

MEMORANDUM

25 June 2012

TO: MO SHAFIL, ASST. CHIEF, WATER DIVISION

FROM: M.L. CORE, PROJECT ENGR., ANRC

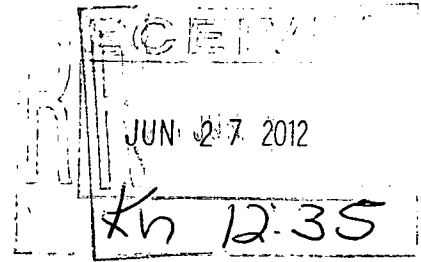
**SUBJECT: REVIEW ON THE IMPROVMENTS TO THE WASTEWATER
SYSTEM FOR THE NORTH LITTLE ROCK WASTEWATER UTILITY**

**These projects involve measures to address issues associated with an updated
Master Plan and a Consent Administrative Order with respect to their current
NPDES permits.**

**Please review the enclosed "Facility Plan" excerpts; and respond with comments as
appropriate.**

Water Division Reviewer _____

Date _____

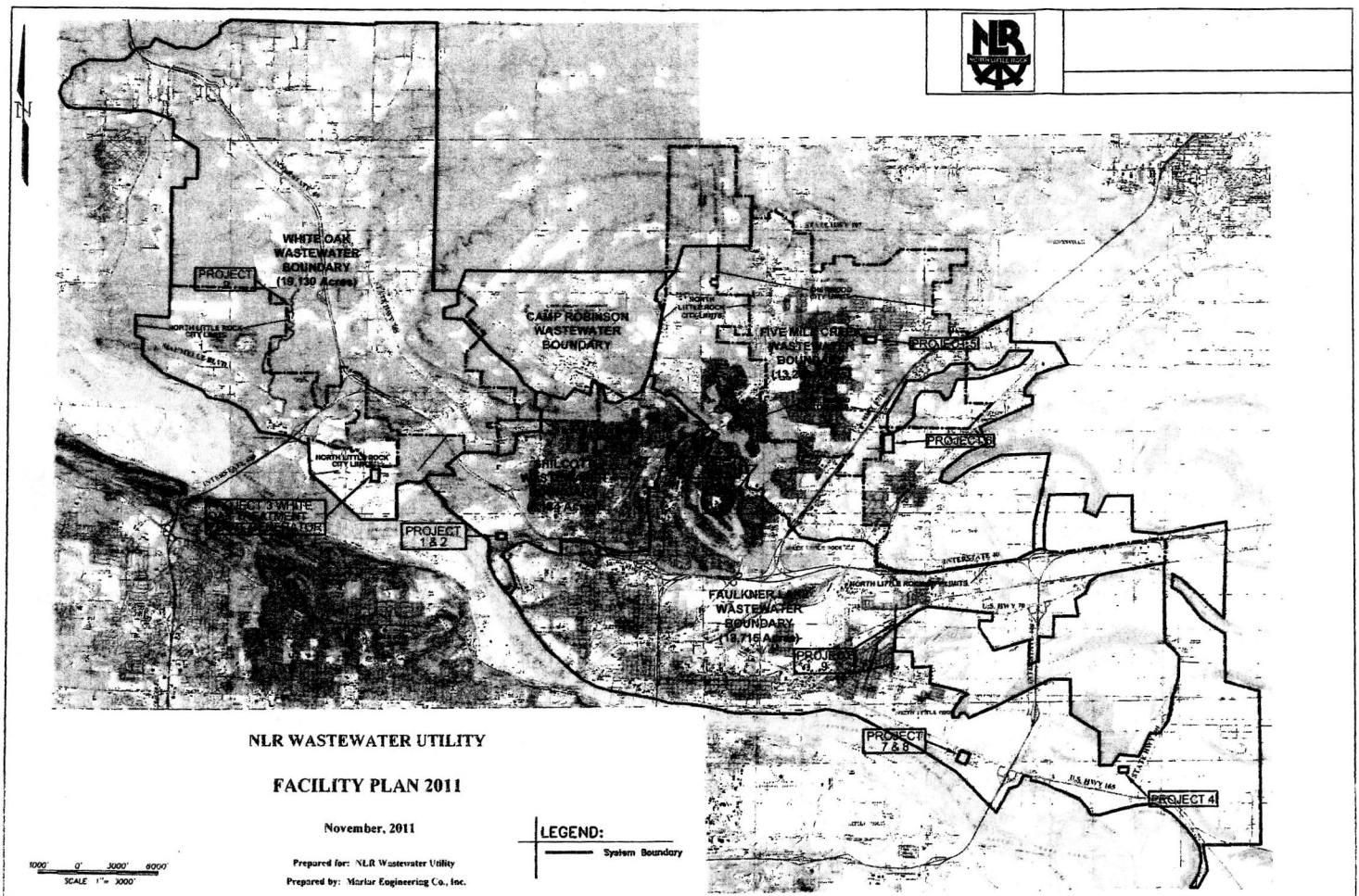


ENGINEERING REPORT / FACILITY PLAN 2011

NORTH LITTLE ROCK WASTEWATER SYSTEM IMPROVEMENTS

APPLICANT: **North Little Rock Wastewater Utility**
PREPARED BY: **Marlar Engineering Company, Inc.**

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SYSTEM IMPROVEMENTS

APPLICANT: North Little Rock Wastewater Utility

PREPARED BY: Marlar Engineering Company, Inc.

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**PROJECT 1 & 2 – SHILLCUTT PUMP STATION IMPROVEMENTS
(Master Plan Project Reference # 1 & 2)**

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PROJECT 1 & 2: SHILLCUTT PUMP STATION IMPROVEMENTS
(Master Plan Project Reference # 1 & 2)

Project 1 – Auxiliary Generator
Project 2 – Pump Station Improvements

I. INTRODUCTION AND NARRATIVE

The Shillcutt pump station pumps wastewater to the White Oak Treatment plant which was recently upgraded from a 4.25 mgd to an 8.5 mgd facility. The Shillcutt pump station receives wastewater from the Shillcutt Drainage basin which includes North Little Rock's Levy community. This project includes replacing the existing pump station to provide larger pump capacity (16.5 mgd) and a deeper wet well to reduce surcharges in the gravity sewer system. Additionally, the project includes installation of an auxiliary generator to provide stand-by power.

