Ivins City
Request for Proposals for
Services to prepare the
Combined User Rate Plan

Ivins City, Utah is soliciting competitive sealed proposals from qualified engineering/financial firms to provide services as outlined in the **SCOPE OF SERVICES SECTION** of this request.

I. Background:

Ivins City has either updated or is in the process of updating the following master plans, impact fee facilities plans (IFFP), and impact fee analyses (IFA): Culinary Water, Irrigation, Wastewater, and Storm Water. Ivins City is seeking professional services to prepare a user rate plan based on recommendations from these plans and analyses.

The following information will be provided by the City:

- 2013 Culinary Water Master Plan, IFFP, and IFA
- 2016 Irrigation Master Plan, IFFP, and IFA
- 2016 Wastewater Master Plan, IFFP, and IFA
- 2016 Storm Water Master Plan, IFFP, and IFA
- Other information as requested

II. Scope of Services:

The scope of services should be applied to each of the following plans: Culinary Water, Irrigation, Wastewater, and Storm Water. The following is the scope of services that should be considered during the preparation of the fee proposal:

USER RATE STUDY

A. Prepare a cost of service analysis. Identify existing and future expenses, including but not limited to the following: administrative, operation and maintenance, replacement fund, existing debt, proposed capital improvements, etc.
B. Identify existing and future revenues, including, but not limited to, the following: user rates, impact fees, miscellaneous income, etc.
C. Conduct a user rate analysis to determine appropriate user rates based on existing and proposed ERU's. Consider the previously identified expenses and revenues in the user rate analysis.
D. Prepare a cash flow analysis to help determine the financial viability of each of the systems based on projected expenses, revenues, and recommended user rate.

III. Compensation for Services:

Ivins City intends to enter into a professional services contract with the successful engineering/financial firm. Compensation for the services rendered, is to be based upon a time-expended basis with an agreed maximum not to exceed value. **The selection of the firm will not be based solely on the fee.**

Attached to this RFP is the City's template contract for professional services. By submitting a proposal for this RFP you are agreeing with the standard terms and conditions of the contract.

IV. Evaluation Criteria and Selection Process:

A selection committee will review each submittal. Selection criteria to be used by the selection team include the following:

A. Level of training, experience, expertise, and availability of key project personnel.
B. References regarding past performance on similar projects for other owners and the City.
C. Quality, clarity, and completeness of previous projects and of the example report.
D. Professional services fee proposal.

V. Proposal Format and Content:

Proposals are to follow the format and are to contain information listed in this section. In order to be considered, proposals must address all the items listed in this section and adhere to page limitations.

A. Letter of transmittal introducing firm and nature of proposal.
B. Project Team and Approach (Two pages maximum)
C. Firm Experience and References (Two pages maximum)
    i. Provide a listing of previous experience the firm has had with projects of similar size and complexity. (Two projects minimum).
    ii. For each project, provide the name of a contact person and his/her phone number.
D. Fee Proposal (Two pages maximum)
    i. Provide proposed fee for meeting the requirements of the Scope of Services in Section II. Fees shall be reasonably itemized based on Scope of Services.
    ii. Identify billing rates of each member of project team and number of hours required for project tasks as well as estimated direct charges.
E. Appendices
    i. Resumes (1 or ½ page per person) – Include principal-in-charge and key technical/professional personnel to be assigned to the project. Identify the role assigned for each person.
    ii. Provide copy of report from a previous project that is most similar to this project.

VI. Submittal Requirements:

Proposals are due on Tuesday, December 8th at 5:00 p.m.

The proposal should be submitted electronically in a PDF format to jchapman@ivins.com. Large files may be transmitted by including a link to an FTP site on the email. Hard copies will not be accepted.

Inquiries regarding the RFP should be directed to Chuck Gillette, P.E., Public Works Director or Tom Jorgensen, P.E., Assistant Public Works Director at (435) 634-0689, or by inquiry to the address above. The City reserves the right to award the contract to the firm chosen by the selection committee without further consideration or discussion. **The City reserves the right to reject any and all proposals received.** The City also reserves the right to waive any irregularity, informality, or technicality in the proposals in its best interest, and is not obligated to award a contract based upon the lowest price submission. If terms cannot be mutually agreed upon, the City will enter into negotiations with the secondary firm.

This RFP is due concurrent with the following RFPs:

A. Irrigation Master Plan, IFFP, IFA, & Implementation Plan
B. Wastewater Master Plan, IFFP, & IFA
C. Transportation IFA
D. Combined User Rate Plan

The professional services firm may choose to offer discounts if they are chosen for more than one of the proposed projects. Please identify what those discounts might be.

PROPOSAL

to provide **Professional Engineering Services**

for **Combined User Rate Plan**

December 2015

Prepared by:

Bowen Collins & Associates, Inc.
CONSULTING ENGINEERS

Prepared for:

OUR HOME BENEATH THE BIG RED MOUNTAIN
IVINS
UTAH

Bowen Collins
& Associates, Inc.
CONSULTING ENGINEERS

20 NORTH MAIN, SUITE 107 • ST. GEORGE, UTAH 84770
TEL: 435.656.3299 • FAX: 435.656.2190

December 8, 2015

Jennifer Chapman
Administrative Assistant – Parks & Public Works
Ivins City
55 North Main
Ivins, Utah 84738

Subject: Proposal to Provide Engineering Services for the Combined User Rate Plan

Dear Jennifer:

Bowen Collins & Associates (BC&A) appreciates the opportunity to submit the attached proposal to perform a combined user rate plan for Ivins City. We believe that we are in a unique position as a consultant who can offer expertise in both utility finance and engineering to help the City develop a stable revenue plan to fund its future utility systems. Our team is exceptionally well qualified to perform this study and we are very interested in continuing to work with the City on this project.

Based on the nature of your request, the consultant you select will need expertise in municipal utility finances and water/irrigation and sewer. We have worked with many municipalities over the past several years to develop equitable cost of service rate analysis in conformance with State law and industry standards. This includes cities such as American Fork, Cedar Hills, Sandy City, Provo City, Murray City, Pleasant Grove City, Logan City, South Valley Sewer District, Timpanogos Special Service District to name just a few. In addition, we are specialists in water, irrigation, sewer, and storm drain engineering, providing engineering services to meet the utility planning and design needs of municipal clients throughout Utah. Our extensive engineering background can provide unique insight into the rate making process that cannot be achieved by individuals or firms with experience on the financial side only.

Our personnel and proposed project team are available and ready to devote the time and resources required to meet the needs of the project. We are anxious for the opportunity to work with you on these plans.

Sincerely,
Bowen Collins & Associates, Inc.

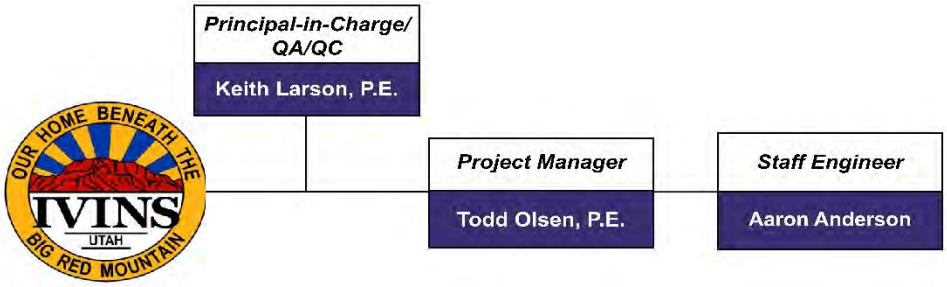
Todd Olsen, P.E.
Principal/Project Manager

Enc: Proposal

A. PROJECT TEAM AND APPROACH

PROJECT TEAM

From experience, we know that having a seasoned, qualified team is vital to the success of any project. For this reason, Bowen Collins & Associates (BC&A) is pleased to present the following team of professionals carefully selected to make this project a success. Our team includes the technical skills of economics, utility finance, and utility engineering, which are necessary to complete the study according to industry standards and ensure compliance with legal requirements. Detailed resumes for each of the team members are included in Appendix A for reference.



APPROACH/KEY ISSUES

Based on our experience with projects similar to Ivins City's, there are several key issues that will ultimately determine the success of this project:

- **Understanding Our Role in Your Study -** Ivins City faces some difficult decisions in how to best provide stable funding for its utility funds. Each potential path has unique advantages and disadvantages. We propose investigating all of the potential options with the City at the beginning of the study. It is important that the City thoroughly understand the options and impacts that the final recommended rate structure will have on its customers. BC&A does not advocate a "one size fits all" approach to rate studies. We will work closely with City staff to develop a defensible approach that makes the most sense for the City's unique circumstances. We will not push any solution on the City that does not meet your long term needs. We provide our expertise, manpower, and knowledge. You provide the leadership and vision for your system.

  We also recognize that the City may experience changes in utility use and/or development patterns over time and that operation and maintenance costs can vary from year to year. As a result, small adjustments to the City's rate schedule may be needed from time to time to reflect these changes. It is BC&A's philosophy that the City should not be obligated to call a consultant every time a small change occurs. While we will always be happy to provide assistance, our goal will be to develop a model that can be easily understood so that it can be quickly updated as changes occur. This will allow the City to address small changes that occur annually without requiring major additional assistance from the rate study consultant.

- **Familiarity with Industry Standards and Cost of Service Principles -** Municipal water rate-setting is normally governed by American Water Works Association (AWWA) cost-of-service principles. Sanitary sewer rates are similarly governed by Water Environment Federation (WEF) guidelines. As an engineering firm, we are not only familiar with these guidelines, but also understand the engineering principles that form the basis of their creation. As a result, we can more accurately apply these methodologies in our rate studies than most financial service firms or banks. In many cases, because our competitors do not understand the cost-of-service principles, they do not use these industry recommended approaches and instead use only a cash balance approach to rates.

By following established and widely accepted industry cost-of-service principles, a rate study will be effective at making sure system revenues are adequate to meet revenue needs, including any revenue bond covenants, and that the rates themselves not be excessively arbitrary or discriminatory. Our team members have the experience and technical expertise to perform a rate study that will result in stable and equitable revenues for the City. We have worked extensively with municipalities facing challenges similar to those of Ivins and have demonstrated the ability to develop rate schedules that are fair, equitable, and defensible. Of our numerous rate analyses for water, wastewater, and storm drain clients in Utah, we have yet to see any of our fees legally challenged after their adoption.

- **Local Knowledge and Experience.** We have performed dozens of rate studies, capital facility plans, impact studies and master plans for clients throughout Utah and are familiar with regional water, sewer, and storm drain issues. Our project team has years of experience with similar studies for numerous water, sewer, and storm drain providers within Utah and the Intermountain West. Our experience on previous projects and our ability to see the larger picture will provide the City with the analysis it needs to make wise decisions.

B. FIRM EXPERIENCE AND REFERENCES

The proposed BC&A team members have worked on and completed numerous masterplans, IFFPs, IFAs, and rate study. Technical expertise and responsive client service form the foundation of our company. The following is a partial listing of similar projects undertaken by our project team members in the last five years:

- City of Cedar Hills – Water, PI, Sewer, and Storm Drain Rate Study Update
- American Fork City – Culinary and Secondary Water, Sanitary Sewer, and Storm Drain Rate Analysis
- Lehi City – Impact Fee Facility Plans – Water, PI, Sewer, Storm Drain, Transportation, Public Safety, Power, and Parks
- Kearns Water Improvement District – Water and Sewer Rate Study, Water and Sewer Impact Fee Study
- Layton City – Water Rate and Impact Fee Study, Storm Drain Rate and Impact Fee Study
- Provo City, Utah – Cost of Service Rate and Impact Fee Study, Sewer and Water
- Herriman City, Utah – Secondary Water Implementation Cost Study
- Logan City, Utah – Cost of Service Water Rate Study
- Sandy City, Utah – Water Rate Study Update, Storm Drain Impact Fee Study
- Murray City, Utah – Water Rate and Impact Fee Study
- Jordanelle Special Service District – Water and Sewer Rate and Impact Fee Studies
- Twin Creeks Special Service District – Water and Sewer Rate and Impact Fee Studies
- North Village Special Service District – Water and Sewer Rate and Impact Fee Studies
- Strawberry Lakeview Special Service District –Sewer Rate Study
- Mt. Olympus Improvement District – Sewer Impact Fee and Rate Study Update
- Timpanogos Special Service District – Sewer Rate and Impact Fee Study
- South Valley Sewer District – Sewer User Charge and Impact Fee Study

For each entity, BC&A worked closely with city or district staff to develop a customized rate approach appropriate for the unique aspects of the individual entity. For example, a rate study in American Fork, Utah included consideration of a secondary water system and the effect of culinary water rates on secondary water use. In Logan, Utah, the rate study included separation of Utah State into its own customer class and calculation of an annual water credit for the university based on its portion of ownership in certain shared facilities. In all cases, BC&A works with city councils and residents to successfully implement new conservation-oriented rate structures.

We would encourage you to contact any of the entities listed above to discuss their experience with BC&A on recent rate studies. Contact information for a few of the primary individuals associated with the studies is provided below:

Bruce Hicken, Finance Director/Controller
Kearns Improvement District
801-968-1011

Ron Phillips, General Manager
Jordanelle Special Service District
435-657-1105

Charl Louw, Finance Director
Cedar Hills City
801-785-9668

Craig White, General Manager
South Valley Sewer District
801-571-1166

Cathy Jensen, Finance Director
American Fork City
801-763-3000

David Bunker, City Manager
Cedar Hills
801-785-9668

C. FEE PROPOSAL

BC&A has studied the scope of work outlined in the City's Request for Proposals (RFP). Based on the level of detail included in the scope of work, it is apparent that the City has carefully thought through the tasks required to accomplish the project. Because the scope of work in the RFP already provides an excellent outline of the required work to complete this project, we would propose following it as written with only a few modifications. Thus, instead of restating the scope of work already contained in the RFP, the following section discusses only those areas where we would propose modifying or adding to the existing RFP scope. This means we will perform all work contained in the RFP scope unless otherwise noted below.

- **Additional Tasks:** We recommend adding the following tasks that were not included in your detailed scope of services:

    - Collect and review existing information
    - Progress and coordination meetings – We will meet with City personnel to gather information, report results, and review work products. It is expected that there will be two progress meetings during the project and a final presentation to the City Council associated with the rate recommendations.
    - Rate Study report preparation – BC&A will prepare a master plan report summarizing the results of the activities identified in the scope. Five hard copies and an electronic copy of this report will be provided to the City.

We propose to complete the scope of services for a time and materials basis, with a not-to-exceed limit. Our detailed man-hour and cost estimate is summarized in the table below. The additional recommended tasks are shown in bold italics print.

Multiple Project Discount

The fee shown in the table represents the cost to complete this project on its own. If BC&A is awarded multiple projects there is expected to be significant increases in efficiency associated with project meetings, growth projections, etc. As a result, BC&A would offer the following discounts for the award of multiple projects:

- Award of Rate Study with one master plan (either sewer or irrigation) – $500 Discount
- Award of both irrigation and sewer master plans – $3,500 Discount
- Award of both irrigation and sewer master plans and Rate Study – $4,500 Discount

We appreciate the opportunity to provide this proposal and hope to have the opportunity to work with you on this project. We would be pleased to negotiate scope and fee if there is something in this proposal that does not meet your needs. Please call if you have any questions or if you need additional information.

