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VIA ELECTRONIC CORRESPONDENCE

August 12, 2016

CCN: 60509
File No: 8.DC.20.32

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
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Florida Department of Environmental Protection
Southeast District – West Palm Beach
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Attn: Compliance/Enforcement Section
Diane.Pupa@dep.state.fl.us

RE: Consent Decree (Case: No.: 1:12-cv-24400-FAM)
Reference DOJ Case No.: 90-5-1-1-4022
Section VI – Gravity Sewer System Operations and Maintenance Program, Paragraph 19(e)

Dear Sir/Madam:

The Miami-Dade Water and Sewer Department (WASD) is in receipt of your request for additional information related to the February 6, 2015 submittal of the Gravity Sewer System Operations and Maintenance Program (GSSOMP) as required by Paragraph 19.(e) of the above referenced Consent Decree (CD). Following please find the restatement of EPA/FDEP comments and WASD's responses, clarification, and/or additional information to your questions and/or comments.

1. Paragraph 19.(e).(i). of the CD requires that the GSSOMP include written preventative operations and maintenance schedules and procedures which shall be scheduled appropriately. The GSSOMP does not provide any details to address this requirement for gravity sewers outside of the Wellfield Protection Areas (WPA). In addition, the GSSOMP states that (Section 5 (page 5-1)): "When the resources recommended by the GSSOMP become available, the WWCTLD [Wastewater Collection and Transmission Line Division] will add a concurrent and parallel cleaning and inspection program for

the remaining three-quarters of the GSS [Gravity Sewer System] on a 10-year cycle." These resources should be used immediately and as they are made available, not waiting upon a future unknown date.

RESPONSE: The Wastewater Collection and Transmission Line Division (WWCTLD) scheduling process and operations and maintenance procedures are included in Section 6 Preventative Operations and Maintenance Schedules and Procedures of the GSSOMP. Due to the size of the collection system, prioritization is currently done on a yearly basis using a 5,000 gallons per day per inch-diameter mile (GPDIM) night flow survey process. Also, the Volume Sewer Customer Ordinance (VSCO) requires a ten year review using the same 5,000 GPDIM process. While it is our intent to perform a ten year cycle it is also impractical to schedule its entirety at one time, specifically when addressing shifting priorities that may arise such as operational hotspots and/or high nominal daily average pump operating time (NAPOT) stations. Yearly priorities are based on the previous year's night flow results as well as addressing repetitive SSOs. Additionally, maintenance schedules will be contingent on future Sewer System Asset Management Program (SSAMP) and life-cycle costing/prioritization activities.

WASD will be adding new staff to WWCTLD and accommodating resources for FY 2016/2017. Staff augmentation is contemplated to be completed by approximately year three of the CMOM consolidated implementation schedule.

2. Paragraph 19.(e).(ii). of the CD requires that the GSSOMP include an engineering evaluation of potential sulfide and corrosion control options and a summary report of findings. The submitted GSSOMP states that this evaluation will not start until 2-years after GSSOMP approval by the EPA and FDEP, and after financial resources are allocated. This time period appears excessive. A summary of the existing program and its effectiveness, with any recommendations for improvements, should be able to be accomplished very quickly. A revised/updated evaluation and report could be done at a later time.

RESPONSE: WASD will submit a summary of the existing program and its effectiveness, with any recommendations for improvements, mirroring what was submitted in the Force Main Operations, Preventative Maintenance and Assessment/Rehabilitation Program (FMOPMARP) Section 5.01. This is expected to be completed by March 31, 2017.

3. Paragraph 19.(e).(iii). of the CD requires that the GSSOMP include prioritization for evaluating the Gravity Sewers based upon the size of the pipe, location of SSOs, community input or other criteria. There is a list of Prioritization Criteria in the GSSOMP. However, it appears each criteria is given equal weight. Miami-Dade should consider whether each criteria should be given a specific weighted prioritization number as some of the items need to be weighted differently.

RESPONSE: The prioritization criteria being used addresses capacity issues through the 5,000 GPDIM process, addresses environmental issues through the WPA and addresses SSOs and community impact issues through its hotspot program. Additional prioritization will be accomplished through the GSS asset criticality schema developed in SSAMP Section 8.01.1.

4. Paragraph 19.(e).(iv). and (v). of the CD requires that the GSSOMP include inspection of Gravity Sewers, manholes, and inverted siphon easements, including inspection of creek crossings, canal crossings, stream bank encroachment toward Gravity Sewers, manholes and inverted siphons, and easement accessibility and develop and implement a schedule for maintenance of easements. Procedures for the inspection and maintenance of easements in the submittal do not appear to be adequate, being limited to whatever evidence of SSOs is observed and whatever action is needed to access the gravity sewer system during operation and maintenance (O&M) activities. Miami-Dade claims customer relations and the high proportion of private residential easements with manmade structure encroachments as reasons to not have a proactive program. Easement inspections should, at a minimum, explicitly be part of every 5-year (for gravity sewers within the WPAs) or 10-year inspection (for gravity sewers outside the WPAs) and should not be limited to just looking for evidence of actual SSOs. Easement maintenance should, at a minimum, be required to be done whenever access reduction is found. Maintenance could be done by Miami-Dade or be required to be done by the property owner.

