

February 28, 2012

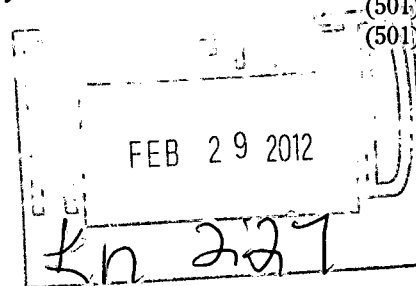


**City of Hot Springs
Utilities Department**

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Arkansas Department of Environmental Quality
Water Division
ATTN: Amy Schluterman
5301 Northshore Drive
North Little Rock, AR 72118

Re: City of Hot Springs Annual Report
CAO LIS No. 08-099



Dear Amy,

This report is submitted to the Arkansas Department of Environmental Quality (ADEQ) to comply with CAO LIS No. 08-099, Attachment A: Schedule of Compliance Activities, Condition II. 1. The City of Hot Springs (CHS) has continued the efforts presented in the document "City of Hot Springs – Response to Consent Administrative Order" dated November 14, 2008 (Response to CAO) with respect to the sanitary sewer collection system. This report is generally submitted in the same format as the three previous annual reports which specifically address the Major Goals presented in the aforementioned November 14th response from the city.

The City of Hot Springs remains committed to addressing the issues facing our wastewater collection and treatment systems. Our efforts remain centered on correcting items that have a direct impact on reducing inflow and infiltration, which is the root cause of the system deficiencies that lead to wastewater overflows and treatment capacity issues. The Consent Administrative Order, which was issued in August, 2008, identifies the aforementioned problems and mandates that the City of Hot Springs address these issues in a defined time frame. The city is proud of our efforts to date and feel that we have made great strides towards the ultimate goal of preventing wastewater overflows and treatment bypasses through a systematic effort that also insures long term compliance.

The latest annual report presented in January of 2011 included a special section that specifically addressed the January, 2011 deadline to achieve compliance with respect to dry weather overflows. This report will update our continued efforts regarding preventing dry weather overflows through the implementation of an innovative pump station monitoring system, pump station replacement and repairs, improved maintenance procedures, and internal staffing re-organization.

Since the issuance of the CAO in 2008, the city has spent and/or encumbered approximately \$21.4 million on projects related to achieving compliance since the CAO was issued in

August, 2008. This was primarily made possible through the issuance of bonds in December, 2009 that yielded \$26.9 million in funds that are dedicated to this effort. The city fully understands that these funds that will be largely expended on projects by 2013, as required by the bond language, and that achieving compliance with the wet weather overflow deadline of January 1, 2018 will involve, at a minimum, another bond issue for a second round of projects. This report includes a proposed schedule of projects along with a funding plan that will address the work to be performed after 2013. It is attached to this report as Appendix A and includes a complete listing of all completed, current and proposed projects known at this time along with actual and estimated costs for each. Appendix A also includes funding sources, existing and proposed, along with actual amounts to date for existing funding sources and proposed projects to be paid for through the remainder of unobligated funding in the 2009 Bond Issue (\$26,861,196.11) and the projected 2015 Bond Issue (projected at \$20 million). There is also a column for projects that remain unfunded that will have to be addressed through the city's annual capital budget and/or future debt issuances. It is important to note that this projected list of improvements and estimated costs will be continually analyzed and revised as necessary in future reports in order to ensure the most effective solutions based on the most current data.

Also included herein is the final component (Chapter 6) of the Sewer Evaluation and Capacity Assurance Plan (SECAP) as well as an Executive Summary, which are included as Appendix B. These report sections were incomplete at the time the SECAP was presented to ADEQ on August 10, 2010, pending additional modeling and analysis, which is now complete. This section contains a listing of recommended capacity related improvements that are a result of analysis of the hydraulic model that was developed from data gathered during the collection system survey. It is important to note that the scope for the list of improvements is extensive and includes substantial projects that are not directly related to elimination of known overflows, and therefore may not be required to meet the requirements of the CAO. City staff will have to prioritize and phase these projects in order to perform the work first that will have the most immediate impact on the wet weather overflows. While staff acknowledges that a portion of this work may not be directly related to system overflows, however, the city is committed to a long term schedule of capital improvements that will address all of the noted deficiencies.

Another item of note that occurred since the last annual report was the settlement of the administrative penalty through an amendment to the Consent Administrative Order. Through this amendment, the City of Hot Springs and ADEQ mutually agreed to an amount of \$105,000 that was paid by the city as settlement of the civil penalties detailed in the CAO.

As an additional update, the city is now complete with the project to replace all of our existing water meters with new, remote read meters. As a result of this project, we are seeing increases in water consumption due to the new meters. As our wastewater rates are based on actual water consumption and not a flat rate charge, we expect that this will provide a relative

boost to wastewater revenues in the coming years. Due to projects such as these and other budgetary and operational improvements, the overall health of our Wastewater Fund continues to improve. Annual rate increases that were approved in 2009 continue to provide the funds necessary to meet our debt obligations as well as fund our operating budget. The city's rate consultant has recently reviewed our wastewater rates with regards to the current and planned budgetary obligations and feels that we are in good condition moving forward. Results from the consultant's rate review are used in this report to project future debt issuances that will be needed to address the CAO.

The City of Hot Springs also realizes that the work cannot stop once compliance is achieved, which is why the city feels that the preventive maintenance, pipeline cleaning and pre-treatment programs must continue to be developed, implemented and/or improved. Addressing these components, as well as continuing to hire, train and retrain qualified staff, is imperative to continually improve on and preserve the work now being performed. Outside of the substantial amount of projects contained within the report, perhaps the most significant event during 2011 involved substantial staffing changes. A full report on these changes and the impact to date is included in Section 8 of this report. The City of Hot Springs also remains committed to keeping the customers informed of how the funding from the 2009 Bond Issue is being spent by including a yearly update that is sent along with the water bill. A copy of the tri-fold 2012 Wastewater Bond Projects Update brochure is included in the report as Appendix C.

We trust that the efforts presented herein illustrate the city's commitment to addressing all of the issues outlined in the CAO. We appreciate the continued cooperation from ADEQ and EPA in working with us as we move forward. Please feel free to contact me at (501) 321-6860 if you have any questions or need additional information.

Sincerely,

CITY OF HOT SPRINGS, ARKANSAS



Steve Mallett, Jr., P.E.
Deputy City Manager for Public Works and Utilities

cc: City of Hot Springs Board of Directors
Lance Hudnell, City Manager
Richard Penn, Utilities Director
Aaron Stallmann, Garver, LLC
Hugh Kelso, RJN Group, Inc.
CAO File

ANNUAL STATUS REPORT

1. ACHIEVE COMPLIANCE WITH REGARDS TO DRY WEATHER OVERFLOWS BY JANUARY 1, 2011.

As mentioned in the cover letter to this report, the previous annual report submitted on January 31, 2011 included a special section dedicated to achieving compliance with regards to dry weather overflows by January 1, 2011 as stated in the CAO. At that time, it was reported that the efforts that we had made in the twelve (12) month period since the time that funding was actually acquired in December, 2009 were substantial and we felt that we had complied with the mandate. However, it was stated that many of the capital projects and maintenance procedures that had a direct impact on dry weather overflow were ongoing. Since that time, we have made great strides in monitoring of our large number of pump stations as well as the repair, rehabilitation and maintenance of the stations. This section will provide an update on those projects.

As stated in previous reports and conversations, city staff has defined certain projects and/or practices that will directly impact current issues related to dry weather overflows and allow us to achieve compliance with the order. As these types of overflows in the Hot Springs Wastewater System are almost entirely related to pump station issues (power outage, lack of and/or failing SCADA units, mechanical pump failure, etc.), our efforts are focused on addressing these shortcomings. The only non-pump station related item identified to address dry weather overflows is the development of an effective pipeline flushing/cleaning program. Therefore, the following is an update on those items that staff feels represents the major issues that lead to dry weather overflows.

1. Pump Station Rehabilitation and Backup Power
2. Major Pump Station SCADA System
3. Minor (Grinder Station) SCADA System
4. Preventive Maintenance Program
5. Pipeline Cleaning Program

PUMP STATION REHABILITATION AND BACKUP POWER GENERATORS:

The City of Hot Springs has identified that the primary cause for dry weather overflows include equipment failure/malfunction and the loss of power at a pump station. The City retained Garver, LLC to begin evaluating pump stations that were considered to be critical to the collection system. An initial list of 76 pump stations for evaluation was developed by the City based on the condition of the station, frequency of overflows and station capacity. Garver conducted meetings with City personnel to gather any available information for the pump stations on this list. Garver then began performing field investigations of the listed

pump stations. Pump operating performance, influent flowrate, power usage, run hours, site measurements, equipment information, general site notes, and pictures were recorded at each station. Collection information in the field regarding pump characteristics and overall site layout was necessary to progress further with the collection system evaluation.

Once the field investigations were completed, the data collected was compiled and developed into a report for each station. The reports included the field information, wet well drawdown calculations, photographs, and recommendations for improvements. An example of these reports was included in the 2011 Annual Report. As reported in the 2011 Annual Report, Garver developed several projects using the information gathered from the pump station evaluations. These projects include 10A, 10C, 10D and Gulpha Pump Station Improvements as well as others that are currently in the design stage.

Project 10A included mechanical and safety improvements at 27 pump stations, including lighting upgrades, replacement of power supplies and control panels, general site improvements, installation of 4 - 100KW natural gas generators, installation of 1 - 200KW diesel generator, and installation of 5 manual transfer switches with receptacles to facilitate the use of portable generators. Project 10A was awarded to H&H Electrical for the contract which was completed in September 2011 at a cost of \$1,024,104.40.

Project 10B included replacing discharge piping and valve vault components in 6 large pump stations. During inspection of these 6 stations, it was noted that discharge piping was in poor conditions and valves were malfunctioning due to severe corrosion. Garver prepared plans and specifications to replace all existing ductile iron discharge piping and guide rails with stainless steel, and to either rehabilitate or replace all valves in the affected pump stations. On-Line Construction was the successful bidder for the construction of Project 10B. The project is expected to be complete in April 2012 at a cost of \$322,594.76.

Project 10D addresses two of the major pump stations in the Hot Springs collection system that have been identified for replacement. The stations will be converted from drywell/wetwell can type stations to submersible. Garver has conducted a hydraulic evaluation of the collection system and force main associated with each station and developed Plans and Specifications for this project. Bids were received and VEI General Contractors was the successful bidder in the amount of \$612,013.00. Project 10D is expected to be complete in or before August, 2012.

