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Water and Sewer
PO Box 330316 • 3071 SW 38 Avenue
Miami, Florida 33233-0316
T 305-665-7471

VIA ELECTRONIC CORRESPONDENCE

May 21, 2018

CCN: 61859
File No: 8.DC.52 & 77

Chief, Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Ben Franklin Station
Washington, D.C. 20044-7611
RE: DOJ No. 90-5-1-1-4022/1
Tom.Mariani@usdoj.gov

Chief, Clean Water Enforcement Branch
Water Protection Division
Attn: Brad Ammons
U.S. Environmental Protection Agency, Region 4
61 Forsyth Street, S.W.
Atlanta, Georgia 30303
Ammons.Brad@epa.gov

Rachael Amy Kamons
Environmental Enforcement Section
U.S. Department of Justice
P.O. Box 7611
Ben Franklin Station
Washington, D.C. 20044-7611
Rachael.Kamons@usdoj.gov

Florida Department of Environmental Protection
Southeast District – West Palm Beach
3301 Gun Club Road, MSC 7210-1
West Palm Beach, FL 33406
Attn: Compliance/Enforcement Section
Jason.Andreotta@dep.state.fl.us

RE: Consent Decree (Case: No. 1:12-cv-24400-FAM)
Reference DOJ Case No. 90-5-1-1-4022/1
Section VI – Specific Capital Improvement Projects, Paragraph 19(i)
Section XX – Modification
Request for Material Change – CD Project 2.14 CDWWTP Digesters Plant 1

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Dear Sir/Madam:

Pursuant to Article VI, Subsection 19(i) and Article XX of the Consent Decree, the County respectfully requests that CD Project 2.14 CDWWTP Digesters Plant 1 be cancelled and deleted from Amended Appendix D2 of the Consent Decree. The reasons for cancelling Project 2.14 is set forth below.

Rehabilitation of the CDWWTP digesters clusters at Plant 1 and Plant 2 is identified as CD Projects 2.14 and 2.15, respectively. There are two digester clusters, each with four digester tanks located at Plant 1 and four more clusters each with four digester tanks at Plant 2, for a total of 24 digesters. The existing digesters stabilize the biosolids generated by the CDWWTP treatment process through mesophilic digestion. About 40% of the generated thickened solids currently go to Plant 1, while the remaining goes to Plant 2.

As approved by EPA and FDEP on August 2, 2016, the County elected to upgrade three clusters (two duty and one standby) from Plant 2 to high rate mesophilic anaerobic digestion. The two clusters would provide sufficient treatment and storage capacity at the average and at the permitted design conditions for CDWWTP. The third cluster would provide additional capacity as a redundant backup. As a result, three active child projects are ongoing under CD 2.15: construction of CD 2.15(1) Plant 2 Cluster 1 was initiated in October 2016; construction start for CD 2.15(2) Plant 2 Cluster 2 is anticipated in August 2018; CD 2.15(3) Plant 2 Cluster 3 is under review by City of Miami Building Department for dry-run permit approval and its anticipated construction start is December 2019. CD 2.15 is anticipated to be completed by the CD Compliance Date of June 18, 2023.

The complete rehabilitation of Plant 2 Clusters 1, 2, and 3 under CD 2.15 will provide full digestion treatment capacity required for CDWWTP and no improvement for CD 2.14 is anticipated for both the CD and Ocean Outfall Legislation Program (OOL). Past communication relative to the requested cancellation for CD 2.14 and modification of CD 2.15 is listed below.

- At the December 4, 2015 CD Program Progress Meeting with EPA and FDEP, the County presented reasons for rehabilitating 3 clusters at the CDWWTP, deleting CD Project 2.14 and modifying the description for CD Project 2.15. Please refer to the attached CD 2.14/2.15 Technical Memorandum.
- The County submitted a Request for Non-Material Change for CD 2.14 and 2.15 on February 8, 2016.
- At the April 21, 2016 CD Program Progress Meeting, EPA mentioned that the formal request for the proposed modification of projects would constitute a material change to CD 2.14 since there was no work being done on Digester Plant 1. EPA suggested the County reassess the possibility of repurposing the Digester Plant 1 and resubmit a request for a different proposed modification of CD 2.14.
- On May 13, 2016, the County resubmitted the Request for the Non-Material Change for CD 2.15 for complete rehabilitation of Plant 2 Clusters 1, 2, and 3.
- On August 2, 2016, the County received EPA and FDEP approval for modification of CD 2.15.
- At the January 24, 2017 CD Program Progress Meeting, the County mentioned that the OOL was in the process of developing the Conceptual Design Report. After the development of that Report the change of scope for CD 2.14 Digesters Plant 1 would be submitted to EPA and FDEP.

