## Richard Healey (adpce.ad)

**From:** Zane Lewis <zlewis@mce.us.com>
**Sent:** Friday, December 22, 2023 1:02 PM
**To:** Water-Inspection-Report
**Cc:** Richard Healey (adpce.ad); William Cody (adpce.ad); Simon Wiley (swiley@eurekaspringsar.gov); Terry Long (eswwtp@yahoo.com); Spencer Briggs; Nick Batker; Butch Berry
**Subject:** 23-2159 Eureka Springs WWTP - Response to DEQ Inspection Report - PDS# 128366(Carroll Co.), AFIN:08-0036, Permit#AR0021865
**Attachments:** Attachments A B C.pdf; 23-2159 Eureka Springs WWTF Response Letter to DEQ Comments 12 22 2023_reduced size.pdf

To Whom it May Concern,

Please see attached response letter to comments from the Inspection Report Letter dated November 9, 2023, and associated response Attachments. Please let us know if you have any questions. Thank you.

**Zane Lewis, P.E., LEED AP BD+C**
Project Manager/Engineer
60 Years
MCE McCLELLAND CONSULTING ENGINEERS, INC.
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December 22, 2023

Mr. William Cody, Inspector
Arkansas Department of Energy and Environment, Office of Water Quality
5301 Northshore Drive
North Little Rock, AR 72118

**RE: NPDES Permit AR0021865; AFIN 08-00036**

Mr. Cody,

Greetings. As you may know, McClelland Consulting Engineers has been retained by the City of Eureka Springs to assist in evaluation of the existing wastewater treatment plant and response to inquiries from your agency. In additional to the previous responses to comments, MCE is working on an overall WWTP assessment and recommendations for expansion/renovation. The proposed improvements have been previously provided. An exhibit with markups and callouts of the proposed improvements is included with this letter as Attachment A.

On November 9, 2023, a Compliance Evaluation Inspection was performed for the Eureka Springs, Arkansas wastewater treatment facility. MCE and the city offer the following responses to the four (4) items outlined in the “Summary of Findings” contained in the inspection report:

1. It is requested that the facility identify all possible areas of concern that have contributed to or have potential to contribute to the presence of sludge in Leatherwood Creek downstream of Outfall 001 in accordance with Part III, B.5 of the permit. A SSO report dated September 12, 2023, by Mr. Terry Long indicates pump failure has caused a recent undesired discharge.

   *With the assistance of city staff, several potential areas of concern have been identified that under certain undesirable circumstances could contribute to the presence of sludge in Leatherwood Creek.*

   *Firstly, it has been reiterated multiple times by plant staff that preventing discharge of sludge into the adjacent Leatherwood Creek is their number one concern along with maintaining full compliance with all permit requirements. See Figure 1 for a picture of the area of unintentional discharge on November 9, 2023. This area has been cleaned and no further discharges have occurred.*

   *The potential areas of concern for sludge discharge from the Eureka Springs wastewater treatment facility are consistent with the types of risks associated with many wastewater treatment plants and can be influenced by daily operations,*

*including staff scheduling, by equipment age, equipment redundancy, automated notification systems and available funding for long-term repairs and equipment replacement.*

*Specific areas of concern at the Eureka Springs WWTF may include the following:*