The Gulpha Pump Station, which is one of the largest pump stations in the Hot Springs collection system, was in desperate need of attention regarding the electrical gear at the station. The Gulpha Pump Station is designed to be a triplex 250 HP wet well/dry well type station. At the time a project was identified, one of the three variable frequency drives (VFD) was non-operational, a second VFD was used only as a starter for the pump connected and the third VFD was functional. Due to the age of the VFDs, manufacturer support is no longer available and repair parts are nearly impossible to procure. Plans and Specifications

were developed to replace all three VFDs, upgrade the electrical service to the Gulpha station, and install a 750 KW standby generator. H&H Electric was the successful bidder in the amount of \$1,153,412.00. The Gulpha electrical upgrades project is scheduled to be complete April 2012.

The Rock Creek pump station is a major station in the Hot Springs collection system located west of the City. This pump station has experienced multiple pump failures over a relatively short time frame. This problem is not only costly to the City, but it provides a significant reliability issue. Garver performed a hydraulic analysis of the Rock Creek force main configuration and developed a recommendation to add an intermediate pump station in the system. Due the topography of the area, the current configuration does not allow for the solids in the line to be pumped up and over the high point of the line. These solids then accumulate in the force main and eventually create a plug. This plugging of the force main is the perceived cause of the excessive pump failure. The proposed additional pump station would provide a means to keep the force main clear by ensuring that the solids move through the system as necessary. Plans and Specification have been developed to approximately 75% complete. Currently the design is on hold pending land procurement issues for the location of the proposed new pump station.

The need for significant improvements has been identified in the Hot Springs collection system in the area south of Lake Hamilton near Highway 7. Wastewater from this area is pumped to the regional Davidson Drive wastewater treatment plant (WWTP). Due to the topography of the area, multiple pump stations are necessary to convey the wastewater the entire distance. The capacity upgrades necessary for these pump stations will also require increased force main sizes. Due to the enormity of the potential effort required for this project, the construction of a new satellite WWTP in the vicinity of these pump stations was identified as possible alternative. The new WWTP would allow for smaller pumps, less pumping cost, smaller lines, and reduced loading on the Davidson Drive WWTP. Garver is currently preparing a report summarizing the effort and costs associated with each of these alternatives to address the deficiencies in this area.

City personnel and Garver have collaborated over the past few years to define a list of the Major pump stations in the collection system. The final list has been established based on pump size and consists of 74 pump stations. Garver has performed evaluation for 39 of the 74 Major pump stations and intends to have the remaining 35 evaluations complete over the next two years.

Currently, we are addressing issues at a number of our wastewater pumping stations related to backup power, mechanical dependability and SCADA monitoring. While the preceding information describes our current efforts, we do realize that it does not address all of our pump stations. In addition to the pump stations detailed above, there are a number of duplex grinder stations used for small subdivisions and commercial businesses that will also be

evaluated with regards to mechanical dependability, back-up power and SCADA. These evaluations will be performed once all major stations and individual grinder stations are addressed.

A detailed listing of the improvements listed above is included in Appendix A of this report. If any agency would like to have copies of any or all of the aforementioned pump station reports, design calculations, construction plans, etc., please contact us and we will provide them as requested.

MAJOR PUMP STATION SCADA:

As mentioned in previous reports, the city acknowledges that one of the most critical shortcomings within our wastewater collection system is the remote monitoring of our 3,000+ wastewater pump stations. Currently, only a small portion of these stations have remote monitoring and of those that do, many of the units are obsolete and/or are no longer supported by the company that supplied them. This lack of remote monitoring is primarily responsible for the inability for staff to respond until after an overflow occurs. For this reason, the City of Hot Springs entered into contract to develop a SCADA Master Plan to provide a comprehensive, standardized remote monitoring system utilizing equipment that incorporates an open architecture that is not proprietary. This would allow us to continue to build upon a stable, standardized system with compatible equipment that can be operated and programmed by anyone who understands basic PLC programming. This plan was completed in 2008 by Brown Engineers.

With regards to implementation of the SCADA Master Plan, the city has installed the major components related to the communications backbone and computer hardware and software at the Ouachita Water Treatment Plant that includes a new Master Radio with connections to the new computer based Wonderware System Platform Human Machine Interface (HMI) system. A new radio repeater was installed at the West Mountain Tower which will provide coverage for the water distribution system and sewer collection system. The first radio based Remote Telemetry Unit (RTU) is installed at Music Mountain Pump Station. With the communications system complete, design of the first 80 Remote Telemetry Units is underway and we expect construction to begin in 2012 and completion by spring 2013. The estimated cost for this project is \$1,300,000.

For these first 80 remote sites, The SCADA system remote equipment is split into three categories. The first category is the larger pump stations and tanks which require near real-time information regarding pump status, pressures, flows, and tank levels. There are approximately 20 of these sites. The second category is the wastewater duplex pump stations and there are approximately 60 of these sites. Another benefit to the Sensus FlexNet metering system will also allow use of these 60 small duplex pump station RTUs that can

deliver data to the SCADA system HMI computers through use of another database connection developed by Brown Engineers.

The third category is the Grinder Lift Stations of which there are approximately 3,000 sites and these are described later in this report under the heading Grinder Lift Station SCADA.

The remote site data consists of both water and wastewater systems and the SCADA system must send the appropriate data to Ouachita Water Plant and Regional WWTP so that the treatment and distribution operators can have access to the real-time data. Brown Engineers will configure the Human Machine Interface (HMI) computers at each plant for these graphical representations of the remote data as well as historical trending, alarming and reports for these remote facilities. A unified HMI software system is planned so that SCADA system data can be made available at any plant as well as for management, supervisors, and engineers who need access to the system information.

Once the contract for the first stations is underway, Brown Engineers will begin working on installation of SCADA on the next phase of stations. It is our intention that all of our pumping stations have monitoring, whether it be the simple power/high level alarm that we are installing on our grinder stations at \$800 per station or the more complex device that is being installed at our major stations capable of providing much more information regarding the station estimated at \$10,000 each.

A detailed listing of the improvements listed above is included in Appendix A of this report.

GRINDER LIFT STATION SCADA:

As mentioned in the previous annual report, our consultant, Brown Engineers has worked with the SENSUS Company to utilize our existing automated water meter reading communications system through a modified electrical meter socket to provide a cost-effective alarm status of the approximately 3000 individual wastewater grinder stations that we have in our system. Previously, none of these stations are equipped with remote monitoring devices other than visual and/or audible alarms. We were dependent on area residents to notify us of problems with these stations, hopefully, before an overflow event occurs. Many of these stations, however, are located at homes that are not full-time residents and alarms may go un-noticed for some time if the property owners are not home. Also, the alarm system may be inoperable and we would have had no way of knowing without individually checking each station.

This system, which utilizes our newly installed automated water meter reading system, includes a modified electrical metering device (Radio Alarm Meter) that will deliver a high level or power fail alarm to our central SCADA system via the new remote communications network. The new Alert Management System allows us to respond independently without

relying on homeowner notification and greatly enhance our ability to prevent overflows on grinder stations. Including the cost of engineering design, application development, programming and system integration, the cost for each installation is approximately \$458 per site. This cost is substantially lower than any traditional RTU and will provide the critical data to our staff real-time. This project was awarded to All Service Electric and is nearing completion. The devices that have been installed are working properly and providing alarm status to almost 3,000 grinder stations. The cost for this work is \$899,171.50.

Again, we did not propose this work in the original scope presented in our response to the CAO as we were not aware of any practical way to effectively monitor these stations at a reasonable cost. We are grateful to our consulting engineer, Brown Engineers, and SENSUS metering company who worked together to craft a solution to this historical issue.

Another benefit to the SENSUS FlexNet metering system will also allow use of small duplex pump station RTUs that can deliver data to the SCADA system HMI computers through use of another database connection developed by Brown Engineers. These enhancements continue to add value to the Sensus Advanced Metering Infrastructure.

A detailed listing of the improvements listed above is included in Appendix A of this report.

PREVENTIVE MAINTENANCE PROGRAM:

The City of Hot Springs staff had increased focus on the revision and/or development of a comprehensive and effective preventive maintenance program as we realize it is critical to ensure pump station(s) and pipeline reliability. Currently, the majority of our in-house staff comprised of 19 personnel is dedicated to emergency pump station maintenance and repair, making it difficult to perform much needed routine maintenance. We currently utilize the Cityworks asset management software for work order generation and tracking.

Early in 2011, we hired Bobby Harris, an outside applicant with extensive background in equipment repair and maintenance, as our Lift Stations Manager, taking the place of a long time city employee. In a short period of time, Mr. Harris has organized the pump station information as well as developing a dispatch operation within his division that allows for immediate response to trouble calls as well as proper documentation with the Cityworks software for proper tracking and reporting. The improvements made to date have greatly improved our efficiency and response time related to trouble calls. Mr. Harris is now working on the development of a comprehensive Preventive Maintenance Program using Cityworks.

We are in the process of gathering information on our extensive inventory of pump station equipment so that it can be entered into the software and begin generating scheduled maintenance tasks related to this equipment. To date, we have been entering this data and we

currently have the process ready to implement in a smaller scale approach. However, the key issue now is available resources. At this time we do not have adequate staffing to fully implement the system. The lack of adequate staffing will have to be addressed through contract labor, re-assignment of existing staff and/or hiring new personnel. We understand that we must dedicate personnel to perform these tasks independent of our current repair efforts in order for the program to be effective. . We expect to have this system in place in some capacity by end of year 2012.

PIPELINE CLEANING PROGRAM:

Staff continues to evaluate and revise our pipeline cleaning program as situations arise. We are currently formalizing our list of known trouble areas. In 2011, our Wastewater Collections Division staff cleaned and/or televised approximately 170,000 ft. of mains to address issues and identify potential problems. These group works closely with the preventive team on flushing mains for problems and also as a preventive maintenance measure. Our staff flushed approximately 90,000 ft. of mains in 2011 both in response to reported issues and also as part of the monthly schedule to flush mains that are habitually plugging for various reasons. We continually monitor our overflow reports that are a result of grease, etc. and making sure any of these that appear to be repeat offenders are on the list to be periodically cleaned as a preventive measure.

The City of Hot Springs Wastewater Pretreatment Department continues to target commercial establishments that have food service capable of producing grease waste to ensure that these businesses follow the Pretreatment Ordinance requirements related to trapping and disposing of waste grease. Based on these focused efforts since the passage of an amendment to the Pretreatment Ordinance in 2002 which included strict regulations related to fats, oils and greases, we have seen dramatic improvements. We have experienced a reduction in the occurrences of SSO's and sewer line blockages as a result of regulating the design, installation, cleaning schedule and maintenance of the businesses' grease interceptors, oil separators and grease recovery device (GRD) units. Educating the general public about the hazards associated with the disposal of cooking grease has also had an impact in reducing SSO's. Our Pretreatment Division has taken enforcement action with several businesses in recent years to stress to local businesses that our ordinance will be strictly enforced.