Since the request, OOL has performed numerous alternative evaluations at the CDWWTP at the conceptual design level and explored the possibility of repurposing the Digesters Plant 1 for peak flow management, biosolids projections, and real estate utilization for other improvements. Please refer to the attached July 21, 2017 letter regarding Technical Memorandum on Evaluation of Required Treatment Plant Improvements – Central District Wastewater Treatment Plant by OOL. As indicated in the attachment, OOL has determined that the Digesters Plant 1 are not suitable for repurposing or utilization within the scope of OOL. Furthermore, repurposing of Digesters Plant 1 will be further assessed during

OOL detailed design phase and any improvements proposed will be completed independently of the CD Program.

Based on the above reasons, pursuant to Article VI, Section 19(i) of the Consent Decree, the County respectfully requests to modify the Consent Decree, specifically CD Amended Appendix D-2 by deleting CD Project 2.14 Digesters Plant 1.

Should you have any questions regarding this matter, please call me at (786) 552-8474.

I certify under penalty of law that this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering such information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Sincerely,


Lynnette M. Ramirez, P.E.,
Senior Advisor, Capital Improvement Programs & Regulatory Compliance

 ec: Jonathan A. Glogau
Special Counsel
Chief, Complex Litigation
Office of the Attorney General
PL-01, The Capitol
Tallahassee, FL 32399-1050
850-414-3817
Jon.Glogau@myfloridalegal.com

Florida Department of Environmental Protection
Southeast District – West Palm Beach
3301 Gun Club Road, MSC 7210-1
West Palm Beach, FL 33406
Attn: Compliance/Enforcement Section
Lisa.M.Self@dep.state.fl.us
Mike.Bechtold@dep.state.fl.us
Sed.wastewater@dep.state.fl.us

Mayor Carlos A. Gimenez
Miami-Dade County
111 NW First Street 29th Floor
Miami, Florida 33128

Kevin T. Lynskey, Director
Miami-Dade Water and Sewer Department
3071 SW 38th Avenue
Miami, Florida 33146

Jack Osterholt, Deputy Mayor/Director
Miami-Dade Regulatory and
Economic Resources
111 NW 1st Street. 29th Floor
Miami, FL 33128
Josterholt@miamidade.gov

Henry Gillman
Assistant County Attorney
Miami-Dade County Attorney's Office
111 NW First Street Suite 2810
Miami, Florida 33128

WUB
William Bush
Associate Regional Counsel
U.S. EPA, Region 4
61 Forsyth Street, SW
Atlanta, Georgia 30303
Bush.William@epa.gov

William A. Weinischke
Senior Trial Attorney
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611
Washington, D.C. 20044
Bill.Weinischke@usdoj.gov

ebc: Hardeep Anand
Antonio Cotarelo
Douglas L. Yoder
Josenrique Cueto
Lynnette M. Ramirez
Manuel Moncholi
Lashika Nelson
Frances G. Morris
Sarah Davis
Sherry Negahban
Richard O'Rourke
Annalise Mannix
Robert Fergen
Al Galambos
Dan Edwards
Rolando Roque
Juan Bedoya
Lee N. Hefty (RER-DERM)
Carlos Hernandez (RER-DERM)
Rashid Istambouli (RER-DERM)
David Wood (CD PMCM)
Andrea Suarez Abastida (CD PMCM)
Scott Eckler (CD PMCM)
Abby Diaz (CD PMCM)

AMM

Attachment

Technical Memorandum CD CIPs 2.14 and 2.15



Consent Decree PMCM Team
135 San Lorenzo | Suite 600
Coral Gables, FL 33146
(O) 305.444.4691 | (F) 305.447.3580

To	Manuel Moncholi
CC	Pedro Hernandez, PE, Maricela J. Fuentes, PE, Brian Stitt
Subject	CD PROJECT # 2.14 and 2.15, PCTS: 13159 Digesters Plant 1 and Plant 2
From	John Ososkie, PE / Consent Decree PMCM Team
Date	January 21, 2016
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Technical Memorandum