\$5,400,000

\$500K

II. PURPOSE

The purpose of the project is to increase the pumping capacity of the Shillcutt pump station to 16.5 mgd and to deepen the wet well to reduce surcharges to the collection system. The project will include the addition of an auxiliary generator to provide stand-by power.

III. EXISTING CONDITIONS

Sewage flow to the White Oak Treatment Plant is pumped by two pump stations, White Oak influent pump station at the Plant site and the Shillcutt Station which receives wastewater from the Shillcutt drainage basin in North Little Rock. The design flow for the White Oak treatment plant is 8.5 mgd with a peak design flow of 24 mgd. A flow of 16.5 mgd is the recommended flow for the Shillcutt pump station through two existing 20 inch forcemains to the treatment plant. The master plan recently completed by NLRWW recommends increasing the Shillcutt pump station to 16.5 mgd.

IV. ALTERNATIVES

The improvements will include a new wet well, new pumps with variable frequency drives, modifications to the existing bar screens, discharge piping and valves, and miscellaneous structural, piping, electrical and site work. Three pump station wet well configurations were reviewed to upgrade the Shillcutt pump station:

1. Trench wet well.
2. Flygt wet well.
3. Multiple cylindrical wet wells.

The trench wet well is the current Hydraulics Institute recommended wet well for wastewater pump stations while the "Flygt" wet well was previously recommended by

the Institute. A summary of the advantages and disadvantages of each alternative are identified below:

Trench Wet Well:

Advantages include small footprint, lower costs, self cleaning wet well, better pump efficiency, suitable for submersible pumps, less potential for air entrapment in the discharge line. Disadvantages include deeper construction for this type wet well, low wet well storage volume.

Flygt Wet Well:

Advantages include a baffle wall and flow vanes directing flow to the pumps for good wet well hydraulics, larger wet well volume which can decrease pump cycle time. Disadvantages include higher costs due to large wet well, larger flat bottom that can contribute to solids accumulation.

Multiple Cylindrical Wet Wells:

Advantages include multiple wet wells that can be isolated for cleaning and maintenance. Disadvantages include the need for splitting the flow, larger excavated area and associated higher costs.

V. SELECTED ALTERNATIVE

Preliminary recommended alternative is a Flygt wet well with four (4) pumps. This arrangement allows four of the same pumps to be used while providing minimum daily flows with one pump and peak maximum flows with three pumps. The fourth pump ~~would be a stand by pump, providing back-up capacity giving the station a firm capacity of 16.5 mgd.~~ A graph of the pump system curve is provided. The preliminary pump selection is 4 – 335 hp Flygt pumps. The range of flow is approximately 2 mgd for one pump at 50% speed and a maximum of 17 mgd for 3 pumps at 100% speed. Other improvements will include a new wet well, new pumps with variable frequency drives, modifications to the existing bar screens, discharge piping and valves, and miscellaneous structural, piping, auxiliary generator, electrical and site work.

VI. RATES

A rate study has been performed by the Utility.

VII. PERMITS AND REQUIREMENTS

The following permits and reviewing agency approvals will be required:

- Department of Health
- NLRWW Utility

VIII. TIMETABLE

The following schedule is estimated to plan, fund, design and build future improvements based on the ANRC RLF program:

<u>TASK:</u>	<u>DATE</u>
--------------	-------------

1. Prepare and approve ANRC RLF Resolutions:
(The following 2 Resolutions and 2 applications must be submitted and ~~60~~ approved before being officially in the RLF program.)
 - Resolution of Signature Authority (identifying the City's representative.)
 - Resolution of Intent (Intent to do the project for a specified amount by tax exempt bonds and to be reimbursed for previous services before bonds issued.)
 - Preapplication to WWAC Committee Nov. 2011
 - Prepare and submit loan application Dec. 2011
2. Submit to ANRC engineering report and cost analysis for approval. Dec. 2011
NLRWW Utility will receive from ANRC letter of approval regarding project cost which will likely be higher than that requested.
3. Memorandum of Agreement (MOA). The MOA will include projected submittal dates for facility plans, specifications, rate ordinance, and all other items up to the advertisement for construction bids.

At this point, Engineer can be working on plan preparation.

4. Submit plans to various agencies for review and approval
5. Advertise for Construction Bids
6. Contract with Contractor
7. Construct Improvements
8. Prepare O&M Manual/ Start Up

Note: Final target dates to be determined and are under consideration.

IX. IMPLEMENTATION

All operations personnel are properly licensed.

X. PUBLIC PARTICIPATION

Public participation will be conducted by the Utility.

XI. EXHIBITS

Site location for the improvements is shown in Exhibit 1. Summary of costs for all improvements is shown in Exhibit 2.

**PROJECT 3: WHITE OAK WASTEWATER TREATMENT PLANT
AUXILIARY GENERATOR
(Master Plan Project Reference # 3)**

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**PROJECT 3: WHITE OAK WASTEWATER TREATMENT PLANT
AUXILIARY GENERATOR (Master Plan Project Reference # 3)**

I. INTRODUCTION AND NARRATIVE

The White Oak Treatment Plant was recently expanded to treat wastewater from residential, commercial and industrial customers along the White Oak drainage basin which includes areas along Maumelle Boulevard, Crystal Hill, Highway 365 and Morgan communities in North Little Rock and from the Shillcutt Pump Station.

II. PURPOSE

The purpose of the project is to provide auxiliary generators for the White Oak Treatment Plant. This generator will be permanently mounted and will provide stand-by power.

*do we currently have one?
is there more than one electrical service feed*

III. EXISTING CONDITIONS

The treatment facility includes an influent pump station, four facultative lagoons, chlorination and chlorine contact and flow measurement and is one of the City's three treatment plants. The facility was recently expanded from 4.25 to 8.5 mgd.

IV. ALTERNATIVES

No alternatives are identified.