As we complete projects related to reducing inflow and infiltration, we must be aware that these efforts may lower the flow and velocity in the lines which may increase the potential for blockages/build up due to grease. With this said, we must continue to keep our fats, oils and grease program a top priority for our Pretreatment Division.

SUMMARY

Given the listing of work mentioned above, the City of Hot Springs is proud of our efforts to date targeted at addressing the dry weather overflows. We believe that the work completed in addition to future work (detailed in Appendix A) has shown our commitment to our community to provide a safe and reliable wastewater collection and treatment systems. We continue to be encouraged by the trends we are seeing related to plant flows, overflow volumes, etc. We are extremely excited about our ability to develop and/or utilize new technology that allows us to monitor large components of our system that were previously thought to be impractical due to the cost of such a project. The city owes our gratitude to all the firms who have worked on the vast array of projects to date, by partnering with these groups we have found innovative and dependable ways to develop cost effective solutions to the problems that face our system. While we have not eliminated dry weather overflows, we have seen a reduction in overflow volumes due to our in-house efforts targeted at reducing response times, improving notification methods, etc.

2. ACHIEVE COMPLIANCE WITH REGARDS TO WET WEATHER OVERFLOWS BY JANUARY 1, 2018.

On August 27, 2010, the City of Hot Springs submitted the original System Evaluation and Capacity Assurance Plan (SECAP), along with an update that was current at the time of that correspondence. Updates to the SECAP, which include the Executive Summary and Chapter 6 that details the collection system assessment and hydraulic capacity analysis dated September 29, 2011, are included with this update as Appendix B. Chapter 6 outlines all of the inflow and infiltration sources found in the field as well as the capacity and structural deficiencies within our system that need to be addressed based on priority. This is a critical part of the data needed to develop short and long term plans to address our overflow issues.

All of the projects listed in Appendix A can be directly tied to our commitment to reduce wet weather overflows. As summarized in the report, to date, we have spent over \$12.7 million since the issuance of the CAO to address the stated requirements therein. Furthermore, currently we have obligated (spent and/or encumbered) almost \$21.4 million in funding to date to address dry and wet weather overflows. Of particular importance to addressing capacity related wet weather overflows are primarily the improvements listed under Sections labeled "PUMP STATION EVALUATION AND REHAB" and "COLLECTION SYSTEM EVALUATION AND REHAB". These sections contain a large number of projects that have been completed, designed and/or identified along with actual or projected costs. The majority of the projects listed under "PUMP STATION EVALUATION AND REHAB" are either a result of visual inspections and testing of the stations performed by Garver, or pump station capacity related issues as defined by RJN Group, Inc. through the development of the hydraulic model. The large majority of the projects listed under "COLLECTION SYSTEM EVALUATION AND REHAB" are also based on system capacity related issues as defined

by RJN Group, Inc. through the development of the hydraulic model. All of the projects listed in these two sections include projected funding sources and timelines.

Included in the listing of projects are four phases of manhole rehabilitation. The first two of the four phases of manhole rehabilitation contracts were awarded to KIM Construction totaling \$3,410,523. These first two phases will remove approximately 2.65 million gallons of infiltration/inflow (I/I) from a one year storm event. The remaining two phases have been designed and are projected to be awarded in 2015. In addition, 662 manholes were identified as good candidates for Uretek, utilizing their patented polymer and \$650,000 was awarded to rehabilitate those manholes. These projects currently under construction will address over half of the access structures identified in RJN's SECAP report that were identified as having excessive inflow.

In addition to the manhole repairs, RJN has completed smoke testing of all the system's gravity pipelines and completed CCTV on the lines that indicated the possibility of problems during the smoke testing and visual pipe efforts. The first phase of pipeline replacement has been awarded to The Heller Company totaling \$1,439,184. This project addresses 10,129 linear feet of sewer replacement and will remove approximately 0.230 million gallons of I/I and improve the overall efficiency of the collection system. An additional 10,100 linear feet of sewer replacement is currently under design and should be awarded in 2015. This project should remove approximately 0.290 million gallons of I/I, as well as address specific structural deficiencies. Future phases of pipeline replacement projects will be developed and bid in order to comply with the January 1, 2018 deadline related to wet weather overflows and may require that the city obtain additional funding through future bond issues.

Also included in Appendix A are current projects to construct a parallel force main to serve the Fairwood Pump Station (Fairwood Force Main Phase I), four major pump station rehab projects (10A, 10B, 10D, and Gulpha), and improvements at our two wastewater treatment plants (Equalization Basin Liner Replacement and Southwest Wastewater Plant Sludge Improvements), all of which directly address dependability and/or capacity related issues.

All of the projects listed above, as well as a large number of future projects are included in Appendix A along with the status of each. This information represents all of the work to date as well as future projects that may change in size and/or scope based on further evaluation of the system components. At this time, this spreadsheet is all inclusive of work that has been identified through the evaluations and surveys to date. **It is important to note that not all of these projects are directly related to achieving compliance with the CAO, therefore, staff must identify and prioritize those projects that we feel will have the greatest impact on wet and dry weather overflows. This spreadsheet is our best effort as of this date in time to project when certain projects should be projected based on system impact and available funding. Going forward, this document will be our capital improvements plan and will be modified as necessary in future reports.**

3. DEVELOPMENT OF A COMPREHENSIVE MAINTENANCE PROGRAM FOR ALL WASTEWATER COLLECTION SYSTEM ELEMENTS AND DETERMINE PROPER STAFFING LEVELS TO COMPLETE THE WORK ORDERS ISSUED BY THE SYSTEM.

This item was addressed within item No. 1 in the section titled "Preventive Maintenance Program". Please refer to this section for information regarding the development and staffing of a comprehensive maintenance program. Again, city staff acknowledges that this is perhaps the most vital component of the city's long-term efforts to minimize dry weather overflows due to mechanical problems.

4. OBTAIN ADEQUATE FUNDING REQUIRED TO COMPLETE PROJECTS REQUIRED FOR COMPLIANCE.

As mentioned in this and previous reports, the City of Hot Springs Wastewater Fund was basically at a zero fund balance at the time the CAO was issued and struggled to include substantial capital improvements in the annual budgets. It was obvious that in order to correct the issues included in the CAO, the city would need to obtain funding that was initially estimated at over \$37 million over the next ten years. The city was successful at securing funding in excess of \$26 million to address the first round of capital improvements. We are approximately two thirds of the way through the initial phase of projects to be funded by this money.

Based on the results of the collection system survey performed by RJN and Associates and the pump station surveys to date performed by Garver Engineers, it is evident that the original estimate of \$37 million was insufficient and staff now has to develop a prioritized schedule of improvements and funding plans up to and beyond the January, 2018 deadline.

The current review of our rates by our rate consultant shows that the schedule of rate increases that were approved in 2009 remain sufficient to fund our existing expenses and debt payments and will also allow us to issue new debt in 2014/15 in an amount of approximately \$15 million and in 2017 in an amount of approximately \$5 million. This report includes a proposed schedule of projects through the deadline of January, 2018 that is based on the balance of the current bond issue as well as an additional \$20 million of funding through future debt issuance.

This proposed schedule of projects is summarized in Appendix A which includes funding sources, both known and proposed.

5. IMPLEMENT AN INCREASE IN WASTEWATER RATES IN EARLY 2009 TO SUPPORT PAYBACK OF FUNDING MECHANISM.

As mentioned in previous reports, the city was successful in increasing wastewater rates to a level that will support a \$26 million bond issue in 2009 as well as future debt issues of approximately \$20 million over the next 5 years. We are also optimistic that as we continue to complete major projects that reduce inflow and infiltration, we will see substantial decreases in collection and treatment costs such as pumping power, emergency callout personnel, and pump station repair costs. These reductions, if realized, could enable the city to issue additional debt and maintain the existing rate structure. As mentioned in item No. 4, we have secured a contract with Economists.com, our rate consultant based in Dallas, Texas, to perform annual rate reviews of our current water and wastewater rates to ensure that we are progressing as projected. The current review indicates that we are in sound financial condition and the existing rate structure is sufficient to fund our current needs as well as additional debt over the next five years. The city fully understands that circumstances could change that may require future rate adjustments to insure that we are able to comply with the requirements of the CAO.

6. IMPLEMENT THE RECOMMENDATIONS OUTLINED IN THE RECENTLY DEVELOPED SCADA MASTER PLAN.

These items were addressed in item No. 1 under the "Pump Station SCADA" and "Grinder Lift Station SCADA" items as they are considered to be key components in addressing the dry weather overflow issues. Please refer to this section for information regarding the implementation of the SCADA Master Plan. All of the projects described within these two sections are detailed in Attachment A. City staff acknowledges that these improvements are vital in addressing both dry and wet weather overflows as reporting problems is imperative, regardless of the conditions that create them.

7. DEVELOP CRITICAL INVENTORY LIST AND ENSURE THOSE PARTS ARE IN STOCK.

As stated in previous annual reports, this item has been completed. We are currently improving the inventory and parts warehouse operations to further insure that our records are accurate and all materials are properly stocked and tracked

By utilizing the City Works software program we are able to trend repair parts both overall and also for any particular pump. This tool is essential in identifying areas that may have more frequent pump issues which may be an indication of a unique issue in that specific area. This also enables us to maintain a stock of frequently used repair parts. This provides us the ability to keep replacement pumps on hand to immediately replace faulty pumps and is yet another process improvement for our Lift Station group.

8. EVALUATE EXISTING PERSONNEL WITH REGARDS TO EFFICIENCY, WORKLOAD, JOB DUTIES, ETC. AND IMPLEMENT NECESSARY CHANGES

During 2011, the city made substantial improvements to our Wastewater Utilities and Engineering staffs. Most notably, the position of Utilities Director was re-established, as well as the replacement of perhaps the most critical position related to our efforts to eliminate wet and dry weather overflows, the Lift Stations Manager. Also created and filled in 2011 are the positions of City Engineer, whose time is split 50/50 between Utilities and Public Works, and Project Manager, whose time is dedicated 100% to management and inspection of Utilities projects. These two positions were deemed to be imperative to the city's ability to administer the large number of contracts and projects related to addressing the CAO as evidenced by the listing of projects included as Attachment A. The hiring and/or promotion of the four individuals who filled these positions has produced measurable results related to the operations and management of the Wastewater Department.