RESPONSE: On page 4 of WASD's 2014 Semi-Annual Report No. 2, in Table 1-3 Issues Log, it states "EPA agreed to the following regarding the GSSOMP: 1) EPA concurred with MDWASD's interpretation of plan contents and that implementation of the plan takes place after the plan is approved for both the corrosion control study/findings and the inspection of easements. 2) EPA agreed with MDWASD's tentatively proposed level of easement inspection/maintenance. MDWASD proposed conducting easement inspections in conjunction with other field investigations, such as: responses to SSO events, Sanitary Sewer Evaluation Surveys, critical crossing inspections, etc. MDWASD also proposes to inspect those easements which are primarily rear alley easements that are not maintained by property owners. In the event inspection reveals an encroachment or other obstruction in such easements that prevents or makes it difficult to access the sewer facility, the County will take action to remove such obstruction and further maintenance of such easements will be done by the County only when there is a need to access the sewer facility.

5. Paragraph 19.(e).(vi). of the CD requires that the GSSOMP include a staffing and funding plan sufficient in structure, skills, numbers and funding to allow completion of the O&M activities required by the GSSOMP. The submitted GSSOMP includes a list of job titles with job descriptions. No analysis of staffing needs are given. The staffing appears to have only six supervisors covering 171 employees. That equates to approximately one supervisor for every 28 workers. Too few supervisors of field personnel could cause inefficient work to be performed; thus, a staffing evaluation is needed. In addition, there is only one engineering staff member (qualification of minimum 2 years of experience). Miami-Dade appears to just put the maintenance of gravity sewer piping on a time schedule instead of including other criteria that could be used to prioritize. The data developed by the inspection and maintenance staff is being evaluated by 4 staff with only minimum technical education. Thus, it appears these staff members are for data entry instead of data evaluation. Data evaluation could eliminate costly unneeded inspections, cleaning, TV and/or grouting activities.

RESPONSE: The ratio of 6 to 171 used above is incorrect. These are second line Supervisors with many first field Supervisors under them. The average field Supervisor has an average of 7 field workers under his purview. The analysis was done by the Assistant Superintendent of WWCTLD prior to the development of staffing needs. The analysis involved historical evaluation of work load and established WWCTLD goals. WASD contends that its supervisory level of staffing is reasonable.

Due to the size of the collection system, prioritization is currently done on a yearly basis using a 5,000 gallons per day per inch-diameter mile (GPDIM) night flow survey process. Also, the Volume Sewer Customer Ordinance (VSCO) requires a ten year review using the same 5,000 GPDIM process. The present procedure of the video review unit has proven to be very effective in the reduction of Infiltration/Inflow (I/I). Video reviewers go through extensive on-the-job training and follow a stringent video review protocol which is based on the most cost effective repair for every defect they identify.

6. Paragraph 19.(e).(vii). of the CD requires that the GSSOMP include data attributes for Miami-Dade's mapping (GIS) program allowing program data to be compared in the forthcoming Information Management System (IMS) against other pertinent data such as the occurrence of SSOs. The GSSOMP appears to be more of a proposed overlay (layer) for the GIS system. How will Miami-Dade management utilize this information to schedule needed work and eliminate un-needed work?

RESPONSE: Miami-Dade currently has a SSO layer in GIS. The layer is vetted by key senior WWCTLD staff in their monthly root cause analysis meetings. Corrective actions established at these meetings result in scheduling of needed work or rehabilitation/replacement projects, public outreach and/or establishment of accelerated hotspot cleaning cycles.

7. Paragraph 19.(e).(viii). of the CD requires that the GSSOMP include an inventory management system. The inventory control system describes four locations where parts and equipment held by Miami-Dade Water and Sewer Department (WASD) are stored. Equipment is listed and assigned to specific work units and storage sites. Spare parts are listed and the location of each item is tracked via a bar code system. Contracts with large diameter pipe (> 36 inch diameter pipe) suppliers are mentioned in general terms, with no reference to how to identify the specific suppliers or how to obtain the pipe in an emergency. Streamlined procedures for emergency access to parts and equipment should be established and put in writing, with locations of spare parts and equipment held by other entities and who controls them. There should be a means to ensure that parts and equipment held by other County Departments or contractors is immediately available for use, without procedural or access delays. In addition, the inventory control system describes how, when the minimum allowable inventory threshold is reached, the system notifies the Stores Division of the WASD of the need to reorder. There should be a means to ensure prompt acquisition of depleted parts, tools, supplies and equipment, without procedural or other delays or deferrals. All divisions, sections, approval authorities, etc. must make such acquisition a high priority to avoid delays.

RESPONSE: Appendix C of the GSSOMP provides a list of critical spare parts stored at the WASD Inventory Storerooms listed in section 13.02 of the GSSOMP. Prompt acquisition of high priority items

(defined as "insurance items" in the GSSOMP) is managed by WASD's Stores and Procurement Division via the use of County contracts with multiple manufacturers necessary to supply parts listed as "insurance items". The minimum stock thresholds set for "insurance items" are set in such a way to ensure there are no delays in availability of these critical parts. Additionally, WASD does not require procedures for emergency equipment and parts because it maintains critical parts repair kits for all diameters in the Wastewater Collection and Transmission System (WCTS) up to 102-inch. In the rare case where the repair item is not available in stock, existing vendors are contacted.

