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ENGINEERS, INC.

Engineering Client Success

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LETTER OF TRANSMITTAL

DATE: 02/28/19	JOB NO.: 2018149
ATTENTION: Ms. Bailey Taylor	
RE: Mena Water Utilities WWTP NPDES No. AR0036692	

TO: Ms. Bailey Taylor
Arkansas Dept of Environmental Quality
5301 Northshore Drive
North Little Rock, Arkansas 72118

WE ARE SENDING YOU VIA:

FAX MAIL FEDEX HAND DELIVERY
Hilary

THE FOLLOWING DOCUMENTS ARE ENCLOSED:

PLANS AND SPECIFICATIONS CHANGE ORDER COPY OF LETTER SOQ
 CONTRACT DOCUMENTS PAY ESTIMATE ELECTRONIC COPY OTHER


COPIES	DATE	NO.	DESCRIPTION
1			Modified Corrective Action Plan CAO LIS 18-046 dated February 28, 2019 Mena Water Utilities WWTP - NPDES No. AR0036692, AFIN: 57-00423

THESE ARE TRANSMITTED as checked below:

FOR YOUR USE FOR YOUR SIGNATURE FOR YOUR FILES
 FOR YOUR REVIEW AND COMMENTS PER YOUR REQUEST REVIEWED BY ENGINEER
 FOR BIDS DUE _____
 OTHER _____

REMARKS: _____

COPY TO: _____

SIGNED: 
Hilary DuBois, Administrative Assistant

If enclosures are not as noted, kindly notify us at once

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MODIFIED CORRECTIVE ACTION PLAN

CAO LIS 18-046

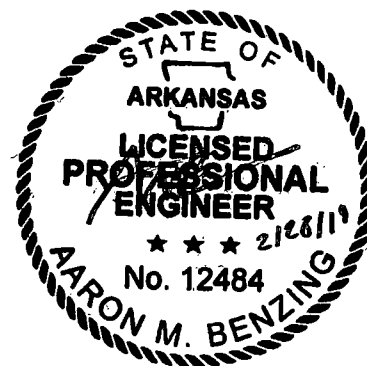
MENA WATER UTILITIES

WASTEWATER TREATMENT PLANT

NPDES No. AR0036692 AFIN: 57-00423

CITY OF MENA

ARKANSAS



HWEI PROJECT No. 2018149

FEBRUARY 28, 2019

PREPARED BY

HW **HAWKINS WEIR**
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1.0 INTRODUCTION

1.1 Existing Facilities

Mena Water Utilities' ("Utility") Wastewater Treatment Plant (WWTP) (AFIN 57-00423) is operated per the requirements of NPDES AR0036692. The WWTP, which was originally constructed in 1970, has been upgraded several times over its nearly 50-year operational life. The facility was originally constructed as a two-cell facultative lagoon. In 1986 sand filtration was added to the plant to improve effluent quality. A decade later fine bubble diffused aeration was installed in both lagoons to enhance biological treatment. In 2004, a coagulation basin was installed prior to filtration. Subsequently, a mechanically cleaned bar screen was added to the WWTP in 2011.

Sludge accumulation in both lagoons may be limiting the WWTP's treatment capacity. Seepage has been noted on outer slope of Lagoon No. 2's levee which could indicate a structural problem. The sand filters have exceeded their design life and are no longer serviceable by their manufacturer. The diffused aeration system has required significant maintenance since it was installed and continued maintenance issues are anticipated. The Utility has done a commendable job operating this facility for nearly half a century, but as a result of age and more restrictive permit requirements, improvements are needed to ensure consistent permit compliance.

1.2 Consent Administrative Order

The City of Mena entered into Consent Administrative Order LIS 18-046 (CAO) with the Arkansas Department of Environmental Quality (ADEQ) on June 10, 2018. In summary, the CAO was issued to address sanitary sewer overflows (SSOs), repeated discharge from an unpermitted outfall, and exceedances of permitted values for Total Suspended Solids (TSS) and Ammonia Nitrogen. One of the CAO requirements was that a Corrective Action Plan (CAP) be submitted if the facility could not immediately comply with all permitted effluent limits. A CAP, prepared by CLB Engineers, Inc. and dated November 17, 2018, was approved by ADEQ on November 30, 2018. That CAP included a completion date of March 31, 2019 after which the City of Mena would be expected to achieve consistent compliance with its Permit requirements.