In the 2011 Utilities Budget, funding was included to hire a Utilities Director and re-establish the position of a Project Manager. Over the previous two years, due to budget constraints, these two positions were combined into a single position, Utilities Operations Manager. Based on the increasing number of projects that are being undertaken as described within this report and otherwise, city administration felt it was imperative to our success to dedicate someone to monitor the many engineering and construction contracts associated with this effort. Larry Merriman, who was originally hired as the Project Manager due to his extensive knowledge and experience related to the inspection and administration of large construction contracts, had spent the previous two years as the Utilities Operations Director and has concentrated on operational issues related to our personnel, including overflow response time, pipeline cleaning, material inventory, training, etc. Upon the hiring of the Utilities Director position in May, 2011, Mr. Merriman returned to his original position as Project Manager and has been much more involved in management and monitoring of the various listing of wastewater projects.

As mentioned above, in May, 2011, the position of Utilities Director was re-established and filled. The city was fortunate to hire Richard Penn, an outside applicant from a neighboring city, where he was Public Works Director for many years and was involved in management of the Utilities. Mr. Penn was familiar with the state and federal wastewater regulations and was able to quickly come up to speed on the issues facing both our water and wastewater system and has become an integral part of our team.

As mentioned above, the city also established and filled the position of City Engineer. This responsibility had previously been included in the Public Works Directors job duties, but city administration felt it was critical to create a position dedicated to the engineering project development and review process without the responsibilities of general management of four other divisions and associated staff. The position was filled in mid 2012 with Gary

Carnahan, an outside applicant with many years of direct management and consulting experience as well as brief experience as City Engineer of a growing town in Northwest Arkansas. Mr. Carnahan manages the Engineering division which has a staff of seven, including Mr. Merriman, the Project Manager. The development of this division, which includes these two new positions, has had a dramatic impact on our efforts to manage the large number of wastewater projects and staff feels that they are a primary reason that we have been able to manage as many wastewater contracts and projects in such a short period of time. Without this division, the city would have had difficulty meeting our aggressive commitments.

Perhaps the hire with the most immediate impact on our operations is the replacement of the Lift Stations Manager position with Bobby Harris. As mentioned earlier in this report, Mr. Harris' experience as manager of a marine service department gave him a solid background in both understanding mechanical equipment and setting up a program to properly maintain such equipment. Bobby has made great strides in a short period of time since his hire in early 2011 and his staff has embraced the changes and is much more productive and efficient now. Having the new accurate mapping system along with an exceptional work order software in Cityworks gave them the tools they need to establish a fully operational "service department" which responds quickly to alarms, is properly equipped and trained to address the problems in the field and has a work order software that allows them to build a history on the elements within our system. We expect Mr. Harris to continue to evaluate and benchmark our Lift Station Division's efforts and strive to improve in areas of critical importance. In addition he will be reviewing our current standards and specifications to ensure our requirements are a best practices approach.

9. PROPERLY TRAIN ALL PERSONNEL IN ACCORDANCE WITH EXISTING AND FUTURE POLICIES IN REGARD TO APPLICABLE PROCEDURES IN THE WASTEWATER SYSTEM.

The City of Hot Springs continues to invest time and money to train staff with regards to the knowing and understanding current wastewater regulations, proper operations and maintenance of the system and educating them as to the current technology that is available to us. The city continues to send appropriate personnel to the annual CMOM conference in Austin, Texas. In 2012, Richard Penn, the Utilities Director, and Bobby Harris, the Lift Stations Manager, both of which were hired in early 2011, attended the conference and gained a lot of information regarding the rules and regulations as well as information regarding how we correct our system. They were able to network with other cities as well as meeting our EPA representatives related to our CAO.

We continue to benefit from our on-going relationship with administrative staff from the City of Fayetteville, Arkansas, as they have been very successful in addressing the same overflow issues in their city. We have visited their system in the past and continue to value the

assistance and insight provided by David Jergens and his staff in Fayetteville. We also continue to use this opportunity to meet with EPA officials and ensure we are current in understanding the rules and regulations that affect our system. We plan to schedule a meeting in early March to meet and discuss this report and our overall progress. Our relationship with our state and federal officials remains open and positive and the City of Hot Springs very much appreciates the assistance we have received from both ADEQ and EPA. It is vital that we are all marching in the same direction given the large financial and staffing investment that is being dedicated to this process.

The city continues to evaluate and attend appropriate training which is applicable to our effort as we must ensure personnel are adequately equipped and trained to perform required duties. Several Lift Station Division staff members have taken the initiative to educate themselves on the Cityworks software program through formal and on the job training. This allows us to better utilize this resource and, coupled with the greatly improved pump station monitoring and implementation of the dispatch center, strongly improves our ability to respond to and track trouble calls. The city is very appreciative of the initiative taken by Bobby Harris and his staff to develop an efficient and reliable in-house system to receive, respond to, and record trouble calls in our system. Continuing to develop and enhance this process as well as a preventive maintenance system is imperative to our future success.

10. UTILIZE THE EXISTING GIS DATABASE TO INTEGRATE THE WORK ORDER SYSTEM WITH THE MAP FEATURE TO IMPROVE MANAGER'S ABILITY TO ANALYZE WORKLOAD AND IDENTIFY TROUBLE AREAS.

The city has received mapping data from RJN Group, Inc that was developed during the collection system survey. This information includes accurate horizontal and vertical coordinates of the manholes and inlets and outlets, which was used to develop the hydraulic model. We have incorporated this information into our GIS system and now have accurate maps of our gravity collection system.

The city has also received coordinates of all of our grinder pump stations, which were gathered during the project that equipped all of our 3,000+ grinder stations with remote alarm telemetry as discussed in previous sections of this report. Prior to this project, our mapping data for these stations was nonexistent or suspect at best.

We have also received new aerial base maps flown to 6" pixel resolution of our wastewater service area. All of these improvements over the last 12 months have greatly improved the accuracy and dependability of our wastewater mapping system. We continue to work on our ability to graphically tie our work order system to these system features for reporting and ease of historical referencing.

ADDITIONAL INFORMATION:

Schedule of Projects as Provided in Previous Correspondence

The following table lists the proposed projects intended to address the goals described above. Dates have been revised as necessary based on the latest information. A much more detailed listing of these generalized projects is included in this report as Appendix A.

Description	Estimated Percentage Complete	Current Estimated Completion Date
Collection System Survey Phase I – Flow Metering	100%	COMPLETE
Collection System Survey Phase II – MH Inspection	100%	COMPLETE
Collection System Survey Phase III – Smoke Testing	100%	COMPLETE
Treatment Plant Expansion Study	100%	On Hold
Fairwood Force Main Phase I	80%	April 2012
Pump Station SCADA, Phase I	0%	Fall 2012
Pump Station Mechanical Upgrades and Standby Power, Phase I	64%	Summer 2012
Pump Station SCADA, Phase II	0%	January 2016
Development of Wastewater System Model	100%	COMPLETE
Collection System Manhole Repairs, Phases I&II	0%	January 2013
Pump Station Mechanical Upgrades and Standby Power, Phase II	0%	January 2013
Collection System Pipeline Repairs, Phase I	2%	June 2013
Pump Station Mechanical Upgrades and Standby Power, Phase III	0%	January 2018
Collection System Manhole Repairs, Phases II&IV	0%	January 2018
Collection System Pipeline Repairs, Phase II-IV	0%	January 2018

Closing Remarks

In closing, the City of Hot Springs wastewater division remains committed to improving both its operational and financial status. The City of Hot Springs Board of Directors is dedicated to insuring that staff is fully equipped with the means to meet the requirements of the CAO, as evidenced by the completed and proposed efforts included in this report.