Table 1
Ivins City
Combined User Rate Plan
Engineering Man-Hour and Fee Estimate
Last Updated 12/08/2015

		Office/Support		Engineers				Subtotal Hours	Subtotal Labor	Subtotal Expenses	Total Cost
	Labor Category	Office	Editor	Eng. 1	Eng. 3	PM	PIC				
	Staff	GR	MH	AA	KB	TO	KL				
	2014 Labor Rate	$62	$62	$93	$98	$112	$135				
Task No.	**Task Description**										
1	***Collect and Review Existing Information***			8		4		**12**	$ 1,192.00	$84	$ 1,276.00
2	***Project Coordination Meetings***					12	4	**16**	$ 1,884.00	$112	$ 1,996.00
3	Cost of Service Analysis	1		14		2	4	**21**	$ 2,128.00	$147	$ 2,275.00
4	Identify Existing and Future Revenues			8		4	2	**14**	$ 1,462.00	$98	$ 1,560.00
5	User Rate Analysis	1		22		6	2	**31**	$ 3,050.00	$217	$ 3,267.00
6	Cash Flow Analysis			10		2	2	**14**	$ 1,424.00	$98	$ 1,522.00
7	***Report Preparation***	1	4	22		10	4	**41**	$ 4,016.00	$287	$ 4,303.00
	Subtotal	**3**	**4**	**84**	**0**	**40**	**18**	**149**	**$ 15,156.00**	**$1,043**	**$ 16,199.00**
	Total Hours	**3**	**4**	**84**	**0**	**40**	**18**	**149**			
	Total Cost								**$ 15,156.00**	**$1,043**	**$ 16,199.00**

Expenses include:
Mileage reimbursement at $0.75/mile
Computer/Communications Charge at $7/labor hour

Assumptions:

APPENDIX A
RESUMES



KEITH J. LARSON, P.E.

PRINCIPAL/PROJECT MANAGER

Bowen Collins & Associates, Inc.
CONSULTING ENGINEERS

DISTINGUISHING QUALIFICATIONS

- Recognized in the region as a leading expert in water, wastewater, and storm drain master plan, impact fee facility plan studies,
- Extensive experience with hydraulic and hydrologic computer modeling applications
- Capable of providing unique engineering insight in the areas of asset management and utility finances

EDUCATION

M.S., Civil and Environmental Engineering, University of California – Davis, 2000

B.S., Civil and Environmental Engineering, University of Utah, 1998

EXPERIENCE

Master Planning

Mr. Larson has extensive experience in the master planning of water, wastewater and storm drain facilities. He has served as Project Manager or Project Engineer on numerous master plans including:

Jordanelle Special Service District Water and Sewer Master Plans	WBWCD Supply and Demand Study
Orem City Water, Sewer, and Storm Drain Master Plans	Ogden City Major Conveyance Study
Layton City Water, Sewer, and Storm Drain Master Plans	Ashley Valley Wastewater Collection System Master Plan
American Fork Storm Drain Master Plan	Salt Lake County Supply and Demand Study
2013 and 2008 Park City Water Master Plan	Salt Lake City Major Conveyance Study
Herriman City Potable and Secondary Water System Master Plans	Snyderville Basin Water Transport Study
Saratoga Spring Sewer and Storm Drain CFP and Impact Fee Plans	MWDSL&S Supply and Demand Study
2011 and 2002 Provo City Sewer and Water Master Plans	Major Conveyance Master Plan for JVWCD
Salt Lake City Sewer Master Plan	Ogden City Sanitary Sewer Master Plan
2010 and 2001 Sandy City Water Master Plan	

In each of these projects, his work included master planning activities such as network system development, model calibration, population growth and development projections, recommendations for capital improvements, asset management, cost estimates, project scheduling, and training.

Rate and Impact Fee Analysis

Mr. Larson has extensive experience in impact fee studies. He understands the details of recent impact fee law changes and has completed dozens of Impact Fee Facility Plans and Impact Fee Analyses in accordance with State law. He also served as Project Engineer on recent water rate studies for Cedar Hills, American Fork City, Kearns Improvement District, Sandy City, Murray City, Provo City, Logan City, Pleasant Grove City, and Virgin Valley Water District in Mesquite, Nevada. His work included assessing existing rate structures, developing water rate models, and recommending future changes in water pricing. In each case, he has worked with city councils and residents to successfully implement new conservation-oriented rate structures. He has also been the Project Engineer for sewer and/or storm drain rate studies for Provo City, Cedar Hills, Kearns Improvement District, Mount Olympus Improvement District, Sandy Suburban Improvement District, Timpanogos Special Service District, and South Valley Sewer District. These projects included the development of rate models for multiple service areas within each of the entities analyzed.



TODD OLSEN P.E.

PRINCIPAL

Bowen Collins & Associates, Inc.
CONSULTING ENGINEERS

DISTINGUISHING QUALIFICATIONS

- Principal/Project Manager at Bowen, Collins & Associates with over twelve years of experience focused on planning, design, and construction management services for water, wastewater, stormwater, and flood control/irrigation infrastructure projects.
- Experience as a construction manager, and on-site field representative in related wastewater, water, storm drainage and flood control projects.

EDUCATION

B.S., Civil Engineering-Hydraulics and Water Resources, Utah State University

EXPERIENCE

STUDIES

Master Plan, Capital Facilities Plan, IFFP, and IFA Study, Ash Creek Special Service District, Utah. Mr. Olsen is currently serving as project manager for the Ash Creek Special Service District's Wastewater Master Plan, Capital Facilities Plan, Impact Fee Facilities Plan, and Impact Fee Analysis. This project involves developing a new master plan and GIS based model to inventory the system, develop a 5 to 10 year plan of recommended system improvements, and develop new impact fee.

Ivins City Storm Drain Master Plan and Capital Facilities Plan, Ivins City, Utah. Mr. Olsen is currently serving as project manager for the Ivins City Storm Drain Master Plan and Capital Facilities Plan. This project also includes an updated Impact Fee Facility Plan (IFFP) and Impact Fee Analysis (IFA). The project included updating the City's storm drain master plan, developing a new design storm, storm distribution, and storm water design criteria. BC&A will completed the IFFP and IFA using in-house resources and help the City develop and new users fee structure.

St. George City Storm Drain Impact Fee Facility Plan, St. George, Utah. BC&A completed a Storm Drain Master Plan update for St. George City. As part of this master plan, BC&A also developed a capital facilities plan. Mr. Olsen used this capital facilities plan to complete an Impact Fee Facility Plan (IFFP) for the City. This IFFP was used by the City to develop their impact fee for future development related projects.

PROFESSIONAL REGISTRATION

Professional Engineer – Arizona, Nevada, and Utah

PROFESSIONAL ASSOCIATIONS AND AWARDS

American Water Works Association, Water Resources – Young Professionals Committee Chair (2008 to 2014)

Member of Tau Beta Pi, Engineering Honor Society

2014 ASCE Southern Utah Branch Engineer of the Year



AARON ANDERSON, E.I.T.

STAFF ENGINEER

Bowen Collins & Associates, Inc.
CONSULTING ENGINEERS

DISTINGUISHING QUALIFICATIONS

- Staff Engineer at Bowen, Collins & Associates with over one year of engineering experience focused on planning, design, and construction management services for water, wastewater, stormwater, and flood control projects.
- Experience with master planning, including hydraulic and hydrologic computer modeling as well as the development of Impact Fee Facility Plans, Impact Fee Analyses, and Rate Studies.
- Construction inspector for a variety of water distribution and storm water management projects.

EDUCATION

M.S., Civil and Environmental Engineering, Utah State University, 2014

B.S., Civil Engineering, Utah State University, 2013

EXPERIENCE

MASTER PLANNING/COMPUTER MODELING

Orem City Water & Sewer Master Plans

Mr. Anderson worked as a project engineer in the development of the 2013 Water and Sewer Master Plan update for Orem City. The project involved extensive population growth evaluations and hydraulic computer modeling (steady-state and extended period simulation) to determine necessary infrastructure improvements to meet future demands. Mr. Anderson aided in the development of a Capital Improvements Plan for Orem City, providing budgeting recommendations and cost estimates for future improvements to the City's infrastructure.

Lehi City Storm Drain Impact Fee Facilities Plan

Mr. Anderson served as a project engineer for the 2013 Impact Fee Facilities Plan for Lehi City. The project required the evaluation of population growth and land use in GIS to determine the capacity of existing storm drain facilities and necessary future improvements. This analysis provided the framework to develop the IFFP, allocating the costs of storm drain improvements in the City to existing and future users.

Twin Creeks Special Service District Sewer Master Plan

Mr. Anderson played a key role in the development of a 2014 Master Plan Update for Twin Creeks Special Service District located near Heber City, Utah, including an Impact Fee Facilities Plan, Impact Fee Analysis, and Rate Study. The formulation of the report required Mr. Anderson to develop an extended period hydraulic computer model of existing and future sewer conveyance components. The results of this modeling effort were used to identify necessary improvements to the sewer system to meet the demands of future growth. The IFFP, IFA, and Rates Study provided the District with a budgetary plan to pay for the proposed improvements.

Tooele Valley Airport Water and Sewer Master Plan Update

Mr. Anderson was a project team member for the 2014 update to the Water and Sewer Master Plan update for Tooele Valley Airport. The project required Mr. Anderson to work closely and coordinate with County and State regulatory agencies, including the Utah Division of Drinking Water, Tooele County Public Health Department, and the North Tooele County Fire District.

APPENDIX B
SAMPLE REPORT

CEDAR HILLS CITY
UTILITY RATE STUDY

PREPARED FOR:

CEDAR HILLS CITY

PREPARED BY:

BOWEN, COLLINS & ASSOCIATES
154 EAST 14000 SOUTH
DRAPER, UTAH 84020

MAY 2012

CEDAR HILLS CITY
UTILITY RATE STUDY



May 2012

Prepared by:

Bowen, Collins & Associates
154 E. 14000 S.
Draper, Utah 84020

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SECTION 1
PROJECTED REVENUE NEEDS

INTRODUCTION

Cedar Hills City authorized Bowen, Collins & Associates (BC&A) to update its culinary water, pressurized irrigation, sewer, and storm rates in March of 2012. The purpose of this study is to update City utility rates based on changes in demand patterns and system revenue requirements that have occurred since the last study. The rate study will calculate detailed rates for the next five years and present a longer-term finance plan to achieve the City's primary objectives of:

- Maintaining high quality, reliable water, pressurized irrigation, sewer, and storm drain services at affordable prices for customers;
- Encouraging wise use of resources through water conservation;
- Maintaining stable revenue generation adequate to fund system needs; and
- Minimizing the City's long-term costs by avoiding debt where possible.

Implementing the recommendations contained in this report will help Cedar Hills City keep its utility systems adequately funded to maintain its current infrastructure and keep pace with its currently approved capital improvements plans. The report will first examine water rates, followed by secondary water rates, sanitary sewer rates, and storm drain rates.

PROJECTED REVENUE NEEDS

Before calculating detailed rates for individual customer classes, it is important to consider the overall plan for meeting the future revenue needs of the City. The first step in this process is to project future expenditures. Historic and projected expenditures for the City from 2010 through 2022 are shown in Figures 1-1 through 1-5 as follows:

- Figure 1-1 – Water
- Figure 1-2 – Pressurized Irrigation
- Figure 1-3 – Sewer
- Figure 1-4 – Storm Drain
- Figure 1-5 – Combined revenues

Tables containing the values used to generate these figures are contained in Appendices A-D. Future expenditures can be grouped into three categories:

- **Operation and Maintenance Expenditures –** These are the annual costs of running the system. They include items such as salary and benefit costs for City staff, equipment and supplies, power costs, and all other costs associated with doing business throughout the year. Operation and maintenance (O&M) costs are relatively constant from year to year

