Compliance Maintenance Annual Report

Madison Sewage Collection System

Last Updated: 5/14/2021 Reporting For: **2020**

Financial Management

1. Provider of Financial Information

Name: Steve Danner-Rivers

Telephone: (608) 261-9689 (XXX) XXX-XXXX

E-Mail Address (optional): sdannerrivers@cityofmadison.com

2. Treatment Works Operating Revenues

2.1 Are User Charges or other revenues sufficient to cover O&M expenses for your wastewater treatment plant AND/OR collection system ?

- ● Yes (0 points) ☐☐
- ○ No (40 points)

If No, please explain:

2.2 When was the User Charge System or other revenue source(s) last reviewed and/or revised?

Year: 2021

- ● 0-2 years ago (0 points) ☐☐
- ○ 3 or more years ago (20 points)☐☐
- ○ N/A (private facility)

2.3 Did you have a special account (e.g., CWFP required segregated Replacement Fund, etc.) or financial resources available for repairing or replacing equipment for your wastewater treatment plant and/or collection system?

- ● Yes (0 points)
- ○ No (40 points)

0

REPLACEMENT FUNDS [PUBLIC MUNICIPAL FACILITIES SHALL COMPLETE QUESTION 3]

3. Equipment Replacement Funds

3.1 When was the Equipment Replacement Fund last reviewed and/or revised?

Year: 2020

- ● 1-2 years ago (0 points)☐☐
- ○ 3 or more years ago (20 points)☐☐
- ○ N/A

If N/A, please explain:

3.2 Equipment Replacement Fund Activity

3.2.1 Ending Balance Reported on Last Year's CMAR		$ 478,423.07
3.2.2 Adjustments - if necessary (e.g. earned interest, audit correction, withdrawal of excess funds, increase making up previous shortfall, etc.)		$ 0.00
3.2.3 Adjusted January 1st Beginning Balance		$ 478,423.07
3.2.4 Additions to Fund (e.g. portion of User Fee, earned interest, etc.)	+	$ 893,000.00

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3.2.5 Subtractions from Fund (e.g., equipment replacement, major repairs - use description box 3.2.6.1 below*) - $ 152,560.94

3.2.6 Ending Balance as of December 31st for CMAR Reporting Year $ 1,218,862.13

All Sources: This ending balance should include all Equipment Replacement Funds whether held in a bank account(s), certificate(s) of deposit, etc.

3.2.6.1 Indicate adjustments, equipment purchases, and/or major repairs from 3.2.5 above.

Controls Upgrade at Fayette & Woodley Lift Stations
Pump Replacement at Fremont Lift Station
Rehab Planning/Design of Truax, Thurber & Harper Lift Stations

3.3 What amount should be in your Replacement Fund? $ 0.00

0

Please note: If you had a CWFP loan, this amount was originally based on the Financial Assistance Agreement (FAA) and should be regularly updated as needed. Further calculation instructions and an example can be found by clicking the SectionInstructions link under Info header in the left-side menu.

3.3.1 Is the December 31 Ending Balance in your Replacement Fund above, (#3.2.6) equal to, or greater than the amount that should be in it (#3.3)?

- ● Yes
- ○ No

If No, please explain.

4. Future Planning

4.1 During the next ten years, will you be involved in formal planning for upgrading, rehabilitating, or new construction of your treatment facility or collection system?

- ● Yes - If Yes, please provide major project information, if not already listed below.☐☐
- ○ No

Project #	Project Description	Estimated Cost	Approximate Construction Year
1	Sewer Impact Fee Districts: This program extends sanitary sewer service to developing areas of the City that require sewer infrastructure installation. The program is funded entirely by Impact Fees, and review for planned projects is conducted annually as dictated by demand for development. Amount shown is the estimate for 2023-2024.	2,200,000	
2	Sewer Reconstruction: This project involves the replacement of older, problematic sewers in coordination with the City's Street Reconstruction and Pavement Management Program or as 'stand alone' projects. Typically this provides for the replacement of clay sewers that are difficult to maintain, nearing the end of their service life, have significant repair costs or are undersized. Also, the Sewer Utility encourages residents to replace the portion of their sewer lateral that lies within the public right-of-way by offering to fund 75% of the cost. Six-inch mains under streets that are being reconstructed will be replaced because they do not meet current codes. Sewers beneath streets being resurfaced are evaluated for replacement on a case-by-case basis. Amount shown is the estimate for 2021-2026.	69,695,000	