APPENDIX "A" - WASTEWATER PROJECT STATUS REPORT

PROJECT DESCRIPTION (Current in Black/Projected in Yellow)	FIRM/CONTRACTOR	COST (Actuals in Black/Estimates in Yellow)	SPENT TO DATE	TARGET	STATUS	FUNDING SOURCE				
						CHS BUDGET	2009 BOND OBLIGATED	2009 BOND SPENT TO DATE	2009 BOND REMAINDER	2015 BOND PROJECTED
SCADA MASTER PLAN PROJECTS										
Scada Master Plan Development										
1 Engineering Study, Plan Development & Radio Path Study	Brown Engineers	\$ 48,543.00	\$ 48,543.00	2009	Complete	\$ 48,543.00				
2 Ouachita Water Plant HMI Upgrade	Brown Engineers	\$ 149,400.00	\$ 149,400.00	2009	Complete	\$ 149,400.00				
3 SCADA RTU Program Development	Brown Engineers	\$ 196,700.00	\$ 196,700.00	2010	Complete	\$ 196,700.00				
4 SCADA Radio Repeater	Brown Engineers	\$ 134,540.00	\$ 134,540.00	2011	Complete	\$ 25,599.00	\$ 108,941.00	\$ 108,941.00		
Grinder Station Alarm System										
5 Engineering Design, Bidding, etc	Brown Engineers	\$ 170,967.58	\$ 169,257.90	2012	99% Complete		\$ 170,967.58	\$ 169,257.90		
6 Construction Contract for 3000+ Grinder Stations	All Service Electric	\$ 899,171.50	\$ 808,572.71	2012	85% Complete		\$ 899,171.50	\$ 808,572.71		
7 Engineering Integration, Programming, etc	Brown Engineers	\$ 335,000.00	\$ 335,000.00	2012	Complete		\$ 335,000.00	\$ 335,000.00		
Computer Equipment	Dell	\$ 14,867.41	\$ 14,867.41	2012	Complete		\$ 14,867.41	\$ 14,867.41		
8 Regional Wastewater Plant HMI Upgrade	Brown Engineers	\$ 178,102.00	\$ 35,620.40	2012	20% Complete		\$ 178,102.00	\$ 35,620.40		
9 Equipment needed (to be purchased by CHS)	CHS Procurement	\$ 16,254.81	\$ 16,254.81	2012	Complete	\$ 16,254.81				
RTU Installation Project - 80 Wastewater Sites										
10 Design	Brown Engineers	\$ 138,375.58	\$ 76,106.61	2012	55% Complete		\$ 138,375.58	\$ 76,106.61		
11 Construction, Engineering Services, Integration	To Be Determined	\$ 1,300,000.00		2013	2013				\$ 1,300,000.00	
12 Ignition Software Purchase and Conversion	To Be Determined	\$ 100,000.00		Future	Future				\$ 100,000.00	
13 Backup Generator for Alarm System Servers	To Be Determined	\$ 200,000.00		Future	Future				\$ 200,000.00	
14 Future Engineering, Software Support	To Be Determined	\$ 100,000.00		Future	Future				\$ 100,000.00	
	SCADA Subtotal	\$ 3,981,921.88	\$ 1,984,862.84							
PUMP STATION EVALUATION AND REHABILITATION										
1 Wastewater Pump Station Evaluation, Design and Construction - Phase 1	Garver, LLC	\$ 1,202,754.00	\$ 1,144,523.96	2012	95% Complete		\$ 1,202,754.00	\$ 1,144,523.96		
2 Pump Station Rehabilitation and Upgrade - Project 10A	H&H Electric	\$ 1,024,104.40	\$ 1,024,104.40	2011	Complete		\$ 1,024,104.40	\$ 1,024,104.40		
3 Pump Station Piping Replacement - Project 10B	On-Line Const.	\$ 322,594.76	\$ 212,881.39	2012	53% Complete		\$ 322,594.76	\$ 212,881.39		
4 Pump Station Rehabilitation and Upgrade - Project 10D	VEI General Cont.	\$ 612,013.00	\$ -	2012	0% Complete		\$ 612,013.00	\$ -		
5 Gulpha Wastewater Pump Station Improvements	H&H Electric	\$ 1,153,412.00	\$ 374,793.92	2012	26% Complete		\$ 1,153,412.00	\$ 374,793.92		
6 Wastewater Pump Station Evaluation, Design and Construction - Phase 2	Garver, LLC	\$ 1,800,000.00		2012	Contract Review				\$ 1,000,000.00	\$ 800,000.00
7 Pump Station Rehabilitation and Upgrades - Phase 2	To be determined	\$ 10,000,000.00		Future	Future				\$ 2,000,000.00	\$ 8,000,000.00
8 Pump Station Rehabilitation and Upgrade - Future Phases										
Future Gulpha PS Upgrade (Priority 1)	To be determined	\$ 8,360,300.00		Future	Future					\$ 8,360,300.00
Highway 270 (Priority 1)	To be determined	\$ 486,000.00		Future	Future					\$ 486,000.00
Hot Springs Creek(Priority 1)	To be determined	\$ 14,453,000.00		Future	Future					\$ 14,453,000.00
Molly Creek (Priority 1)	To be determined	\$ 71,500.00		Future	Future					\$ 71,500.00
PS 20/Bull Bayou Rd. (priority 1)	To be determined	\$ 262,600.00		Future	Future					\$ 262,600.00
Lakeside (Priority 1)	To be determined	\$ 725,000.00		Future	Future					\$ 725,000.00
Mazarn 1 (Priority 1)	To be determined	\$ 45,500.00		Future	Future					\$ 45,500.00
Mazarn 4 (Priority 1)	To be determined	\$ 247,000.00		Future	Future					\$ 247,000.00
	Pump Station Subtot	\$ 40,765,778.16	\$ 2,756,303.67							

APPENDIX "A" - WASTEWATER PROJECT STATUS REPORT

Priority 1	To Be Determined	\$ 1,097,486.00		Future	Future						\$ 1,097,486.00
Priority 2	To Be Determined	\$ 28,080.00		Future	Future						\$ 28,080.00
26 Post Rehabilitation Flow Monitoring	To Be Determined	\$ 450,000.00		varies	varies			\$ 50,000.00	\$ 100,000.00		\$ 300,000.00
	Collections Subtotal	\$ 90,249,727.14	\$ 7,652,822.31								
WASTEWATER PLANT EXPANSION/IMPROVEMENTS											
1 Regional Wastewater Plant Expansion from 12 MGD to 16 MGD - Engr. Design	Garver, LLC	\$ 228,000.00	\$ 116,296.29	On Hold	Pending ADEQ Approval		\$ 228,000.00	\$ 116,296.29			
2 Southwest Wastewater Treatment Plant Water Pipeline	Kimzey Water Dist.	\$ 58,620.00	\$ 58,620.00	2010	Complete		\$ 58,620.00	\$ 58,620.00			
3 Regional Wastewater Plant Phosphorous Removal Study and Design	Garver, LLC	\$ 334,000.00	\$ 14,825.39	On Hold	Study Complete - Des. Pending	\$ 14,825.39					\$ 319,174.61
4 Regional Wastewater Plant Methane Gas Project/TBLL	Garver, LLC	\$ 83,500.00	\$ 21,257.15	On Hold	TBLL Done/Methane On Hold		\$ 83,500.00	\$ 21,257.15			
5 Southwest Wastewater Treatment Plant Sludge Equipment	Fournier	\$ 375,236.00		2011	Complete		\$ 375,236.00	\$ -			
6 Engineering - Southwest Wastewater Treatment Plant Sludge Improvements	CDM	\$ 164,810.00	\$ 150,119.00	2012	2012	\$ 150,119.00		\$ 14,691.00			
7 Equalization Basin Liner Replacement	To be determined	\$ 1,200,000.00		2012	2012			\$ 200,000.00			\$ 1,000,000.00
8 Southwest Wastewater Treatment Plant Sludge Improvements	To be determined	\$ 1,300,000.00		2012	2012					\$ 1,300,000.00	
9 Wastewater Dump Station Construction at Regional Wastewater Plant	Engineers, Inc	\$ 500,000.00		2012	2012			\$ 500,000.00			
10 Regional Wastewater Treatment Plant Grit Chamber	To be determined	\$ 2,500,000.00		2015	2015					\$ 2,500,000.00	
	Plants Subtotal	\$ 6,744,166.00	\$ 361,117.83								
Total Amount Spent To-Date (City Budget plus 2009 Bond Issue)		\$ 12,755,106.65									
Total Amount Obligated To-Date (City Budget plus 2009 Bond)		\$ 21,378,277.57									
						\$ 2,182,373.42	\$ 19,195,904.15	\$ 10,572,733.23	\$ 7,664,691.00	\$ 19,500,000.00	\$ 93,198,624.61

Total Amount Projected To Be Spent and/or Encumbered through 2014 \$ 29,042,968.57

Projects That Are Projected to Be Funded Through a 2015 Bond Issue \$ 19,500,000.00

Remaining Future Projects after 2015 Bond Issue* \$ 93,198,624.61

\$ 26,861,196.11 Original 2009 Bond Proceeds
 \$ 26,860,595.15 Actual + Projected 2009 Bond Project Costs

*Addresses all known and projected system defects. Subject to change pending further study and analysis.

*Not all remaining future projects are required to address the CAO.

EXECUTIVE SUMMARY

RJN Group, Inc. was retained by the City of Hot Springs to perform a comprehensive Sanitary Sewer Evaluation and Capacity Assurance Plan (SECAP) with hydraulic capacity analysis. The purpose of this study was to identify I/I sources and develop a recommended plan for the elimination of those sources along with recommendations for capacity improvements across the City. The study consisted of field investigations, computer modeling for hydraulic capacity analysis and a plan to reduce I/I and improve the integrity and capacity of the system to remove wet-weather overflows.

The City of Hot Springs contains approximately 2,280,000 linear feet of gravity wastewater mains ranging in size from 6 inches to 48 inches in diameter. Along with the gravity mains exists an extensive pressurized system that includes approximately 290 pump stations, 1,200,000 linear feet of force mains, and over 3,000 grinder pumps. Field activities included:

- Manhole/visual pipe inspection
- GPS survey
- Smoke testing
- Dyed water testing
- TV inspection

Manhole/Cleanout Above and Below Ground Inspections

Manhole below ground and visual pipe inspections included the documentation of locations and an evaluation of the physical conditions of each structure. A total of 10,619 structures were physically inspected.

Smoke Testing/Rainfall Simulation

Smoke testing was performed across 83 percent of the gravity collection system. The portions of the gravity main that were not smoke tested were shown not to have excessive inflow or infiltration during the flow monitoring. Testing identified sources of inflow such as defective cleanouts, service laterals, main lines, storm sewer cross connections, area drains and downspouts. A total of 1,904,329 linear feet of sewer was inspected by smoke testing in the study area.

Dyed Water Flooding

Dyed water flooding was performed on potential main lines, cross connections, and manhole leaks to further pinpoint defect locations identified during smoke testing. A total of 419 dyed water tests were performed.

Television Inspection and Recommended Repairs

Closed circuit television inspection was attempted on 147,844 linear feet of the sewer system in the study area. TV inspection was used to identify the exact location of defects identified from smoke and dyed water testing and to document progressing defects.

Recommended repairs are summarized in Tables 5-C (point repairs) and Table 5-D (Complete line replacement). There are 93 point repairs and 97,723 linear feet of sewer pipe recommended for replacement.

GPS Survey and Mapping

GPS (Global Positioning System) survey was performed on 11,416 sewer manholes. Over 8,000 of the structures were measured to sub-centimeter level, while the remainder were surveyed to sub-meter level.

Mapping corrections were made on all sewer manholes and sewer lines within the study area.

Hydraulic Modeling

A hydraulic capacity analysis was performed on the entire gravity and pressurized system in Hot Springs. Included in this complex hydraulic model were 2.3 million linear feet of gravity mains, 1.2 million linear feet of force mains, over 290 pump stations, and over 3,000 grinders pumps. There were 41 gravity line segments (12,303 lf) 6 force mains (65,445 lf), and 8 pump stations recommended for capacity improvements. This was based on a 2-year design storm and the criteria where overloading of the sewer lines occur when the hydraulic gradient results in a sanitary sewer overflow (SSO).

Recommended Improvement Plan

Financial restraints, coupled with the complexity of the sanitary system led to recommendations built around several parameters. First, solutions were derived to eliminate only the reported overflows and were assigned "Priority 1". These ranged from inflow/infiltration removal projects, limited gravity sewer up-sizing, force main upgrades, and increased capacity at several pump stations. Priority 1 was further broken down to look at costs associated with the City undergoing inflow/infiltration projects and limited capacity improvements and also evaluated without any reduction in inflow/infiltration and only increasing capacities.

Next, solutions were developed for "Priority 2" improvements. These address areas which exhibit excessive surcharging during the design rain event. Priority 2 improvements were also evaluated by reducing inflow/infiltration with limited capacity enhancements and also with no reduction in inflow/infiltration and only capacity projects.

Third, solutions were developed for "Modeled/ Un-Verified" overflows. These were locations that the hydraulic model predicted overflows would occur during the design storm, however no documented overflow had been recorded. These locations need to be studied to see if indeed an overflow does occur. If so, then recommended solutions for these locations have been developed and are described in Chapter 4.