Figure 1-1
10-Year Revenue and Expenditures - Water

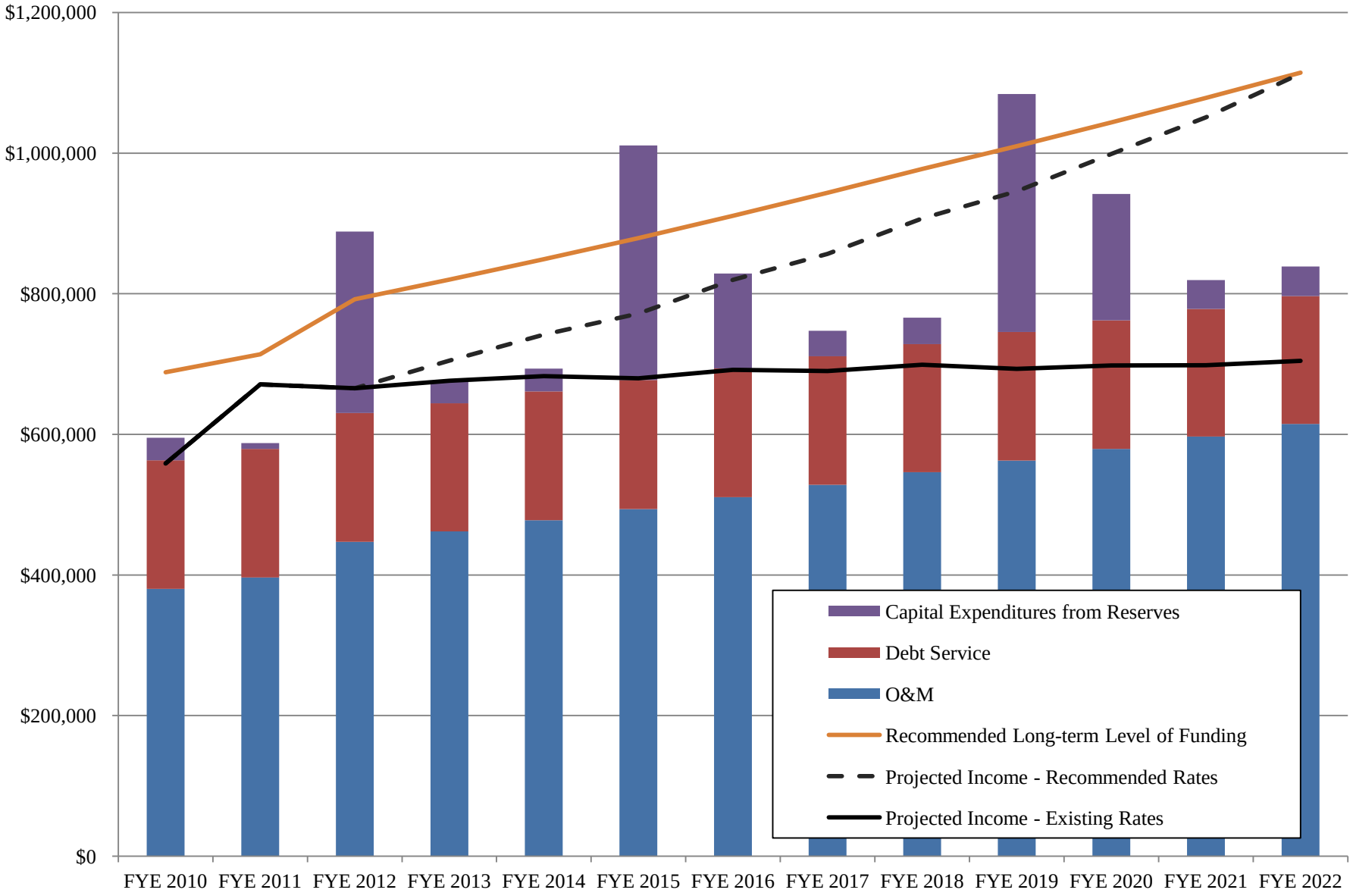


Figure 1-2
10-Year Revenue and Expenditures - Pressurized Irrigation

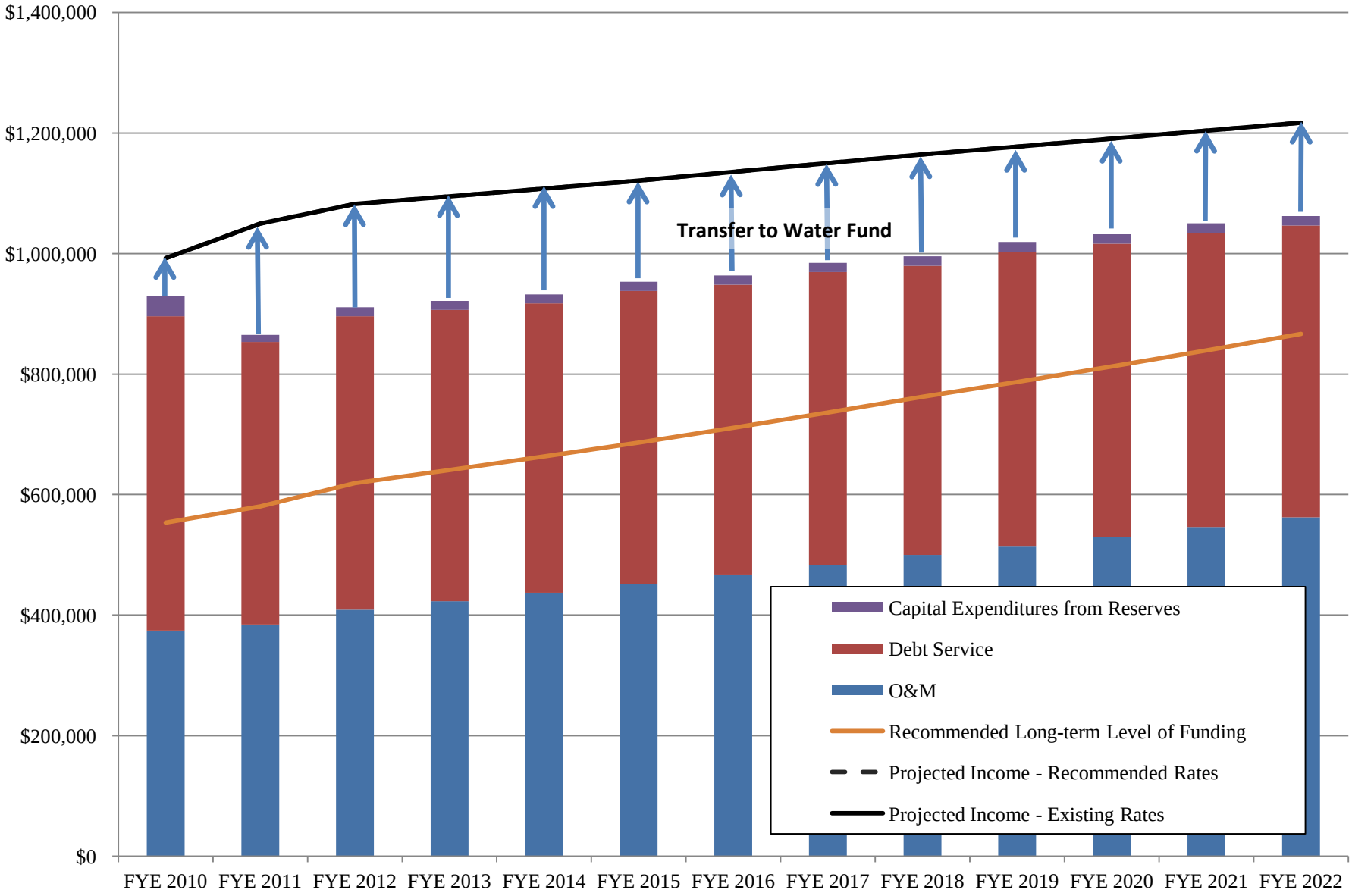


Figure 1-3
10-Year Revenue and Expenditures - Sewer

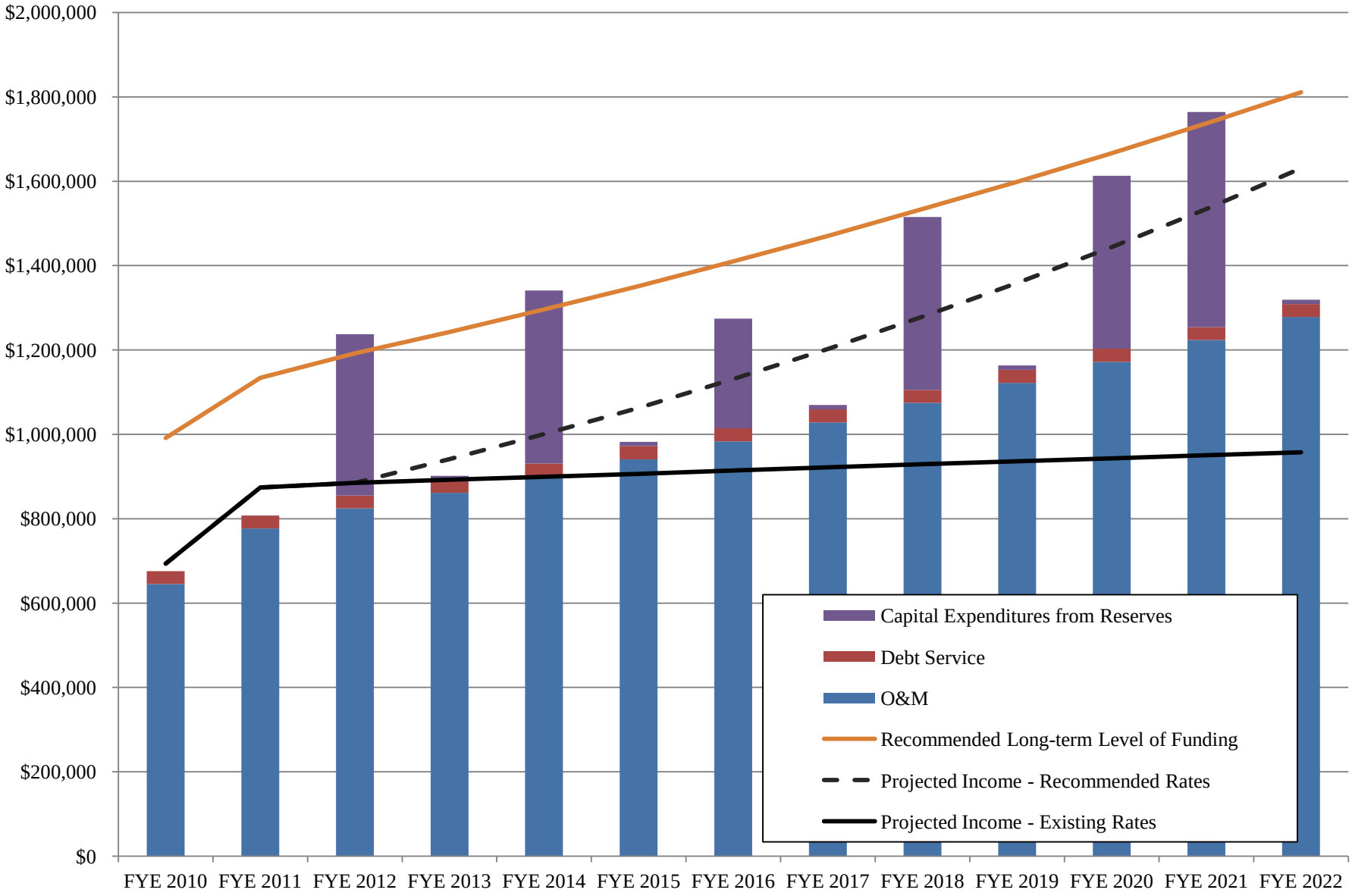


Figure 1-4
10-Year Revenue and Expenditures - Storm Drain

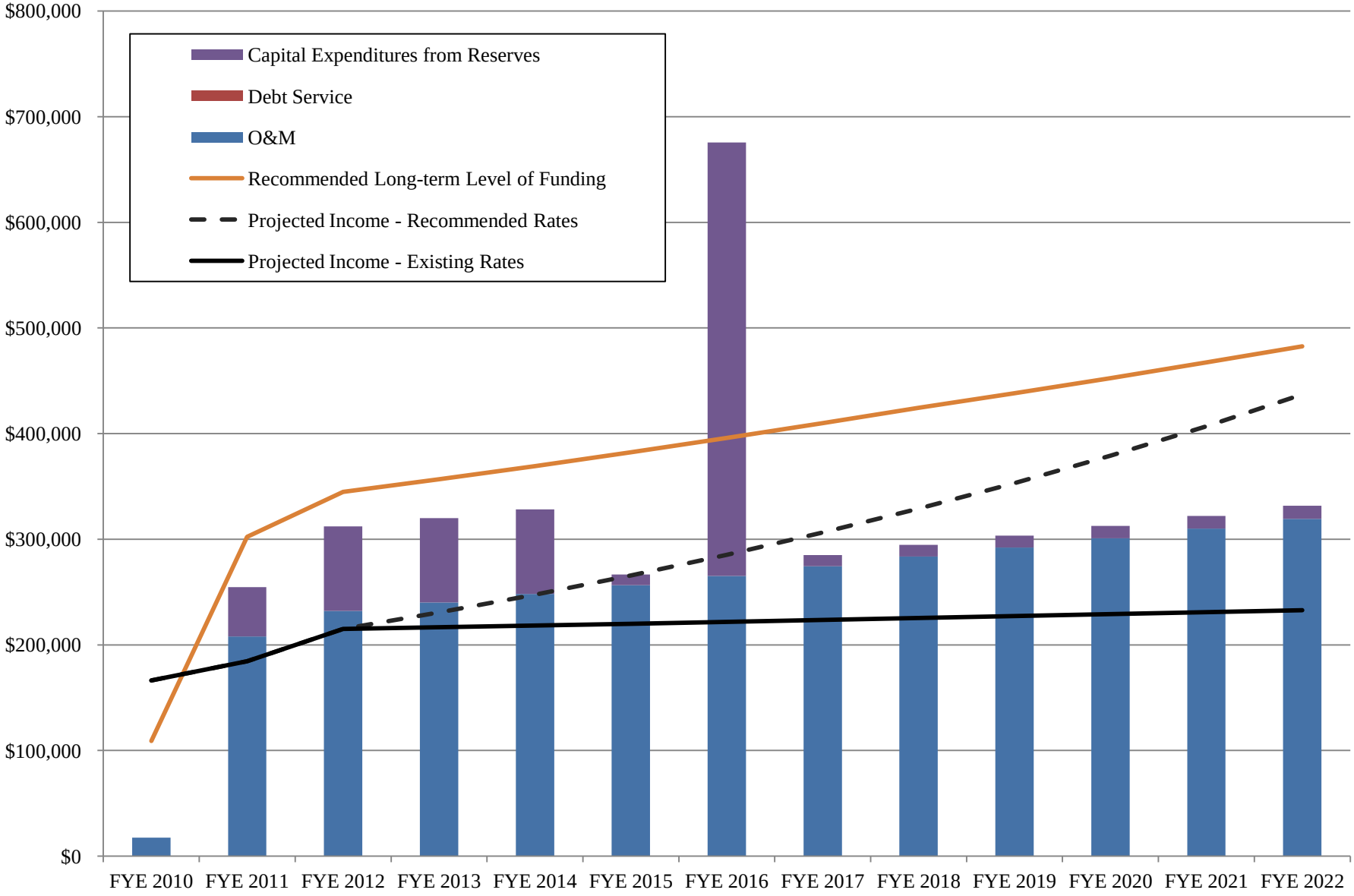
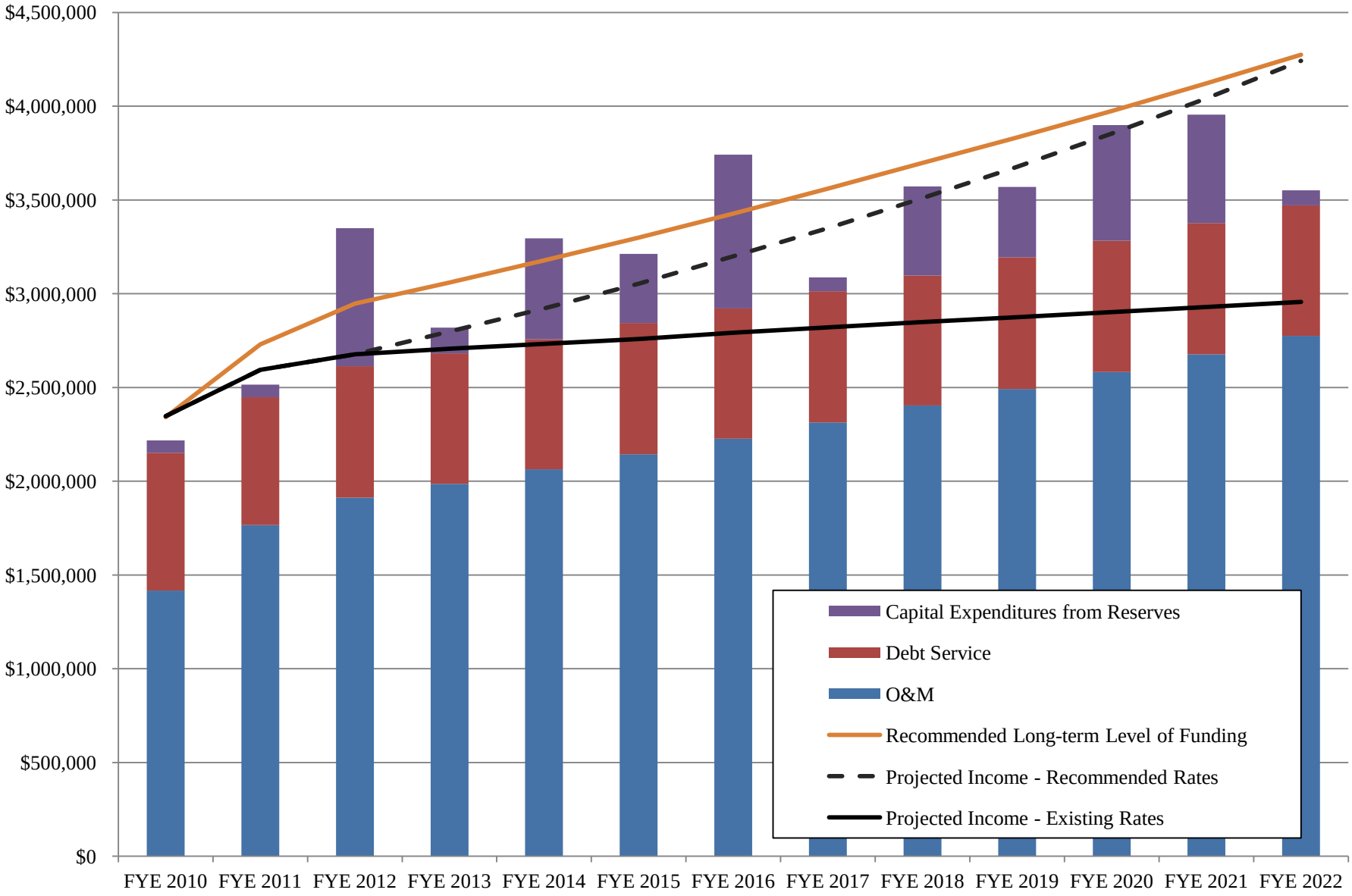


Figure 1-5
10-Year Revenue and Expenditures - All Utilities



and tend to follow the rate of inflation. Some of the largest O&M costs are utility costs, supplementary water purchase costs for the secondary irrigation system, and sewage treatment costs from the Timpanogos Special Services District (TSSD). While TSSD has increased rates significantly in recent years, similarly dramatic rate increases are not expected to occur in the near future. Historically, O&M costs for the City for the culinary and secondary systems have been combined in the same water expenditures category. For this study, expenditures that are spent on both culinary and secondary systems have been assigned 60 percent to culinary water and 40 percent to pressurized irrigation.