V. SELECTED ALTERNATIVE

It is recommended to install a new stand-by generator for the White Oak Treatment facility.

77K

VI. RATES

A rate study has been performed by the Utility.

VII. PERMITS AND REQUIREMENTS

The following permits and reviewing agency approvals will be required:

- NLRWW Utility

VIII. TIMETABLE

The following schedule is estimated to plan, fund, design and build future improvements based on the ANRC RLF program:

TASK:

DATE

1. Prepare and approve ANRC RLF Resolutions:
(The following 2 Resolutions and 2 applications must be submitted and
~~60~~ approved before being officially in the RLF program.)
 - Resolution of Signature Authority (identifying the City's representative.)
 - Resolution of Intent (Intent to do the project for a specified amount by tax exempt bonds and to be reimbursed for previous services before bonds issued.)
 - Preapplication to WWAC Committee Nov, 2011
 - Prepare and submit loan application Dec, 2011

2. Submit to ANRC engineering report and cost analysis for approval.
NLRWW Utility will receive from ANRC letter of approval regarding project cost which will likely be higher than that requested.
3. Memorandum of Agreement (MOA). The MOA will include projected submittal dates for facility plans, specifications, rate ordinance, and all other items up to the advertisement for construction bids.

At this point, Engineer can be working on plan preparation.

4. Submit plans to various agencies for review and approval
5. Advertise for Construction Bids
6. Contract with Contractor
7. Construct Improvements
8. Prepare O&M Manual/ Start Up

Note: Final target dates are under consideration by the Utility.

IX. IMPLEMENTATION

All operations personnel are properly licensed.

X. PUBLIC PARTICIPATION

Public participation will be conducted by the Utility.

XI. EXHIBITS

Site location for improvements and costs are identified in Exhibits 1 and 2. ✓ ✓

PROJECT 4: WILCOX PUMP STATION UPGRADE
(Master Plan Project Reference # 4)

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PROJECT 4: WILCOX PUMP STATION UPGRADE
(Master Plan Project Reference # 4)

I. INTRODUCTION AND NARRATIVE

The Wilcox pump station is a submersible lift station handling wastewater for an area of North Little Rock located east of I-440 and north along Highway 391 and the Galloway community on each side of I-40 which includes significant industrial and commercial establishments. Both residential, commercial and industrial growth are present in this area of North Little Rock.

II. PURPOSE

The purpose of the project is to provide auxiliary generators for the Wilcox pump station. This generator will be permanently mounted and will provide stand-by power to this station.

ASOK is here made than 500 KW?

III. EXISTING CONDITIONS

Currently the submersible lift station includes 3 submersible pumps in a rectangular concrete wet well configuration, valve vault and electrical controls. Sewage enters the lift station through a series of gravity sewers and forcemains serving the residential communities and industry in the area.

IV. ALTERNATIVES

No alternatives are identified.

V. SELECTED ALTERNATIVE

It is recommended to install a new stand-by generator for the Wilcox pump station.

VI. RATES

A rate study has been performed by the Utility.

VII. PERMITS AND REQUIREMENTS

The following permits and reviewing agency approvals will be required:

- Department of Health
- NLRWW Utility

VIII. TIMETABLE

The following schedule is estimated to plan, fund, design and build future improvements based on the ANRC RLF program:

TASK: _____ DATE

1. Prepare and approve ANRC RLF Resolutions:
(The following 2 Resolutions and 2 applications must be submitted and ~~60~~ approved before being officially in the RLF program.)
 - Resolution of Signature Authority (identifying the City's representative.)
 - Resolution of Intent (Intent to do the project for a specified amount by tax exempt bonds and to be reimbursed for previous services before bonds issued.
 - Preapplication to WWAC Committee Nov. 2011
 - Prepare and submit loan application Dec. 2011

2. Submit to ANRC engineering report and cost analysis for approval.
NLRWW Utility will receive from ANRC letter of approval regarding project cost which will likely be higher than that requested.

3. Memorandum of Agreement (MOA). The MOA will include projected submittal dates for facility plans, specifications, rate ordinance, and all other items up to the advertisement for construction bids.

At this point, Engineer can be working on plan preparation.

4. Submit plans to various agencies for review and approval
5. Advertise for Construction Bids
6. Contract with Contractor
7. Construct Improvements
8. Prepare O&M Manual/ Start Up
Note: Target dates are under consideration by the Utility.

IX. IMPLEMENTATION

All operations personnel are properly licensed.

X. PUBLIC PARTICIPATION

Public participation will be conducted by the Utility.

XI. EXHIBITS

Site locations and costs for improvements are identified in exhibits 1 and 2. ✓ ✓

**PROJECT 5: OAKBROOK PUMP STATION IMPROVEMENTS
(Master Plan Project Reference # 5)**

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PROJECT 5: OAK BROOK PUMP STATION IMPROVEMENTS
(Master Plan Reference # 5)

I. INTRODUCTION AND NARRATIVE

The Oakbrook pump station is a submersible lift station and serves areas of Sherwood north and south of Kiehl Avenue originally developed as part of an Improvement District. Currently, the lift station capacity is 0.72 mgd.

II. PURPOSE OF THE PROJECT

The purpose of the project is to increase the capacity of the lift station from 0.72 to 1.4 mgd to handle wet weather flows.

III. EXISTING CONDITIONS

The Oakbrook pump station is a submersible lift station and serves areas of Sherwood north and south of Kiehl Avenue originally developed as part of an Improvement District. Currently, the lift station capacity is 0.72 mgd.

IV. ALTERNATIVES

Alternatives to replacing the lift stations with submersible pumps include:

1. Wet Pip/Dry Pit Pump Stations
Estimated Cost: \$ 950,000
2. Vertical Pumps
Estimated Cost: \$ 1,200,000
4. Submersible Station
Estimated Cost: \$ 670,000

The Utility has a long-standing unwritten policy requiring submersible pump stations within the collection system. Only submersible type pump stations have been constructed within the NLRWWU service area since at least 1989, and new specifications are being drafted which will include the requirement for submersible pump stations.