Below is a table which summarizes the recommended "Priority 1" and "Priority 2" solutions:

Table 6-E

SUMMARY OF RECOMMENDED IMPROVEMENT PLAN

Item	I/I Reduction		Estimated Capital Cost ^{2/} Without I/I Reduction (\$ Million)	Estimated Capital Cost ^{2/} With I/I Reduction (\$ Million)
	Inflow ^{1/} (mgd)	Infiltration (mgd)		
Manhole Rehabilitation (Priority 1)	5.601	1.461	7.022	7.022
Sewer Line Rehabilitation				
Point Repairs				
Priority 1	0.208	0.013	0.193	0.193
Priority 2	0.216	0.014	0.283	0.283
Complete Rehabilitation				
Priority 1	4.138	0.419	7.451	7.451
Priority 2	3.121	0.316	5.527	5.527
Inflow Removal^{3/}				
Public Sector (Priority 1)	0.105	0.000	0.037	0.037
Private Sector (Priority 2)	10.405	0.000	2.313	2.313
Capacity Improvements				
Priority 1	N/A	N/A	47.340	27.629
Priority 2	N/A	N/A	28.557	25.175
New Grit Removal Chamber Davidson WWTP			<u>2.300</u>	<u>2.300</u>
Subtotal Priority 1			62.043	42.332
Subtotal Priority 2			<u>36.680</u>	<u>33.298</u>
Total	23.794	2.223	101.023	77.930

1/ Based on projected 5-year/60-minute inflow.

2/ Includes estimated construction cost plus a 30 percent engineering service and contingency fee.

3/ It should be noted that interior building inspections were not included in this scope of services and that there are likely basement drains or sump pumps contributing I/I that were not identified during this study. An evaluation of the private grinder pumps was also not included in the scope of services for this project and are likely sources of I/I that were not identified.

SUMMARY OF RECOMMENDED IMPROVEMENT PLAN

The recommended improvement plan consists of work to be performed in the public and private sector of the collection system. The plan includes inflow repairs, infiltration repairs, sewer line replacement/rehabilitation, maintenance repairs, and capacity improvements including pipelines, pump stations, and force mains. The cost to perform the recommended plan is given in capital cost which includes construction plus 20 percent contingency and 10 percent engineering costs. Cost for land acquisition for new pump stations is not included. Costs in this report are in 2011 dollars. Any inflation that occurs between the submission of this report and start of construction is not accounted for in this report. The recommended plan is discussed in the following sections.

The estimated cost and improvement plan does not include the cost of other lift station improvements identified by Garver Engineers, Inc. The only lift station and force main improvements included in this plan are for ones requiring capacity improvements. The plan also does not include any cost associated with the Fairwood Pump Station and force main improvements nor the planned SCADA system and backup power system.

RECOMMENDED MANHOLE REHABILITATION

The recommended rehabilitation plan for manholes includes the rehabilitation of 4,735 manholes contributing approximately 1.461 mgd of infiltration and 5.601 mgd of 5-year inflow. The estimated 2011 capital cost is approximately \$7.022 million. The manholes recommended for rehabilitation are presented in the computer printout in Appendix H. A summary of the recommended plan for manhole rehabilitation is given in Table 6-A.

RECOMMENDED SEWER LINE REHABILITATION

Sewer line rehabilitation is recommended for 354 line segments totaling 74,287 linear feet and sewer line point repairs at 66 locations. A detailed discussion of the recommended plan for sewer line repair is included in Chapter 5. A summary of the plan is given in Table 6-B. A detailed list of line segments that are recommended for point repairs and rehabilitation is included in Tables 5-C and 5-D.

Table 6-A

**SUMMARY OF RECOMMENDED
MANHOLE REHABILITATION PLAN**

Rehabilitation Description ^{2/}	Number of Manholes	Estimated Inflow ^{1/} (mgd)	Estimated Infiltration (mgd)	Estimated Capital Cost ^{3/} (\$)
Replace Cover/Frame/Frame Seal	2,298	2.903	0.050	2,988,960
Install Bolts/Gasket for Bolted Cover	11	0.026	0.000	1,001
Seal Corbel	68	0.055	0.016	44,200
Seal Corbel & Replace Cover/Frame/Frame Seal	68	0.146	0.009	135,915
Seal Corbel & Replace Frame Seal	67	0.102	0.008	109,558
Seal Wall	356	0.089	0.353	388,024
Coat Manhole and Grout Lower 18" of Manhole	310	0.126	0.078	303,295
Grout Lower 18" of Manhole	407	0.000	0.350	158,730
Complete Manhole Rehab w/ New Frame and Cover	275	0.554	0.145	672,173
Complete Manhole Rehab w/o New Frame and Cover	84	0.066	0.076	178,296
Replace Cover/Frame/Frame Seal & Grout Lower 18"	167	0.222	0.076	278,623
Replace Cover/Frame/Frame Seal & Seal Wall	69	0.201	0.033	159,899
Replace Cover/Frame/Frame Seal & Coat Manhole	477	1.030	0.207	1,494,692
Install Bolts/Gasket for Bolted Cover & Seal Walls	1	0.000	0.001	576
Install Bolts/Gasket for Bolted Cover & Coat Manhole	3	0.006	0.001	7,766
Install Bolts/Gasket for Bolted Cover and Grout Lower 18" of Manhole	2	0.003	0.001	962
Repair Frame Seal & Grout Lower 18" of Manhole	72	0.068	0.057	99,060
Total	4,735	5.601	1.461	7,021,730

^{1/} Based on 5-year/60-minute storm.

^{2/} Final rehabilitation recommendations should be determined in design phase.

^{3/} Includes estimated construction cost plus a 30 percent engineering service and contingency fees.

Table 6-B

**SUMMARY OF RECOMMENDED
SEWER REHABILITATION^{1/}**

Item	I/I Removal		Estimated Capital Cost ^{2/} (\$ Million)
	Inflow ^{3/}	Infiltration	
Priority 1			
Point Repairs	0.208	0.013	0.193
Complete Rehabilitation	<u>4.138</u>	<u>0.419</u>	<u>7.451</u>
<i>Subtotal</i>	<i>4.346</i>	<i>0.432</i>	<i>7.644</i>
Priority 2			
Point Repairs	0.216	0.014	0.283
Complete Rehabilitation	<u>3.121</u>	<u>0.316</u>	<u>5.527</u>
<i>Subtotal</i>	<i>3.337</i>	<i>3.174</i>	<i>5.810</i>
Total	7.683	0.762	13.454

^{1/} Lines recommended for complete rehabilitation to remove I/I, correct structural or maintenance defects and may or may not be directly related to any sanitary sewer overflow elimination.

^{2/} Includes estimated construction cost plus a 30 percent engineering service and contingency fee.

^{3/} Based on 5-year/60-minute storm

RECOMMENDED INFLOW REMOVAL FROM SERVICE LINE SOURCES

The recommended plan for service line inflow removal includes the repair of all identified sources discovered through field procedures. Each area of rehabilitation is addressed in the following sections.

Public Sector. There are 33 identified public sector sources contributing 0.105 mgd of 5-year/60-minute inflow that are recommended for repair. The capital cost to remove these public sector sources is approximately \$0.037 million. A computer printout of the inflow sources recommended for repair is given in Appendix G.

The projected inflow reduction is based on the assumption that comprehensive rehabilitation repairs will be completed for the identified I/I sources and that the repairs will effectively eliminate I/I from those identified sources.

Private Sector. There are 2,291 identified private sector sources contributing 10.405 mgd of 5-year/60-minute inflow. The capital cost to remove these private sector sources is approximately \$2.313 million. It should be noted that these repairs and costs are the responsibility of the homeowner and not the City of Hot Springs. A computer printout of the inflow sources recommended for repair is given in Appendix G.

A summary of the recommended plan for inflow removal is given in Table 6-C.

Table 6-C

**SUMMARY OF RECOMMENDED PLAN
FOR SERVICE LINE INFLOW REMOVAL**

Item	Quantity of Sources	5-Year Inflow Reduction (mgd)	Estimated Capital Cost^{1/} (\$ Million)
Public Sector	33	0.105	0.037
Private Sector ^{2/}	<u>2,291</u>	<u>10.405</u>	<u>2.313</u>
Total	2,324	10.510	2.350

1/ Includes estimated construction cost plus a 30 percent engineering service and contingency fee.

2/ Private sector defect repairs are the responsibility of the homeowner and not the City of Hot Springs.

It should be noted that interior building inspections were not included in this scope of services and that there are likely basement drains or sump pumps contributing I/I that were not identified during this study. Also, an evaluation of the private grinder pumps was not included in the scope of services for this project and are likely sources of I/I that were not identified.

CAPACITY IMPROVEMENTS

Recommended capacity improvements will eliminate the occurrence of wet-weather overflows during the design storm event and provide improved efficiency in the transportation of the wastewater flow. The recommended Priority 1 capacity improvements include 41 gravity sewer segments containing approximately 12,302 linear feet, 6 force mains totaling approximately 65,445 linear feet, and 8 pump station improvements. The recommended Priority 2 capacity improvements include 308 gravity sewer segments containing approximately 67,424 linear feet and one force main totaling approximately 732 linear feet. There are an additional 93 gravity sewer segments containing approximately 17,909 linear feet and 3 pump stations that would require capacity improvements to eliminate wet-weather overflows predicted by the hydraulic model that have not been observed as actual overflows during storm events. These locations should be investigated further during wet-weather periods to determine if the overflows actually occur or only predicted by the model due to possible inaccurate pipe sizes or slopes. The estimated capital cost of the capacity improvements is approximately \$75.897 million accounting for no reduction in inflow and infiltration and \$52.804 million if recommended public inflow and infiltration repairs are taken into account. Gravity lines identified for capacity improvements were selected by accounting for I/I reduction. If I/I reduction was not part of the plan an additional \$23.083 million dollars would be required to construct additional capacity improvements. As discussed in Chapter 4, additional capacity improvements may be required to eliminate model predicted overflows. A summary of projects that are recommended for capacity improvements is given in Table 6-D.

SUMMARY OF RECOMMENDED PLAN

The recommended plan includes repairing 2,324 inflow sources, rehabilitation of 4,735 manholes, 354 sewer lines, and point repairs at 66 locations. In addition, 359 gravity segments, 7 force main segments, and 8 pump stations are in need of up-sizing for capacity purposes. Approximately 2.223 mgd of infiltration will be eliminated by implementation of the recommended plan. The peak 5-year inflow in the basins is projected to be reduced by 23.794 mgd after rehabilitation of the recommended inflow sources.