1. INTRODUCTION

Miami-Dade Water and Sewer Department (WASD) is faced with the dual challenges of providing increased treatment capacity for growth while also achieving more stringent discharge requirements at each of their wastewater facilities. Both challenges must be met using the aged infrastructure of the existing plants. The principal components of the system were constructed in the 1950s and 1960s. The South District Wastewater Treatment Plant (SDWWTP) recently completed an expansion to include high level disinfection treatment facilities, but the last major expansion and upgrades to the North District Wastewater Treatment Plant (NDWWTP) and Central District Wastewater Treatment Plant (CDWWTP) were completed in the 1980s.

The CDWWTP is WASD's oldest existing wastewater treatment facility. The plant is located on Virginia Key and was originally constructed in 1956. The plant has undergone numerous expansions and upgrades from its original permitted capacity of 47 million gallons per day (mgd) as a modified activated sludge process to its current configuration as a 143 mgd average annual daily flow (AADF) high-purity oxygen activated sludge facility. The CDWWTP has two separate liquid process treatment streams - Plant 1 and Plant 2. Plant 1 is rated at 60 mgd AADF and Plant 2 is rated at 83 mgd AADF.

At the May 21, 2013 Board of Miami-Dade County Commissioners (BCC) meeting, the BCC approved the Consent Decree (CD) that had been negotiated with the United States Environmental Protection Agency (EPA), the United States Department of Justice (DOJ) and the State of Florida Department of Environmental Protection (FDEP). The CD outlines the activities to be undertaken to reduce exceedances of treated effluent limitations. This includes rehabilitation and improvements at each of the treatment plants owned by WASD. All improvement projects to these plants must be completed on or before 15-years from the date of lodging (04/09/2013) of the CD with the United States District Court. A series of condition assessment reports outlining the current state of plant treatment facilities have been prepared – one for each WWTP. These documents form the basis for required projects that will be undertaken by WASD. Projects specific to the CDWWTP are listed within the Appendix D-2 of the CD. Rehabilitation of the digesters is identified as Project Nos. 2.14 and 2.15 in the CD.

2. EXISTING CONDITIONS AND PROJECT OVERVIEW

The "Existing Conditions Report - Upgrades to the Central District Wastewater Treatment Plant - Work Order No.1" dated September 2008 and updated in 2012, identified all the digesters as critical areas in need of rehabilitation and repair. There are four digester clusters each with four digester tanks located at Plant 2, and two more clusters of four digesters tanks at Plant 1, for a total of 24 digesters. The digesters stabilize the

biosolids generated by the CDWWTP treatment process through mesophilic digestion. Each cluster of digesters has an associated Digester Cluster Control Building that houses the sludge digestion equipment (e.g., pumps, blowers, heat exchangers, etc.) piping, appurtenances, and electrical and instrumentation panels.

The majority of the equipment, piping, and valves within the Digester Cluster Control Buildings are in poor condition and/or require immediate replacement under the improvements plan. Internal meetings with plant operation and maintenance (O&M) staff suggest the existing yard piping that is associated with the anaerobic digesters is also in poor condition and in need of replacement. Similar to the equipment located in the Digester Cluster Control Buildings, a majority of the electrical and instrumentation panels and components are past their useful life, and in need of replacement.

The digester tank covers have been rebuilt and repaired several times to keep them in service. The covers are in need of replacement. Additionally, the piping and equipment internal to the digesters tanks (e.g., mixing systems, recirculation pumps, gas handling facilities, etc.) are in varying stages of operability and/or in need of major maintenance, and should be replaced where necessary.

The operation of the equipment and systems associated with each of the digester clusters has become a challenge, due to the equipment limitations and changes to the original system. Currently, the inoperability and equipment age within the digester system is impacting the ability to provide the level of service required and stressing the treatment system capacity.

3. BASIS OF DESIGN REPORT

The facility currently uses mesophilic anaerobic digestion (MAD) for sludge stabilization. About 40% of the generated thickened solids currently go to Plant 1, while the remaining goes to Plant 2. In total there are 24 total digesters, each is 105 ft diameter with volume of approximately 1.2 to 1.7 million gallons depending on the operating liquid level of the digester which has a side water depth (SWD) ranging from 17.9 to 25.9 ft not including the volume in the 3 ft cone section. Currently most of the digester clusters operate with two primary digesters that are heated and mixed and two secondary digesters which are unheated and unmixed. One exception is Plant 2, Cluster 2 which uses three primary digesters and one secondary digester. Another exception is Plant 2, Cluster 4 which currently operates with one primary digester and three secondary digesters. Digesters 15 and 16 in Plant 2, Cluster 4 receive sludge from all digesters and provide the buffer between digestion and dewatering.



