators in the rare event that the digester generators are not in service. These boilers are being included on the insignificant emission unit list since the PTE's are below the exemption threshold for individual emission units.

In addition, the facility has four diesel-fired generators, which can produce standby emergency power in the event of a power outage or provide supplemental power generation to the electric power grid for Tampa Electric Company (non-emergency operation). Each generator is a 2 MW generator equipped with a Caterpillar 3516 DITA engine. The compression ignition engines, rated at 2,847 bhp, are fired on No. 2 diesel fuel at a maximum rate of 137.5 gallons/hr. These generators were installed between 1993 and 1994. Each generator is equipped with a crankcase ventilation kit to capture any non-exhaust emissions from the engines. Also, each engine also has a catalyst, manufactured by Johnson Matthey, which is used to comply with the 70% CO reduction requirement of 40 CFR 63, Subpart ZZZZ.

Methanol is used as a feedstock for the biological denitrification stage of the wastewater treatment process. The methanol is delivered on a daily to weekly basis by truck or railcar to a fixed roof storage tank with a volume of approximately 95,000 gallons. Methanol is considered a VOC and HAP, and emissions are generated by evaporative losses (breathing and working losses) through the venting of displaced air through the "J" neck vent located on the roof of the tank. Minimal emissions are also generated from evaporation of methanol in the denitrification stage and from the fugitive losses of handling methanol through the piping, valves, flanges, etc. VOC and HAP emissions, which includes methanol, will be controlled by limiting the product throughput and submerged filling pursuant to Rule 62-296.320, F.A.C., General Pollutant Emission Limiting Standards.

CAM does apply to the control systems (cyclones, scrubbers, oxidizers) for Sludge Dryer Train Nos. 2 and 3 for VOC and PM. This sludge drying facility is subject to 40 CFR 61, Subpart E - National Emission Standard for Mercury and Rule 62-296.700, F.A.C. (PM-RACT). The engines at the facility are subject to 40 CFR 63 Subpart ZZZZ, and are not subject to 40 CFR 60 Subpart IIII nor Subpart JJJJ due to the date of construction of the engines.

Also included in this permit are miscellaneous insignificant emissions units and/or activities.

Based on the Title V Air Operation Permit Renewal application received November 12, 2010, this facility is not a major source of hazardous air pollutants (HAPs).

## PROJECT DESCRIPTION

The purpose of this permitting project is to revise the existing Title V permit for the above referenced facility.

## PROCESSING SCHEDULE AND RELATED DOCUMENTS

Initial Title V Air Operation Permit issued: September 11, 2000
Title V Air Operating Permit Amendment issued: July 16, 2001
Title V Air Operating Permit Amendment issued: April 25, 2002
Title V Air Operating Permit Revision issued: September 3, 2003
Application for a Title V Air Operation Permit Renewal received March 11, 2005
Draft CAM Plan received April 12, 2005
Additional Information Request dated May 9, 2005
Additional Information Responses received June 13, August 5, August 8, and June 28, 2005
Title V Air Operating Permit Revision issued: May 18, 2006
Title V Air Operating Permit Revision issued: March 15, 2010
Title V Air Operating Permit Renewal Permit issued: November 1, 2011
Title V Air Operating Permit Revision application received: May 14, 2014
Title V Air Operating Permit Revision Permit issued: October 2, 2014
Title V Air Operating Permit Revision application received: October 3, 2014
Title V Air Operating Permit Revision Permit issued: January 15, 2015

## PRIMARY REGULATORY REQUIREMENTS

Title III: The facility is not identified as a major source of hazardous air pollutants (HAP).

Title V: The facility is a Title V major source of air pollution in accordance with Chapter 62-213, Florida Administrative Code (F.A.C.).

PSD: The facility is not a Prevention of Significant Deterioration (PSD)-major source of air pollution in accordance with Rule 62-212.400, F.A.C.

NSPS: The facility does not operate units subject to the New Source Performance Standards (NSPS) of 40 Code of Federal Regulations (CFR) 60.

NESHAP: The facility does operate units subject to the National Emissions Standards for Hazardous Air Pollutants (NESHAP) of 40 CFR 61 and 40 CFR 63.

CAIR: The facility is not subject to the Clean Air Interstate Rule (CAIR) set forth in Rule 62-296.470, F.A.C.

CAM: Compliance Assurance Monitoring (CAM) applies to Sludge Dryer Train Nos. 2 and 3 for VOC and PM since the pre-control device emissions are estimated to be above the major source thresholds. These emission units are controlled by cyclones, scrubbers, and thermal oxidizers.

## PROJECT REVIEW

The purpose of this Title V operation permit revision permit issued concurrently with the air construction Permit No. 0570373-022-AC is to limit the operation of the digester gas fueled engines, identified as EU 020 in the current Title V Permit No. 0570373-021-AV, so that the facility does not trigger the PSD requirements of Rule 62-212.400, F.A.C. Specifically, the AC/Title V permit will limit the total hours of operation for these engines for any 12-month consecutive period,

while giving the facility flexibility to operate more than one digester gas engine at any given time. The potential to emit (PTE) is based on the combined total hours of operation for all the engines of 12,700 hours/12-month consecutive period, operated at a maximum flow rate of 9,000 $ft^3$/hr, heat input rate of 5.6 MMBtu/hr and heat content for digester gas of 621 Btu/$ft^3$ (AP-42 Table 3.2-3).

**CONCLUSION**

This FINAL Title V air operation permit revision is being issued under the provisions of Chapter 403, Florida Statues (F.S.), and Chapters 62-4, 62-210 and 62-213, F.A.C.