8. Paragraph 19.(e).(ix). of the CD requires that the GSSOMP include reports that list equipment problems and the status of work orders generated during the prior Month. The GSSOMP lists several sources of information to determine if work is either planned/preventative or not planned/reactive. Duplication and/or overlooking needed work could result from these multiple data sources. In addition, Miami-Dade appears to be relying on institutional knowledge to schedule work. With the planned retirement of a significant number of workers with that institutional knowledge, Miami-Dade should develop a workable program to complete all O&M work.

RESPONSE: WWCTLD currently exercises knowledge transfer with its exiting staff to the successor staff. The development of various CMOM tools will implicitly allow capture of institutional knowledge and information.

9. In at least 7 places, the GSSOMP states that various things will be implemented when additional resources are allocated, referring to additional staff, equipment, and/or materials proposed for next year's budget and beyond. Timing of additional resource allocation is not an acceptable basis for determining the implementation schedule. Rather, the implementation schedule should drive resource allocation. Miami-Dade shall provide a schedule for GSSOMP implementation and assurance of timely resource allocation to meet that schedule by March 31, 2016.

RESPONSE: The CMOM consolidated implementation schedule provided on March 31, 2016 includes a detailed implementation schedule for the GSSOMP as well as the Sewer Overflow Response Plan (SORP), SSAMP and Information Management System Program (IMSP) related implementation activities impacting the WWCTLD. Staff augmentation is contemplated to be completed by approximately year three of the CMOM consolidated implementation schedule. This will position WASD to achieve CMOM Key Performance Indicators (KPIs) by conclusion of the implementation period. For your convenience, Attachment A provides a copy of the March 31, 2016 submittal. It is Miami-Dade's objective to re-baseline the attached schedule, as applicable, when the respective plans are approved. Miami-Dade is committed to fulfilling the final approved CMOM Program Implementation Schedule. Additionally, along with the monthly CD program schedule submitted as handouts at the EPA/FDEP/WASD CD monthly program meeting, CMOM consolidated implementation schedule monthly updates will be provided.

10. In at least 6 places, the GSSOMP states that various components will be implemented after the required IMS (CD Paragraph 19.(c).) has been implemented. The IMS Program submittal is due in December 2015. The time for IMS development and implementation is unknown, as it is for the subsequent Geographic Information System (GIS) tool. Some items, such as Prioritization, may, therefore, not be implemented for several years. Miami-Dade shall provide an overall CMOM Programs implementation schedule by March 31, 2016, as well as a more detailed implementation schedule for the GSSOMP.

RESPONSE: The CMOM consolidated implementation schedule provided on March 31, 2016 includes a detailed implementation schedule for the GSSOMP as well as the SORP, SSAMP and IMSP related implementation activities impacting the WWCTLD. For your convenience, Attachment A provides a copy of the March 31, 2016 submittal. It is Miami-Dade's objective to re-baseline the attached schedule, as applicable, when the respective plans are approved. Additionally, along with the monthly CD program schedule submitted as handouts at the EPA/FDEP/WASD CD monthly program meeting, CMOM consolidated implementation schedule monthly updates will be provided.

11. The GSSOMP repeatedly refers to being an interim plan, that is, the initial part of a phased plan. The expected duration of the "interim" period is not described (except for in Section 11 (Planned Staffing and Funding Plan) which lists it as a rolling 5-year period). The phased implementation approach makes supplements to the GSSOMP necessary to complete the requirements of Paragraph 19.(e). as implementation progresses beyond the initial phase. Miami-Dade shall provide a schedule for submittal of periodic supplements to the GSSOMP and a more definite schedule for full development and implementation of the GSSOMP by March 31, 2016.

RESPONSE: The CMOM consolidated implementation schedule provided on March 31, 2016 includes a detailed implementation schedule for the GSSOMP as well as the SORP, SSAMP and IMSP related implementation activities impacting the WWCTLD. For your convenience, Attachment A provides a copy of the March 31, 2016 submittal. It is Miami-Dade's objective to re-baseline the attached schedule, as applicable, when the respective plans are approved. Additionally, along with the monthly CD program schedule submitted as handouts at the EPA/FDEP/WASD CD monthly program meeting, CMOM consolidated implementation schedule monthly updates will be provided.

12. Table 01.2 contains the Gravity Sewer assets by pipe material. It shows the majority (87.1%) of the pipe material as "Not Determined." All of the Gravity Sewers have been inspected and/or televised many times over the last 20 years. The key to proper O&M is to use the inspections to develop data for planning future O&M needs and/or schedules. The material helps establish the useful life of the asset. This lack of data on pipe material shows a lack of personnel to manage the massive amount of information generated by Miami-Dade's numerous data sources. Please include details on how Miami-Dade will manage and use data collected during future inspections if the pipe material is truly unknown.

RESPONSE: Once the software and inspection tool, GraniteNet, is integrated with GIS and the SSAMP under IMSP implementation, the County will develop a procedure to integrate GraniteNet data to GIS. This procedure will improve the percentage of undetermined pipe material.

13. The level of service for inverted siphons of 20 percent inspected and cleaned in the submittal appears to be inadequate. The FDEP recommends a minimum of a 3-year cycle for all of the inverted siphons inspected and cleaned. If the inspection of an inverted siphon can be used to determine if the inverted siphon needs to be cleaned, the level of service for cleaning can be revised to as need basis (e.g. consider annual inspections and then cleaning as needed based on the inspection(s)). If the only way to inspect the inverted siphons is to clean the inverted siphons, cleaning and inspection should be combined.