- *Failure of the effluent discharge valves located at the south end of the SBR reactor basins to close which could result in MLSS discharging through the decanter. This risk varies based on the sludge blanket depth. Under normal operating conditions the sludge blanket is maintained at a basin level that is below the normal operating range of the discharge decanter.*
- *Failure of the pressure transducer sensor or other component of the SBR basin liquid depth monitoring system that would allow for uncontrolled liquid depth in the reactor basins. If the controls are not accurately reading the level of water in the SBR basin liquid and sludge blanket depths will not be maintained at design conditions, which could allow the water level to drop low enough for solids to be pulled out of the basin.*
- *Failure of the software that controls the automatic operation of pumps and valves could result in an erroneous operational control sequence which may allow a motive pump to turn on and begin mixing the contents of the SBR basin during a decant cycle.*
- *Failure of the software that controls the automatic operation of the pumps and valves could result in an erroneous operational control sequence which may result in an effluent discharge valve opening during the mixing or aeration stage of the batch treatment process.*
- *Failure to maintain the design mixed liquor suspended solids concentration with seasonally variable waste loading could result in an MLSS increase to the point that the sludge blanket is above the effluent decant valve discharge elevation.*
- *Failure to maintain design MLSS settleability with seasonally variable waste loading could allow for MLSS to be discharged with treated effluent.*
- *Failure to waste necessary sludge volumes could allow the MLSS concentration to become too large to settle out sufficiently prior to the decant cycle.*
- *Toxic shock of the treatment system due to unlawful discharge of pollutants into the collection system that could upset or 'kill' the wastewater plant biology.*
- *Failure of the MLSS to settle due to toxic pollutant introduced to the waste collection and treatment system.*
- *Unintentional discharge of partially treated sludge as a part of the sludge dewatering and ultimate disposal operations.*
- *Unintentional discharge of partially treated wastewater due to seeps/leaks at equipment including lower bearings, discharge valves, isolation gates, elevated manholes, and elevated pipes.*
- *Sabotage of the system controls due to vandalism or cyber security breach.*

*Figure 1: West side of SBR system where initial overflow occurred indicating there have been no recent overflows*

2. There is evidence of exposed solids on the concrete slab adjacent to the influent bar screen. Furthermore, the collection container (55-gallon barrel) does not have additional measures to prevent a discharge in the event of a spill. The solids accumulation next to the bar screen is in violation of Part III, B.6.A of the permit.

   *At the influent manual bar screen the spilled waste solids referenced above have been removed from the concrete slab, see Figure 2. Following the solids removal, the area has been washed down with a garden hose and bleach. The disinfectant was allowed to sit for approximately five (5) minutes and then washed into the influent flow channel with site NPW.*

*New standard operating procedure moving forward shall be that the operators will not ever leave any solids on the concrete during, or after, cleaning the manual influent bar screen. If solids do fall off the shovel during cleaning they will be immediately picked up and placed in the waste barrel for disposal and the concrete area flushed with water directed back to the influent channel and the entire area cleaned with bleach as need.*

*The area adjacent to the manual bar screenings collection 55-gallon barrel drum will be paved with a concrete pad with a perimeter containment curb/lip like the new slab adjacent to the mechanical screen and grit removal unit. The existing 55-gallon barrel with drain to this secondary containment area in case of a spill, see Figure 3 and Figure 4 for pictures of the new containment slab at the mechanical equipment area.*

*If it is determined that full repair/replacement of these mechanical pieces of equipment will occur at this same location, a shed roof will be constructed to cover the secondary containment areas. If new equipment is constructed at an alternate location this area will be abandoned and fully remediated after the new facilities are put into service.*

*Figure 2: Concrete slab adjacent to slab after cleaning*

*Figure 3: East side of newly constructed concrete slab adjacent to screening and grit removal equipment.*

*Figure 4: West side of newly constructed concrete slab adjacent to screening and grit removal equipment.*

3. A cinder block is currently used for manual flow measurements, which is not consistent with accepted scientific practices and does not ensure reliable data. It is required that a staff gauge and/or ruler of adequate length be implemented for manual flow measurements at the Parshall flume before Outfall 001. This is in violation of Part III, C.2 of the permit.

   *Effluent flow measurement from the wastewater treatment system is performed at the existing Parshall flume. A concrete cinder block has been used as a temporary offset for manual flow depth measurements. This temporary item has been removed from the area of the Parshall flume. A stainless-steel measurement ruler has been ordered to be used for the periodic verification of effluent flow measurement for calibration/verification of the automatic flow meter.*

   *The existing Parshall flume measurement gauge affixed to the wall of the flume is also used for flow measurement/verification. The existing automatic effluent flow meter is calibrated annually, as required by the permit, by a third party. See Figure 5 for a view of the top of the Parshall flume box, covered in protective grating.*

*Figure 5: Photo indicating that the cinder block and attached rope have been removed from the Parshall flume*

4. It is required that pH and Dissolved Oxygen calibration records and results be documented and retained in accordance with Part III, C.7 of the permit.