The total capital cost to implement the recommended plan is approximately \$77.930 million if I/I reduction is accounted for and approximately \$101.013 million if not accounted for. The total capital cost consists of \$0.037 million for inflow removal in the public sector, \$2.313 million for inflow removal in the private sector, \$7.022 million for manhole rehabilitation, and \$13.454 million for main sewer rehabilitation. Capacity improvements result in a cost of \$52.804 million with I/I reduction or \$75.897 million without I/I reduction. A summary of the recommended plan is given in Table 6-E.

Although the scope of services for this project ended at the headworks of the wastewater treatment plants, a preliminary analysis of the headwork grit removal chamber at Davidson WWTP was performed. This was done because of the need to utilize the full storage potential of the EQ Basin at the WWTP. It is anticipated that a new grit removal chamber will be required at a construction cost of \$2.3 million. Although this cost is included in the recommended improvement plan, it is recommended that the City undertake a more detailed study of the Davidson WWTP headworks and treatment unit prior to proceeding with this project.

Table 6-D

**SUMMARY OF RECOMMENDED PLAN
FOR CAPACITY IMPROVEMENTS**

Project^{1/}	Length (ft)	No I-I Reduction Capital Cost^{2/} (\$)	With I-I Reduction Capital Cost^{2/} (\$)
PRIORITY 1 PROJECTS			
<i>Gravity Mains</i>			
E. Grand Ave	295		
Upper Gulpha Interceptor	<u>1,873</u>	<u>457,178</u>	<u>457,178</u>
	<i>Gravity Subtotal</i>	2,168	508,950
<i>Force Main</i>			
Gulpha Pump Station Force Main	<u>16,016</u>	<u>5,621,686</u>	<u>5,205,265</u>
	<i>Force Main Subtotal</i>	16,016	5,621,686
<i>Pump Station</i>			
Gulpha Pump Station		<u>8,360,300</u>	<u>6,999,980</u>
		<i>Pump Station Subtotal</i>	<u>8,360,300</u>
		Priority 1 Total	14,490,936
			12,714,196
PRIORITY 2 PROJECTS			
<i>Gravity Mains</i>			
Gulpha Interceptor	20,192	14,321,445	12,998,981
Ridgeway St	8,159	2,170,446	2,119,174
Spring St & Festival St	247	58,858	58,858
Upper Gulpha Interceptor	<u>4,014</u>	<u>859,905</u>	<u>662,380</u>
	<i>Gravity Subtotal</i>	32,613	<u>17,410,653</u>
		Priority 2 Total	<u>15,839,393</u>
		Gulpha Total	31,901,589
			28,553,589
Hot Springs Creek Pump Station/Davidson WWTP Tributary Area			
Priority 1 Projects			
<i>Gravity Mains</i>			
4th St & Greenwood Ave	321	70,282	70,282
Hot Springs Creek Interceptor	<u>38</u>	<u>25,194</u>	<u>25,194</u>
	<i>Gravity Subtotal</i>	359	95,476
<i>Force Mains</i>			
Albert Pike Rd Force Main	3,010	449,995	450,055
24-Inch Parallel to Fairwood Force Main ^{3/}	11,182	3,198,052	N/A
Carpenter Dam Rd Force Main	<u>519</u>	<u>114,655</u>	<u>N/A</u>
	<i>Force Main Subtotal</i>	14,711	3,762,702
			450,055

^{1/} Projects are gravity sewer main only unless otherwise stated.

^{2/} Includes estimated construction cost plus a 30 percent engineering service and contingency fee.

^{3/} Does not include cost of Fairwood Force Main with increased diameter of 42-inch from 36-inch currently designed.

Table 6-D (Cont.)

**SUMMARY OF RECOMMENDED PLAN
FOR CAPACITY IMPROVEMENTS**

Project^{1/}	Length (ft)	No I-I Reduction Capital Cost^{2/} (\$)	With I-I Reduction Capital Cost^{2/} (\$)
<i>Pump Stations</i>			
Highway 270 PS		486,200	486,200
Hot Springs Creek PS		14,453,400	N/A
Molly Creek PS		71,500	71,500
PS20		262,600	262,600
Lakeside PS		<u>725,400</u>	<u>618,800</u>
	<i>Pump Station Subtotal</i>	<u>15,999,100</u>	<u>1,439,100</u>
	Priority 1 Total	19,857,278	1,984,631
Priority 2 Projects			
<i>Gravity Mains</i>			
4th St & Greenwood Ave	5,490	1,016,945	782,265
Albert Pike Rd	2,706	604,149	604,149
Hot Springs Creek Interceptor	12,427	6,717,932	5,161,690
Lake Hamilton Dr	1,570	364,801	364,801
Park Ave	775	136,013	136,013
Seneca St	3,354	586,378	586,378
Shady Grove Rd	5,425	1,038,161	1,038,161
Carpenter Dam Rd	<u>1,086</u>	<u>242,951</u>	<u>237,393</u>
	<i>Gravity Subtotal</i>	<u>10,707,328</u>	<u>8,910,850</u>
<i>Force Main</i>			
Farrs Landing FM	<u>732</u>	<u>109,434</u>	<u>95,160</u>
	<i>Force Main Subtotal</i>	<u>109,434</u>	<u>95,160</u>
	Priority 2 Total	10,816,762	9,006,010
	Hot Springs Creek Total	30,674,040	10,990,641
<u>Stokes Pump Station Tributary Area</u>			
Priority 1 Projects			
<i>Gravity Main</i>			
Stokes Interceptor	<u>9,775</u>	<u>3,093,202</u>	<u>3,090,202</u>
	<i>Gravity Subtotal</i>	<u>3,093,202</u>	<u>3,090,202</u>
<i>Force Main</i>			
Stokes Force Main	<u>29,751</u>	<u>8,508,872</u>	<u>8,508,872</u>
	<i>Force Main Subtotal</i>	<u>8,508,872</u>	<u>8,508,872</u>
	Priority 1 Total	11,602,073	11,599,074

Table 6-D (Cont.)

**SUMMARY OF RECOMMENDED PLAN
FOR CAPACITY IMPROVEMENTS**

Project ^{1/}	Length (ft)	No I-I Reduction Capital Cost ^{2/} (\$)	With I-I Reduction Capital Cost ^{2/} (\$)
Priority 2 Projects			
<i>Gravity Main</i>			
W Saint Louis St	<u>1,672</u>	<u>301,334</u>	<u>301,334</u>
<i>Gravity Subtotal</i>	<u>1,672</u>	<u>301,334</u>	<u>301,334</u>
Priority 2 Total		301,334	301,334
Stokes Total		11,903,407	11,900,408
<u>Mazarn/Southwest WWTP Tributary Area</u>			
Priority 1 Projects			
<i>Force Main</i>			
Mazarn Force Main	<u>4,966</u>	<u>1,097,486</u>	<u>1,097,486</u>
<i>Force Main Subtotal</i>	<u>4,966</u>	<u>1,097,486</u>	<u>1,097,486</u>
<i>Pump Stations</i>			
Mazarn #1 PS		45,500	N/A
Mazarn #4 PS		<u>247,000</u>	<u>234,000</u>
<i>Pump Station Subtotal</i>		<u>292,500</u>	<u>234,000</u>
Priority 1 Total		1,389,986	1,331,486
Priority 2 Projects			
<i>Gravity Main</i>			
Marion Anderson Rd	<u>306</u>	<u>28,080</u>	<u>28,080</u>
<i>Gravity Subtotal</i>	<u>306</u>	<u>28,080</u>	<u>28,080</u>
Priority 2 Total		28,080	28,080
Mazarn Total		1,418,066	1,359,566
Gravity Total			
	79,726	32,145,022	28,774,286
Force Main Total			
	66,177	19,100,180	15,356,838
Pump Station Total			
		24,651,900	8,673,080
GRAND TOTAL		145,903	75,897,102
		32,145,022	52,804,204

Table 6-E

SUMMARY OF RECOMMENDED IMPROVEMENT PLAN

Item	<u>I/I Reduction</u>		Estimated Capital Cost ^{2/} Without I/I Reduction (\$ Million)	Estimated Capital Cost ^{2/} With I/I Reduction (\$ Million)
	Inflow ^{1/} (mgd)	Infiltration (mgd)		
Manhole Rehabilitation (Priority 1)	5.601	1.461	7.022	7.022
Sewer Line Rehabilitation				
Point Repairs				
Priority 1	0.208	0.013	0.193	0.193
Priority 2	0.216	0.014	0.283	0.283
Complete Rehabilitation				
Priority 1	4.138	0.419	7.451	7.451
Priority 2	3.121	0.316	5.527	5.527
Inflow Removal^{3/}				
Public Sector (Priority 1)	0.105	0.000	0.037	0.037
Private Sector (Priority 2)	10.405	0.000	2.313	2.313
Capacity Improvements				
Priority 1	N/A	N/A	47.340	27.629
Priority 2	N/A	N/A	28.557	25.175
New Grit Removal Chamber Davidson WWTP			<u>2.300</u>	<u>2.300</u>
Subtotal Priority 1			62.043	42.332
Subtotal Priority 2			<u>36.680</u>	<u>33.298</u>
Total	23.794	2.223	101.023	77.930

^{1/} Based on projected 5-year/60-minute inflow.

^{2/} Includes estimated construction cost plus a 30 percent engineering service and contingency fee.

^{3/} It should be noted that interior building inspections were not included in this scope of services and that there are likely basement drains or sump pumps contributing I/I that were not identified during this study. An evaluation of the private grinder pumps was also not included in the scope of services for this project and are likely sources of I/I that were not identified.

CONSTRUCTION STAGING PLAN

Construction of the recommended improvements must be completed by 2018 for the City of Hot Springs to be in compliance with the schedule submitted as part of the ADEQ Administrative Order. It is recommended that the construction of improvements be completed in stages to allow for the elimination of the most wet-weather sanitary sewer overflows (SSOs) in the quickest time possible. The City-wide improvement plan has been broken down into four areas. These stages are as follows:

1. Stokes Pump Station Tributary Area – Includes all pipeline improvements tributary to the Stokes Pump Station as well as the new force main from Stokes Pump Station to the Davidson WWTP. Improvements in this area will eliminate 18 wet-weather SSOs.
2. Mazarn / Southwest WWTP Tributary Area – The limited amount of work in this area includes the new force main from Mazarn #4 and minor pump station upgrades. Improvements will eliminate 4 wet-weather SSOs.
3. Hot Springs Creek Pump Station Tributary Area – This would consist of all pipeline work tributary to the Hot Springs Creek Pump Station as well as parallel force main to the Davidson WWTP. A total of 4 wet-weather SSOs will be eliminated by these improvements.
4. Gulpha Pump Station Tributary Area – These improvements will include all pipeline and manhole improvements upstream of the Gulpha Lift Station. After completion of this work it is recommended that post-rehabilitation flow monitoring be performed to determine the proper sizing of the new Gulpha Pump Station and parallel force main to the Davidson WWTP. This will eliminate 3 SSOs.