RESPONSE: WASD presently maintains the three inverted siphons in its system on a 5-year cycle. Historically, the 5-year inspection and cleaning cycles have not identified any major deficiencies within the siphon. WASD commits to an initial 3-year cycle for the cleaning and inspection of the inverted siphons and the necessity for a 3- or 5- year cycle will be evaluated.

14. The purpose of inspections is to determine what maintenance is needed and when (e.g. determine whether or not cleaning or other maintenance is needed). The GSSOMP appears to show that inspections are not being used to determine the need for cleaning or other maintenance activity(ies). If Miami-Dade is going to clean the same sewers it inspects, the inspection may be excessive or duplicative work. Inspections should be used to determine what maintenance is needed for that specific asset and when that maintenance is needed. For example: Miami-Dade staff inspects a manhole. Based on the inspection, Miami-Dade can determine if cleaning is needed and, if not, when the next inspection should be performed. Another example for gravity mains:

a. The initial step in inspection of a gravity main is to lamp the line. If the lamping shows clean pipe with no or minimal Infiltration/Inflow (I/I), the inspection is complete and no cleaning or CCTV is needed. Subsequently, WASD should schedule the next inspection/lamping (e.g. in 3-years). If future inspections show the same conditions, extend the schedule for the subsequent lamping (e.g. in 5-years).

b. If the lamping shows need for cleaning, schedule the cleaning. After cleaning the gravity sewer pipe segment, establish the amount of material cleaned from the line segment. Then establish a schedule for the next lamping (e.g. 7-years for little material, 5-years for average material and 3-years for heavy material). Each subsequent cleaning should consider the previous amount collected. Eventually, Miami-Dade should have a schedule where an average amount of material is removed. During the cleaning, Miami-Dade should evaluate the need for CCTV of the pipe segment. If, during the cleaning, there is no leakage found and the collected material did not include soils/sand which appear to leak into the pipe from the ground through defects in the pipe and the lamping did not show offsets in the pipe, Miami-Dade can determine no CCTV of that pipe section is needed at that time. The evaluation should consider the age and

material of the pipe, as well as historical data (e.g. the pipe line was previously slip lined with continuous liner).

c. This cycle continues until all potential work has been determined to be needed, delayed or not needed and when such work will be completed.

RESPONSE: According to WEF Manual of Practice No. FD-6, Existing Sewer Evaluation and Rehabilitation, Chapter 3 - Methods of Structural Evaluation, Section 2.6.4 Lamping, "Lamping has limited use for the detailed structural assessment of a sewer line. Lamping will reveal large root masses, extreme situations of offset joints, and large areas of debris. However, defects, such as separated lateral connections and cracks, or precise distances to defects cannot be obtained by lamping. Lamping is an effective method of verifying defects in a manhole and any pipe within 1.5 m (5 ft) of the manhole." WASD believes that its current I/I program adequately addresses existing sewer evaluation. Miami-Dade's I/I Program as a whole has the combined benefit of I/I reduction and inspection. Cleaning and inspecting provides both the cost saving of I/I reduction and identification of maintenance needs which in the long run will reduce SSOs.

The above responses serve to clarify the intent of the GSSOMP submitted to EPA/FDEP on February 6, 2015 to fully comply with the requirements set forth in Paragraph 19(e) of the CD. Should you have any further questions regarding this matter, please call me at (786) 552-8571.

Sincerely,

Hardeep Anand, PE
Deputy Director

Attachment: Attachment A – CMOM Consolidated Implementation Schedule

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Attachment A
CMOM Consolidated Implementation Schedule