   *Documentation of treated effluent dissolved oxygen and pH measurements shall be maintained. New data collection Form sheets have been created to record the pertinent information (date, time, results) concerning the calibration of the pH meter and the Dissolved Oxygen meter. These new forms have been incorporated into new SOP's effective immediately. Copies of the blank calibration and test result sheets are included with this letter as Attachment B. Completed data log sheets will be retained in a 3-ring binder at the plant.*

Additional items that have been identified recently needing maintenance and repair include:

- Motive Pump for SBR#1
- Influent Valve for SBR#1
- UV Disinfection System
- Site Security Cameras
- Bulk Chemical Storage

Motive pump for SBR#1 failed due to a bent drive shaft. The enclosed drive shaft coupling/bearing housing has been replaced and the pump has been rebuilt and placed back into service.

Additionally, a spare enclosed drive shaft coupling/bearing assembly has been purchased to have on hand as an immediate repair if this issue occurs again. See Figure 6 for photos of the repaired pump system and spare parts.


*Figure 6: Rebuilt motive pump for SBR#1 in service (left); new backup pump (right)*

Influent valve for SBR#1 failed due to a broken actuator. The broken actuator was replaced, and reverse internal acme threads were added to the brass drive nut to provide more reliable service. See Figure 7 for pictures of the replaced valve actuator.


*Figure 7: Influent valve for SBR#1 in operation*

The exiting UV Disinfection unit failed due to multiple components reaching the end of their useful life. The system has been repaired with new quartz sleeves, new UV bulbs, a new DCA assembly, and new liquid tight strain relief fittings.

Currently both UV treatment modules are operational. However, the system is still experiencing communications/controls issues between the UV system control panel and UV modules.

Plant staff continues to coordinate with a manufacturer's field service technician to resolve these issues. See Figure 8 for pictures of the rebuilt UV system.


*Figure 8: Ongoing issue with communication (left); both UV modules in operation (right)*

Plant site security has been an ongoing issue. The plant has experienced multiple occurances of members of the public entering the plant while staff is away. Previously no remote monitoring was possible at the plant. Recently, new wireless security cameras have been installed and are operational. To fully activeate this new security/monitoring system a new wifi signal booster will be installed at the plant to provide the required service at remote corners. See Figure 9 for pictures of the new secutity cameras.

*Figure 9: Camera used to monitor SBR basins (left); camera to monitor fence gap and sludge storage (right)*

Onsite bulk chemical storage has been expanded with new construction at the existing belt filter press building. A new chemical storage bay has been added to the south side of the existing building. See Figure 10 for pictures of the new storage area. The new storage areas will provide a temperature-controlled environment for the chemicals.

*Figure 10: Building add on for temperature controlled chemical storage*

Preliminary planning and design are ongoing for the full set of proposed improvements to be considered by the City of Eureka Springs. Currently, anticipated work is projected to cost as much as $5.2M. See Attachment C, Engineer's Estimate of Probable Construction Costs for this project. It is unclear if adequate funding is currently available for the anticipated total project budget for the recommended repairs and improvements.

MCE continues to work with Eureka Springs Public Works to initiate a detailed cost-of-service utility rate study that will develop recommended rate adjustments to finance the proposed/required improvements at the WWTF. Do not hesitate to contact us if you have any questions or comments concerning these matters. Thank you.

*Sincerely,*

**Zane Lewis, P.E., LEED AP BD+C**
Project Manager
1580 East Stearns Street
Fayetteville, AR 72703
479.443.2377 office
479.443.9241 fax
mce.us.com

Encl: Attachments A, B, C

CC: Mr. Richard Healey, DEQ Enforcement Branch Manager
Mr. Simon Wiley, Eureka Springs Public Works Director
Mr. Robert 'Butch' Berry, Eureka Springs Mayor

# Attachment A

**Eureka Springs Wastewater Treatment Facility**
**DO Meter Calibration Sheet**

**MONTH:** _____

| DATE | TIME | INIT | CAL. VALUE | MEMBRANE | INIT |
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# Attachment A

**Eureka Springs Wastewater Treatment Facilty**
pH Meter Calibration Sheet

**MONTH:** _____

| DATE | INIT | TIME | TEMP | CALIBRATION READINGS | | | BUFFERS CHANGED |
|---|---|---|---|---|---|---|---|
| | | | | 4.0 BUFFER | 7.0 BUFFER | 10.0 BUFFER | |
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# Attachment A