3	Trenchless Sewer Rehabilitations: This program rehabilitates failing sewers that meet certain criteria but do not necessitate the need for a complete replacement by means of open cutting. New technology allows the lining of existing sewer mains using cameras and remote controlled tools. Some are also rehabilitated (or lined) to address inflow and infiltration problems, where clear water flow enters the sewer system, reducing pipe capacity and increasing treatment costs. The amount budgeted will repair approximately seven miles of sewer main at a number of strategically selected locations, based on citywide need. This item may also include replacement of inaccessible sewers by a 'direct bore' method, which is a relatively new technology for replacement of gravity sewer mains. Backyard sewer mains are a focus. Amount shown is the estimate for 2021-2026.	10,504,000	
4	Citywide Pumping Stations-Emergency Power Stationary Generators: This program funds the installation of emergency power stationary generators at the City's pumping stations. The goal of the program is to ensure continuous service in the event of a power loss. Amount shown is for 2021-2026.	350,000	

5. Financial Management General Comments

Annually, the City of Madison adopts a Capital Budget which funds equipment replacement and infrastructure improvements, listed in a project format. Each project is reviewed and the funding amount for the next budget year is determined. In addition, the budget details future year estimates for the five subsequent years for each project.

ENERGY EFFICIENCY AND USE

6. Collection System

6.1 Energy Usage

6.1.1 Enter the monthly energy usage from the different energy sources:

COLLECTION SYSTEM PUMPAGE: Total Power Consumed

Number of Municipally Owned Pump/Lift Stations: 30

	Electricity Consumed (kWh)	Natural Gas Consumed (therms)
January	54,343	256
February	54,254	247
March	50,830	178
April	49,103	65
May	43,603	33
June	45,806	24
July	47,151	56
August	43,842	20
September	39,801	22
October	42,036	76
November	42,760	39
December	44,762	234
Total	**558,291**	**1,250**
Average	**46,524**	**104**

6.1.2 Comments:

6.2 Energy Related Processes and Equipment

6.2.1 Indicate equipment and practices utilized at your pump/lift stations (Check all that apply):

- ☐ Comminution or Screening
- ☒ Extended Shaft Pumps
- ☒ Flow Metering and Recording
- ☒ Pneumatic Pumping
- ☒ SCADA System
- ☒ Self-Priming Pumps
- ☒ Submersible Pumps
- ☐ Variable Speed Drives
- ☐ Other:

6.2.2 Comments:

6.3 Has an Energy Study been performed for your pump/lift stations?

- ● No
- ○ Yes

Year:

By Whom:

Describe and Comment:

6.4 Future Energy Related Equipment

6.4.1 What energy efficient equipment or practices do you have planned for the future for your pump/lift stations?

The City plans to replace four lift stations within the next 5 years because the stations require excessive repair work or they have reached the end of their service life(50+ years old). The new pumps and equipment will be more energy efficient than the old equipment.

Total Points Generated	0
Score (100 - Total Points Generated)	100
Section Grade	**A**

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Sanitary Sewer Collection Systems

1. Capacity, Management, Operation, and Maintenance (CMOM) Program

1.1 Do you have a CMOM program that is being implemented?

- ● Yes
- ○ No

If No, explain:

1.2 Do you have a CMOM program that contains all the applicable components and items according to Wisc. Adm Code NR 210.23 (4)?

- ● Yes
- ○ No (30 points)
- ○ N/A

If No or N/A, explain:

1.3 Does your CMOM program contain the following components and items? (check the components and items that apply)

☒ Goals [NR 210.23 (4)(a)]

Describe the major goals you had for your collection system last year:

Goals & Objectives
A. DNR Required
The City of Madison's CMOM program is designed to ensure that the following general standards as articulated in NR 210.23 are met:
1. The sewage collection system is properly managed, operated, and maintained at all times.
2. The sewage collection system provides adequate capacity to convey all peak design flows.
3. All feasible steps are taken to eliminate excessive infiltration and inflow as defined in s. NR 110.03 (13c), cease sanitary sewer overflows and sewage treatment facility overflows and mitigate the impact of such overflows on waters of the state, the environment, and public health.
4. A process is in place to notify the public and other directly affected parties of any incidents of overflows from the sewerage system.
5. Annual reports are submitted in accordance with the provisions of ch. NR 208.
B. MSU Specific
The City of Madison's goals for the operation and maintenance of its wastewater collection system are:
• Convey wastewater to the Nine Springs Wastewater Treatment Plant with minimum inflow,infiltration and exfiltration.
• Prevent public health hazards.
• Reduce inconvenience and damage by responsibly handling service interruptions.
• Eliminate claims and legal fees related to backup by providing immediate, concerned and efficient service to all emergency calls.
• Protect municipal investment by increasing the useful life and capacities of the system and parts.
• Use operating funds efficiently.
• Perform all activities safely and avoid injury.

Did you accomplish them?

- ● Yes
- ○ No

If No, explain:

☒ Organization [NR 210.23 (4) (b)]☐☐

Does this chapter of your CMOM include:

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☒ Organizational structure and positions (eg. organizational chart and position descriptions)
☒ Internal and external lines of communication responsibilities
☒ Person(s) responsible for reporting overflow events to the department and the public

☒ Legal Authority [NR 210.23 (4) (c)]

What is the legally binding document that regulates the use of your sewer system?
Chapter 35 of the Madison General Ordinances The Public Sewage System

If you have a Sewer Use Ordinance or other similar document, when was it last reviewed and revised? (MM/DD/YYYY) 2020-04-14

Does your sewer use ordinance or other legally binding document address the following:
☒ Private property inflow and infiltration
☒ New sewer and building sewer design, construction, installation, testing and inspection
☒ Rehabilitated sewer and lift station installation, testing and inspection
☐ Sewage flows satellite system and large private users are monitored and controlled, as necessary
☒ Fat, oil and grease control
☒ Enforcement procedures for sewer use non-compliance

☒ Operation and Maintenance [NR 210.23 (4) (d)]

Does your operation and maintenance program and equipment include the following:
☒ Equipment and replacement part inventories
☒ Up-to-date sewer system map
☒ A management system (computer database and/or file system) for collection system information for O&M activities, investigation and rehabilitation
☒ A description of routine operation and maintenance activities (see question 2 below)
☒ Capacity assessment program
☒ Basement back assessment and correction
☒ Regular O&M training

☒ Design and Performance Provisions [NR 210.23 (4) (e)]☐☐

What standards and procedures are established for the design, construction, and inspection of the sewer collection system, including building sewers and interceptor sewers on private property?
☒ State Plumbing Code, DNR NR 110 Standards and/or local Municipal Code Requirements
☒ Construction, Inspection, and Testing
☒ Others:

City of Madison Standard Specifications for Public Works Construction

☒ Overflow Emergency Response Plan [NR 210.23 (4) (f)]☐☐

Does your emergency response capability include:
☒ Responsible personnel communication procedures
☒ Response order, timing and clean-up
☒ Public notification protocols
☒ Training
☒ Emergency operation protocols and implementation procedures

☒ Annual Self-Auditing of your CMOM Program [NR 210.23 (5)]☐☐

☒ Special Studies Last Year (check only those that apply):
☒ Infiltration/Inflow (I/I) Analysis
☒ Sewer System Evaluation Survey (SSES)
☒ Sewer Evaluation and Capacity Managment Plan (SECAP)
☒ Lift Station Evaluation Report
☒ Others:

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I/I Analysis- The City has 3 areas (Hargrove/Johns Street, Truax Airport, and Midtown Pumping Station) where we experience high pump run times during wet weather events. Pump run time and flow monitoring data combined CCTV inspection have been used to identify issues in these area and develop strategies for reducing I/I. Point repairs, open-cut and trenchless are used to remedy isolated defects. Replacement and manhole-to-manhole lining are used to address mains with numerous defects. Since the initial 2012 study 65,680 LF of mains have been replaced or lined in the Hargrove/Johns area. In 2021 two projects will replace an additional 4,780' of main in this area. Private sewer laterals will also be replaced as part of these projects. Studies were conducted in the Truax Airport Lift Station Basin in 2004 and 2015. Since then 14,385 of sewer main has been replaced or lined. Additionally, 19 structures were lined. The Mid-Town basin which is less than 20 years old continues to experience high pump run times during rain events. We have raised and wrapped manholes located off pavement and used CCTV to inspect the mains and have yet to identify the source of I/I. In 2020, the City experienced 2 major rain events on the west side exceeding 2 inches (July 9th - 2.74 inches and the October 22nd - 2.26 inches). Following the 7/9/2020 rain event the Midtown lift station flow was 133% of normal flow (average flow 250,444 gpd; 322,280 gpd during rain event). Following the 10/22/21 rain event flow was 153% of normal. The east side, had significant rain events on July 7th (2.17") and July 9th (1.97"). On July 10th flow at the lift station serving the Hargrove/Johns area was 2.73 MGD (149% over average flow). In the Truax basin, we observed 0.98 MGD (184% over average flow) on July 10th. SSES – The City regularly televises sanitary sewer mains to evaluate performance and plan for improvements to system based upon pipe defects(broken, fractured pipe, root obstructions, sags) or capacity concerns (pipe appears to be running at high levels). SECAP - While the City is not required to have a formal SECAP plan, we have been closely monitoring the downtown redevelopment monitoring our capacity needs and upsizing sewer interceptors where it is needed. The City did do a study in 2015 of the sewer capacity needs in the near east side and the campus area where there has been a significant high density residential growth. The City had planned to upsize the sanitary sewer on Frances Street from Dayton Street north to University Ave., 1,158' of sewer to a 27" diameter sewer within the next 5 years. In 2016, as a result of an 836 bedroom development at Bassett and University, the City installed a diversion sewer on Bassett Street to take flow off of the Frances Street sewer. In 2018. 2019 and 2020, the City installed 2 flow monitors downtown in the UW campus area: one Frances St. and one on Langdon/ Lake Street. As a result of the sewer flow diversion, the Frances Street sewer appears to have residual capacity (3.86 cfs residual of the total 6.15 cfs capacity). We rechecked this in October of 2020 and found that we have (4.76 cfs residual of the total 6.15 cfs capacity). It is noteworthy that in 2020, the downtown campus are was impacted by COVID-19 with many students attending the UW Madison remotely. The diversion sewer on Bassett Street appears to have relieved sewer capacity problems on Frances Street. Lift Station Evaluation Report- the City's Lift Stations are maintained and operated by the Madison Metropolitan Sewerage District. MMSD provides the City updates if there are pump run time spikes and or if there are problems with operation of the stations. The City also meets annually with MMSD to identify which stations have been problematic through the year. They also notify the City which stations are in need of upgrades whether it being upgrading pumps, electrical upgrades or complete pumping station renovation.	**0**
2. Operation and Maintenance	

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2.1 Did your sanitary sewer collection system maintenance program include the following maintenance activities? Complete all that apply and indicate the amount maintained.

Cleaning	55.55	% of system/year
Root removal	0.44	% of system/year
Flow monitoring	4	% of system/year
Smoke testing	0	% of system/year
Sewer line televising	5.47	% of system/year
Manhole inspections	3.46	% of system/year
Lift station O&M	72.8	# per L.S./year
Manhole rehabilitation	0.59	% of manholes rehabbed
Mainline rehabilitation	2.74	% of sewer lines rehabbed
Private sewer inspections	0	% of system/year
Private sewer I/I removal	0	% of private services
River or water crossings	64.12	% of pipe crossings evaluated or maintained

Please include additional comments about your sanitary sewer collection system below:

3. Performance Indicators

3.1 Provide the following collection system and flow information for the past year.

38.92	Total actual amount of precipitation last year in inches
34.48	Annual average precipitation (for your location)
798	Miles of sanitary sewer
30	Number of lift stations
0	Number of lift station failures
21	Number of sewer pipe failures
10	Number of basement backup occurrences
26	Number of complaints
26.45	Average daily flow in MGD (if available)
	Peak monthly flow in MGD (if available)
	Peak hourly flow in MGD (if available)