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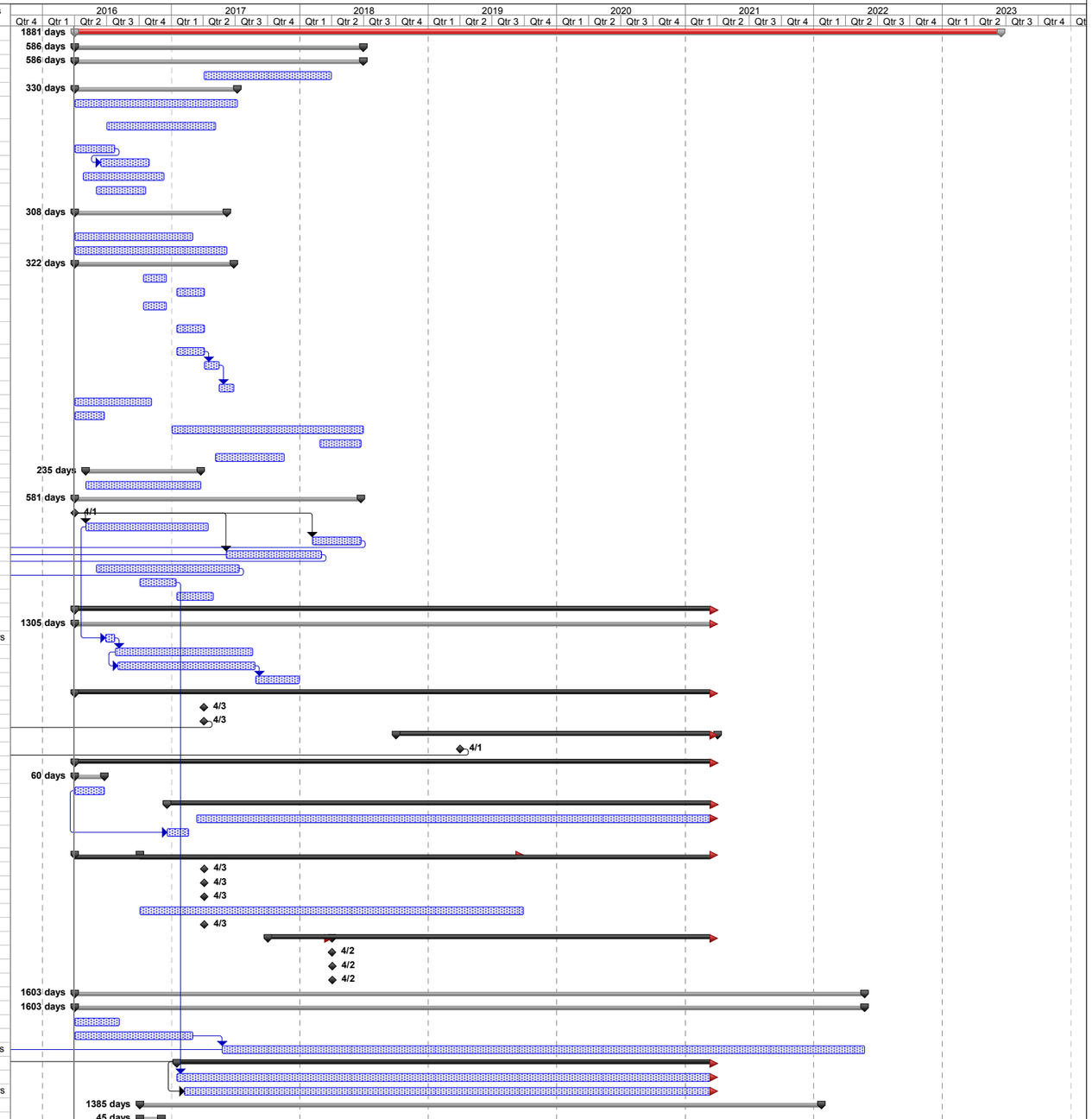
Miami-Dade Water and Sewer Department (WASD)
Capacity, Management, Operations and Maintenance (CMOM) Program
Consolidated Implementation Schedule