- **Debt Service Expenditures –** These are the costs paid toward bonds taken out by the City in previous years. These costs are easily predictable because they are tied to set payment schedules for each bond. The City issued two bonds to fund the recently implemented pressurized irrigation system. These PI bonds constitute the largest debt service expenditures for the City.
- **Capital Improvement Expenditures –** These are costs for constructing new facilities within the City. This can include completely new facilities or replacement of existing facilities. Capital improvement expenditures are usually the most volatile of expenditure categories. Because O&M and debt service costs are basically fixed, budgets are usually balanced by increasing or decreasing capital improvement expenditures as necessary. While some fluctuation in the funding of capital improvements is acceptable from year to year, the overall health of each utility will depend on adequately funding this portion of the budget over the long term.

10-YEAR BUDGET PLAN

With the expected expenditures outlined above, it is possible to prepare a future budget plan. A budget plan has been developed for culinary water, pressurized irrigation, sewer, and storm drain utilities and is shown on top of projected expenditures in Figures 1-1 through 1-5. The process of creating this budget plan was as follows:

1. **Identify projected revenue based on existing water, pressurized irrigation, sewer, and storm drain rates –** Using the City's existing water, pressurized irrigation, sewer, and storm drain rates, BC&A calculated the revenue the City could expect to receive over the next 10 years if no changes are made to existing rates. These projections include consideration of future system growth. As can be seen in Figures 1-1 through 1-5, projected revenue based on existing rates falls short of projected expenditures in all categories except pressurized irrigation. Because the pressurized irrigation system and culinary water system have historically been funded from the same budget, the surplus revenue from the pressurized irrigation system has been transferred to the culinary water budget. This effectively increases the projected income for the culinary water system and reduces its overall deficit. Unfortunately, a deficit still exists for culinary water as shown in Figure 1-1, even with the transfer of excess funds from the pressurized irrigation system.

2. **Identify recommended level of funding based on long-term system needs** – As with most things, each component of a water, pressurized irrigation, sewer, and storm drain system has a finite service life. As such, it is necessary to continually budget money for the rehabilitation or replacement of these system components. If adequate funds are not set aside for regular system renewal, the system will fall into disrepair and be incapable of providing the level of service customers in the City expect. To maintain the utility in good operating condition, it is recommended that the City's annual investment into the system (including debt service costs and capital improvements) be approximately equal to the replacement value of the system divided by its estimated service life.

   - **Water System** – The estimated replacement value of the City's culinary water system is $34.5 million. This estimate includes the value of City pipelines, pump stations, wells, and storage reservoirs. The service life for water facilities can vary greatly depending on the type of facility it is and the conditions in which it serves. Some facilities such as the mechanical equipment at pump stations may last as little as 10 years. Conversely, pipelines typically have an expected life of 60 to 100 years. Because Cedar Hills is a relatively young City with new infrastructure, the recommended funding level for capital improvements has been estimated based on 1 percent of system value. This equates to a 100-year system life, the very high end of expected life for water facilities. Based on this value, BC&A would recommend the City budget approximately $345,000 per year for capital investment in its water system.

   - **Pressurized Irrigation System** – The estimated replacement value of the City's pressurized irrigation system is $21 million. Following the same logic as outlined for the culinary water system, it is recommended that the City budget $210,000 per year for capital investment in its pressurized irrigation system.

   - **Sewer System** – The estimated replacement value of the City's sewer system is $49 million. Sewer systems generally have a longer expected life span than water systems. Based on their longer life span and greater opportunities for insitu rehabilitation, the level of capital funding recommended by BC&A is slightly less than for pressurized water systems. We would recommend the City budget approximately 0.75 percent of replacement costs ($367,500) per year for capital investment in its sewer system.

   - **Storm Drain System** – The estimated replacement value of the City's sewer system is $15 million. Following the same logic as outlined for the sewer system, it is recommended that the City budget $112,500 per year for capital investment in its pressurized irrigation system.

   The recommended system investment budgets identified above were added to the City's projected O&M costs to estimate a recommended long-term level of funding based on system needs. This projected funding level is shown in Figures 1-1 through 1-5. As can been seen in the figures, the City's historic level of investment in the system falls just short of the long-term recommendations for all utilities except pressurized irrigation. However, this gap will become larger and larger in future years unless increases to existing rates are made.

For pressurized irrigation, the projected level of investment is above the long-term recommendation. However, this is the result of required payments towards the City's existing pressurized irrigation bonds and will need to continue until the debt is retired.

3. **Create a plan to transition from existing revenue to revenue adequate to support long-term system needs** – To close the gap between projected revenue from existing rates and recommended revenue for long-term system needs, it is recommended that existing rates be increased over the next several years for all utilities except pressurized irrigation. In addition, it is in the best interest of the City to implement rate adjustments that also keep pace with inflation. To minimize the pain for customers, especially under the difficult current economic conditions, it is recommended that this increase be completed gradually over several years as shown in Figures 1-1 through 1-5. To generate the revenue shown in the budget plan in the figures, annual increases to existing rates (for water, sewer, and storm drain systems) will need to be as shown in Table 1-1. It is recommended that existing rates for the pressurized irrigation system be left unchanged.

Table 1-1
Recommended Annual Rate Revenue Increase for 10-Year Budget Plan

Year	Culinary Water Percent Increase	Sewer Percent Increase	Storm Drain Percent Increase	Total Utility Increase
2013	6.4%	5.5%	6.5%	3.7%
2014	6.4%	5.5%	6.5%	3.7%
2015	6.4%	5.5%	6.5%	3.8%
2016	6.4%	5.5%	6.5%	3.9%
2017	6.4%	5.5%	6.5%	4.0%
2018	6.4%	5.5%	6.5%	4.1%
2019	6.4%	5.5%	6.5%	4.1%
2020	6.4%	5.5%	6.5%	4.2%
2021	6.4%	5.5%	6.5%	4.3%
2022	6.4%	5.5%	6.5%	4.3%

*Note: No increase proposed for pressurized irrigation

It will be noted that the proposed increases don't completely eliminate the deficit between revenue and the recommended long-term level of funding for sewer and storm drain. However, the recommended increases do narrow the gap and are adequate to fund the current capital improvement plans of the City.

4. **Verify City reserve funds are adequate to cover interim cash flow needs** – The City has prepared capital improvement plans for its utility systems based on the results of master planning efforts and knowledge of City staff. While the overall plan generates adequate revenue to fund these improvements over the 10-year planning window, there will be some early years in which the overall budget will need to be augmented from reserve funds. Based on the current plan, the City will need to draw approximately $1.1 million from reserve funds to cover expenditures in the first four years of the plan before it is paid back in later years. It is recommended that the City verify it has adequate reserve funds to cover this need.

SECTION 2
WATER RATE ANALYSIS

In Section 1, a 10-year budget plan was developed for the culinary water, pressurized irrigation, sewer, and storm drain systems. Based on this overall budget plan, detailed rates can now be calculated for each utility. The purpose of this chapter is to calculate detailed culinary water rates for the next 6 years based on the overall budget plan.

This analysis focuses on four major tasks:

1. **Projecting Water Use:** Future water sales were estimated by examining current use patterns and by projecting water system growth for the next several years.
2. **Calculating Revenue Requirements:** Total revenue requirements for the system were projected for the next several years based on the budget plan outlined in Section 1. Non-rate revenue (including impact fee revenue) was deducted from the total to give the net revenue requirement to be recovered from rate payers.
3. **Cost Allocation:** This analysis generally follows the basic cost-of-service approach recommended by the American Water Works Association (AWWA).[1] The essential principle of this method is that "water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers."[2] To accomplish this goal, the system revenue requirements were allocated to four customer service characteristics: average day demand, peak day demand, billing & collection, and meters & services.
4. **Rate Design:** Rates were calculated to recover the allocated cost of service for each customer service characteristic based on a given rate structure.

The remainder of this report details the results of each of these four major tasks. Detailed rate tables from the model used to develop the rate recommendations are located in Appendix A.

KEY ASSUMPTIONS

The results presented in this report are based on the following assumptions:

1. The Culinary Water Fund will continue to be a self-funding, enterprise-type fund.
2. Customers will continue to be billed using the City's existing customer classes: Residential (including HOA accounts), Commercial, and Institutional (churches & schools).
3. The study follows the basic recommended methodologies of AWWA in developing cost-of-service water rate options for consideration by Cedar Hills City. Only the "cash basis" approach has been used to allocate costs to users. The "cash basis" study methodology is summarized later in this report.

[1] American Water Works Association. *Principles of Water Rates, Fees, and Charges: Manual M1.* 2000.
[2] *Ibid,* p. xix.

4. The City's current rate structure does not include a water allowance in the monthly base charge. It has been assumed this practice will continue.
5. This rate study is based on projections of future water demands and projected system operation, maintenance, and improvement costs. These projections are based on current economic conditions and weather patterns over the last several years. Because conditions may change over time, it is recommended that Cedar Hills City review the rates annually to determine if any adjustments are needed. It is also recommended that a comprehensive review and updating of water rates be undertaken in three to five years so that the basic analytical foundations of this study can be re-evaluated.

PROJECTING WATER USE

Historical Water Use

Cedar Hills City provides water service to almost 2,400 accounts, as summarized in Table 2-1. The residential customer class is the largest customer class, accounting for 99 percent of the accounts and over 93 percent of the total water use. As fiscal year 2012 has not yet ended, water use for 2012 was estimated by using the historic water use for fiscal year ending 2011. The 2012 usage estimates in Table 2-1 include an increase in residential use proportional to the increase in number of accounts due to the City's acquiring 128 new culinary connections from the dissolution of Manila Water in December 2011. In addition, it is assumed that Cedar Ridge Elementary school will connect to the pressurized irrigation system, which will decrease the summertime culinary usage for the institutional customer class.

Table 2-1
2012 Estimated Account and Water Use Summary

Customer Class	Annual Use (kgal)	Accounts	Average Use per Account (kgal/month)
Residential	172,383	2,349	6.1
Commercial	5,453	7	64.9
Institutional	2,682	9	24.8
Total	**180,518**	**2,365**	**6.4**

Note: Number of accounts based on January 1, 2012. Annual use based on metered use July 1, 2010 to July 1, 2011 for commercial & institutional classes, with an estimated increase for the residential customer class proportional to the number of accounts added from Manila Water.

Projected Accounts

Cedar Hills City has historically seen a wide range of growth rates depending on economic conditions in the area. Current projections available from the City estimate annual growth of between 0.75 to 0.83 percent over the next 6 years. These projections are somewhat conservative and take into account the current ongoing economic downturn. Per the City's projections, it has been assumed that 18 annual residential accounts will be added through 2015

and 20 annual accounts added through 2020. Projected growth rates and accounts by customer type are summarized in Table 2-2.

Table 2-2
Projected Growth in System Accounts

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Customer Class	**0.76%**	**0.76%**	**0.75%**	**0.83%**	**0.83%**	**0.81%**
Residential	2,367	2,385	2,403	2,423	2,443	2,463
Commercial	7	7	7	7	7	7
Institutional	9	9	9	9	9	9
Total	**2,383**	**2,401**	**2,419**	**2,439**	**2,459**	**2,479**
Additional Connections/Year	*18*	*18*	*18*	*20*	*20*	*20*

Projected Water Use

Future water demands were projected by multiplying the estimated average use per account in 2012 from Table 2-1 by the projected number of accounts in Table 2-2. Using this methodology, the projected growth in total volume of water sold is shown in Table 2-3.

Table 2-3
Projected Growth in Water Use

	Average	Amount (kgal)					
Customer Class	**Use/Acct.**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	73.4	173,704	175,025	176,346	177,814	179,282	180,749
Commercial	779.0	5,453	5,453	5,453	5,453	5,453	5,453
Institutional	298.0	2,682	2,682	2,682	2,682	2,682	2,682
Total		**181,839**	**183,160**	**184,481**	**185,949**	**187,417**	**188,884**

Peaking Characteristics

The peak month peaking factor is the ratio of the peak month rate of flow divided by the average month rate of flow. Typically, peaking factors are used to project peak demands for each customer class so that the cost of serving those peak demands can be estimated. For simplicity and for ease of implementation, the City has indicated a desire to continue to bill all customer classes at the same rate. Therefore, the system-wide peaking factor of 1.18 is used for all customer classes in this study.

Demands by Water Use Block

Cedar Hills City currently uses an increasing block rate for all customers. Table 2-4 summarizes the City's current block structure and the historic use by block. As can be seen in the table, over 83 percent of total water use was in the lowest block. This is not unexpected since the average

residential indoor water use per account is only 6,100 gallons per month, while the first block division point is at 10,000 gallons.

In addition, it can be seen in Table 2-4 that a higher percentage of total water use was in the highest block than in the second and third blocks combined. This is likely an indication that some large commercial and industrial users use most of their water in the highest block.

Table 2-4
FYE 2011 Block Water Use for All Customers

Upper Block Limits (kgal)				2011 Total Use by Block			
Block 1	**Block 2**	**Block 3**	**Block 4**	**Block 1**	**Block 2**	**Block 3**	**Block 4**
10	12	18	+	144,254	6,223	6,390	16,456
Percent Total Use				**83.2%**	**3.6%**	**3.7%**	**9.5%**

Meters

Table 2-5 summarizes the number of existing meters in the Cedar Hills culinary water system by size. Meters range in size from 3/4-inch to 3-inch meters. Over 99 percent of the meters are 3/4-inch meters. Only 16 meters are 1-inch or larger, representing just 0.7 percent of the system. Table 2-5 also presents equivalent meter data based on AWWA meter cost-of-service criteria. The information in Table 2-5 is used to develop monthly base rates by meter size.

Table 2-5
Meters and Equivalent Meters by Size

	Size (Inches)									
	3/4 and smaller	**1**	**1 1/2**	**2**	**3**	**4**	**6**	**8**	**10**	**Total**
Number of Meters	**2,349**	**5**	**10**	**0**	**1**	**0**	**0**	**0**	**0**	**2,365**
% of Total	**99.3%**	**0.2%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**
AWWA Equiv. Meter Ratios	1.0	1.3	1.6	2.6	10.0	12.7	19.1	26.4	36.4	
Equivalent Meters	**2,349**	**6**	**16**	**0**	**10**	**0**	**0**	**0**	**0**	**2,382**
% of Total	**98.6%**	**0.3%**	**0.7%**	**0.0%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**

CALCULATING REVENUE REQUIREMENTS

There are two methods for determining a water utility's revenue requirements. One is called the Cash Basis of revenue requirements. The other method is called the Utility Basis of revenue requirements. The revenue requirements for each approach are summarized as follows.

	Cash Basis		**Utility Basis**
	Operation and Maintenance Costs		Operation and Maintenance Cost
Plus:	Debt Service	Plus:	Depreciation
	Cash-Financed Capital Outlays		Return on Investment
	Taxes (if applicable)		Taxes (if applicable)
	Net Additions to Reserves		
	Total Requirements		Total Requirements
Less:	Non-Rate Revenues	Less:	Non-Rate Revenues
Equals:	Net Requirements from Rates	Equals:	Net Requirements from Rates

The cash basis of revenue requirements is based on the actual cash expenditures of the system. Its goal is to make sure revenues match the cash needs of the system. In public utilities, this method generally matches the budgetary expenditures for the period. It has the additional advantage of being more understandable to most ratepayers and more directly meets any debt service coverage requirements that the system might need to comply with.