In order to meet the ADEQ AO schedule it is anticipated that much of the design work of the anticipated stages would be concurrently.

A brief summary of the anticipated improvements in each tributary area is given below.

Stokes Pump Station Tributary Area

These improvements will consist of several projects. The main interceptor discharging into Stokes Pump Station will require upsizing from the existing 18-inch diameter to 30 inches in diameter. A new 24-inch force main that flows from the Stokes Pump Station to the Davidson WWTP would be constructed parallel to the existing 24-inch force main. Both gravity and force main line work is required along Albert Pike Road. Additionally, the Highway 270, Molly Creek, and PS20 Pump Stations necessitate minor upsizing. The improvements also include all of the recommended manhole and sewer line replacement/rehabilitation work. The new grit removal chamber at the Davidson WWTP should be completed prior to placing the improvements in service

Mazarn / Southwest WWTP Tributary Area

Mazarn consists of 4 projects. A new 10-inch diameter force main will need to be constructed that from Mazarn PS#4 that manifolds into the existing force main which discharges at the Southwest WWTP from South Rodgers Pump Station. The result of this new force main will prevent additional capacity improvements in Mazarn except for Mazarn PS#1. The additional gravity line work is along Marion Anderson Road. Mazarn PS#1 and Mazarn PS#4 will need to be upsized. If the projected I/I Reduction is achieved, capacity enhancements at Mazarn #1 will not be required.

Hot Springs Creek Pump Station Tributary Area

The Hot Springs Creek Stage consists of 13 projects. The currently designed Fairwood force main needs to include a 42-inch diameter section leading to Davidson WWTP from where Hot Springs Creek Pump Station manifolds into the force main. A new 24-inch force main shall be constructed parallel to the 42-inch Fairwood force main to convey the wet-weather flow from Hot Springs Creek Pump Station to the Davidson WWTP. Additionally, the Lakeside Pump Station requires upsizing. Accounting for full predicted I/I reduction may prevent Hot Springs Creek Pump Station

from requiring modifications. Not accounting for or achieving I/I reduction would necessitate the pump station to be upsized from the current 40 MGD capacity to a capacity of 51 MGD. Additionally, taking credit for the I/I reduction the parallel 24-inch force main would not need to be constructed, but the Fairwood force main still needs to be increased in the downstream sections. Hot Springs Creek Interceptor and several other gravity mains located throughout the Hot Springs Creek Drainage Basin provide insufficient conveyance and therefore require upsizing.

Gulpha Pump Station Tributary Area

The Gulpha Stage consists of multiple projects. Several sewer lines and manholes require replacement/rehabilitation for I/I reduction and structural replacement/rehabilitation. The main interceptor in the Gulpha Drainage Basin requires upsizing from 21-30 inch diameter to 27-42 inches in diameter. In addition, upsizing other various locations of the gravity mains is also necessary. A new 30-inch diameter force main is required from the Gulpha Pump Station to Davidson WWTP to transport wet-weather events. The Gulpha Pump Station requires upsizing to convey the increased flow.

Davidson WWTP

The Davidson WWTP is currently constructed to handle a peak 24-hour volume of 40 MG with an additional 80 MG of available storage and the grit chamber/splitter box has a 53 MGD capacity. With the I/I reduction not accounted for and recommended improvements, the predicted 24-hour peak volume would be approximately 73 MG at the Davidson WWTP. This will exceed the capacity of the current grit chamber/splitter box. A new 50 MGD grit removal system built before the existing headworks of the plant is recommended at a cost of approximately \$2.3 million. As previously stated a study of the Davidson WWTP headworks and treatment units prior to proceedings with this project is recommended. This new system will remove grit from wet-weather flows and conveyed directly to the existing equalization basin. The grit should be removed and dewatered in units independent of the headworks.

previous system is obsolete or no longer supported by the vendor.

Brown Engineers was selected to develop and assist with the implementation of a standardized monitoring system (SCADA Master Plan). Projects including installation of new radio communications equipment at Grinder Station locations are in progress with ~2900 installed to date.

FAIRWOOD FORCE MAIN

The Fairwood Force Main contract has been awarded to a local contractor (Coakley Co.) and with ~18,000 ft. of piping installed to date the project is progressing as scheduled. This initial phase of a multiphase project to upgrade piping to the Regional Wastewater Treatment Plant will provide much needed redundancy for conveying Wastewater to the plant for treatment.



The Hot Springs Board of Directors and City Staff sincerely appreciate the community support for these and other projects that will ensure compliance with the Clean Water Act and protect citizens' health and safety.

COLLECTION SYSTEM PROJECTS SUMMARY

PROJECT	ENGINEER/ CONTRACTOR	SPENT TO DATE	PERCENT COMPLETE
Flow Monitoring	RJN Group	\$412,000.00	100%
System Survey and Modeling	RJN Group	\$3,589,934.22	99%
Project Design and Bidding	RJN Group	\$550,429.58	88%
Pump Station Rehab and Upgrades	Garver/ Various	\$2,756,303.67	64%
Phase I Grinder Station Monitoring	Brown/ All Service Electric	\$1,327,698.02	93%
Phase I Pump Station Remote Monitoring	Brown/ TBD	\$76,106.61	5%
Phase I Fairwood Force Main	Engineers Inc./ Coakley Co.	\$1,327,698.02	85%

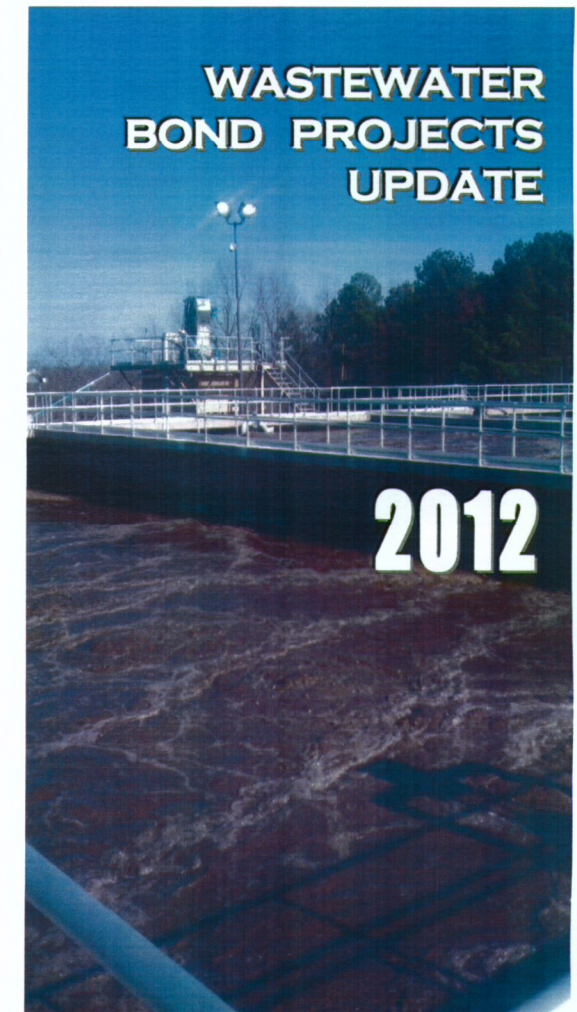
EMERGENCY/TROUBLE

Working hours (501) 623-7473
 After-hours - Wastewater (501) 262-1881
 After-hours - Water (501) 623-5621

CONCLUSION

The projects listed in this report, in addition to various other efforts are directly targeted at complying with the requirements of the Consent Administrative Order.

CITY OF HOT SPRINGS UTILITIES DEPARTMENT



PURPOSE OF THIS REPORT

This report is intended to provide our customers an update on the status of projects related to the Hot Springs Wastewater Collection System. In November 2008, the City of Hot Springs was placed under a Consent Administrative Order (CAO) by the Arkansas Department of Environmental Quality (ADEQ) due to violations primarily related to wastewater overflows in the collection system. These overflows occur within the system as a result of pump station mechanical or power failure (dry weather), or due to exceeding the capacity of the pipelines and/or pump stations during heavy rainfall events (wet weather).

BOND FINANCING

The CAO requires that the City address dry weather flows by January 2011 and wet weather overflows by January 2018. The City, on behalf of, Hot Springs Utilities Department issued a \$26 Million dollar bond in December 2009. This funding, supported by Wastewater rates, will be utilized to achieve compliance with the requirements of the CAO. As a measure of accountability this report includes an update of expenditures for each project, as well as completion status. The Hot Springs Utilities Department is committed to ensuring the health and safety needs of the public by making continued improvements to the water and wastewater systems.

COLLECTION SYSTEM FLOW MONITORING

An evaluation of the collection system was performed utilizing more than 60 flow monitoring devices that were strategically placed within the system over a time period that

included major rainfall events. The information collected enabled the RJN Group, a firm specializing in this type of testing, to identify and prioritize areas requiring attention.

COLLECTION SYSTEM SURVEY

With the results of the flow monitoring the major task of surveying and evaluating the system's manholes, pipelines and pump stations had to be performed. Projects addressing the system defects have been developed and are in progress. This scope of work was included in Phase II of the contract with RJN Group.

HYDRAULIC MODELING



Phase III of the contract with RJN included development of a hydraulic model of the wastewater system that simulates existing wastewater flows and predicts the impact of additional flows related to future growth. This model

has already been utilized to ensure our system is capable of handling additional flows for projects such as the new jail facility and a proposed apartment complex to be constructed on the West side of our service area.

MANHOLE & PIPELINE REPAIR PROJECTS

Phase IV of the contract with RJN includes development of plans and specifications for projects to address the manhole and pipeline deficiencies identified in the Phase II system

survey. The first two projects have been awarded and construction is in progress. RJN is currently working on the design for the next phase of projects required to address the CAO mandates.

PUMP STATION EVALUATION & REHAB



The City of Hot Springs Wastewater system includes ~3,000 individual household grinder pump stations and ~ 300 major pump stations. It is imperative the City maintains these stations to ensure reliable operation. The stations will also be equipped with alarm and monitoring equipment. Backup power generation will be installed at select sites. Garver Engineers is performing the evaluations.

The first project (10A) has been completed and we currently have three other projects in progress. Garver continues evaluating and providing design for the remaining pump stations.



PUMP STATION MONITORING

A dependable pump station monitoring and alarm system is a key component of addressing dry weather issues related to mechanical or power failures. Much of the