

CORRECTIVE ACTION PLAN UPDATE

MARCH 31, 2022

STUTT GART WASTEWATER TREATMENT FACILITY STUTT GART, ARKANSAS

ISSUED FOR REVIEW

PREPARED FOR:

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**Corrective Action Plan
Stuttgart Municipal Works
Stuttgart Wastewater Treatment Facility**

Table of Contents

Introduction & History	1
Existing Facilities	2
Permit Violations & Corrective Action Measures	2
Proposed Infrastructure Improvements	3
Milestone Schedule	4

Introduction & History

This Corrective Action Plan (CAP) update was prepared by PMI on behalf of Stuttgart Municipal Waterworks., which owns and operates the Stuttgart wastewater treatment facility. The Corrective Action Plan was prepared at the request of the Office of Water Quality, Enforcement Branch, of Arkansas Energy and Environment, Division of Environmental Quality (DEQ). DEQ requested an updated CAP and milestone schedule during a meeting with Stuttgart on March 10, 2022.

DEQ issued a Consent Administrative Order effective May 5, 2021, for the Stuttgart Wastewater Treatment Facility—AR0034380. The Consent Order is generally in place due to effluent violations at the treatment facility for Three (3) violations of pH, Seven (7) violations of Total Suspended Solids, Two (2) violations of Carbonaceous Oxygen Demand, Three (3) violations of Total Residual Chlorine, Thirteen (13) violations of Fecal Coliform Bacteria, and Three (3) violations of Nitrogen Ammonia.

The Order also listed server items that were in need of attention to properly operate and maintain the facility which are:

1. Influent flowmeter was inoperable
2. Scraper drive for the north final clarifier was inoperable
3. Equalization basin contained excessive sludge
4. Emergency contact information was not posted at lift stations
5. SCADA at main lift stations was inoperable

On November 17, 2021, Aaron Baggett, an inspector from the Office of Water Quality performed a Compliance Evaluation Inspection of the Facility. DEQ submitted the inspection report and summary of findings to Stuttgart on February 15, 2022. The summary of findings included the following items:

1. Non-compliance reports have not been submitted after July 2021
2. Excessive foam has been present in the peracetic acid chamber
3. North Bio-Tower was leaking due to damaged concrete
4. EQ basin trailer mounted pump discharge line has been leaking into ditch
5. Small pile of sludge was located on the ground next to the travelling bridge filter
6. Check valves in the primary headworks pumps (“A” pumps) are malfunctioning causing influent to be directed to the EQ basin outside of significant rain events
7. “A1” and “B3” headworks pumps were inoperable at the time of inspection
8. East sludge digester has been inoperable for 1.5 years
9. EQ basin has excessive accumulation of sludge which has caused the basin to be over design volume
10. Distribution arms in both Trickling Filters were stationary at the time of inspection
11. Distribution arms in both Biotowers had significant vegetation growth

12. Belt press was inoperable
13. Scraper drives in the intermediate clarifiers were inoperable causing septic conditions
14. One of the two Travelling Bridge Filters was inoperable

During a conference call with DEQ on March 10, 2022, Stuttgart personnel discussed progress on inspection report items. Items that could be attended to with readily available parts and city labor have been corrected. Other items will require significant capital expense, planning, design, and permitting. This Corrective Action Plan details those improvements and presents a proposal to achieve compliance with all NPDES effluent limits.

Existing Facilities

Stuttgart's treatment plant consists of an influent bar screen, influent pump station ("A" pumps to process, "B" pumps to EQ basin), grit removal, 3 primary clarifiers, 2 trickling filters, 2 intermediate clarifiers, 2 biotowers, 2 intermediate aeration chambers, 2 final clarifiers, 3 sand filters, and a PAA disinfection chamber.

Due to changes in loading and age, many of the items listed above have reached the end of their useful lives and/or are not suited to reach current and anticipated effluent limits. Stuttgart performed 24-hr composite influent sampling in 2021 to determine influent loading which will aid in rehabilitation or replacement of equipment.