Submersible pump stations allow service mechanics and electricians to maintain the equipment without entering the wet well. Staff really likes that because it eliminates the hazards associated with confined space entry. Also, it is considerably easier to pull a submersible pump for maintenance. This is accomplished simply by attaching a winch truck to the lifting chain and hoisting it to the surface, whereas in a dry pit pump installation the pump is flanged to the suction and discharge piping and bolted to the foundation.

V. SELECTED ALTERNATIVE

Replace the existing stations with submersible type pump stations as previously identified.

VI. RATES

A rate study has been performed by the Utility.

VII. PERMITS AND REQUIREMENTS

The following permits and reviewing agency approvals will be required:

- Department of Health
- NLRWW Utility

VIII. TIMETABLE

The following schedule is estimated to plan, fund, design and build future improvements based on the ANRC RLF program:

<u>TASK:</u>	<u>DATE</u>
--------------	-------------

1. Prepare and approve ANRC RLF Resolutions:
(The following 2 Resolutions and 2 applications must be submitted and approved before being officially in the RLF program.)
 - Resolution of Signature Authority (identifying the City's representative.)
 - Resolution of Intent (Intent to do the project for a specified amount by tax exempt bonds and to be reimbursed for previous services before bonds issued.)
 - Preapplication to WWAC Committee Nov. 2011
 - Prepare and submit loan application Dec. 2011

2. Submit to ANRC engineering report and cost analysis for approval.
NLRWW Utility will receive from ANRC letter of approval regarding project cost which will likely be higher than that requested.

3. Memorandum of Agreement (MOA). The MOA will include projected submittal dates for facility plans, specifications, rate ordinance, and all other items up to the advertisement for construction bids.

At this point, Engineer can be working on plan preparation.

4. Submit plans to various agencies for review and approval
5. Advertise for Construction Bids

6. Contract with Contractor

7. Construct Improvements

8. Prepare O&M Manual/ Start Up

Note: Target dates are under consideration by the Utility.

IX. IMPLEMENTATION

All operations personnel are properly licensed.

X. PUBLIC PARTICIPATION

Public participation information will be conducted by the Utility.

XI. EXHIBITS

Locations of improvements and associated costs are included in exhibits 1 and 2. ✓ ✓

**PROJECT 6: FIVE MILE CREEK WASTEWATER TREATMENT PLANT
IMPROVEMENTS (Master Plan Project Reference # 6)**

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PROJECT 6: FIVE MILE CREEK WASTEWATER TREATMENT PLANT IMPROVEMENTS (Master Plan Project Reference # 6)

I. INTRODUCTION AND NARRATIVE

The North Little Rock Wastewater Utility provides wastewater collection and treatment for customers living in North Little Rock, Sherwood and areas in Pulaski County. The Utility owns and operates three wastewater treatment plants including:

1. White Oak Treatment Plant
2. Faulkner Lake Treatment Plant
3. Five Mile Creek Treatment Plant

The Utility desires to implement improvements to its Five Mile Creek Treatment Plant to meet additional capacity requirements in the growing community and handle infiltration and inflow which will reduce the occurrence of sewer system overflows.

Relation Between 2008 Storm Events, Consent Order and Sewer System Overflows:

Infiltration and inflow increased significantly due to the 2008 storm events. These rain events caused significant infiltration into the sewer collection system which caused overflows from sewer manholes throughout the system. The Utility is currently under a Consent Administrative Order (CAO) from the Arkansas Department of Environmental Quality (ADEQ) to upgrade its collection system to reduce Sewer System Overflows (SSOs). The Utility also desires the facility to meet discharge limitations as sewer flow increases due to increasing population in the area. The Five Mile Creek basin includes areas in North Little Rock, Sherwood and Pulaski County west of I-440, east and west of I-67/167 and along the drainage basin of Five Mile Creek. The Five Mile Creek treatment facility serves the McAlmont community consisting of 1236 customers (2400 population) and is 71.8 percent low to moderate income families according to the 2000 census. These customers make up 6.5 % of the total customers for the Five Mile Creek treatment plant.

II. EXISTING CONDITIONS

- A. Location - An area map identifying the boundary of the Five Mile Creek drainage basin is included with site maps of each of the proposed treatment facility alternatives in Exhibit 1 of the report.

- B. Need - The Utility currently operates a partially mixed aerated lagoon system with chlorine disinfection. The project is needed to improve treatment conditions and provide additional capacity due to growth in the area and flow equalization to handle wet weather flows due to infiltration and inflow resulting from the 2008 storm events.

will be phased

Phase 1 now
headwork
p.s. improvement

C. Collection System – The existing collection system include gravity sewer, pump stations and force main with a main interceptor located along Five Mile Creek which is the outfall line for parts of North Little Rock and Sherwood. The Utility completed a master plan study to identify needed improvements in the collection system to reduce sewer system overflows, infiltration and inflow.

D. NPDES Permit Limitations – The current NPDES permit limitations are as follows:

- CBOD – 30 mg/l
- TSS – 90 mg/l average 135 mg/l maximum
- pH – 5 – 9.0
- Fecal Coliform – 200-1000 colonies (Summer Months)
2000-4000 colonies (Winter Months)
- Chlorine (no limit in permit, only reporting at this time)
- Current Design Flow – 5.1 mgd

E. Sewer Flow Characteristics

The average flow over the last 12 months at the treatment plant was 6.6 mgd.

F. Current rates to all NLR customers are a minimum of \$ 10.20 for the first 400 cu.ft. and \$ 2.55 / 100 cu.ft. for additional usage. Operation and maintenance costs for the Five Mile Creek treatment plant was \$ 866,000 for the past 12 months.

III. FUTURE CONDITIONS

As part of the master plan study the Utility, future conditions for the Five Mile Creek Basin including flow and population projections are summarized below:

2010 Population / Flow	2030 Population / Flow
37,000 / 5.1 mgd	56,150 / 7.02 mgd

The Utility desires to plan an expansion of its existing treatment process and as Phase 1 of those improvements as follows:

- Construct new headworks facility
- Construct pump station improvements

\$2,225,000

IV. ALTERNATIVES

No alternatives were identified.

