



205 Executive Court  
Little Rock, Arkansas 72205  
Telephone (501) 664-1552  
Fax (501) 664-8579  
www.cristengineers.com

Matthew D. Dunn  
Craig A. Johnson  
Leslie B. Price  
Chad A. Hastings  
Brian N. Wintle

November 28, 2022

Mr. Richard C. Healey  
Enforcement Branch Manager  
Office of Water Quality, DEQ  
5301 Northshore Drive  
North Little Rock, AR 72118-5317

RE: City of Malvern, AR  
NPDES Permit No. AR0034126, AFIN 30-00040  
Request for Corrective Action Plan

Dear Mr. Healey:

In accordance with the requirements of your letter dated September 30, 2022, we submit herewith the Corrective Action Plan.

Should you have any questions regarding this correspondence plan please don't hesitate to contact me at 501.664.1552.

Sincerely,

A handwritten signature in blue ink that reads "Matt Dunn".

Matthew D. Dunn, P.E.

Enclosures: Corrective Action Plan  
Preliminary Engineering Report  
Sanitary Sewer Evaluation Survey Report

Cc: David Coston, Director, Malvern Water Works  
Carl Wheatley, Superintendent, Malvern Water Works



**MALVERN WATER**

QUALITY SINCE 1914

**THE CITY OF MALVERN, ARKANSAS**

**CORRECTIVE ACTION PLAN**

**AFIN 30-00040, NPDES PERMIT No.: AR0034126**

DATE: NOVEMBER 28, 2022

PREPARED FOR:

City of Malvern  
506 Overman Street  
Malvern, Arkansas 72104  
[www.malvernar.gov](http://www.malvernar.gov)

PREPARED BY:



Crist Engineers, Inc.  
205 Executive Court  
Little Rock, Arkansas 72205

Crist Project No.: 22040

CERTIFIED BY:



Matthew D. Dunn

AR PE 11048

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# SECTION 1

## BACKGROUND

### 1.1 PURPOSE AND SCOPE

The City of Malvern was solicited by the Arkansas Department of Energy and Environment, Department of Environmental Quality, Office of Water Quality (OWQ), Water Quality Enforcement Branch, to provide a corrective action plan (CAP) in response to recurring sanitary sewer overflows (SSOs) at MH0154 and MH0155 near the intersection of Laurel and Davis in Malvern. This CAP includes the following information:

1. Detailed work that is being done and will be done to identify and correct the cause of the ongoing sanitary sewer overflows (SSOs) including a milestone schedule and expected date of completion.
2. Individual SSO evaluations to identify the cause of the recurring SSOs.
3. Identification of collection line segments and manholes that require immediate remediation, repair, or replacement to develop a priority schedule for the collection line segments and manholes.

### 1.2 BACKGROUND

The City of Malvern has endeavored to reduce wet weather related inflow and infiltration (I&I) into the collection system and to reduce wet weather related SSO's by spending approximately \$3.2 Million in engineering and construction since 2018. **Table 1** outlines the cost and timetable for the projects related to sewer system rehabilitation and SSO reduction. Through these efforts and expenditures, the City of Malvern continues to perform work to identify areas of concerns regarding inflow and infiltration and correct SSOs throughout the collection system.

The City of Malvern hired Crist Engineers in 2017 to develop a preliminary engineering report (PER) to be submitted with a funding application to the Water/Wastewater Advisory Committee (WWAC) for collection system rehabilitation and treatment plant rehabilitation. The report identified the Laurel Street and Davis Street area as problematic due to the recurring SSOs and surcharging during heavy rains or long periods of rain. Flow monitoring, rainfall monitoring, smoke testing, and closed-circuit television (CCTV) inspection as part of a Sanitary Sewer Evaluation Survey (SSES) were highlighted as effective methods of locating areas of excessive I&I as well as establishing dry and wet weather flows. Analysis of SSES data is a critical first step in determining the collection system improvements required to correct the ongoing SSOs. **Figure 1 – SSO Frequency and Volume at MH0154 & MH0155** is included to highlight the issues in this area.

In 2018, the City of Malvern contracted with RJN Group to provide a Sanitary Sewer Evaluation Study Report completed in January 2020 that identified prioritized sewer basins of concern. The

field investigations required for the study included manhole inspections, smoke testing, dyed water flooding, and CCTV inspection. RJN conducted sanitary sewer investigation activities in basins 2, 3, 3A, 4, 5, and 5A. The report had the following conclusions, some of which are currently being used to help mitigate I&I and SSOs throughout the system. The conclusions are as follows:

1. Rehabilitate 237 manholes, 231 service line sources, 13,088 linear feet of sewer line, and 860 linear feet of sewer line point repairs.
2. Implementation of these recommendations would remove approximately 0.819 million gallons per day (MGD) of 1-year/60-minute inflow and 0.317 MGD of infiltration.
3. Estimated Capital Cost to implement the recommended plan is \$3.754 million in 2019 dollars.