Permit Violations & Corrective Action Measures (2022 updates in *Italics*)

pH – During periods of high ammonia loading, nitrifying bacteria likely utilized all alkalinity present and low pH reading occurred. *Alkalinity has been monitored and determined to be in satisfactory levels for complete nitrification.*

TSS – High flows result in overloading of the equalization basin and sludge carries through to the plant. Sludge removal in the equalization basin is ongoing and has been delayed by high flows. *Staff has been increased to operate the screw press 24/7. Stuttgart is has obtained budget numbers for land application of biosolids to supplement and get a head start on the screw press operation.*

CBOD – High flows have caused washout of plant biology which has resulted in organics remaining in the effluent. I&I work in the collection system is ongoing and has reduced high flows. Further studies of appropriate biological treatment capacity will be performed. *Preliminary findings from the biological treatment study indicate that for current and future limits a new biological reactor will be beneficial for consistent operation of the treatment facility. Evaluation of an oxidation ditch equipment with phosphorus removal capabilities is ongoing, however capital cost of this type of upgrade must be supplemented with grant funds to be feasible. Stuttgart is actively pursuing grant opportunities.*

TRC – Total residual chlorine violations have occurred when sulfur dioxide has not removed all chlorine from the effluent. The plant has switched to PAA as a disinfectant. *TRC residual has been eliminated by switching to PAA.*

Fecal Coliform – Due to insufficient chlorine when trying to maintain the TRC at permit limits, fecal coliform bacteria have not been fully oxidized. The plant has switch to PAA to maintain a higher residual to ensure complete oxidation. *PAA has helped with maintaining fecal coliform limits, however sludge carryover and accumulation from upstream infrastructure has increased PAA demand levels higher than necessary. Rehabilitation of the upstream clarifiers will alleviate this issue.*

Ammonia – Incomplete nitrification along with higher ammonia loading resulted in ammonia violations. Alkalinity will be tested for along with further monitoring of nitrification. *While alkalinity was adequate in most sampling for complete nitrification, future infrastructure improvements will include alkaline chemical feed addition capability. Ammonia removal is similar to CBOD removal in that a new biological reactor will allow for more consistent treatment and ability to meet permit limits.*

Proposed Infrastructure Improvements

After completing influent sampling and reviewing flow rates, the treatment facility would benefit from upgrades to existing infrastructure and new infrastructure as described below. Upgrading the bioreactor will provide more consistent biological treatment and allow for future nutrient removal if necessary.

All equipment is preliminarily sized for 2.0 MGD avg and 5.0 MGD peak flowrates. Prior to engineering design a detailed assessment of flow data will be completed and design flowrates refined accordingly.

Oxidation Ditch

- 2 Biological Nutrient Removal Systems
 - o Anoxic zone followed by aerobic treatment
- 4 Aerators, 50 Hp
- Advanced Control System with VFDs

Final Clarifier Upgrades

- 2 Activated Sludge Clarifiers
- Replace clarifier internals with new center column and rakes
- Includes new bridge, drive, column, full radius rake arms, skimmer and scum box, FRP effluent weir, and upgraded controls

Tertiary Filter

- 2 Tank Mounted Disc Filters

- Activated sludge filters to remove biological solids and phosphorus

Ancillary Items

- Upgrade plant controls with remote access for department manager to view plant activity and status
- Rework EQ bypass pumping to avoid excessive grit carryover in influent pump station to EQ basin
- Replace valves and pumps where necessary
- Dredge and remove sludge

The work listed above will require a significant capital investment that at this time Stuttgart cannot afford. At the date of this report, inflation pressure and volatility of the market has caused treatment equipment to increase in cost substantially more than sewer rates can cover. Stuttgart is actively pursuing grants for the infrastructure upgrades. Delays in and amounts of funding could negatively impact ability to include the necessary infrastructure and meet the milestone schedule described below.

Milestone Schedule

The milestone schedule for implementation of the Corrective Action Plan is provided below. Delays in permitting/approval from DEQ will result in extensions to the milestone schedule. Typical permit approval timeframes are indicated.

<u>Date</u>	<u>Milestone</u>
April 15, 2022	Initiate CAP upon approval by DEQ
April 15, 2022	Apply to Water & Wastewater Advisory Committee for Funding
July 31, 2022	Begin Application for ARPA/ANRC and Other Sources of Funding
September 31, 2022	Complete Project Funding
October 1, 2022	Begin Engineering Design
January 31, 2023	Submit NPDES Modification & Construction Permit to DEQ
April 1, 2023	Complete Engineering Design
August 31, 2023	Receive NPDES Permit from DEQ
September 1, 2023	Solicit Contractors for Construction of Improvements
November 1, 2023	Begin Construction
April 1, 2025	Complete Construction
May 1, 2025	Compliance with Effluent Limits