V. COST ANALYSIS

Refer to exhibit 2 for costs for these improvements.

VI. RECOMMENDED ALTERNATIVE

The recommendation at this time as part of the phase 1 improvements is to construct improvements to the headworks and pump station at a cost of \$ 2,225,000.

VII. FUNDING RECOMMENDATION

Funding for this project is recommended through two agencies:

1. Loan funds through the Arkansas Natural Resources Commission's (ANRC) Revolving Loan Fund (RLF) program.

VIII. CONCLUSIONS AND RECOMMENDATIONS

There are no further conclusions other than those presented in the report.

The proposed project schedule is as follows:

- | | |
|--|-----------------|
| 1. Prepare Plans and Specifications | 180 days |
| 2. Receive approvals | 60 days |
| 2. Advertise/Receive Construction Bids | 60 days |
| 3. Begin Construction | |
| 4. Complete Construction | <u>300 days</u> |

IX. EXHIBITS

Refer to exhibits 1 and 2 for site location and costs of improvements.

**PROJECT 7: FAULKNER LAKE WASTEWATER TREATMENT PLANT
EQUALIZATION STORAGE AND OTHER IMPROVEMENTS
(Master Plan Project Reference # 7)**

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**PROJECT 7: FAULKNER LAKE WASTEWATER TREATMENT PLANT
EQUALIZATION STORAGE AND OTHER IMPROVEMENTS
(Master Plan Project Reference # 7)**

I. INTRODUCTION AND NARRATIVE

The Faulkner Lake Wastewater Treatment Plant (FLWWTP) includes influent pumping, preliminary and final clarification, aeration/activated sludge process, chlorine contact, flow measurement through a Parshall Flume and discharge to the Arkansas River. Additionally, FLWWTP includes sludge stabilization utilizing sludge thickeners and a belt filter press before land application. Due to significant infiltration, the Utility desires to construct an equalization basin to detain wet weather flow during rain events. All construction will be within the existing plant site.

II. PURPOSE OF THE PROJECT

The purpose of the project is to construct a 23.5 million gallon equalization basin to retain wet weather flow during significant infiltration while maximum allowable flow is processed through the treatment plant.

III. EXISTING CONDITIONS

The Faulkner Lake treatment plant includes preliminary and final clarification and an aeration / activated sludge process reactor with sludge thickening and dewatering. During heavy rain events and during the rain events of April/May, 2011, the facility experienced significant infiltration that needs to be handled in an equalization basin (EQ).

IV. ALTERNATIVES

Although the Utility will conduct annual rehabilitation work in its collection system to reduce infiltration and inflow, the treatment plant will need to be capable of retaining the remaining infiltration to maintain the treatment process. No additional alternatives were identified in the Utility's Master Plan.

V. SELECTED ALTERNATIVE

The recommended improvement is to construct a 23.5 million gallon EQ basin to retain excess wet weather flow.

VI. RATES

A rate study has been performed by the Utility.

BOOK

VII. PERMITS AND REQUIREMENTS

The following permits and reviewing agency approvals will be required:

- ADEQ Construction
- Department of Health
- NLRWW Utility

VIII. TIMETABLE

The following schedule is estimated to plan, fund, design and build future improvements based on the ANRC RLF program:

<u>TASK:</u>	<u>DATE</u>
--------------	-------------

- | | |
|---|-----------|
| 4. Prepare and approve ANRC RLF Resolutions:
(The following 2 Resolutions and 2 applications must be submitted and
60 approved before being officially in the RLF program.) | |
| • Resolution of Signature Authority (identifying the City's representative.) | |
| • Resolution of Intent (Intent to do the project for a specified amount by tax
exempt bonds and to be reimbursed for previous services before bonds
issued. | |
| • Preapplication to WWAC Committee | Nov. 2011 |
| • Prepare and submit loan application | Dec. 2011 |

5. Submit to ANRC engineering report and cost analysis for approval.
NLRWW Utility will receive from ANRC letter of approval regarding
project cost which will likely be higher than that requested.

6. Memorandum of Agreement (MOA). The MOA will include projected
submittal dates for facility plans, specifications, rate ordinance, and all
other items up to the advertisement for construction bids.

At this point, Engineer can be working on plan preparation.

4. Submit plans to various agencies for review and approval

5. Advertise for Construction Bids

6. Contract with Contractor

7. Construct Improvements

8. Prepare O&M Manual/ Start Up

Note: Final target dates are under consideration by the Utility.

IX. IMPLEMENTATION

All operations personnel are properly licensed.

X. PUBLIC PARTICIPATION

Public participation information will be conducted by the Utility.

XI. EXHIBITS

Site locations and costs are identified in exhibits 1 and 2. ✓ ✓

X. OTHER IMPROVEMENTS AT FLWWTP

The Utility proposes to install storm water runoff protection improvements and other improvements including the following:

- Faulkner Lake Maintenance Department equipment storage bays and vehicle wash station. This project will consist of the addition of equipment storage bays along the southeast corner of the plant site to provide covered equipment storage. The project will also include the addition of a vehicle wash bay for cleaning utility vehicles.
- Vacon Dump Station Modifications
- Primary and Secondary Solids Disposal. The Utility has been notified by American Composting of an increase in disposal fees beginning January 1, 2012 with a second increase beginning January 1, 2013. This increase will be as projected below:

YEAR	RATE/CY	PROJECTED ANNUAL COST
2011	\$ 8.55	\$ 55,400
2012	\$ 12.00	\$ 77,760
2013	\$ 16.00	\$ 103,680

**PROJECT 8: FAULKNER LAKE WASTEWATER TREATMENT PLANT
EQUALIZATION PUMP STATION (Master Plan Project Reference # 8)**

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PROJECT 8: FAULKNER LAKE WASTEWATER TREATMENT PLANT EQUALIZATION PUMP STATION (Master Plan Project Reference # 8)

I. INTRODUCTION

The Faulkner Lake Wastewater Treatment Plant (FLWWTP) includes influent pumping, preliminary and final clarification, aeration/activated sludge process, chlorine contact, flow measurement through a Parshall Flume and discharge to the Arkansas River. Additionally, FLWWTP includes sludge stabilization utilizing sludge thickeners and a belt filter press before land application. Due to significant infiltration, the Utility desires to construct a 28 mgd equalization pump station to convey flows to and from the Faulkner Lake treatment plant equalization storage basin (EQB). All construction will be within the existing plant site.