The utility basis approach simulates the financial requirements of private sector companies. It ensures that revenue requirements reflect the depreciation incurred by the system, as well as a return on the investment in rate base by system owners. In the municipal utility setting, the utility basis is most often used when there is significant utility service to customers outside the jurisdictional boundaries of the system owners, such as outside-city customers. It allows the system owners (i.e., inside-city customers) to earn a return from the investments to serve the outside-city customers. Because Cedar Hills City does not have significant outside-city users, rates for this study were developed under the cash basis only.

Impact Fee Revenue

The projected impact fee revenue for the next six years is estimated to increase from about $30,000 a year to nearly $34,000 a year as summarized in Table 2-6. The projected annual revenue from impact fees is based on the projected number of new accounts as discussed previously. For this analysis, it has been assumed that the City's future impact fee rates will be in accordance with the City's current impact fee plan. If the City updates or modifies its future impact fees, the rates calculated in this report will need to be adjusted accordingly.

Table 2-6
Projected Impact Fee Revenue

Year	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Annual Growth Rate	0.76%	0.76%	0.75%	0.83%	0.83%	0.81%
Projected Impact Fee Revenue	$30,109	$30,109	$30,109	$33,455	$33,455	$33,455

Non-Rate Revenue

The projected non-rate revenue for the City is summarized in Table 2-7. This revenue is the net income from activities not associated with water sales or impact fees. It may include service charges, net interest income, fees, and tax revenue. For accounting purposes, the City separates this income into operating and non-operating revenue. It will be noted that there is a significant amount transferred into the culinary water fund from the pressurized irrigation system. As was mentioned in Section 1, the projected income from existing pressurized irrigation rates exceeds the estimated expenditures for the next 10 years. For the purpose of calculating rates, this surplus revenue has been transferred to the culinary water fund as non-rate revenue.

Table 2-7
Projected Non-Rate Revenue

Item	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
Operating						
Water Fees - American Fork City	$18,677	$19,379	$20,106	$20,876	$21,675	$22,501
Water Fees - Contractors	$2,179	$2,261	$2,346	$2,436	$2,529	$2,625
Transfer from PI	$173,477	$175,380	$168,062	$171,885	$165,233	$169,001
Total Operating Non-Rate Revenue	**$194,333**	**$197,019**	**$190,513**	**$195,196**	**$189,437**	**$194,127**
Non-Operating						
Connection Fees	$30,109	$30,109	$30,109	$33,455	$33,455	$33,455
Water Lateral Inspections	$1,058	$1,066	$1,074	$1,083	$1,092	$1,101
Water Meters	$7,523	$7,805	$8,098	$8,408	$8,730	$9,063
Total Non-Operating Non-Rate Revenue	**$38,690**	**$38,981**	**$39,282**	**$42,946**	**$43,277**	**$43,619**
Total Non-Rate Revenue	**$233,023**	**$236,000**	**$229,795**	**$238,143**	**$232,714**	**$237,746**

City Expenditures

The projected City expenditures for the planning period are summarized in Table 2-8. Included in the table are the projected total costs for the three major categories of expenditures: operations and maintenance, debt service, and capital expenditures. Each of these categories is discussed in more detail in following sections.

Table 2-8
Projected Revenue Requirements

Item	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
O&M	$462,150	$477,771	$493,895	$510,762	$528,204	$546,190
Debt Services	$182,086	$183,364	$183,501	$183,054	$182,995	$182,322
Capital (Net of bond revenue)	$60,510	$80,570	$94,502	$125,894	$145,376	$178,421
Total Expenditures	**$704,746**	**$741,705**	**$771,898**	**$819,710**	**$856,576**	**$906,933**

Operation and Maintenance Costs. The projected operation and maintenance (O&M) costs for the City have been taken from the City's budget for 2012. Historically, O&M costs for the City for the culinary and pressurized irrigation systems have been combined in the same water expenditures category. For this study, expenditures that are spent on both culinary and secondary systems have been assigned 60 percent to culinary water and 40 percent to pressurized irrigation. A detailed list of all O&M budget categories is included as part of the rate model in Appendix A. Beyond 2012, it has been assumed that these O&M cost categories will increase at a rate equal to half the system growth rate in each year and an assumed inflation rate of 3.0 percent (e.g. budget growth in 2013 = 0.76%/2 + 3% = 3.38%).

Debt Service Costs. The projected debt service costs for the City have been taken from the City's bond payment schedule through 2018. As indicated by the City, one half of the 2006 Excise Tax Bond for the new Public Works Building is paid for from the water and sewer funds. For this study, this portion of the debt service was split in proportion to the total budget for these two funds; 60 percent for culinary water and 40 percent for sewer (e.g. 60%/2=30% of the 2006 bond is paid from the culinary water fund). A detailed list of all bond payments is included as part of the rate model in Appendix A.

Capital Improvement Costs. The projected capital improvement costs for the City have been taken from the City's 10-year capital improvement plan. A detailed list of all capital improvements is included as part of the rate model in Appendix A.

Included under the capital improvements budget is a section for the transfer of funds to or from the City's reserve fund. As noted in Chapter 1, the reserve fund is being used to smooth out total, overall capital expenditures in the City. In some years water revenue will be used to help pay for other system improvements and in other years, other revenues will help pay for water. With the City's philosophy of paying for improvements without bonding where possible, there will also be years in which excess funds are generated and added to the reserve, only to be drawn out in subsequent years for large projects. From a long-term perspective, there will be no net change in the reserve fund's overall size due to these transfers. City personnel have indicated that the reserve fund should be adequate for transfers of this magnitude.

COST ALLOCATIONS

A key step in a cost-of-service rate analysis is the allocation of costs to customer service characteristics. The allocation approach used in this rate update reflects the basic approaches recommended by the AWWA. The cost allocation method is the Base-Extra Capacity Method, which is one of the two methods specifically recognized by AWWA. Unlike the AWWA suggested approach, this update limits the analysis of peaking costs to peak day costs. It does not include peak hour costs as a customer service characteristic. This is because Cedar Hills City does not have any estimates of peak hour requirements. This variation is minor and does not materially affect the outcome of the analysis or the validity of the results. AWWA specifically recognizes that utilities' circumstances may justify changes from the AWWA methods, and this is one such variation.

Customer Service Characteristics

Customer service characteristics are demands or other "services" that each customer receives. Specifically, the customer service characteristics considered in this rate study include:

- average demand,
- peak day demand,
- billing & collection, and
- meters & services.

The first step in allocating costs is to divide each of the City's revenue requirements into these four categories. This has been done in the water rate model (see Tables 13 and 14 of Appendix A). In each case, these allocations are based on information provided by Cedar Hills City personnel, professional engineering judgment, and knowledge of system operations. Table 13 in Appendix A provides a division by customer service characteristics for O&M expenditures. Table 14 in Appendix A provides the same information for capital and bonding expenditures.

To understand how this has been done, it may be useful to consider a few examples. As one example, the majority of costs for distribution pipelines (60 percent) are attributed to average day demand. This basically represents the cost of maintaining pipes and valves in the ground to provide water to system users. However, the size of the pipelines in the system must be larger than would be required to convey average flow, because of daily and seasonal fluctuations in system flow. Thus, a portion of the distribution budget (15 percent) has been allocated to peak demand to account for the increased costs of maintaining a larger system. The remaining amount (25 percent) has been allocated to cover the costs of meters and service lines.

In contrast to the distribution pipelines, some O&M budget items such as computer expenses, office equipment, communications & telephone, and credit card fees are associated with working with individual customers. For these budget items, 100 percent is assigned to billing and collection. Each of the other revenue requirements has been divided among the customer service characteristic categories based on similar logic.

Using the percentages assigned to each budget category, the system revenue costs are distributed among the customer service characteristics. This is also shown in detail in the rate model. The total revenue requirement for each customer service characteristic is given in Table 16 of Appendix A. Table 17 of Appendix A shows the total cost allocation for each customer class.

RATE STRUCTURES

Water rates are commonly divided into two components: monthly base charges and volumetric charges. The monthly base charge is the amount charged to existing users to be connected to the system, regardless of the amount of water used. This is usually assessed based on meter size and may or may not include a monthly water allowance. Volumetric charges are those charges assessed based on the amount of water used by the customer.

Volumetric charges can be assessed using one of three general rate structures: uniform rates, seasonal rates, and block rates (both increasing and decreasing).

- **Uniform Rates –**A uniform rate structure charges the same for each gallon of water regardless of the amount of water used or time of year. Uniform rate structures are among the easiest rate structures to administer and understand. Unfortunately, they do little to encourage conservation.
- **Seasonal Rates –**A seasonal rate structure charges one rate during the winter and another rate during the summer. Generally, higher rates are charged during the summer months to account for the additional costs of producing water during times of peak demand. Seasonal rates have the advantage of being easy to understand and easy to implement. They also provide a financial incentive for users to conserve during the summer months. Unfortunately, they do little to encourage conservation during the winter months. They are most appropriate for systems without secondary service that have large summer peaking factors.
- **Block Rates –**Block rates charge different amounts for each gallon of water depending on the total amount of water metered each month. For example, the first 5,000 gallons of water sold during a month may be charged at one rate, while any water in excess of 5,000 gallons is charged at a different rate. Blocks can increase with the amount of water sold as well as decrease. Since decreasing blocks generally discourage conservation, they will not be discussed further. In contrast, increasing block rates have the greatest potential of all rate structures for encouraging conservation. The greatest challenge with increasing block rates is that they are difficult to implement and administer fairly. Although one set of blocks could be developed to encourage conservation among family residential users, this same set of blocks may unfairly penalize a large commercial user.

Any of the above rate structures could be used to develop reasonable, cost-based rates that could be implemented by Cedar Hills City. They all generate the same revenues and meet the basic standards established by AWWA for equitable, cost-of-service approaches for rate development. Additionally, any combination of the rate structures could be used to develop an acceptable pricing policy for Cedar Hills City. Therefore, within this set of rates, a recommendation for any individual rate structure is based only on differences in objectives or concepts among the

options. Based on the overall success the City has already had in achieving conservation and its other rate objectives, BC&A would recommend continuing to use an increasing block rate structure for the upcoming planning period.

CURRENT WATER RATE STRUCTURE

Table 2-9 shows the City's existing rate structure.

Table 2-9
Existing Culinary Water Rates

Utility Fees	Rates	
Water (No PI Available)		
Base Rate (Per ERU)	$6.00	per month
1-10,000	$1.25	per 1,000 gal.
10,000-12,000	$2.00	per 1,000 gal.
12,000-18,000	$2.50	per 1,000 gal.
18,000+	$1.50	per 1,000 gal.
Water (PI Available)		
Base Rate (Per ERU)	$6.00	per month
1-10,000	$1.25	per 1,000 gal.
10,000-12,000	$2.00	per 1,000 gal.
12,000-18,000	$3.00	per 1,000 gal.
18,000+	$4.00	per 1,000 gal.
Water (PI Not Connected)		
Base Rate (Per ERU)	$6.00	per month
1-6,000	$2.00	per 1,000 gal.
6,000-12,000	$3.00	per 1,000 gal.
12,000-18,000	$4.00	per 1,000 gal.
18,000+	$5.00	per 1,000 gal.

A couple of things should be noted about the City's existing rate structure:

- **Monthly Base Rates** – The monthly base rate has historically been charged per equivalent residential unit (ERU). An ERU is a unit of measure to equate non-residential water usage to a specific number of equivalent residential households (e.g. a commercial user that uses three times the water of the average residential customer would be assigned an ERU value of 3). ERUs have historically been calculated based on past water use compared to average residential water use.
- **Volume Rates –** The City currently has an increasing block rate structure with four blocks. This basic structure is currently used for all customers with access to the secondary system, regardless of whether the customer has connected to the secondary system. However, different block division points and different rate charges per 1,000 gallons are charged depending on whether the customer has connected to the secondary system. In addition, customers that do not have access to the City's pressurized irrigation

system also follow an increasing block rate structure, with exception of the highest block, which is billed at a rate significantly lower than the middle blocks.

Total projected revenues based on existing City water rates are shown in Table 2-10. It can be seen that the projected revenue from existing culinary water rates will become increasingly insufficient to meet revenue requirements in the coming years. As described in Section 1, BC&A would recommend an overall increase in sales revenue of approximately 6.4% per year over the planning period in order to meet revenue requirements.

Table 2-10
Projected Revenue Based on Existing Water Rates

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Projected Revenue-Existing Rates	$455,442	$458,791	$462,140	$465,862	$469,583	$473,305
Projected Revenue Requirements	$471,723	$505,705	$542,104	$581,567	$623,862	$669,188
Projected Difference	($16,281)	($46,914)	($79,963)	($115,705)	($154,278)	($195,883)

RECOMMENDED FUTURE RATES

Based on the overall success the City has already had using its existing rate structure, BC&A would recommend continuing to use an increasing block rate structure for the upcoming planning period. However, based on cost-of-service principles and standard industry practices, BC&A would recommend that a few minor modifications be made to the existing structure:

- **Charge Monthly Base Rate By Meter Size** – The monthly base rate has historically been charged on a per ERU basis using historic water use to define an ERU. This approach has several disadvantages:
    - It is cumbersome to administer because it requires the City to recalculate ERUs each year based on the water use from the previous year.
    - It is inconsistent with AWWA cost-of-service principles because it essentially charges users twice for water use (once in the volumetric rates and again in the base rates through calculation of the ERU).
    - It is difficult to understand and explain to users.

  A more common method of calculating base rates is to use meter size. From a cost-of-service perspective, the base rate amount should be charged based on the capacity to use water, regardless of the amount of water used. This is well represented by meter size. BC&A would recommend charging a single base rate for each connection based on the industry-standard AWWA meter cost-of-service ratios for meter size. By doing so, the base rate and volumetric charges will be collecting revenue strictly for customer and volume service characteristics, respectively.
- **Reduce Block 1 Division Point to 8,000 gallons/month –** BC&A would recommend modifying the first block division point for 3/4-inch meters to gradually bring it closer to the average residential usage. To initiate this shift without dramatically impacting rate schedules, BC&A recommends lowering the first block division point from 10,000 gallons to 8,000 gallons. This will continue to encourage conservation amongst

residential customers by shifting some above-average usage into a higher block and will help make the volumetric charges more accurately cover the cost of providing water to various types of customers within Cedar Hills City. It should be noted that customers with access to PI but who chose not to connect currently have a Block 1 division point of 6,000 gallons. In conjunction with the recommended change in the Block 1 division point for all other customers, it is recommended that the Block 1 division point for those not connected to the PI system also be changed to 8,000 gallons. This only affects a small number of customers and will greatly simplify administration of the rates.

- **Customize Block Sizes by Meter Size –** As noted previously, the most difficult aspect of an increasing block rate structure is fairly establishing block division points for different sized customers. Currently, the City uses the same block division points for all customers. To be most consistent with cost-of-service principles, BC&A would recommend increasing the block division points for all meters larger than 3/4-inch in proportion to the AWWA equivalent meter ratios for cost-of-service. While the majority of the City's customers fall into the residential customer class, increasing the block sizes for customers with 1-inch, 1 1/2-inch, and 3-inch meters will better distribute the cost of service across the customer classes.

After taking into account the recommended modifications to the ERU calculation and the block division points, the rate model was used to calculate the water rates required to meet revenue needs for the next six years, which equates to a 6.4% yearly revenue increase from water sales. The recommended culinary water rates for customers who are connected to the pressurized irrigation system are summarized in Table 2-11.