1.3 Modified Corrective Action Plan

Hawkins-Weir Engineers, Inc. (HW) was retained by the Utility in January 2019 to address the requirements of their CAP and provide a Wastewater Treatment Masterplan ("Plan") for the utility. After a review of the Utility's treatment facility and compliance history, HW concluded that the milestone corrective actions identified in the CAP were not sufficient to

allow consistent compliance with the Facility's Permit requirements. HW met with ADEQ on February 11, 2019 to discuss their findings. At the conclusion of that meeting, ADEQ requested that the Utility submit a revised CAP. ADEQ also agreed to accommodate an anticipated extension of the timeline required to implement the additional corrective actions recommended in the modified CAP. This document is intended to serve as the Modified Corrective Action Plan for Mena Water Utilities.

2.0 COMPLIANCE CONCERNS

2.1 Lagoon Integrity

The Utility has noted what is believed to be areas of abnormally high moisture along the back slope of the Lagoon No. 2 levee in approximately six (6) locations. They have expressed concern that the moisture could be caused by seepage. A levee breach would significantly impact the ability of the current WWTP to comply with its permit limits. An investigation is warranted to determine if the levee is at imminent risk of failure. This investigation would need to be performed during the driest part of the year. If the risk of imminent failure exists, immediate measures should be taken to secure the levee. If, on the other hand, no cause for immediate concern is noted, further steps, if any, should not be taken until the future use of the lagoon as a part of Mena's wastewater treatment system is identified by the Masterplan.

2.2 Peak Flow

Not unlike most other cities in Arkansas and across the United States, the City of Mena's aging wastewater collection and treatment systems are subjected to peak flows resulting from inflow & infiltration (I/I) during wet weather periods. The Utility has acquired the services of a separate professional engineering firm to identify and prioritize the improvements needed within its collection system. That firm anticipates submitting a draft SSES Report to the Utility by May 1, 2019. The Utility has already begun making sewer system repairs in areas identified by the sewer system evaluation.

HW's scope is to recommend a plan for the Utility to accommodate the peak flows conveyed to their treatment facility. The WWTP's historical dry weather effluent flow ranges from 0.60 MGD to 0.80 MGD. The plant's monthly average and average peak day effluent flows over the past three years were approximately 1.4 MGD and 2.7 MGD respectively. The CAP dated November 18, 2018 identified the design capacity of the WWTP to be 3.1 MGD. HW has not confirmed that design rating. According to the Utility, the WWTP's effluent hydraulic capacity is limited to 2.9 MGD by the coagulation basin installed in 2004.

The WWTP's peak influent flow is limited by the capacity of its influent pump station to approximately 4.4 MGD. Wastewater volume in excess of that which can be pumped into

the WWTP is stored in the collection system. After large rain events, the pump station will often operate at its maximum capacity for several days before returning to typical dry weather operational patterns. During periods when influent flow exceeds the WWTP's effluent capacity, the water level of the lagoons rise as the balance of the flow is stored. The stored volume is ideally processed through the WWTP after the peak flow period subsides. During the 1986 construction of the sand filters, a bypass option was incorporated into the treatment process. This enables the operator to divert partly treated flow around filtration and disinfection if the lagoons reach maximum capacity and risk breaching their levees. If this option were not available and the lagoons were allowed to overflow, the levees could be damaged rendering the treatment facility inoperable. The CAO defined the use of this bypass feature as a discharge from an unpermitted outfall. Increased treatment plant capacity is needed to mitigate collection system SSOs and eliminate the need for the use of the unpermitted outfall as an emergency measure.

2.3 Total Suspended Solids (TSS)

The CAO noted one (1) exceedance of the WWTP's TSS limit in March 2017. That exceedance is believed to have resulted from peak flow. Three additional TSS exceedances have been reported that occurred after the period of time addressed by the CAO. Each of those exceedances occurred during periods of abnormally high plant flow resulting from I/I.

It is not unusual for wastewater lagoons to struggle with high TSS from algae growth or peak flows that can flush suspended solids from the basins. The sand filters installed downstream of Mena's lagoons were designed to help the facility cope with those common issues. During periods of extended peak flows, the filters become overwhelmed and solids breakthrough occurs resulting in permit violations. The sand filters at the WWTP have exceeded their design life and do not have sufficient capacity for the City's needs. The filters are no longer supported by their manufacturer. Alternate treatment processes should be considered to allow consistent compliance with the facility's permit limit for TSS.