II. PURPOSE OF THE PROJECT

The purpose of the project is construct a 28 mgd equalization pump station to convey flows to and from the Faulkner Lake treatment plant equalization storage basin (EQB) during wet weather flow periods.

3,400,000

III. EXISTING CONDITIONS

The Faulkner Lake treatment plant includes preliminary and final clarification and an aeration / activated sludge process reactor with sludge thickening and dewatering. During heavy rain events and during the rain events of April/May, 2011, the facility experienced significant infiltration that needs to be handled in an equalization basin (EQ). Additional pumping capacity is needed to handle the increase flow during wet weather flow periods.

IV. ALTERNATIVES

Although the Utility will conduct annual rehabilitation work in its collection system to reduce infiltration and inflow, the treatment plant will need to be capable of retaining the remaining infiltration to maintain the treatment process and additional pumping capacity in needed.

V. SELECTED ALTERNATIVE

The recommended improvement is to construct a 28 mgd pump station to convey flow to and from the EQ Basin during wet weather flow.

VI. RATES

A rate study has been performed by the Utility and is included in the Appendix of this report.

VII. PERMITS AND REQUIREMENTS

The following permits and reviewing agency approvals will be required:

- ADEQ Construction
- Department of Health
- NLRWW Utility

VIII. TIMETABLE

The following schedule is estimated to plan, fund, design and build future improvements based on the ANRC RLF program:

<u>TASK:</u>	<u>DATE</u>
--------------	-------------

7. Prepare and approve ANRC RLF Resolutions:
(The following 2 Resolutions and 2 applications must be submitted and ~~60~~ approved before being officially in the RLF program.)
 - Resolution of Signature Authority (identifying the City's representative.)
 - Resolution of Intent (Intent to do the project for a specified amount by tax exempt bonds and to be reimbursed for previous services before bonds issued.)
 - Preapplication to WWAC Committee
 - Prepare and submit loan application

8. Submit to ANRC engineering report and cost analysis for approval.
NLRWW Utility will receive from ANRC letter of approval regarding project cost which will likely be higher than that requested.

9. Memorandum of Agreement (MOA). The MOA will include projected submittal dates for facility plans, specifications, rate ordinance, and all other items up to the advertisement for construction bids.

At this point, Engineer can be working on plan preparation.

4. Submit plans to various agencies for review and approval
5. Advertise for Construction Bids
6. Contract with Contractor
7. Construct Improvements

8. Prepare O&M Manual/ Start Up

Note: Final target dates to be determined.

IX. IMPLEMENTATION

All operations personnel are properly licensed.

X. PUBLIC PARTICIPATION

Public participation will be conducted by the Utility.

XI. EXHIBITS

Exhibits 1 and 2 identify project locations and associated costs.

**PROJECT 9: SEWER COLLECTION SYSTEM IMPROVEMENTS AND
MODIFICATIONS
(Master Plan Reference # 18)**

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PROJECT 9: SEWER COLLECTION SYSTEM IMPROVEMENTS AND MODIFICATIONS
(Master Plan Project Reference # 9)

I. INTRODUCTION

The Utility has evaluated the needs to make improvements and extend certain of its interceptors and recommends the following interceptors to be rehabilitated and improved:

1. Rose City Interceptor *\$ 1,509,096*
2. White Oak Interceptor Phase 2 (Proposed Interceptor) *\$ 1,700,000*
3. Collection Improvements in Lakewood No. 2 basin, and along Roseclair Drive *\$ 2,250,000*

An outside engineering firm may be utilized for preparation of contract documents depending on the scope of work required.

Staff projects cost of interceptor improvements and modifications up to \$ 1,000,000 annually and as shown in the Summary of Costs, Exhibit 2.

II. PURPOSE OF THE PROJECT

The purpose of the interceptor improvements is to upgrade existing sewer mains to improve conveyance of wastewater, repair structural failures and/or reduce infiltration/inflow into the system. This will be accomplished by relining, pipe bursting, point repairs, or by replacing certain mains.

III. EXISTING CONDITIONS AND PROCEDURES

Many of the Utility's interceptors were constructed in the 1960's and 1970's and the majority were constructed with concrete pipe. The Utility is evaluating certain interceptors to determine the existing conditions in order to identify necessary rehabilitation and upgrades.

IV. ALTERNATIVES

Internal lining, pipe bursting, point repairs, replacement or a combination of these methods will be selected on a case by case basis for each identified line segment. Estimates of costs are provided in the Exhibit 2.

V. SELECTED ALTERNATIVE

To be determined on a case by case basis for each line segment depending on the nature of the defects identified, the surface and subsurface conditions, available access, and cost.

VI. RATES

A rate study has been performed by the Utility.

VII. PERMITS AND REQUIREMENTS

The following permits and reviewing agency approvals will be required:

- Department of Health
- NLRWW Utility

VIII. TIMETABLE

The following schedule is estimated to plan, fund, design and build future improvements based on the ANRC RLF program:

<u>TASK:</u>	<u>DATE</u>
--------------	-------------

- | | |
|---|-----------|
| 1. Prepare and approve ANRC RLF Resolutions:
(The following 2 Resolutions and 2 applications must be submitted and approved before being officially in the RLF program.) | |
| • Resolution of Signature Authority (identifying the City's representative.) | |
| • Resolution of Intent (Intent to do the project for a specified amount by tax exempt bonds and to be reimbursed for previous services before bonds issued.) | |
| • Preapplication to WWAC Committee | Nov. 2011 |
| • Prepare and submit loan application | Dec. 2011 |

2. Submit to ANRC engineering report and cost analysis for approval. NLRWW Utility will receive from ANRC letter of approval regarding project cost which will likely be higher than that requested.

3. Memorandum of Agreement (MOA). The MOA will include projected submittal dates for facility plans, specifications, rate ordinance, and all other items up to the advertisement for construction bids.