WOOLPERT
CMOM Program Team

ID	Task Name	Duration	Start	Finish	Predecessors
0	**Consolidated Implementation Schedule**	**1881 days**	**Fri 4/1/16**	**Fri 6/16/23**	
1	**Information Technology (IT) Division**	**586 days**	**Fri 4/1/16**	**Fri 6/29/18**	
2	**Management IMS**	**586 days**	**Fri 4/1/16**	**Fri 6/29/18**	
3	Develop Management IMS Dashboards	260 days	Mon 4/3/17	Fri 3/30/18	
4	GIS Program (CD Milestone)	**330 days**	**Fri 4/1/16**	**Thu 7/6/17**	
5	An updated GIS database to include all as-builts and Active As-built Supplemental Information System (“AASIS”) forms, including new and corrected asset attribute data (CD Milestone)	330 days	Fri 4/1/16	Thu 7/6/17	
6	Streamlining of the GIS data entry process. Included shall be development of a system to interface with the WCTS hydraulic computer model (CD Milestone)	221 days	Fri 7/1/16	Fri 5/5/17	
7	Simplification of the AASIS process to facilitate wider usage (CD Milestone)	81 days	Fri 4/1/16	Fri 7/22/16	
8	Development of a “flagging process” for damage investigators to note GIS inaccuracies (CD Milestone)	100 days	Mon 6/13/16	Fri 10/28/16	7FS-30 days
9	Provision for additional GIS training and refresher training (CD Milestone)	165 days	Mon 4/25/16	Fri 12/9/16	
10	Use of Dade On-Line Facilities Information Network version II (“DOLFIN II”) to facilitate more widespread access to GIS resources to remote staff	100 days	Wed 6/1/16	Tue 10/18/16	
11	Determination elevations of all manhole rim elevations and sewer inverts at connections to manholes and Pump Stations and their inclusion into GIS (CD Milestone)	**308 days**	**Fri 4/1/16**	**Tue 6/6/17**	
12	Collect data and provide to WASD	239 days	Fri 4/1/16	Wed 3/1/17	
13	Receive data and input into GIS	308 days	Fri 4/1/16	Tue 6/6/17	
14	Sewer Overflow Response Plan	**322 days**	**Fri 4/1/16**	**Mon 6/26/17**	
15	Include additional fields in the notification form to incorporate repeat SSO identification for each SSO incident.	47 days	Thu 10/13/16	Fri 12/16/16	
16	Develop a Building Backup notification form	56 days	Mon 1/16/17	Mon 4/3/17	
17	Incorporate additional tracking capabilities to ensure the elements of the separate tracking systems are incorporated into an Enterprise system application accessible to RER-DERM	47 days	Thu 10/13/16	Fri 12/16/16	
18	Incorporate the Building Backup tracking capabilities into the SSO Consolidated Database activity to ensure compatibility and ease of access	56 days	Mon 1/16/17	Mon 4/3/17	
19	Implement measures to record, track, and report on SORP performance measures	56 days	Mon 1/16/17	Mon 4/3/17	
20	Develop material for training activities, including workshops, field training, and/or coordination/training meetings to ensure staff are fully informed of the SORP-provisions	30 days	Tue 4/4/17	Mon 5/15/17	19
21	Develop material for refresher training on the Active As-built Supplemental Information System (AASIS) process (CD Milestone)	30 days	Tue 5/16/17	Mon 6/26/17	20
22	Enhanced Spill Application Module	156 days	Fri 4/1/16	Fri 11/4/16	
23	Construction Contracts Management project closeout business practices	60 days	Fri 4/1/16	Thu 6/23/16	
24	SCADA Archives Team	390 days	Mon 1/2/17	Fri 6/29/18	
25	Records Retention and Disposal Policy	85 days	Mon 2/26/18	Fri 6/22/18	
26	Additional IT User Training	140 days	Fri 5/5/17	Thu 11/16/17	
27	**Operations IMS**	**235 days**	**Mon 5/2/16**	**Fri 3/24/17**	
28	WWTMD Enhance MORS Functionality (Operations IMS)	235 days	Mon 5/2/16	Fri 3/24/17	
29	**Maintenance IMS**	**581 days**	**Fri 4/1/16**	**Fri 6/22/18**	
30	Purchase maintenance IMS software and hardware	**0 days**	**Fri 4/1/16**	**Fri 4/1/16**	
31	PSD EAMS Configuration	250 days	Mon 5/2/16	Fri 4/14/17	30
32	WWCTLD EAMS Functionality Enhancement	100 days	Mon 2/5/18	Fri 6/22/18	30
33	WWTMD Update EAMS Configuration	195 days	Mon 6/5/17	Fri 3/2/18	30
34	WWCTLD Implement GraniteNet & Integrate with EAMS	290 days	Wed 6/1/16	Tue 7/11/17	
35	WWCTLD WCTS Basin Prioritization Tool	75 days	Mon 10/3/16	Fri 1/13/17	
36	WWCLTD Night Flow Identification Tool	75 days	Mon 1/16/17	Fri 4/28/17	
37	**Pump Station Division (PSD)**	**1305 days**	**Fri 4/1/16**	**Thu 4/1/21**	
38	**Condition Assessment**	**1305 days**	**Fri 4/1/16**	**Thu 4/1/21**	
39	Develop protocol to update and maintain PS asset database	20 days	Mon 6/27/16	Fri 7/22/16	31SS+40 days
40	Complete PS asset inventory	280 days	Mon 7/25/16	Fri 8/18/17	39
41	Develop a Pump Station Technical Specifications Data Attribution	280 days	Mon 8/1/16	Fri 8/25/17	40SS+5 days
42	Update and refine critical spare parts	90 days	Mon 8/28/17	Fri 12/29/17	41
43	**Inspection**	**1305 days**	**Fri 4/1/16**	**Thu 4/1/21**	
44	Begin 24/7 SCADA alarm monitoring function by PSD	0 days	Mon 4/3/17	Mon 4/3/17	
45	Begin conducting routine inspections of wet well conditions	0 days	Mon 4/3/17	Mon 4/3/17	
46	**Predictive**	**654 days**	**Mon 10/1/18**	**Thu 4/1/21**	
47	Begin predictive maintenance activities	0 days	Mon 4/1/19	Mon 4/1/19	
48	**Maintenance**	**1305 days**	**Fri 4/1/16**	**Thu 4/1/21**	
49	**Training**	**60 days**	**Fri 4/1/16**	**Thu 6/23/16**	
50	Develop training program to promote a higher training level, including certifications for selected job positions	60 days	Fri 4/1/16	Thu 6/23/16	
51	**Maintenance Scheduling**	**1120 days**	**Mon 12/19/16**	**Sun 4/4/21**	
52	Oversight and development of maintenance scheduling for routine, preventative, and predictive maintenance in EAMS	1059 days	Mon 3/13/17	Thu 4/1/21	
53	Analyze communications options, such as radio, cellular, beeper, etc., to determine best means of communications between field personnel and supervisors	45 days	Mon 12/19/16	Fri 2/17/17	50SS
54	**Routine/Preventative**	**1305 days**	**Fri 4/1/16**	**Thu 4/1/21**	
55	Begin performing mechanical preventative maintenance at regional pump stations	0 days	Mon 4/3/17	Mon 4/3/17	
56	Begin providing support to O&M staff and manage capital improvements to mechanical equipment.	0 days	Mon 4/3/17	Mon 4/3/17	
57	Begin maintenance cycles for instrumentation located in the pump stations.	0 days	Mon 4/3/17	Mon 4/3/17	
58	Progressively ramp up staffing to return PS maintenance crew to optimal levels (including 2nd and 3rd shifts)	780 days	Mon 10/3/16	Fri 9/27/19	
59	Begin performing routine wet well cleaning.	0 days	Mon 4/3/17	Mon 4/3/17	
60	**Corrective**	**914 days**	**Mon 10/2/17**	**Thu 4/1/21**	
61	Begin pump station emergency generator and portable pump diesel equipment maintenance cycles	0 days	Mon 4/2/18	Mon 4/2/18	
62	Establish submersible pump repair shops and begin in-house repairs of submersible pumps	0 days	Mon 4/2/18	Mon 4/2/18	
63	Begin structural maintenance cycles	0 days	Mon 4/2/18	Mon 4/2/18	
64	**Wastewater Collection and Transmission Line Division (WWCTLD)**	**1603 days**	**Fri 4/1/16**	**Tue 5/24/22**	
65	**Condition Assessment**	**1603 days**	**Fri 4/1/16**	**Tue 5/24/22**	
66	Implement a pilot program to monitor the pH of sewage flow from select WASD industrial customers	90 days	Fri 4/1/16	Thu 8/4/16	
67	Develop the Force Main Criticality Assessment and Prioritization Report (CD Milestone)	239 days	Fri 4/1/16	Wed 3/1/17	
68	Force Main Assessment (CD Milestone)	1304 days	Thu 5/25/17	Tue 5/24/22	67FS+60 days
69	GSS cleaning/inspection	**1099 days**	**Mon 1/16/17**	**Thu 4/1/21**	
70	Conduct GSS inspections as determined by prioritization strategy	1099 days	Mon 1/16/17	Thu 4/1/21	35
71	WWCTLD maintenance GSS repairs	1084 days	Mon 2/6/17	Thu 4/1/21	69SS+15 days
72	**Inspection and Maintenance**	**1385 days**	**Mon 10/3/16**	**Fri 1/21/22**	
73	**Training**	**45 days**	**Mon 10/3/16**	**Fri 12/2/16**	