Eureka Springs Wastewater Treatment Facility
Effluent Dissolved Oxygen pH Records

**MONTH :** _____

| ***EFFLUENT*** | | | | | | | |
|---|---|---|---|---|---|---|---|
| **DISSOLVED OYGEN** | | | | **pH** | | | |
| **DATE** | **TIME** | **VALUE** | **TEMP** | **DATE** | **TIME** | **VALUE** | **TEMP** |
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Notes

1. See Sheet 612D for sludge waste line connection details.
2. See Sheet 612D for sludge waste line connection details.
3. See Sheet 612D for sludge waste line connection details.
4. At this location, the Contractor shall connect the new 2" PVC non-potable water line to the existing non-potable water line.
5. The Contractor shall install the new 6" force main from the existing Recycle Pump Station No. 1 to the existing flume as shown. The new force main shall be connected to the existing lift station by uncovering and connecting to the existing 6" discharge. The area where the force main is to be laid shall be excavated prior to construction to determine where existing pipe is located.
6. The new 2" force main shall be installed buried from the lift station to the SBR basin at which point the line shall be installed up the basin wall and shall be connected to the influent pipe at the location shown with a 2" tapping saddle and 2" gate valve. The saddle shall be rotated so that the tap is at the top of the influent pipe. The 2" force main shall be secured to the basin wall with a minimum of three 2" steel pipe straps. Insulate 2" pipe that is above ground to 3 feet below ground.
7. New potable water service RPZ to be located inside janitor's closet in office building.
8. Remove existing yard hydrant and install a new hydrant and connect non-potable waterline to 2" existing waterline from Belt Press Building.
9. All buried ductile iron pipe shall be mechanical or push on joint.
10. All exposed ductile iron pipe shall be flanged.
11. Finished grade spot elevations are provided around new structures. The Contractor shall finish grade the site to these elevations and grade the site to drain away from all structures.
12. THE CONTRACTOR SHALL CONSTRUCT A 6-INCH THICK COMPACTED A.B.C. CLASS 7 SURFACE AROUND ALL NEW STRUCTURES A MINIMUM WIDTH OF 20 FEET.
13. All site preperating, excavation, and backfilling shall be done in accordance with the applicable sections of the Technical Specifications.
14. New potable water service RPZ to be located near south property line and a "hot box" enclosure is to be installed around new RPZ.

BASIS OF BEARINGS:
MSI: GPS OBSERVATIONS, AR STATE PLANE, NAD83, ZONE AR NORTH,
REFERENCES:
AHTD: GPS CONTROL IN CARROLL COUNTY
DMS: CITY OF EUREKA SPRINGS, 5/9/2004

LEGEND:

- EXISTING IRON PIN
- EXISTING STONE
- SET 3/8" IRON PIN
- COMPUTED CORNER
- SET 2" ALUM. CAP
- BENCH MARKER
- POWER POLE
- VERTICAL PIPE
- CONCRETE PEER
- CONCRETE PEDISTAL
- FENCE
- FIRE HYDRANT
- WATER METER
- WELL
- WATER VALVE
- WATER HYDRENT
- MANHOLE
- SEWER CLEAN OUT
- U.G. ELEC. TRANS.
- ELEC. ENTRENCE
- GAS ENTRENCE
- GAS METER
- (RECORD MEASUREMENT)
- TELE. STUB-UP
- TELE. ENTRANCE
- FIBER OPTIC CABLE
- U.G.T.V.CABLE BOX
- TV CABLE ENTRENCE
- SATELLITE DISH
- HARDWOOD TREE OR SHRUB
- PINE OR CEDAR TREE