At this point, Engineer can be working on plan preparation.

4. Submit plans to various agencies for review and approval
5. Advertise for Construction Bids
6. Contract with Contractor
7. Construct Improvements

8. Prepare O&M Manual/ Start Up

Note: Final target dates are being considered by the Utility.

IX. IMPLEMENTATION

All operations personnel are properly licensed.

X. PUBLIC PARTICIPATION

Public participation will be conducted by the Utility.

XI. EXHIBITS

Exhibits 1 and 2 identify project locations and associated costs.

**PROJECT 10: SEWER SYSTEM EVALUATION SURVEY (SSES) AND
REHABILITATION
(Master Plan Reference # 19)**

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TABLE 1-1 SSES PRIORITIZATION
FIGURE 1-1 RECOMMENDED SSES FIELDWORK

**PROJECT 10: SEWER SYSTEM EVALUATION SURVEY (SSES) AND
REHABILITATION
(Master Plan Project Reference # 19)**

I. INTRODUCTION

The Utility plans to continue, on an annual basis to perform Sewer System Evaluation Surveys (SSES) on its sewer collection system and to conduct rehabilitation projects based on the recommended rehabilitation procedure from the SSES.

Staff projects cost of interceptor improvements and modifications up to \$ 1,000,000 annually and as shown in the Summary of Costs, Exhibit 2.

II. PURPOSE OF THE PROJECT

The purpose of the interceptor improvements is to upgrade existing sewer mains to improve transportation, repair structural failures and/or reduce infiltration/inflow into the system. This will be accomplished by relining, pipe bursting, point repairs, or by replacing certain mains.

III. EXISTING CONDITIONS AND PROCEDURES

Many of the Utility's interceptors were constructed in the 1960's and 1970's and the majority were constructed with concrete pipe. The Utility proposes to perform SSES to determine the existing conditions in order to identify necessary rehabilitation and upgrades. This project will consist annual Cured-In-Place Pipe (CIPP) maintenance and preparation of contract documents for on-call CIPP rehabilitation of existing pipelines to be identified from staff investigations.

IV. ALTERNATIVES

Internal lining, pipe bursting, point repairs, replacement or a combination of these methods will be selected on a case by case basis for each indentified line segment. Estimates of costs are provided in the Exhibit in this section.

V. SELECTED ALTERNATIVE

To be determined on a case by case basis for each line segment depending on the nature of the defects identified, the surface and subsurface conditions, available access, and cost.

VI. RATES

A rate study has been performed by the Utility and the recommended rate structure has been implemented by City Council. A copy is included in the Appendix of this report.

VII. PERMITS AND REQUIREMENTS

The following permits and reviewing agency approvals will be required:

- Department of Health
- NLRWW Utility

VIII. TIMETABLE

The following schedule is estimated to plan, fund, design and build future improvements based on the ANRC RLF program:

TASK: _____ **DATE**

4. Prepare and approve ANRC RLF Resolutions:
(The following 2 Resolutions and 2 applications must be submitted and 60 approved before being officially in the RLF program.)
 - Resolution of Signature Authority (identifying the City's representative.)
 - Resolution of Intent (Intent to do the project for a specified amount by tax exempt bonds and to be reimbursed for previous services before bonds issued.
 - Preapplication to WWAC Committee Nov. 2011
 - Prepare and submit loan application Dec. 2011
5. Submit to ANRC engineering report and cost analysis for approval.
NLRWW Utility will receive from ANRC letter of approval regarding project cost which will likely be higher than that requested.
6. Memorandum of Agreement (MOA). The MOA will include projected submittal dates for facility plans, specifications, rate ordinance, and all other items up to the advertisement for construction bids.

At this point, Engineer can be working on plan preparation.

4. Submit plans to various agencies for review and approval
5. Advertise for Construction Bids
6. Contract with Contractor
7. Construct Improvements
8. Prepare O&M Manual/ Start Up

Note: Final target dates will be provided by the Utility.

IX. IMPLEMENTATION

All operations personnel are properly licensed.

X. PUBLIC PARTICIPATION

Public participation will be conducted by the Utility.

XI. EXHIBITS

Exhibits 1 and 2 identify project locations and associated costs.

Table 1-1 SSES Prioritization

Flow Meter Basin	Total R Value		Estimated Groundwater Infiltration (gpd/mile)		Model-Predicted Overflow Volume (MG/mile of sewer)		Reported SSOs (Count)		Potential Impact to Sizing of Improvement Project		Average Sewer Age (years)		Rank	Weighted Score	Rank
	Value	Score	Value	Score	Value	Score	Value	Score	Value	Score	Value	Score			
	10%		10%		10%		30%		25%		15%				
Faulkner 01N	0.115	3	8000	2	0.164	3	59	3	Yes	3	38	2	4	2.75	4
Faulkner 02	0.09	3	14000	3	0.013	2	38	3	Yes	3	49	3	2	2.9	2
Faulkner 02N	0.11	3	60000	3	0.827	3	4	2	Yes	3	37	2	4	2.55	8
Faulkner 03	0.146	3	15000	3	0.017	2	25	3	Yes	3	49	3	2	2.9	2
Faulkner 03N	0.068	2	1000	1	0.000	1	22	3	No	1	40	3	21	2	18
Faulkner 04	0.043	2	3500	1	0.041	2	1	2	No	1	26	2	26	1.65	26
Faulkner 05	0.027	1	20212	3	0.000	1	14	2	No	1	42	3	21	1.8	23
Faulkner 06	0.068	2	42000	3	0.000	1	5	2	No	1	48	3	18	1.9	22
Faulkner 07	0.075	2	5000	2	0.262	3	1	2	Yes	3	36	2	12	2.35	14
Faulkner 08	0.04	2	30000	3	0.060	2	10	2	Yes	3	40	3	8	2.5	10
Faulkner 09	0.033	1	16432	3	0.001	1	7	2	No	1	28	2	26	1.65	26
Faulkner 10	0.045	2	1750	1	0.259	3	4	2	Yes	3	44	3	12	2.4	12
Faulkner 11	0.043	2	28532	3	0.119	3	12	2	Yes	3	50	3	4	2.6	7
Faulkner No Meter	0.07	2	18879	3	0.380	3	22	3	No	1	40	3	8	2.4	13
Five Mile 01	0.022	1	3866	1	0.000	1	3	2	Yes	3	12	1	31	1.8	24
Five Mile 02	0.047	2	6752	2	0.000	1	4	2	No	1	21	1	31	1.5	31
Five Mile 03	0.0235	1	7822	2	0.006	2	1	2	No	1	27	2	26	1.65	26
Five Mile 04	0.086	3	6031	2	0.228	3	2	2	Yes	3	31	2	8	2.45	11
Five Mile 05	0.055	2	6676	2	1.117	3	0	1	No	1	31	2	21	1.55	30
Five Mile 06	0.056	2	6676	2	0.000	1	4	2	No	1	23	1	31	1.5	31
Five Mile 07	0.077	2	6676	2	0.007	2	9	2	Yes	3	30	2	16	2.25	16
Five Mile 08	0.071	2	7506	2	0.000	1	1	2	Yes	3	34	2	18	2.15	17