Table 2-11
Recommended Culinary Water Rates

Meter Size	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
3/4 and smaller	$6.06	$6.41	$6.80	$7.21	$7.68	$8.10
1	$7.57	$8.01	$8.51	$9.02	$9.60	$10.14
1 1/2	$9.59	$10.15	$10.79	$11.43	$12.17	$12.86
2	$15.15	$16.04	$17.06	$18.07	$19.23	$20.32
3	$56.05	$59.38	$63.24	$66.92	$71.22	$75.31
4	$71.21	$75.43	$80.35	$85.01	$90.47	$95.68
6	$106.56	$112.88	$120.26	$127.23	$135.40	$143.20
8	$146.96	$155.68	$165.88	$175.48	$186.74	$197.51
10	$202.51	$214.53	$228.60	$241.82	$257.34	$272.19

Block Volume Rates ($/kgal)

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate	$1.31	$1.40	$1.49	$1.59	$1.69	$1.80
Block 2 Rate	$2.15	$2.31	$2.45	$2.63	$2.79	$2.99
Block 3 Rate	$3.18	$3.41	$3.62	$3.89	$4.13	$4.43
Block 4 Rate	$4.21	$4.51	$4.79	$5.15	$5.48	$5.88

Block Division Points by Meter Size

	Upper Block Limits (kgal)			
Meter Size	Block 1	Block 2	Block 3	Block 4
3/4" and smaller	8	12	18	+
1"	10	15	23	+
1 1/2"	13	20	29	+
2"	21	32	47	+
3"	80	120	180	+
4"	102	153	229	+
6"	153	229	344	+
8"	211	316	475	+
10"	291	436	655	+

Monthly Base Charges. The first component of the proposed rate is the monthly base charge. The monthly base charge will be the same for all customer classes. The recommended base charge for meters that are 3/4-inch and smaller needs to be $6.06 per month in 2013, with no water allowance included in this amount. This represents an increase of 1.0 percent in the monthly base charge over the existing rate of $6.00 per month. This rate will need to increase to $8.10 per month by 2018. As noted above, this rate will increase for larger meters in accordance with AWWA cost-of-service meter ratios. Corresponding rates for larger meters are shown in the table.

Volumetric Rates. Recommended volume charges per 1,000 gallons are also included shown in Table 2-11. These rates are for customers who are connected to the pressurized irrigation system. Up to this point, these rates have been calculated and recommended strictly on cost of service. However, the City has historically modified their rate structures to account for certain circumstances amongst the various customer classes. Aside from the largest portion of residential customers, which have access and connections to the pressurized irrigation system, there are two other types of customers: customers that have no access to the pressurized irrigation system and customers who may have access but have chosen not to connect to the pressurized irrigation system.

- **No PI Available** – Typically in the past, customers who do not have access to the pressurized irrigation system pay approximately 20 percent more for water than customers with access. So as to not unfairly burden these customers, the volume rates for blocks 3 and 4 were reduced. To continue this policy of reducing the potential for higher water costs for these customers, BC&A would suggest leaving the volume rates for blocks 3 and 4 unchanged, while using the newly recommended volume rates for blocks 1 and 2. These recommended volume rates are shown in Table 2-12.

Table 2-12
Volume Rates for Customers with No PI Available
Block Volume Rates ($/kgal)

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate	$1.31	$1.40	$1.49	$1.59	$1.69	$1.80
Block 2 Rate	$2.15	$2.31	$2.45	$2.63	$2.79	$2.99
Block 3 Rate	$2.50	$2.50	$2.50	$2.50	$2.50	$2.50
Block 4 Rate	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50

- **PI Not Connected** – The City has historically charged more to customers who have access to the pressurized irrigation system but choose not to connect to it. This has been done to encourage customers to connect to the pressurized irrigation system when available. It has been assumed this practice will continue. Recommended volumetric rates for these customers are shown in Table 2-13. The increase in these recommended rates and the rates for regular PI customers are proportional to the difference in rates charged by the City in the past.

Table 2-13
Volume Rates for Customers Not Connected to PI System
Block Volume Rates ($/kgal)

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate	$2.10	$2.24	$2.38	$2.54	$2.70	$2.88
Block 2 Rate	$3.23	$3.47	$3.68	$3.95	$4.19	$4.49
Block 3 Rate	$4.24	$4.55	$4.83	$5.19	$5.51	$5.91
Block 4 Rate	$5.26	$5.64	$5.99	$6.44	$6.85	$7.35

A few items should be noted about the recommended rates:

1. These recommended rates were calculated on the conservative assumptions that the additional connections from Manila Water will in the long-term exhibit similar usage patterns as the remainder of the residents in the City, and that Cedar Ridge Elementary school will connect to the pressurized irrigation system. Until these events occur, the City will actually generate a little extra revenue beyond its projected revenue requirements.
2. These rates are based on the assumption that conservation will not be significant during the period of planning over the next six years. It should be understood that the assumption of no conservation is for the near future and may not be the level of conservation experienced on a long-term basis. Water use should be closely monitored in future years and the level of conservation used in the rate model should be modified accordingly.

SECTION 3
PRESSURIZED IRRIGATION RATE ANALYSIS

In Section 1, a 10-year budget plan was developed for the water, pressurized irrigation, sewer, and storm drain systems. Based on this overall budget plan, detailed rates can now be calculated for each utility. The purpose of this chapter is to calculate detailed pressurized irrigation rates for the next 6 years based on the overall budget plan.

This analysis focuses on three major tasks:

1. **Projecting Future Connections:** Future pressurized irrigation connections were estimated by examining current connections and by projecting system growth for the next several years. This includes consideration of both the construction of new connections and the conversion of some existing connections from culinary to secondary irrigation.
2. **Calculating Revenue Requirements:** Total revenue requirements for the system were projected for the next several years based on the budget plan outlined in Section 1. Non-rate revenue (including impact fee revenue) was deducted from the total to give the net revenue requirement to be recovered from rate payers.
3. **Cost Allocation:** Because the City's secondary system is not metered, this analysis cannot follow the full cost-of-service approach described for culinary water. However, it does still follow the essential principles of the method and divides costs between two customer service characteristics: volume related costs and customer related costs.
4. **Rate Design:** Rates were calculated to recover the allocated cost of service for each customer service characteristic based on a given rate structure.

The remainder of this report details the results of each of these three major tasks. Detailed rate tables from the model used to develop the rate recommendations are located in Appendix B.

KEY ASSUMPTIONS

The results presented in this report are based on the following assumptions:

1. The pressurized irrigation fund will continue to be an enterprise-type fund.
2. Water use in the pressurized irrigation system will continue to be unmetered, at least for the planning window of this study.
3. The study uses the "cash basis" approach to allocate costs to users. The "cash basis" study methodology was described previously in Section 2.
4. This rate study is based on projections of future water demands and projected system operation, maintenance, and improvement costs. These projections are based on current economic conditions and weather patterns over the last several years. Because conditions may change over time, it is recommended that Cedar Hills City review the rates annually to determine if any adjustments are needed. It is also recommended that a comprehensive

review and updating of water rates be undertaken in three to five years so that the basic analytical foundations of this study can be re-evaluated.

PROJECTING SECONDARY WATER USE

Historical Accounts

Cedar Hills City provides pressurized irrigation service to nearly 2,000 accounts. Pressurized irrigation system is unmetered, therefore current usage per account and future usage is cannot be calculated. However, since the City bills for pressurized irrigation based on lot size, the total irrigated acreage for each customer class can be found by multiplying the lot size by the number of accounts. To estimate the number of equivalent residential units (ERU) for each customer class, as summarized in Table 3-1, AWWA equivalent meter factors were used to normalize the secondary service size to 1-inch.

Table 3-1
2012 Estimated ERUs and Irrigated Acreage Summary

Customer Class	Lot Size (acres)	ERUs	Average Irrigated Acreage (acres/ERU)
Residential	707	2,353	0.3
Commercial	17	19	0.9
Institutional	39	29	1.4
Total	**763**	**2,401**	**0.3**

Projected ERUs

Cedar Hills City has historically seen a wide range of growth rates depending on economic conditions in the area. Current projections available from the City project growth of between 0.75 to 0.83 percent over the next 6 years. These projections are somewhat conservative and take into account the current ongoing economic downturn. Based on this growth, projected ERUs over the planning period for each customer class are shown in Table 3-2.

Table 3-2
Projected ERUs

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Customer Class	**0.76%**	**0.76%**	**0.75%**	**0.83%**	**0.83%**	**0.81%**
Residential	2,371	2,389	2,407	2,427	2,447	2,467
Commercial	19	19	20	20	20	20
Institutional	29	29	29	30	30	30
Total	**2,419**	**2,437**	**2,456**	**2,477**	**2,497**	**2,517**

Projected Irrigated Acreage

Future secondary water demands were projected by multiplying the estimated average irrigated acreage per ERU 2012 from Table 3-1 by the projected number of ERUs in Table 3-2. Using this methodology, the projected growth in irrigated acreage is shown in Table 3-3.

Table 3-3
Projected Irrigated Acreage

Customer Class	Average Acres/ERU	Amount (acres)					
		FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	0.3	712	718	723	729	735	741
Commercial	0.9	17	17	18	18	18	18
Institutional	1.4	40	40	40	41	41	41
Total		**769**	**774**	**781**	**788**	**794**	**800**

CALCULATING REVENUE REQUIREMENTS

Non-Rate Revenue

The projected non-rate revenue for the pressurized irrigation system is summarized in Table 3-4. This revenue is the net income from activities not associated with water sales. It may include service charges, net interest income, and fees. In Cedar Hill City's case, the only non-rate revenue collected for the pressurized irrigation system comes from the CUP Water Fee.

Table 3-4
Projected Non-Rate Revenue

Item	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017
Operations					
CUP Fees	$153,046	$158,801	$164,756	$171,066	$177,618
Total Operations Non-Rate Revenue	**$153,046**	**$158,801**	**$164,756**	**$171,066**	**$177,618**
Expansion and Replacement					
Total Expansion Non-Rate Revenue	**$0**	**$0**	**$0**	**$0**	**$0**
Total Non-Rate Revenue	**$153,046**	**$158,801**	**$164,756**	**$171,066**	**$177,618**

City Expenditures

The projected City expenditures for the planning period are summarized in Table 3-5. Included in the table are the projected total costs for the three major categories of expenditures: operations and maintenance, debt service, and capital expenditures. Each of these categories is discussed in more detail in following sections.

Table 3-5
Projected Revenue Requirements

Item	2012	2013	2014	2015	2016
O&M	$422,886	$437,180	$451,935	$467,368	$483,329
Debt Services	$483,579	$480,032	$485,835	$480,938	$485,842
Capital	$188,591	$190,608	$183,405	$187,356	$180,832
Total Expenditures	**$1,095,056**	**$1,107,820**	**$1,121,174**	**$1,135,662**	**$1,150,002**

Operation and Maintenance Costs. The projected operation and maintenance (O&M) costs for the City have been taken from the City's budget for 2012. Historically, O&M costs for the City for the culinary and pressurized irrigation systems have been combined in the same water expenditures category. For this study, expenditures that are spent on both culinary and secondary systems have been assigned 60 percent to culinary water and 40 percent to pressurized irrigation. A detailed list of all O&M budget categories is included as part of the rate model in Appendix B. Beyond 2012, it has been assumed that these O&M cost categories will increase at a rate equal to half the system growth rate in each year and an assumed inflation rate of 3.0 percent (e.g. budget growth in 2013 = 0.76%/2 + 3% = 3.38%).

Debt Service Costs. The projected debt service costs for the City have been taken from the City's bond payment schedule through 2018. A detailed list of all bond payments is included as part of the rate model in Appendix B. Pressure irrigation is responsible for the largest portion of existing utility bonds in the City.

Capital Improvement Costs. Because Cedar Hills City's pressurized irrigation system is relatively new, large capital improvement or replacement projects are absent from the City's budget. An amount of $15,000 (increased with an assumed inflation rate of 3.0%) per year is budgeted for miscellaneous pressurized irrigation projects.

Included under the capital improvements budget is a section for the transfer of funds to or from the City's reserve fund. As noted in Section 1, the reserve fund is being used to smooth out total, overall capital expenditures in the City. Since the pressurized irrigation fund is projected to have surplus revenue in all years for the planning period, excess pressurized irrigation revenue will be transferred to the reserve fund to help pay for system improvements in other areas.

COST ALLOCATIONS

As with the culinary water rate analysis, a key step is the allocation of costs to customer service characteristics. The allocation approach used in this rate update reflects the basic approaches recommended by AWWA.

Customer Service Characteristics

Customer service characteristics for the pressurized irrigation rate analysis are similar to those in the culinary model, but simplified. Specifically, the customer service characteristics considered in this rate study are divided into two categories:

- volume characteristics (which include average & peak day demand), and
- customer characteristics (which include billing & administrative costs).

The first step in allocating costs is to divide each of the City's revenue requirements into these categories. This has been done in the secondary water rate model (see Tables 7 and 8 of Appendix B). In each case, these allocations are based on information provided by Cedar Hills City personnel, professional engineering judgment, and knowledge of system operations. Table 7 in Appendix B provides a division by customer service characteristics for O&M expenditures. Table 8 in Appendix B provides the same information for capital and bonding expenditures.

Using the percentages assigned to each budget category, the system revenue costs are distributed among the customer service characteristics. This is also shown in detail in the rate model. The total revenue requirement for each customer service characteristic is given in Table 10 of Appendix B. Table 11 of Appendix B shows the total cost allocation for each customer class.

CURRENT PRESSURIZED IRRIGATION RATE STRUCTURE

Existing pressurized irrigation rates are shown in Table 3-6.

Table 3-6
Existing Pressurized Irrigation Rates
(Per Month)

Base Rate	Existing
All Customers (Per ERU)	$15.95

Volume Rate	Existing
1/4 acre lot and smaller	$12.28
1/4 acre to 1/3 acre lot	$16.38
1/3 to 1/2 acre lot	$24.57
Larger Lots ($/acre)	$49.12

Similar to the culinary rate structure, pressurized irrigation rates are commonly divided into two components:

- **Monthly Base Charge –** The monthly base charge is the amount charged to existing users to be connected to the system, regardless of the amount of water used. The monthly base rate has historically been charged per equivalent residential unit (ERU).

- **Volumetric Charges -** Volumetric charges are those charges assessed based on the amount of water used by the customer. Since there are no meters on the secondary system, the potential amount of water used is estimated based on lot size. Current City rate schedules specify the volume rate for three different lot size ranges. For larger lot sizes, the volume rate is calculated based on total lot size (e.g. volume rate for a 4 acre lot = $49.12*4 = $196.48).

In general, the City's existing secondary rate structure appears to be a reasonable, cost based structure. Based on cost-of-service principles and standard industry practices, BC&A would recommend that just one minor modification be made to the existing structure:

- **Charge Monthly Base Rate By Connection Size** – Similar to the culinary water rates, the monthly base rate for secondary service has historically been charged on a per ERU basis using lot size to define an ERU. For the same reasons outlined for culinary water, BC&A would recommend changing this calculation to be based on the industry-standard AWWA meter capacity ratios. This would better reflect the cost-of-service perspective that the base rate amount should be charged based on the capacity to use water, regardless of the amount of water used. This is best represented by connection size.

RECOMMENDED FUTURE RATES

Based on projected revenue requirements and the recommendations contained above, calculated pressurized irrigation rates are shown in Table 3-7.

Table 3-7
Calculated Cost-of-Service Pressurized Irrigation Rates (Per Month)

Monthly Base Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
All Customers (Per 1-inch equivalent connection	$15.74	$15.79	$15.83	$15.87	$15.91	$15.96

Volume Rate ($/acre)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
All Customers	$52.57	$52.46	$52.31	$52.14	$52.02	$51.90

As shown in the table, the calculated cost-of-service rates change very little over the planning period. There is a slight shift from volume charges to monthly base charges over time as a result of shifting system costs, but the overall charge to individual customers will be very similar.