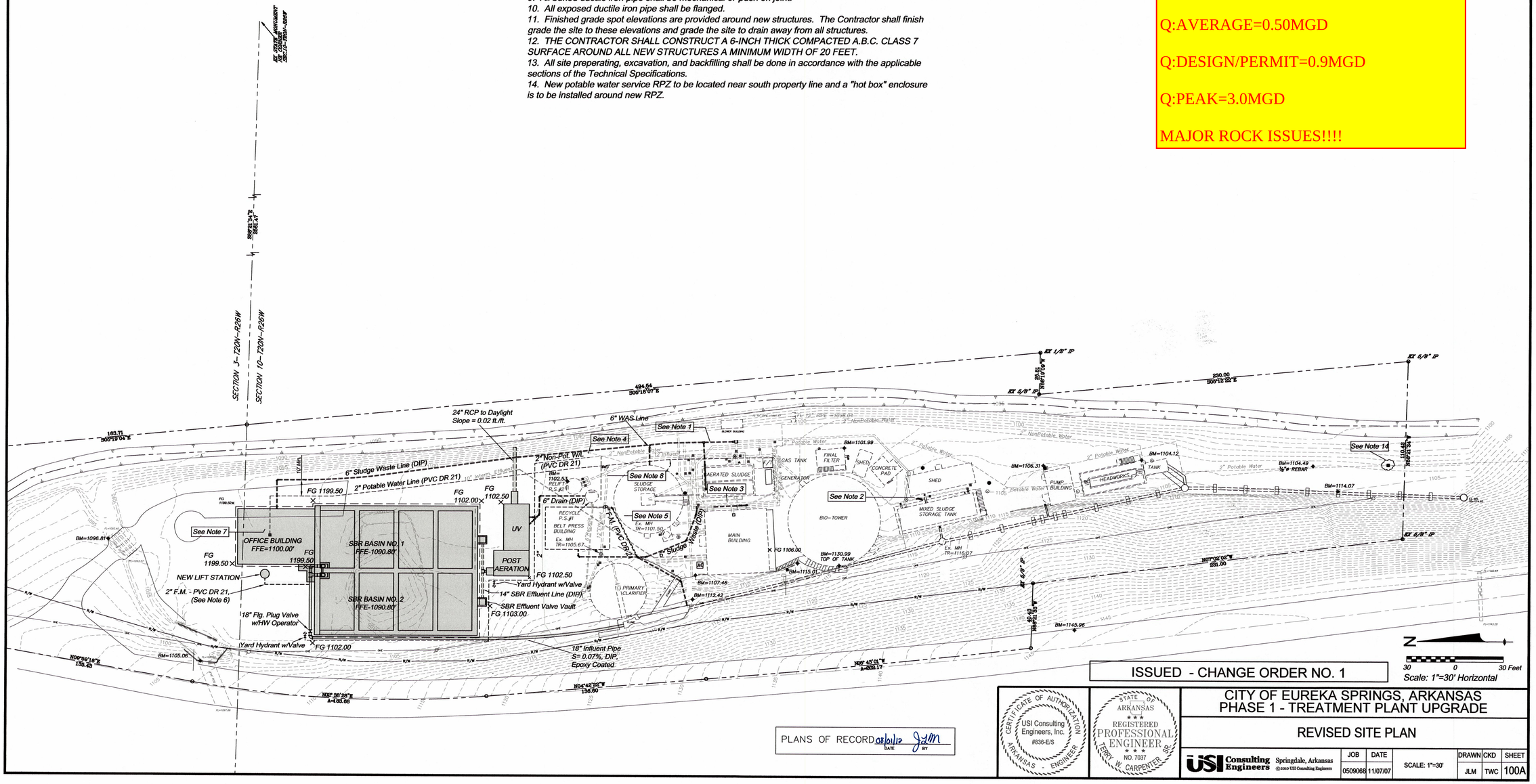
ADDITIONAL PLANT DESIGN CRITERIA:

Q:AVERAGE=0.50MGD

Q:DESIGN/PERMIT=0.9MGD

Q:PEAK=3.0MGD

MAJOR ROCK ISSUES!!!!