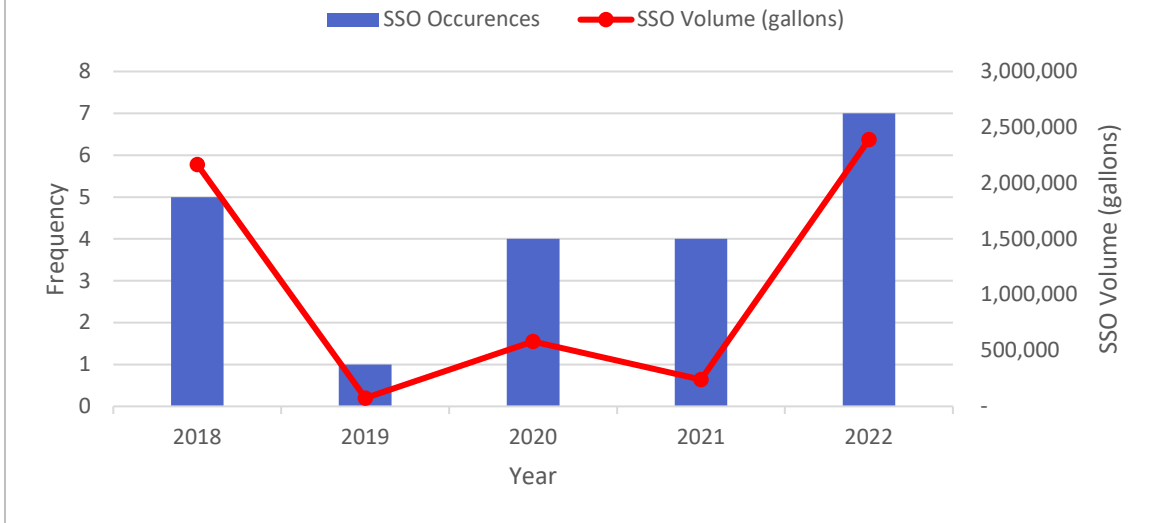
Manholes MH0154, MH0155, and the pipe segment between them were visually inspected during the field investigation. However, smoke testing, dye testing, and CCTV inspection were not performed at these manholes as part of this SSES.

Item No.	Begin	End	Description	Amount
1	3/2017	9/2017	PER – Wastewater System Improvements	\$20,000
2	8/2018	1/2020	Sanitary Sewer Evaluation Study	\$300,000
3	7/2021	3/2022	Sewer System Rehabilitation - Phase 1	\$1,398,000
4	7/2021	11/2021	Manhole Rehabilitation – Contract 2	\$94,980
5	11/2022	Ongoing	Sewer System Rehabilitation – Phase 2	\$1,040,904
6	3/2017	Ongoing	Engineering and Administration for All Projects	\$350,000
<b>Current Total</b>				<b>\$3,202,000</b>

**Table 1: Capital Project Cost for SSO Reduction**

Further, copies of the PER and SSES Report are included with this transmission.

City of Malvern - Figure 1: SSO Frequency and Volume at MH0154 & MH0155



# PLANNED CORRECTIVE ACTIONS

## 2.1 CURRENT STATUS

The City of Malvern has initiated a contract with Crist Engineers evaluate the area of concern and begin identifying potential causes of the recurring SSOs at MH0154 and MH0155. The scope of the current work being done includes assessing the condition of selected gravity sewer segments and manholes at and around Laurel and Davis by performing field GPS surveys, manhole measure downs, and additional preliminary manhole inspections to identify potential points of I&I and to obtain precise location and elevation information. This information is necessary to develop a scope of work that includes the following SSES investigations:

1. Flow Monitoring
2. Rainfall Monitoring
3. CCTV Inspection
4. Smoke Testing

These investigations will be used to recommend collection system improvements and rehabilitation required in this area to correct the ongoing SSOs.

## 2.2 FLOW MONITORING

The Engineer will review the available electronic mapping, the operational information for the collection system, and the proposed collection system network to identify key temporary flow meter locations. The Engineer shall prepare and present to the City a flow metering plan that describes the final temporary flow metering, equipment installation requirements (i.e. manhole access, traffic control, notification to landowners, assistance from the City staff, etc.), equipment maintenance requirements, data recording frequency, and termination and removal of the equipment following completion of the monitoring period.

Five (5) temporary flow meters will be maintained over the sixty (60) day monitoring period. Maintenance shall be carried out on a regular basis and includes calibration of the recording equipment, downloading of recorded data, onsite analysis of the data to ensure proper meter function, cleaning of the sensor, and replacement of any defective equipment. It is assumed that adequate weather conditions will be observed during the monitoring period so that dry weather and wet weather conditions that include at least three (3) storm events of different rainfall intensities are observed.

## 2.3 RAINFALL MONITORING

Three (3) rain gauge sites will be selected to obtain rainfall data during the monitoring period. The rain gauges will continuously record rainfall conditions during the monitoring period. Each rain gauge will also be inspected regularly and coincide with flow meter inspection.

## 2.4 CCTV INSPECTION

Engineer will solicit consultant to perform CCTV inspection of gravity sewer pipes within and upstream of the Laurel and Davis area. Video from these inspections will be reviewed to evaluate pipe integrities and identify potential points of I&I.

## 2.5 SMOKE TESTING

Engineer will solicit consultant to smoke test selected gravity sewer pipes and manholes to quickly and effectively detect inflow sources into Malvern's sanitary sewer system.



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## SECTION 3

# MILESTONE SCHEDULE

### 3.1 SCHEDULE

As previously indicated, compliance with the CAP requirements will be a staged implementation plan that will incorporate capital projects that will require funding sources through sewer rate increases or other available sources, such as sales tax. At the completion of the CAP, which will be submitted to DEQ-OWQ for review, a capital improvement plan will establish a timeline of projects.

Item No.	Corrective Action Description	Target Completion Date
1	Flow Monitoring and Rainfall Monitoring	July 31, 2023
2	CCTV Inspection	August 31, 2023
3	Smoke Testing	September 30, 2023
4	Capital Improvement Plan and Schedule of Improvements	December 31, 2023

**Table 2: Schedule**