For simplicity and ease of implementation, BC&A would recommend adopting a simplified rate schedule the planning window as summarized in Table 3-8. This rate structure maintains the currently base rate (1-inch connection) at $15.95 through the planning window with corresponding volume charges (i.e. charge by lot size).

Table 3-8
Recommended Pressurized Irrigation Rates

Utility Fees (per month)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Base Rate						
1-inch connection	$15.95	$15.95	$15.95	$15.95	$15.95	$15.95
1 1/2-inch connection	$31.90	$31.90	$31.90	$31.90	$31.90	$31.90
2-inch connection	$51.04	$51.04	$51.04	$51.04	$51.04	$51.04
3-inch connection	$95.70	$95.70	$95.70	$95.70	$95.70	$95.70
4-inch connection	$159.50	$159.50	$159.50	$159.50	$159.50	$159.50
Lot size-1/4 acre or less	$12.98	$12.98	$12.98	$12.98	$12.98	$12.98
1/4 acre to 1/3 acre	$17.30	$17.30	$17.30	$17.30	$17.30	$17.30
1/3 acre to 1/2 acre	$25.95	$25.95	$25.95	$25.95	$25.95	$25.95
Larger lots ($/acre)	$51.90	$51.90	$51.90	$51.90	$51.90	$51.90

It will be noted that the volume charges recommended in Table 3-8 are slightly higher than the existing rates. This may appear to be in conflict with Section 1 where it was recommended that there be no increase in pressure irrigation rates. This is the result of the recommendation that the ERU calculation method be based on service size instead of the method used by the City in the past. Moving to the service size calculation method results in a slight decrease in revenue from base rates. Thus, a corresponding slight increase in volume charges is required to balance the fund, even though the total revenue will remain constant.

SECTION 4
SEWER RATE ANALYSIS

In Section 1, a 10-year budget plan was developed for the water, pressurized irrigation, sewer, and storm drain systems. Based on this overall budget plan, detailed rates can now be calculated for each utility. The purpose of this chapter is to calculate detailed sewer rates for the next six years based on the overall budget plan.

This analysis focuses on four major tasks:

1. **Projecting Wastewater Production:** Future wastewater production was estimated by examining current production patterns and by projecting sewer system growth for the next several years.
2. **Calculating Revenue Requirements:** Total revenue requirements for the system were projected for the next several years based on the budget plan outlined in Section 1. Non-rate revenue (including impact fee revenue) was deducted from the total to give the net revenue requirement to be recovered from rate payers.
3. **Cost Allocation:** This analysis generally follows the design cost-causative procedure recommended by the Water Pollution Control Federation (WPCF), American Society of Civil Engineers (ASCE), and American Public Works Association (APWA)[1]. The essential principle of this method is that wastewater revenue should be recovered from classes of customers in proportion to the cost of serving those customers.
4. **Wastewater Rate Design:** Wastewater rates were calculated to recover the allocated cost of service based on operation and maintenance costs and capital improvement plan costs. The report develops one rate for all customer classes: residential, commercial, and institutional.

The remainder of this report details the results of each of these four major tasks. Detailed rate tables from the model used to develop the rate recommendations are located in Appendix C.

KEY ASSUMPTIONS

The results presented in this report are based on the following assumptions:

1. The City operating fund will continue to be a self-funding enterprise fund.
2. The study follows the basic recommended methodologies of the joint publication, "Financing and Charges for Wastewater Systems". Only the "cash basis" approach has been used to allocate costs to users. The "cash basis" study methodology was summarized in Section 2 of this report.
3. This wastewater rate study is based on projections of future wastewater production and projected system operation, maintenance, and improvement costs. These projections are based on current economic conditions and wastewater use patterns. Because conditions

[1] Water Pollution Control Federation, American Society of Civil Engineers, and American Public Works Association. Financing and Charges for Wastewater Systems, 1984.

may change over time, it is recommended that the City review the wastewater rates periodically and adjust them as needed to provide a revenue stream that will adequately fund operation and maintenance costs as well as needed rehabilitation and replacement projects. It is also recommended that a comprehensive review and updating of wastewater rates be undertaken in three to five years so that the basic analytical foundations of this study can be re-evaluated.

PROJECTING WASTEWATER PRODUCTION

Historic Indoor Water Use

The City currently provides sewer service to approximately 2,370 accounts. For the purposes of this report, it has been assumed that winter water meter data can be used to estimate indoor water use. During the winter, irrigation demands are not present and metered water should be proportionate to wastewater production. As fiscal year 2012 has not yet ended, water use for 2012 was estimated by using the historic water use for fiscal year ending 2011. Estimated indoor water use for the City in 2012 is summarized by customer class in Table 4-1. To estimate the number of equivalent residential units (ERU) for each customer class, AWWA equivalent meter factors were used to normalize the water meter size to 3/4-inch.

Table 4-1
2012 Estimated ERUs and Indoor Water Use Summary

Customer Class	Annual Use (kgal)	ERUs	Average Use per ERU (kgal/month)
Residential	161,206	2,354	5.7
Commercial	6,594	18	30.5
Institutional	5,301	15	30.0
Total	**173,101**	**2,387**	**6.0**

Projected ERUs

Cedar Hills City has historically seen a wide range of growth rates depending on economic conditions in the area. Current projections available from the City project growth of between 0.75 to 0.83 percent over the next 6 years. These projections are somewhat conservative and take into account the current ongoing economic downturn. Per the City's projections, it has been assumed that 18 annual residential accounts will be added through 2015 and 20 annual accounts added through 2020. Projected growth rates and accounts by customer type are summarized in Table 4-2.

Table 4-2
Projected Growth in System Accounts

Customer Class	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
	0.76%	**0.76%**	**0.75%**	**0.83%**	**0.83%**	**0.81%**
Residential	2,372	2,390	2,408	2,428	2,448	2,468
Commercial	18	18	18	19	19	19
Institutional	15	15	15	15	15	15
Total	**2,405**	**2,423**	**2,441**	**2,462**	**2,482**	**2,502**

Projected Indoor Water Use

Future sewer demands were projected by multiplying the estimated average use per ERU in 2012 from Table 4-1 by the projected number of accounts in Table 4-2. Using this methodology, the projected growth in total sewer sales are shown in Table 4-3.

Table 4-3
Projected Annual Indoor Water Use

Customer Class	Average Use/ERU	Amount (kgal)					
		FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	68.5	162,439	163,671	164,904	166,274	167,643	169,013
Commercial	366.3	366.3	6,594	6,594	6,594	6,960	6,960
Institutional	359.9	5,398	5,398	5,398	5,398	5,398	5,398
Total		**174,431**	**175,664**	**176,896**	**178,632**	**180,002**	**181,371**

Infiltration and Inflow

Infiltration and inflow is the intrusion of groundwater or stormwater into the sewer system through cracked pipes, broken and offset joints, improper connections, leaky manholes, etc. In areas with aging sewer lines and high groundwater, infiltration can actually be the largest component of flow being conveyed in the sewer. Infiltration is very difficult to measure because it varies across the service area based on climate conditions, water table levels, pipe diameter, and pipe condition. Because of the difficulty of identifying the source of infiltration, the City does not bill sewer accounts for infiltration directly. Thus, infiltration and inflow are not included in the rate model and billing flows are based on indoor water use only.

Peaking Characteristics

Unlike water used for outdoor irrigation, indoor water use is relatively constant year round. As a result, the calculation of sewer rates does not need to consider peak day demands. However, sewer flow does tend to vary significantly over the course of a single day. Thus, the sewer rate model includes consideration of peak hour factors so that users with varying peaking rates can be

assessed fairly. Unfortunately, there is no data available to isolate accurate peak hour factors for any individual customer class. Thus, a peaking factor of 1.90 has been assumed for all customer classes based on the City's overall average.

Strength Characteristics

Similar to peaking characteristics, there is no data available to isolate accurate wastewater strength characteristics for any individual customer class. Additionally, Cedar Hills City doesn't currently bill customers for wastewater strength characteristics. However, for potential future use, consideration of wastewater strength for the City as a whole is included here.

Using the City's most recent invoice from Timpanogos Special Service District, a BOD concentration of 225 mg/L and a TSS concentration of 221 mg/L has been used for all customer classes based on the City's overall averages. The total projected strength loadings for the City are summarized in Table 4-4.

Table 4-4
Projected Growth in Strength Loading

	Average Concentration (mg/L)	Amount (lbs/year)					
		FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
BOD	225	445,440	448,588	451,736	456,168	459,666	463,163
TSS	221	437,512	440,604	443,695	448,050	451,485	454,921

Also from the City's most recent TSSD invoice, it has been calculated that 80 percent of the treatment costs are allocated to the volume service characteristic, while the remaining 20 percent of the costs are allocated to the strength service characteristic.

CALCULATING REVENUE REQUIREMENTS

There are two methods for determining revenue requirements for a City as outlined in Section 2, the cash basis and utility basis. As with the water rate analysis, wastewater rates were developed under the cash basis only.

Impact Fee Revenue

The projected impact fee revenue for the next six years is estimated to increase from about $4,900 a year to $5,300 a year as summarized in Table 4-5. The projected annual revenue from impact fees is based on the projected number of new accounts as discussed previously. For this analysis, it has been assumed that the City's current impact fee rates will be constant over throughout the planning period. If the City updates its impact fees, the rates calculated in this report will need to be adjusted accordingly.

Table 4-5
Projected Impact Fee Revenue

Year	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Annual Growth Rate	0.76%	0.76%	0.75%	0.83%	0.83%	0.81%
Projected Impact Fee Revenue	$4,899	$4,826	$4,826	$5,631	$5,363	$5,363

Non-Rate Revenue

The projected non-rate revenue for the City is summarized in Table 4-6. This revenue is the net income from activities not associated with sewer user rates or impact fees. It may include service charges, net interest income, fees, and tax revenue. For accounting purposes the City separates this income into operating and non-operating revenue. The biggest portion of this revenue comes from connection fees.

Table 4-6
Projected Non-Rate Revenue

Item	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
Operating						
Sewer Lateral Inspections	$1,089	$1,130	$1,173	$1,218	$1,264	$1,313
Total Operating Non-Rate Revenue	**$1,089**	**$1,130**	**$1,173**	**$1,218**	**$1,264**	**$1,313**
Non-Operating						
Connection Fees	$4,899	$4,826	$4,826	$5,631	$5,363	$5,363
Total Non-Operating Non-Rate Revenue	**$4,899**	**$4,826**	**$4,826**	**$5,631**	**$5,363**	**$5,363**
Total Non-Rate Revenue	**$5,988**	**$5,957**	**$5,999**	**$6,849**	**$6,627**	**$6,675**

City Expenditures

The projected City expenditures for the planning period are summarized in Table 4-7. Included in the table are the projected total costs for the three major categories of expenditures: operations and maintenance, debt service, and capital expenditures. Each of these categories is discussed in more detail in following sections.

Table 4-7
Projected Revenue Requirements

Item	2012	2013	2014	2015	2016	2017
O&M	$861,499	$900,313	$940,911	$983,501	$1,028,069	$1,074,678
Debt Services	$30,333	$30,793	$31,213	$30,613	$30,993	$30,333
Capital (Net of bond revenue)	$49,664	$69,198	$90,705	$117,281	$143,599	$173,648
Total Expenditures	**$941,495**	**$1,000,303**	**$1,062,828**	**$1,131,395**	**$1,202,661**	**$1,278,659**

Operation and Maintenance Costs. The projected operation and maintenance (O&M) costs for the City have been taken from the City's budget for 2012. A detailed list of all O&M budget categories is included as part of the rate model in Appendix C. Beyond 2012, it has been assumed that all O&M cost categories will increase at a rate equal to half the system growth rate in each year and an assumed inflation rate of 3.0 percent (e.g. budget growth in 2013 = 0.76%/2 + 3% = 3.38%). An exception to this assumption is made for the O&M cost of Timpanogos Special Service District (TSSD) fees. This expenditure was increased at 5.0% to account for expected future rate increases in addition to inflation.

Debt Service Costs. The projected debt service costs for the City have been taken from the City's bond payment schedule through 2018. As indicated by the City, one half of the 2006 Excise Tax Bond for the new Public Works Building is paid for from the water and sewer funds. For this study, this portion of the debt service was split in proportion to the total budget for these two funds; 60 percent for culinary water and 40 percent for sewer (e.g. 40%/2=20% of the 2006 bond is paid from the sewer fund). A detailed list of all bond payments is included as part of the rate model in Appendix C.

Capital Improvement Costs. The projected capital improvement costs for the City have been taken from the City's 10-year capital improvement plan. A detailed list of all capital improvements is included as part of the rate model in Appendix C.

Included under the capital improvements budget is a section for the transfer of funds to or from the City's reserve fund. As noted in Chapter 1, the reserve fund is being used to smooth out total, overall capital expenditures in the City. In some years sewer revenue will be used to help pay for other system improvements and in other years, other revenues will help pay for sewer. With the City's philosophy of paying for improvements while minimizing bonding, there will also be years in which excess funds are generated and added to the reserve, only to be drawn out in subsequent years for large projects. From a long-term perspective, there will be no net change in the reserve fund's overall size due to these transfers. City personnel have indicated that the reserve fund should be adequate for transfers of this magnitude.

COST ALLOCATIONS

A key step in a cost-causative wastewater rate analysis is the allocation of costs to customer service characteristics. The allocation approach used in this study reflects the basic approaches recommended by WPCF, ASCE, and APWA.

Customer Service Characteristics

This approach recommends the allocation of costs into one of four cost allocation categories:

- **Volume costs –** Volume costs refer to costs that are determined by the volume of wastewater generated in the system. Costs associated with treatment at City's wastewater reclamation facility would fit under this category.
- **Capacity costs –** Capacity costs are costs determined by the peak wastewater production of system users. This category would include such items as the design and construction of major trunk lines since they are sized based on peak flow rates.

- **Strength costs –** Strength costs are those costs determined by biochemical oxygen demand (BOD) or total suspended solids (TSS) concentrations.
- **Customer related costs –** Customer related costs are any costs independent of the quantity or quality of wastewater generated. This category is mostly limited to administrative services such as the cost of generating and sending out a bill each month.

Each of the revenue requirements discussed previously was divided between these four customer service characteristic categories. This has been done in the sewer rate model (see Tables 12 and 13 of Appendix C). In each case, these allocations are based on information provided by Cedar Hills personnel, professional engineering judgment, and knowledge of system operations. Table 12 in Appendix C provides a division by cost allocation category for O&M expenditures. Table 13 in Appendix C provides the same information for capital and bonding expenditures.

Using the percentages assigned to each budget category, the system revenue costs are distributed among the customer service characteristics. This is also shown in detail in the rate model. The total revenue requirement for each customer service characteristic is given in Table 15 of Appendix C. Table 16 of Appendix C shows the total cost allocation for each customer class.

CURRENT WASTEWATER RATE STRUCTURE

Existing wastewater rates and projected revenue for each customer class are shown in Table 4-8. The monthly base administrative charge is the amount charged to existing users to be connected to the system, regardless of the amount of water discharged. Volumetric charges are those charges assessed based on the amount of wastewater generated by the customer (as estimated based on indoor water use). It should be emphasized that this is based on indoor water use and not actual wastewater production. This is because the City does not measure wastewater production directly, but does collect data on water use. Winter water meter data is used to estimate indoor water use.

Table 4-8
Existing Sewer Rates

Base Rate ($/month)	Existing
All Customers	$13.50

Volume Rate ($/kgal)	Existing
All Customers	$2.85

In general, the City's existing sewer rate structure appears to be a reasonable, cost based structure. Based on cost-of-service principles and standard industry practices, BC&A would recommend that just one minor modification be made to the existing structure:

- **Charge Monthly Base Rate By Water Meter Size** – Similar to the culinary water rates, the monthly base rate for sewer service has historically been charged on a per ERU basis

using historic indoor water use as the basis for calculating an ERU. For the same reasons outlined for culinary water, BC&A would recommend changing this calculation to be based on the industry-standard AWWA meter capacity ratios using each customer's water meter size. This would better reflect the cost-of-service perspective that the base rate amount should be charged based on the capacity to produce wastewater, regardless of the amount of wastewater actually produced. Of the customer information available to the City, this is best represented by water meter size.