ISSUED - CHANGE ORDER NO. 1

PLANS OF RECORD 08/01/12 DATE JLM BY

CERTIFICATE OF AUTHORIZATION — USI Consulting Engineers, Inc. #836-E/S — ARKANSAS ENGINEER

STATE OF ARKANSAS — REGISTERED PROFESSIONAL ENGINEER — NO. 7037 — TERRY W. CARPENTER

# CITY OF EUREKA SPRINGS, ARKANSAS
## PHASE 1 - TREATMENT PLANT UPGRADE
## REVISED SITE PLAN

USI Consulting Engineers — Springdale, Arkansas 

| JOB | DATE | | DRAWN | CKD | SHEET |
|---|---|---|---|---|---|
| 0509068 | 11/07/07 | SCALE: 1"=30' | JLM | TWC | 100A |

# Attachment C

**City of Eureka Springs**
**WWTP Emergency Response**
Estimate of Probable Construction Costs - DEQ Response to Comments
Prepared by McClelland Consulting Engineers, Inc.
MCE JOB # 23-2159
**12/22/2023**

| Item No. | Description | Unit | Estimated Quantity | Estimated Unit Costs | Estimated Cost |
|---|---|---|---|---|---|
| 1 | Mobilization | LS | 1 | $126,000 | $126,000 |
| 2 | Bonds and Insurance | LS | 1 | $126,000 | $126,000 |
| 3 | Act 291, 1993 Trench and Excavation Safety System | LS | 1 | $10,000 | $10,000 |
| 4 | Environmental Compliance and Erosion Control | LS | 1 | $15,000 | $15,000 |
| 5 | Pre Construction Video | LS | 1 | $2,500 | $2,500 |
| 6 | 5' Diameter Epoxy Lined Manhole | EA | 3 | $12,000 | $36,000 |
| 7 | Site Security Fence | LF | 100 | $100 | $10,000 |
| 8 | Rock Excavation | CY | 1000 | $250 | $250,000 |
| 9 | Flowable Fill, as directed by Engineer | CY | 100 | $150 | $15,000 |
| 10 | Full Depth Class 7 Backfill | LF | 100 | $60 | $6,000 |
| 11 | New Structural Pipe Supports | EA | 10 | $5,000 | $50,000 |
| 12 | Post Construction CCTV Inspection of Sewer Main | LS | 1 | $1,500 | $1,500 |
| 13 | Remove & Dispose of Existing Manhole | EA | 4 | $3,500 | $14,000 |
| 14 | Remove & Dispose of Existing Abandoned Process Piping | LF | 1000 | $50 | $50,000 |
| 15 | 1/4" Mechanical Automatic Bar Screen + Compactor Washer | EA | 2 | $460,000 | $920,000 |
| 16 | Advnaced Grit Removal Equipment | EA | 1 | $656,000 | $656,000 |
| 17 | Prefabricated Stainless Steel Screen Channel | EA | 1 | $500,000 | $500,000 |
| 18 | Screen and Grit Equipment Concrete Slab on Grade | LS | 1 | $25,000 | $25,000 |
| 19 | Existing SBR Pump room floor trench drains | LS | 1 | $50,000 | $50,000 |
| 20 | Demolition & Disposal of Existing Structures | LS | 1 | $150,000 | $150,000 |
| 21 | Demolition & Disposal of Existing Clarifier Equipment | LS | 1 | $50,000 | $50,000 |
| 22 | New Sludge Storage - Aeration equipment | LS | 1 | $150,000 | $150,000 |
| 23 | New Sludge Storage - Equipment and Piping Modifications | LS | 1 | $100,000 | $100,000 |
| 24 | Cleanout rocks and debris from SBR reactors | LS | 1 | $50,000 | $50,000 |
| 25 | Repair/replacement of SBR equipment | LS | 1 | $150,000 | $150,000 |
| 26 | Foundation repairs to SBR basin exterior | LS | 1 | $20,000 | $20,000 |
| 27 | Extended Plant entrance storm drain box culvert | LS | 1 | $250,000 | $250,000 |
| 28 | WWTF Spare Parts Inventory | LS | 1 | $100,000 | $100,000 |
| 29 | Construction Bypass pumping | LS | 1 | $150,000 | $150,000 |
| 30 | Project Closeout, As-Builts, Record Drawings, Warranty Bond, etc. | LS | 1 | $126,000 | $126,000 |
| | | | | **Subtotal Estimate of Probable Construction Costs** | **$4,159,000** |
| | | | | **25% Construction Contingency** | **$1,039,750** |
| | | | | **Total Estimate of Probable Construction Costs** | **$5,198,750** |