Section 1
Overview

Flow Meter Basin	Total R Value		Estimated Groundwater Infiltration (gpd/mile)		Model-Predicted Overflow Volume (MG/mile of sewer)		Reported SSOs (Count)		Potential Impact to Sizing of Improvement Project		Average Sewer Age (years)		Rank	Weighted Score	Rank
	Value	Score	Value	Score	Value	Score	Value	Score	Value	Score	Value	Score			
Weights	10%		10%		10%		30%		25%		15%				
Five Mile 09	0.084	3	8367	2	0.026	2	7	2	Yes	3	31	2	12	2.35	14
Five Mile 10	0.045	2	1959	1	0.339	3	0	1	Yes	3	34	2	18	1.95	19
Five Mile 11	0.054	2	6697	2	0.000	1	23	3	No	1	36	2	21	1.95	20
Five Mile 12	0.07	2	6824	2	0.000	1	3	2	No	1	30	2	26	1.65	26
Five Mile 13	0.099	3	12390	3	0.058	2	2	2	No	1	35	2	16	1.95	20
Five Mile 14	0.027	1	14681	3	0.006	2	1	2	No	1	31	2	21	1.75	25
Five Mile 15	0.015	1	5274	2	0.066	2	0	1	No	1	29	2	31	1.35	36
Five Mile 16	0.047	2	4613	1	0.014	2	2	2	No	1	23	1	31	1.5	31
Five Mile 18	0.067	2	5477	2	0.000	1	0	1	No	1	24	1	36	1.2	37
Five Mile No Meter	0.055	2	6676	2	0.498	3	0	1	No	1	15	1	26	1.4	34
White Oak 01	0.007	1	5631	2	0.000	1	0	1	No	1	12	1	40	1.1	40
White Oak 02	0.012	1	3138	1	0.005	2	3	2	No	1	0	1	36	1.4	34
White Oak 03	0.049	2	5628	2	0.000	1	0	1	No	1	22	1	36	1.2	37
White Oak 04	0.048	2	5642	2	0.000	1	0	1	No	1	12	1	36	1.2	37
White Oak 05	0.098	3	9533	2	0.134	3	18	3	Yes	3	39	2	4	2.75	4
White Oak 06	0.073	2	11085	3	0.000	1	29	3	Yes	3	43	3	8	2.7	6
White Oak 07	0.148	3	10347	3	0.100	3	18	3	Yes	3	43	3	1	3	1
White Oak No Meter	0.073	2	7286	2	0.055	2	53	3	Yes	3	34	2	12	2.55	8



North Little Rock Wastewater Utility

Legend

- SSES Prioritization**
- Lower Priorities
 - White Oak 07
 - Faulkner 02, Faulkner 03
 - Faulkner 01N, White Oak 05
 - White Oak 06
 - Faulkner 11
 - Faulkner 02N, White Oak Unmetered
 - Faulkner 08
 - Five Mile 04
 - Faulkner 10
- Modeled System**
- Pump Station
 - Gravity
 - Force Main
- Other Features**
- Treatment Plant
 - Major Roads
 - Surface Water
 - Swamp/Marsh



FIGURE I-1:
Recommended
Prioritization for
SSES Fieldwork

CDM

**Master Plan Recommendation of Improvements
North Little Rock Waste Water Utility**

EXHIBIT 2
PHASE 1 - 2012 - 2014

Ref No.	Basin	Project Description	Construction Costs
1	White Oak	Shillcutt Pump Station Stand-By Power (Auxiliary Generator)	\$ 500,000.00
2	White Oak	Shillcutt Pump Station Improvements Replace existing pump station to provide larger pump capacity (16.5 mgd) and deeper wet well to reduce surcharges	\$ 5,400,000.00
3	White Oak	White Oak Back Up Generator	\$ 77,000.00
4	Faulkner Lake	Wilcox Pump Station Back Up Generator	\$ 50,000.00
5	Five Mile Creek	Oakbrook Pump Station	\$ 670,000.00
6	Five Mile Creek	Five Mile Creek Wastewater Treatment Plant Upgrade Headworks and Influent Pump Station	\$ 2,225,000.00
7	Faulkner Lake	Equalization Storage - Construct 23.5 MG equalization facility to detain wet weather flows. Equipment storage bays and wash station.	\$ 800,000.00
8	Faulkner Lake	Equalization Pump Station - Construct 28 mgd pump station to convey flows to and from the FLWWTP equalization storage basin	\$ 3,400,000.00
9		Sewer Collection System Improvements Lakewood No. 2 basin collection system improvements, Rose-clair dirve collection system improvements	\$ 2,250,000.00
		White Oak Interceptor Phase 2	\$ 1,700,000.00
		Rose City Interceptor	\$ 1,509,096.00
10		SSES and Rehabilitation	\$ 2,250,000.00
Total Phase 1 Improvements			\$ 20,831,096.00

MAP(S)/PLAN(S) SCANNED IN
SEPARATE FILE