2.4 Ammonia Nitrogen

The CAO noted five (5) violations for Ammonia Nitrogen as occurring during the period of October 1, 2014 through October 31, 2017. Five (5) additional Ammonia Nitrogen exceedances occurred more recently. The Utility suspects that anaerobic digestion of biosolids that have accumulated in the lagoons since they were placed in service nearly fifty years ago is contributing Ammonia Nitrogen to the plant effluent. Other potential contributing factors include low pH, insufficient alkalinity, reduced detention time, and insufficient nitrifying biomass. Alternate treatment methods should be considered to allow the WWTP to achieve consistent compliance with its seasonal Ammonia Nitrogen limits.

2.5 Copper

The Utility's WWTP NPDES Permit includes a limit for Total Recoverable Copper (Cu) of 10.5 ppb monthly average and 21 ppb 7-day average. Mena's WWTP was not designed to remove heavy metals such as copper. Any reduction achieved is likely due to algae uptake. Since alum, a necessary coagulant to aid filtration, is present in the filter backwash stream flowing to Lagoon No. 1, the pH in the lagoons is suppressed below the level where any significant precipitation of copper should be expected. The presence of ammonia in the lagoons would also inhibit copper precipitation. The Utility has observed increasing copper concentrations in the WWTP effluent. If that trend continues, permit exceedances could result. An alternate discharge point and/or the addition of an appropriate form of treatment should be considered for long term compliance with this permit condition.

2.6 Disinfection

Chlorine disinfection is used to achieve compliance with the WWTP's fecal coliform permit limit. The WWTP is under an interim Total Residual Chlorine (TRC) limit of 0.1 mg/l until September 1, 2020. After that date, its TRC limit will be lowered to 0.011 mg/l. Since Mena's WWTP has consistently complied with its TRC limit, this aspect of the plant's treatment process was not included in the CAO. Due to the fact that the current WWTP will not be capable of consistent compliance with its TRC limit following September 1, 2020, a discussion of that process is included in this CAP. The Utility has previously considered the use of sodium thiosulphate to quench chlorine residual following contact time sufficient for disinfection. Construction plans were submitted to ADEQ in October 2017 by another professional engineer on behalf of the Utility. A construction permit was not issued for those improvements and they have not been implemented. HW will evaluate the use of sodium thiosulfate as a temporary compliance measure for the Utility. The WWTP will not be modified until a construction permit is obtained from ADEQ. The use of ultraviolet disinfection or peracetic acid should be evaluated for long term use.

3.0 CORRECTIVE ACTION PLAN

3.1 Masterplan

Mena Water Utilities has acquired the services of HW to develop a wastewater treatment masterplan. It is intended that the Plan will provide a recommendation of affordable improvements that will allow the Utility to consistently comply with their permit limits and better prepare them for future growth and/or more stringent permit conditions. The general outline of the Plan is as follows:

- A. Evaluate existing wastewater treatment facility
 - 1. Evaluate historical performance of WWTP
 - 2. Evaluate existing condition of WWTP
 - a. Coordinate additional influent, effluent, and solids testing as needed to current loadings and treatment efficiencies.
 - b. Document current condition and design life of existing WWTP equipment.
 - c. Evaluate applicability of existing equipment based on current permit requirements and available technology.
 - d. Evaluate the WWTP's SCADA controls and monitoring systems.
 - e. Evaluate the WWTP's current power and emergency power infrastructure.
 - f. Estimate remaining useful life of existing WWTP.
- B. Evaluate long-range wastewater treatment needs for the City of Mena.
- C. Evaluate WWTP improvement alternatives. Consider preliminary treatment improvements, alternate biological treatment alternatives, alternate disinfection alternatives such as UV and peracetic acid, and solids handling.
 - 1. Identify improvements required to the existing WWTP to provide consistent NPDES permit compliance over the planning period.
 - 2. Evaluate the option to install a new modern WWTP on the existing WWTP site while incorporating existing WWTP components.
 - 3. Evaluate the option to install a new modern WWTP on an alternate site.

A draft version of the Plan is due to the Utility by June 30, 2019. HW will review the draft Plan with Mena Water Utilities prior to finalizing its recommendations. After the Plan's recommendations have been presented to and accepted by Mena Water Utilities' Commission, it will be submitted to ADEQ.

3.2 Interim Operation Plan

Excessive I & I has created wastewater influent flow rates above the 2.9 MGD hydraulic capacity of Mena's WWTP. Long rainfall events or periods of wet weather with multiple closely spaced periods of rain can exhaust the equalization storage capacity of the WWTP's lagoons. Without active intervention the lagoons would overflow their levees. This would result in severe property damage including the possibility of a total loss of the Utility's wastewater treatment ability. HW is currently developing a Plan that will recommend a long-term solution for this issue. The Plan's recommendation will also enable the Utility to consistently comply with its permit limits for TSS, Ammonia Nitrogen, and copper. This Interim Operation Plan (IOP) has been created to protect the Mena WWTP, neighboring property, and maximize Mena's ability to comply with the

requirements of its NPDES permit until the point in time that the Plan recommendations can be implemented.