Figure 1: Typical Digester Cluster Configuration

The current recommendation by MWH is to upgrade CDWWTP to high rate mesophilic anaerobic digestion and details regarding the design are provided in the Cluster 1 BODR (April, 2015) and Cluster 4 BODR (August, 2015) prepared by MWH.

To determine the number of digesters that would need to be in operation for the high rate anaerobic digestion alternative and the downstream dewatering impacts, the following design assumptions were made:

- Minimum SRT of 15 days at Design Conditions with one digester out of service to meet the minimum EPA PSRP standard for Class B biosolids
- Nominal Digester Volume ~ 1.6 Mgal/digester based on previous evaluations by WASD assuming operating at one foot below the maximum operating water level (SWD = 24.9 ft).
- Maximum Volatile Solids Loading Rate (SLR) – 0.2 lb VS/ft³ (WEF MOP-8, 2010)
- Digester VSR = 55% based on historical plant records and calculations made by MWH (February, 2015).
- Centrifuge Dewatering Sizing – 190 gpm (Based on sizing in MWH Technical Memorandum No. 2.2 “Thickening/Dewatering Process Technology Alternatives Development and Evaluation” for CDWWTP – draft, July 2015)

The results of the sizing analysis are presented in Table 1.

Table

Table 1: High Rate MAD Digester Sizing Analysis

Mesophilic Digester Design	Units	Current AA	Year 2025 AA	Past Year 2025 AA	Design
Mass Throughput	lb/d	208,050	223,044	173,324	332,500
Hydraulic Throughput	MGD	0.454	0.486	0.378	0.725
# of Digesters Required ¹	Units	5	5	4	7
Total Digester Volume	Mgal	8.1	8.1	6.5	11.3
Digester SRT	days	17.8	16.6	17.1	15.6
Digester Solids Loading Rate	lb VS/ft ³	0.15	0.16	0.15	0.17
Digester VSR	% VSR	55.0%	55.0%	55.0%	55.0%
Digested Sludge Production	lb/d	119,502	127,520	101,044	191,091
Dewatering Hydraulic Throughput	gpm	307.6	329.7	256.4	491.6
# of Dewatering Centrifuges	Units	1.6	1.7	1.3	2.6

¹ Does not include a redundant digester

Table 1 shows that for this configuration, at least seven digesters would need to be in operation to maintain greater than 15 days SRT at the permitted capacity design conditions. This would require two digester clusters to be available to provide at least one redundant digester at permitted capacity design conditions.

At the projected future average annual loadings, only four to five digesters need to be in operation so two clusters provides extra capacity at those conditions. At the 96 percentile 7-day average conditions in year 2025 (before the West District WWTP is online) six digesters would need to be in operation to maintain greater than 15 days SRT.

WASD has elected to have three available clusters in the future to provide extra capacity for digestion and sludge storage. Having a third cluster available would also facilitate maintenance of the equipment and

systems in one of the cluster's dedicated Control Buildings. One digester has the ability to provide up to 2.2 days of storage at peak design conditions. If all 24 digesters are in operation then the SRT would be over 53 days. If all 16 digesters in Plant 2 are in operation then the SRT would be over 35 days. This indicates that there is excess capacity available beyond what is needed. Although retrofitting all of the clusters would provide extra redundancy and potentially modest increases in VSR, significant capital savings could be realized with only retrofitting the needed capacity. Furthermore it has been shown that long SRTs in digestion can generate extracellular polymeric substances which can inhibit dewatering performance (Novak et. al., 2004).

4. CONCLUSIONS

Table 1 summarizes the results of operating the high rate MAD process at Central District at design future flows with a volume per digester of 1.6 Mgal. The results show that two clusters is still sufficient to maintain the minimum SRT and SLR for high rate MAD and the number of digesters needed in operation does not change at average operating conditions.