3.2 Performance ratios for the past year:

0.00	Lift station failures (failures/year)
0.03	Sewer pipe failures (pipe failures/sewer mile/yr)
0.00	Sanitary sewer overflows (number/sewer mile/yr)
0.01	Basement backups (number/sewer mile)
0.03	Complaints (number/sewer mile)
0.0	Peaking factor ratio (Peak Monthly:Annual Daily Avg)
0.0	Peaking factor ratio (Peak Hourly:Annual Daily Avg)

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4. Overflows

LIST OF SANITARY SEWER (SSO) AND TREATMENT FACILITY (TFO) OVERFLOWS REPORTED **				
	Date	Location	Cause	Estimated Volume
0	4/4/2020 11:30:00 AM - 4/4/2020 11:35:00 AM	2453 Grimm St. Madison WI 53704	Broken Sewer, Broken Sewer, Other causes	1,000

** If there were any SSOs or TFOs that are not listed above, please contact the DNR and stop work on this section until corrected.

What actions were taken, or are underway, to reduce or eliminate SSO or TFO occurences in the future?

This SSO was from a privately owned lift station and should not be attributed to the City. The City responded to the SSO and addressed the problem, then notified DNR and the property owner.

5. Infiltration / Inflow (I/I)

5.1 Was infiltration/inflow (I/I) significant in your community last year?

○ Yes

● No

If Yes, please describe:

5.2 Has infiltration/inflow and resultant high flows affected performance or created problems in your collection system, lift stations, or treatment plant at any time in the past year?

○ Yes

● No

If Yes, please describe:

5.3 Explain any infiltration/inflow (I/I) changes this year from previous years:

In 2020, the City of Madison did not experience significant I/I where we had impacts to properties. The 2020 storm events were not as significant storm events as we have had in the recent past. The largest storm event was on July 10th (2.74 inches) on the west side, and July 9th (2.17 inches on East Side (airport). However, we do continue to observe increase in pump run times in the 3 basins during rain events. The additional wastewater flow was not a problem for the City's collection system. We did not experience sewer backups or SSOs as a result of the 2020 rain events.

5.4 What is being done to address infiltration/inflow in your collection system?

The City continues to monitor problem areas in the collection system where we have observed Infiltration/ Inflow (I/I). The primary method to correct I/I has been the City's aggressive Cured in Place Lining program (approximately 7 miles of pipe lined per year). The other method to address I/I has been replacing sewer mains and laterals with street reconstruction projects. Manholes installed in high groundwater areas with construction projects are wrapped at the joints to prevent seepage of groundwater into the sanitary sewer. All sanitary manholes installed near street low points include internal chimney seals to prevent water from entering the sanitary sewer through the manhole's adjustment rings. The City had a City wide manhole lining project planned for construction in 2019 (bid in 2018) to also address I/I (53 manholes) but very limited rehabilitation work in 2020.

Beyond construction projects, clearwater sources such as roof drain and sump pump connections are eliminated as they are discovered with our studies, smoke testing, and through televising.

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Total Points Generated	0
Score (100 - Total Points Generated)	100
Section Grade	**A**

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Grading Summary

WPDES No: 0047341

SECTIONS	LETTER GRADE	GRADE POINTS	WEIGHTING FACTORS	SECTION POINTS
Financial	A	4	1	4
Collection	A	4	3	12
TOTALS			**4**	**16**
GRADE POINT AVERAGE (GPA) = 4.00				

Notes:
A = Voluntary Range (Response Optional)
B = Voluntary Range (Response Optional)
C = Recommendation Range (Response Required)
D = Action Range (Response Required)
F = Action Range (Response Required)

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Resolution or Owner's Statement

Name of Governing Body or Owner:

Date of Resolution or Action Taken:

Resolution Number:

Date of Submittal:

ACTIONS SET FORTH BY THE GOVERNING BODY OR OWNER RELATING TO SPECIFIC CMAR SECTIONS (Optional for grade A or B. Required for grade C, D, or F):

Financial Management: Grade = A

Collection Systems: Grade = A

(Regardless of grade, response required for Collection Systems if SSOs were reported)

ACTIONS SET FORTH BY THE GOVERNING BODY OR OWNER RELATING TO THE OVERALL GRADE POINT AVERAGE AND ANY GENERAL COMMENTS

(Optional for G.P.A. greater than or equal to 3.00, required for G.P.A. less than 3.00)

G.P.A. = 4.00