- A. During normal flow rates, WWTP staff will continue to operate the plant using the full treatment process shown as Exhibit A.

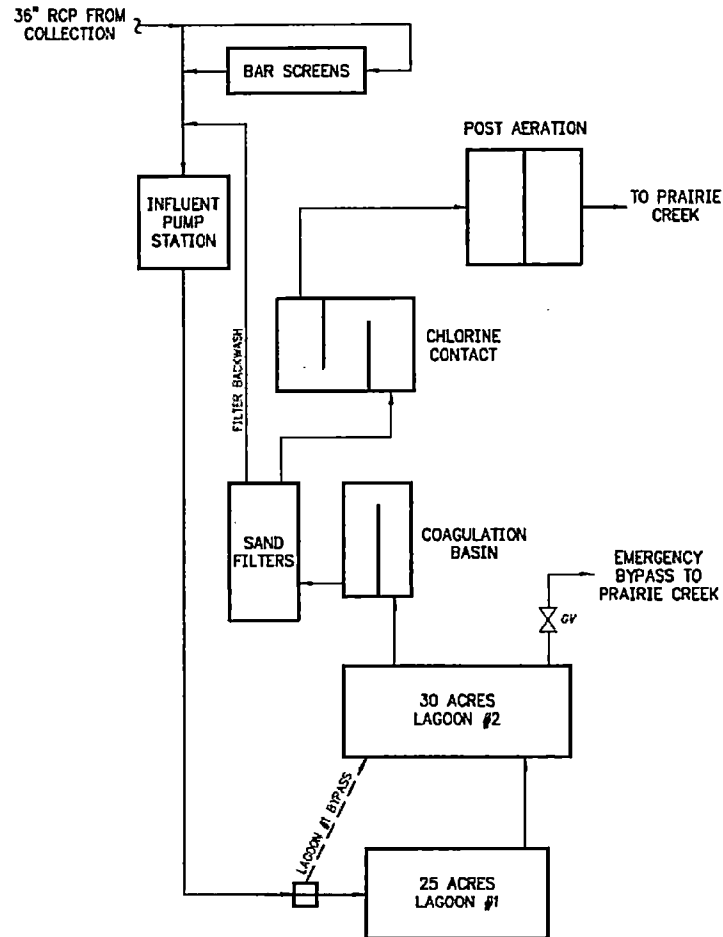


Exhibit A – Mena WWTP Process Diagram

- B. When the WWTP influent flow rate reaches a level that threatens to overflow the Lagoon No. 2 levee, threatening neighboring property and potentially causing catastrophic damage to the WWTP, the operator will open the existing emergency bypass valve depicted in Exhibit A. By opening that valve, partly treated wastewater will be discharged from Lagoon No. 2 to a point within approximately 50 feet of Outfall 001. During these uncontrollable events, WWTP staff will sample and record the total volume of emergency bypass flow. All samples and flow data will be reported to ADEQ. The emergency bypass valve will be closed as soon as the threat to the WWTP infrastructure has been alleviated.

3.3 Milestone Schedule

A. MODIFIED CORRECTIVE ACTION PLAN	FEBRUARY 28, 2019
B. PROGRESS REPORT #2	JULY 10, 2019
C. WASTEWATER TREATMENT MASTERPLAN	SEPTEMBER 1, 2019
D. LEVEE ANALYSIS	SEPTEMBER 1, 2019
E. CONSTRUCTION PERMIT APPLICATION (INTERIM TRC)	DECEMBER 1, 2019
F. PROGRESS REPORT #3	JANUARY 10, 2020
G. MAJOR MODIFICATION OF NPDES PERMIT APPLICATION	FEBRUARY 1, 2020
H. PROGRESS REPORT #4	JULY 10, 2020
I. CONSTRUCTION OF INTERIM TRC IMPROVEMENTS COMPLETE	AUGUST 1, 2020
J. PROGRESS REPORT #5	JANUARY 10, 2021
K. DESIGN OF SELECTED IMPROVEMENTS COMPLETE	JUNE 1, 2021
L. PROGRESS REPORT #6*	JULY 10, 2021
M. CONSTRUCTION OF IMPROVEMENTS COMPLETE	JUNE 1, 2023
N. FINAL COMPLIANCE DATE	AUGUST 1, 2023

* Progress Reports will continue to be submitted every 6 months unless the CAO is otherwise amended.