The results of the sizing analysis show that for high rate MAD, two clusters would be sufficient at the average or at the permitted capacity design conditions. The two clusters would be sufficient for normal expected operating conditions at all ranges of the digester volume but three clusters will be rehabilitated to provide additional capacity for the permitted design condition. Rehabilitating three clusters, would also provide excess capacity for sludge storage and would facilitate maintenance of the equipment and systems in one of the cluster's dedicated control buildings.

5. RECOMMENDATION

The CD PMCM Team recommends a non-material modification of the Consent Decree project as follows:

- Re-scoping of CD Project 2.14 – Based on Engineer's evaluation no additional work will be performed on Digester Clusters 1 and 2.
- CD 2.15 Digesters Plant 2 – Complete rehabilitation of Clusters 1, 2 and 3 (12 digesters including roof, concrete structures, recirculation & transfer pumps, mixers & electrical systems).

Attachment

CD 2.14 Plant 1 Digester Clusters 1 and 2 Utilization under Ocean Outfall Legislation (OOL)
Program Letter



Ocean Outfall Legislation Program
3150 SW 38 Ave., Suite 700
Miami, Florida 33146
Tel (305) 441-1864
Fax (305) 443-8856

Reference Number: 0116

Reply Required

July 21, 2017

Project Name: TA 21: Central District Wastewater Treatment Plant Expansion Conceptual Design Report

Sergio A. Hoyos, M.S., P.E
WASD Consent Decree Program
135 San Lorenzo Ave, Suite 600
Coral Gables, Florida 33146

Subject: CD 2.14 Plant 1 Digester Clusters 1 and 2 Utilization under Ocean Outfall Legislation (OOL) Program

Dear Mr. Hoyos,

This letter is a follow up to the letter sent April 24, 2017 (Reference Number: 0096) presenting the anticipated plans for Plant 1 Digester Clusters 1 and 2 at the Central District Wastewater Treatment Plant (CDWWTP). Please note that several progress meetings were held with Miami-Dade Water and Sewer Department (WASD) after April 24th letter, to discuss concepts and alternatives of peak flow management at CDWWTP. A summary of the discussion with WASD and recommendations are presented below:

- 1- Five peak flow management alternatives were evaluated including alternatives with and without equalization. High rate parallel treatment alternatives were also considered. The selected approach includes step-feed and return activated sludge (RAS) capacity improvements as well as addition of one oxygenation train to Plant 1, five secondary clarifiers, and additional headworks capacity. This alternative was selected because of its simplicity of operation, everyday redundancy benefit, the most favorable visual impact, and potential to improve grit removal from the 60-inch pipeline from Miami Beach. Based on this, the digester cluster in Plant 1 are no longer being considered for equalizing flow.
- 2- Biosolids projections, developed as part of the process modeling, were compared to those used for the Consent Decree Program/Manager Construction Manager (PMCM) and Renewal and Rehabilitation (R&R) Program projects (the new thickening and dewatering building project Consent Decree 2.16/2.12/2.13). The maximum solids production that controls sizing of the facilities is the 2025 condition before the WDWTP is online. The recommended biosolids treatment improvements for the CDWWTP (based on an evaluation done under the R&R Program) include continuing with the planned Consent Decree improvements for thickening, anaerobic digestion, and dewatering to produce a Class B sludge for land application until a consolidated Class AA biosolids production facility is built at the SDWWTP. The solids projections developed under the Consent Decree PMCM/R&R projects for 2025 conditions are more conservative than those developed as part of the OOL Program for the 2035 flow and load conditions and therefore the improvements planned under that project are adequate.
- 3- The preferred location to site the new electrical building is closer to the FPL feed line therefore the digester cluster in Plant 1 real estate are no longer a feasible option.

The design basis, concepts and work summarized above is presented in the Technical Memorandum attach to this letter. Once the conceptual design is approved by WASD, the design consultants will further detail OOL improvements at CDWWTP and they may further assess repurposing this space.

Please let us know if you have any questions related to this issue. We are committed to closely collaborating with the PMCM team.

Sincerely,
CH2M HILL, Inc.



Thomas V. Waldeck, P.E
Pre-Construction Manager
Ocean Outfall Legislation Program

Attached/Copy: James Ferguson, Program Manager, MDC-WASD
Maricela Fuentes, Assistant Director, Capital Projects, MDC-
WASD Carlos Baixauli, MDC Inspector General Office (by email)
Evelio Agustin, OOL Program Manager
Gisselly Anania, OOL Project Manager