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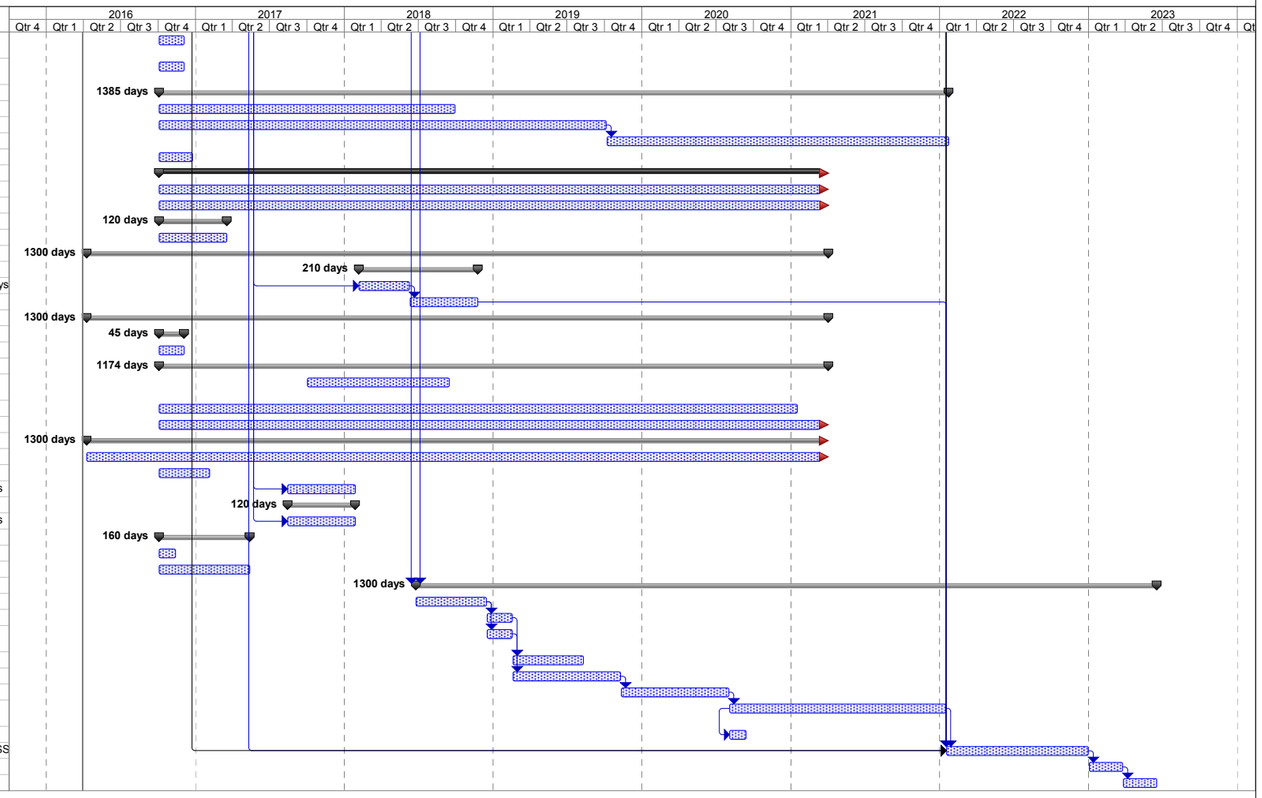
Task | Split | Milestone | Summary | Project Summary | External Tasks | External Milestone | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | Progress | Deadline

ID	Task Name	Duration	Start	Finish	Predecessors
74	Develop training plan for the new and existing construction management staff with regards to proper pipe handling, bedding, coating and field repair.	45 days	Mon 10/3/16	Fri 12/2/16	
75	Develop material for Utility Locations and Special Billings staff to offer a Contractor Outreach Workshop, or other educational activity as might be identified.	45 days	Mon 10/3/16	Fri 12/2/16	
76	**Inspection**	**1385 days**	**Mon 10/3/16**	**Fri 1/21/22**	
77	Add resources for GSS inspection and repair to address the existing backlog of regulatory compliance	520 days	Mon 10/3/16	Fri 9/28/18	
78	Add resources for FMO inspection and repair to address the existing backlog of regulatory compliance	785 days	Mon 10/3/16	Fri 10/4/19	
79	Provide a comprehensive inspection of WCTS easements utilizing vendor services and identify current encroachments	600 days	Mon 10/7/19	Fri 1/21/22	78
80	Develop integrated electronic manhole inspection data collection form	60 days	Mon 10/3/16	Fri 12/23/16	
81	**Routine/Preventative**	**1174 days**	**Mon 10/3/16**	**Thu 4/1/21**	
82	Add resources to continue and expand the execution of the existing preventative maintenance program for GSS Section	1174 days	Mon 10/3/16	Thu 4/1/21	
83	Add resources to continue and expand the execution of the existing preventative maintenance program for FMO Section	1175 days	Mon 10/3/16	Fri 4/2/21	
84	**Predictive**	**120 days**	**Mon 10/3/16**	**Fri 3/17/17**	
85	Deploy Smart Covers to all “hot spots” to closely monitor and provide data to better assess these areas	120 days	Mon 10/3/16	Fri 3/17/17	
86	**Wastewater Treatment and Maintenance Division (WWTMD)**	**1300 days**	**Fri 4/8/16**	**Thu 4/1/21**	
87	**Condition Assessment**	**210 days**	**Mon 2/5/18**	**Fri 11/23/18**	
88	Develop the Maintenance Work Management Guideline	90 days	Mon 2/5/18	Fri 6/8/18	33SS+160 days
89	Condition assessments will be performed on highly critical (#5 – Hazard) equipment and systems	120 days	Mon 6/11/18	Fri 11/23/18	88
90	**Inspection and Maintenance**	**1300 days**	**Fri 4/8/16**	**Thu 4/1/21**	
91	**Training**	**45 days**	**Mon 10/3/16**	**Fri 12/2/16**	
92	Develop training plan for new staff to capture knowledge of unique operating and maintenance characteristics	45 days	Mon 10/3/16	Fri 12/2/16	
93	**Inspection**	**1174 days**	**Mon 10/3/16**	**Thu 4/1/21**	
94	Add staff to create a new Maintenance Management Support Group for the support of maintenance activities and develop a long-term strategic program	250 days	Mon 10/2/17	Fri 9/14/18	
95	Update and maintain WWTMD website for access on general information such as; septic waste disposal and public tours	1120 days	Mon 10/3/16	Fri 1/15/21	
96	Track established performance measures to objectively plan, and adjust resource funding levels	1174 days	Mon 10/3/16	Thu 4/1/21	
97	**Routine/Preventative**	**1300 days**	**Fri 4/8/16**	**Thu 4/1/21**	
98	Peform routine/preventative O&M activities within WWTPs	1300 days	Fri 4/8/16	Thu 4/1/21	
99	Develop Standard Operating Procedures for emergency and/or critical operational events	90 days	Mon 10/3/16	Fri 2/3/17	
100	Implement PM Program as part of the Maintenance Work Management Guideline	120 days	Mon 8/14/17	Fri 1/26/18	33SS+50 days
101	**Corrective**	**120 days**	**Mon 8/14/17**	**Fri 1/26/18**	
102	Implement Corrective Maintenance Program as part of the Maintenance Work Management Guideline.	120 days	Mon 8/14/17	Fri 1/26/18	33SS+50 days
103	**Predictive**	**160 days**	**Mon 10/3/16**	**Fri 5/12/17**	
104	Add condition-based monitoring of vibration and other indicators to the current PdM activities	30 days	Mon 10/3/16	Fri 11/11/16	
105	Monitor the Hauled Waste Program and adjust procedures to ensure effective management of the program.	160 days	Mon 10/3/16	Fri 5/12/17	
106	**Asset Management**	**1300 days**	**Mon 6/25/18**	**Fri 6/16/23**	**32,33**
107	Hire or Appoint an Asset Management Program Manager and its needed resources	125 days	Mon 6/25/18	Fri 12/14/18	
108	Develop / Assemble Program foundational elements such as Policies, Strategies, Objectives and Plans	45 days	Mon 12/17/18	Fri 2/15/19	107
109	Define the organizational resource needs (skill sets and number of resources) to sustain the SSAMP and O&M Plans beyond their initial execution	45 days	Mon 12/17/18	Fri 2/15/19	107
110	Hire or assign resources to the Asset Management program team	125 days	Mon 2/18/19	Fri 8/9/19	109
111	Perform market research to identify the potential software/tools/products that support asset-based life cycle costing	190 days	Mon 2/18/19	Fri 11/8/19	108
112	Develop and issue an RFQ, select a new product or new functionality and implement the solution on WASD systems	190 days	Mon 11/11/19	Fri 7/31/20	111
113	Implement the life cycle costing product, one Division at a time. Replicate the effort across the entire WASD WCTS dataset. (Note that asset inventories, identification of critical assets, and condition assessments must be available for these analyses)	380 days	Mon 8/3/20	Fri 1/14/22	112
114	Incorporate climate resiliency feature in life cycle costing product	30 days	Mon 8/3/20	Fri 9/11/20	113SS
115	Use the software to perform multiple life cycle costing what-if scenarios	250 days	Mon 1/17/22	Fri 12/30/22	113,45,47,68SS
116	Select one proposed life cycle costing scenario for future cost projections	60 days	Mon 1/2/23	Fri 3/24/23	115
117	Develop long term life cycle cost projections for 5 to 50 year planning period	60 days	Mon 3/27/23	Fri 6/16/23	116



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