Total projected revenues based on existing City water rates are shown in Table 4-9. It can be seen that the projected revenue from existing sewer water rates will become increasingly insufficient to meet revenue requirements in the coming years. As described in Section 1, BC&A would recommend an overall increase in sales revenue of approximately 5.5% per year over the planning period in order to meet revenue requirements.

Table 4-9
Projected Revenue Based on Existing Sewer Rates

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Projected Revenue-Existing Rates	$886,738	$893,167	$899,596	$907,946	$915,089	$922,233
Projected Revenue Requirements	$935,507	$994,346	$1,056,829	$1,124,546	$1,196,034	$1,271,983
Projected Difference	**($48,769)**	**($101,179)**	**($157,232)**	**($216,600)**	**($280,945)**	**($349,751)**

RECOMMENDED FUTURE RATES

Based on projected revenue requirements and the recommendations contained above, calculated sewer rates are shown in Table 4-10. Included in Table 4-10 is a breakdown of volume charges by service characteristics, including strength. Although the City currently has no practical way of measuring items such as strength for individual customers, this breakdown has been included for future reference in the event any significant industrial or high strength customers intend to connect to the system.

Table 4-10
Calculated Cost-of-Service Rates

Monthly Base Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
All Customers (per 3/4-inch equivalent water connection)	$9.36	$10.09	$10.86	$11.71	$12.61	$13.56

Volume Rate ($/kgal)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Volume Component						
All Customers	*$3.13*	*$3.28*	*$3.43*	*$3.58*	*$3.75*	*$3.93*
Capacity Component						
All Customers	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*
Strength Component						
All Customers	*$0.69*	*$0.71*	*$0.75*	*$0.77*	*$0.81*	*$0.84*
Total Volume Rate						
All Customers	$3.81	$3.99	$4.18	$4.36	$4.56	$4.77

As can be seen in Table 4-10, the monthly base rate calculated after allocating costs across the various customer service characteristics is actually less than the City is currently charging. Conversely, the total volume rate calculated based on revenue requirements is higher than the City's current schedule. This would suggest that the City's current rate structure isn't quite in line with the actual cost-of-service and that a shift from the monthly base administrative charge to the volume charge is merited.

To maintain rate stability, BC&A would recommend that this shift in cost allocation take place gradually over the next six years. Our recommended approach is shown in Table 4-11. The monthly base rates would be held constant through 2017 at the current rate of $13.50/month for a customer with a 3/4-inch water meter. During this period, all projected increases would be reflected entirely in the volume rates charged to customers. If this approach is followed, the cost allocations will be balanced with actual cost-of-service by FYE 2018.

Table 4-11
Recommended Sewer Rates

Monthly Base Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
3/4-inch water meter	$13.50	$13.50	$13.50	$13.50	$13.50	$13.56
1-inch water meter	$17.18	$17.18	$17.18	$17.18	$17.18	$17.26
1 1/2-inch water meter	$22.09	$22.09	$22.09	$22.09	$22.09	$22.20
2-inch water meter	$35.59	$35.59	$35.59	$35.59	$35.59	$35.76
3-inch water meter	$135.00	$135.00	$135.00	$135.00	$135.00	$135.64
4-inch water meter	$171.82	$171.82	$171.82	$171.82	$171.82	$172.63
6-inch water meter	$257.73	$257.73	$257.73	$257.73	$257.73	$258.95
8-inch water meter	$355.91	$355.91	$355.91	$355.91	$355.91	$357.60
10-inch water meter	$490.91	$490.91	$490.91	$490.91	$490.91	$493.24
Total Volume Rate ($/kgal)						
All Customers	$3.13	$3.43	$3.74	$4.06	$4.41	$4.77

SECTION 5
STORM DRAIN RATE ANALYSIS

In Section 1, a 10-year budget plan was developed for the water, pressurized irrigation, sewer, and storm drain systems. Based on this overall budget plan, detailed rates can now be calculated for each utility. The purpose of this chapter is to calculate detailed storm drain rates for the next 6 years based on the overall budget plan.

This analysis focuses on three major tasks:

1. **Projecting Future Connections:** Future storm drain connections were estimated by examining current connections and by projecting system growth for the next several years.
2. **Calculating Revenue Requirements:** Total revenue requirements for the system were projected for the next several years based on the budget plan outlined in Section 1. Non-rate revenue (including impact fee revenue) was deducted from the total to give the net revenue requirement to be recovered from ratepayers.
3. **Cost Allocation:** Because of the nature of this utility, the storm drain analysis cannot follow the same full cost-of-service approach described for culinary water. However, it does still follow the essential principles of the method and divides costs between two customer service characteristics: volume related costs and customer related costs.
4. **Rate Design:** Rates were calculated to generate the required rate revenue.

The remainder of this report details the results of each of these three major tasks. Detailed rate tables from the model used to develop the rate recommendations are located in Appendix D.

KEY ASSUMPTIONS

The results presented in this report are based on the following assumptions:

1. The storm drain fund will continue to be an enterprise-type fund.
2. This rate study is based on projections of future system operation, maintenance, and improvement costs. These projections are based on current economic conditions and regulatory requirements. Because conditions may change over time, it is recommended that Cedar Hills City review the rates annually to determine if adjustments are needed to provide a revenue stream that will adequately fund operation and maintenance costs as well as needed capital improvements. It is also recommended that a comprehensive review and updating of water rates be undertaken in three to five years so that the basic analytical foundations of this study can be re-evaluated.

PROJECTING STORM DRAIN USE

Historic Drainage Area

Cedar Hills City provides storm drain service to over 2,000 accounts as shown in Table 5-1. To estimate the potential for storm drainage from each of these accounts, Table 5-1 also summarizes the total lot area associated with each customer class. The average lot size for each residential connection is 0.3 acres (e.g. 0.3 acres=1 Equivalent Residential Unit "ERU").

Table 5-1
2012 Estimated Account and Drainage Area Summary

Customer Class	Lot Size (acres)	Accounts	Average Drainage Area (acres/acct.)
Residential	705	2,349	0.3
Commercial	18	7	2.5
Institutional	49	9	5.5
Total	**772**	**2,365**	**0.3**

It should be noted here that a decision has been made to base this analysis on total lot size. This is one of two common methods of looking at potential for storm drainage. The other common method is to consider only impervious area. For this study, total lot size has been deemed a more appropriate measure because all development is required to detain storm water on site based on lot size. Thus, impervious area only effects onsite facilities and has little effect on what the City ultimately receives in storm water.

Projected Accounts

Cedar Hills City has historically seen a wide range of growth rates depending on economic conditions in the area. Current projections available from the City project growth of between 0.75 to 0.83 percent over the next 6 years. These projections are somewhat conservative and take into account the current ongoing economic downturn. Projected growth rates and accounts by customer type are summarized in Table 5-2.

Table 5-2
Projected Accounts

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Customer Class	**0.76%**	**0.76%**	**0.75%**	**0.83%**	**0.83%**	**0.81%**
Residential	2,367	2,385	2,403	2,423	2,443	2,463
Commercial	7	7	7	7	7	7
Institutional	9	9	9	9	9	9
Total	**2,383**	**2,401**	**2,419**	**2,439**	**2,459**	**2,479**

Projected Drainage Area

Future storm drainage areas were projected by multiplying the estimated average drainage area per account from Table 5-1 by the projected number of accounts in Table 5-2. Using this methodology, the projected growth in drainage area is shown in Table 5-3.

Table 5-3
Projected Drainage Area

Customer Class	Average Drainage Area per Account	Total Drainage Area (acres)					
		FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	0.3	710	715	721	727	733	739
Commercial	2.5	2.5	18	18	18	18	18
Institutional	5.5	49	49	49	49	49	49
Total		**777**	**783**	**788**	**794**	**800**	**806**

CALCULATING REVENUE REQUIREMENTS

Non-Rate Revenue

Cedar Hills City currently has no non-rate revenue from the storm drain system.

City Expenditures

The projected City expenditures for the planning period are summarized in Table 5-4. Included in the table are the projected total costs for the three major categories of expenditures: operations and maintenance, debt service, and capital expenditures. Each of these categories is discussed in more detail in following sections.

Table 5-4
Projected Revenue Requirements

Item	2012	2013	2014	2015	2016
O&M	$240,048	$248,162	$256,537	$265,298	$274,358
Debt Services	$0	$0	$0	$0	$0
Capital Expenditures	($9,331)	($592)	$9,102	$19,946	$31,918
Total Expenditures	**$230,718**	**$247,570**	**$265,639**	**$285,245**	**$306,277**

Operation and Maintenance Costs. The projected operation and maintenance (O&M) costs for the City have been taken from the City's budget for 2012. A detailed list of all O&M budget categories is included as part of the rate model in Appendix D. Beyond 2012, it has been assumed that most of these O&M cost categories will increase at a rate equal to half the system growth rate in each year and an assumed inflation rate of 3.0 percent (e.g. budget growth in 2013 = 0.76%/2 + 3% = 3.38%).

Debt Service Costs. Cedar Hills City currently has no projected debt service costs for the storm drain system.

Capital Improvement Costs. Aside from an annual $80,000 (increased with an assumed inflation rate of 3.0%) budget for miscellaneous rehabilitation and replacement projects, there is only one capital improvement project planned during the next six years: a $400,000 Old Town Storm Drain Retention Project in 2016.

Included under the capital improvements budget is a section for the transfer of funds to or from the City's reserve fund. As noted in Chapter 1, the reserve fund is being used to smooth out total, overall capital expenditures in the City. In some years storm drain revenue will be used to help pay for other system improvements and in other years, other revenues will help pay for storm drain. With the City's philosophy of paying for improvements without bonding, there will also be years in which excess funds are generated and added to the reserve, only to be drawn out in subsequent years for large projects. From a long-term perspective, there will be no net change in the reserve fund's overall size due to these transfers. City personnel have indicated that the reserve fund should be adequate for transfers of this magnitude.

COST ALLOCATIONS

As with the culinary water rate analysis, a key step is the allocation of costs to customer service characteristics. The allocation approach used in this rate update reflects the basic approaches recommended by AWWA.

Customer Service Characteristics

Customer service characteristics for the storm drain rate analysis are similar to those in the culinary model, but simplified. Specifically, the customer service characteristics considered in this rate study are divided into two categories:

- volume characteristics (which includes total storm water flow), and
- customer characteristics (which include billing & administrative costs).

The first step in allocating costs is to divide each of the City's revenue requirements into these categories. This has been done in the storm drain rate model (see Tables 7 and 8 of Appendix D). In each case, these allocations are based on information provided by Cedar Hills City personnel, professional engineering judgment, and knowledge of system operations. Table 7 in Appendix D provides a division by customer service characteristics for O&M expenditures. Table 8 in Appendix D provides the same information for capital and bonding expenditures.

Using the percentages assigned to each budget category, the system revenue costs are distributed among the customer service characteristics. This is also shown in detail in the rate model. The total revenue requirement for each customer service characteristic is given in Table 10 of Appendix D. Table 11 of Appendix D shows the total cost allocation for each customer class.

CURRENT STORM DRAIN RATE STRUCTURE

Existing monthly storm drain rates consist of a flat rate of $7.25 per month charged per ERU to all customer classes. Customers are charged based on lot sizes only through the calculation of ERUs.

Based on cost-of-service principles and standard industry practices, BC&A would recommend just one modification be made to the existing structure:

- **Break Existing Fee into Base and Volume Charge** – Like all of the other rates discussed in this report, storm drain rates are commonly divided into two components: monthly base charges and volumetric charges. The monthly base charge is the amount charged to existing users to be connected to the system, regardless of lot size or detention/retention needs. Volumetric charges are those charges assessed based on the amount of storm water produced by the customer. BC&A would recommend continuing to charge a base rate to residential customers or customers on lots that are 0.3 acres or less (1 ERU=0.3 acres). For the commercial & institutional customer classes, lots that are 0.3 acres or less would also pay the same flat base rate. On larger lots, however, which require more expensive infrastructure to handle storm runoff, a base rate and volume charge based on lot size is recommended. This will allow the City to distribute costs more fairly across the various customer classes.

Total annual projected rate revenues based on existing storm drain rates are shown in Table 5-5. It can be seen that the projected revenue from existing storm water rates will become increasingly insufficient to meet revenue requirements in the coming years. As described in Section 1, BC&A would recommend an overall increase in sales revenue of approximately 6.5% per year over the planning period in order to meet revenue requirements.

Table 5-5
Projected Revenue Based on Existing Storm Rates

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Projected Rate Revenue-Existing Rates	$225,379	$226,945	$228,511	$230,251	$231,991	$233,731
Projected Rate Revenue Requirements	$230,718	$247,570	$265,639	$285,245	$306,277	$328,838
Projected Difference	**($5,339)**	**($20,625)**	**($37,128)**	**($54,994)**	**($74,286)**	**($95,107)**

RECOMMENDED FUTURE RATES

The calculation of new rates, which is determined in order to meet projected rate revenue requirements, are shown in Table 5-6, and are the same for all customer classes. The volume rates in Table 5-6 are the total annual rates on a per acre basis that will be required in addition to the monthly base rate to meet the revenue requirements.

Table 5-6
Calculated Monthly Storm Drain Rates

Base Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
All Customers	$3.37	$3.46	$3.55	$3.64	$3.74	$3.83

Volume Rate ($/acre)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
All Customers	$14.40	$15.74	$17.19	$18.75	$20.42	$22.21

BC&A recommends that the rates in Table 5-6 be implemented in order to distribute the cost of service across the various customer classes based on lot size. The same rates calculated in Table 5-6 are shown in a different format in Table 5-7, grouped by customer class for easier comparison to existing rate schedules. The recommended storm drain rates shown include a base rate which is the same for all customer classes. For residential customers, the total fee will be based on the average ERU of 0.3 acres. This equates to a total monthly storm drain charge of $7.69 for FYE 2013 (e.g. $3.37 base rate + $14.40 * 0.3 acres = $7.69). The same structure will exist for commercial and institutional customer classes, with increasing rates for lots larger than 0.3 acres.

Table 5-7
Recommended Storm Drain Rates

Utility Fees (per month)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$7.69	$8.18	$8.71	$9.27	$9.86	$10.50
Commercial & Institutional						
0.3 acres or less	$7.69	$8.18	$8.71	$9.27	$9.86	$10.50
Larger lots						
Base Rate	$3.37	$3.46	$3.55	$3.64	$3.74	$3.83
$/acre based on lot size	$14.40	$15.74	$17.19	$18.75	$20.42	$22.21

SECTION 6
CONCLUSIONS AND RECOMMENDATIONS

Based on the analysis contained in the previous sections of this report, BC&A would recommend the following actions:

Implement Recommend Structure Changes: A number of small changes in approach to current rate structures have been recommended in the previous chapters. This includes:

- **Charge Monthly Base Rates By Meter/Service Size** – Monthly base rates for water, pressurized irrigation, and sewer have historically been charged on a per ERU basis with definitions of ERU varying between each utility. To better reflect cost-of-service principles and provide a more consistent approach it is recommended that water and sewer rates be charged based on water meter size and pressurized irrigation be charged based on service connection size.
- **Reduce Block 1 Division Point to 8,000 gallons/month –** BC&A would recommend reducing the first block division point for 3/4-inch meters from 10,000 gallons/month to 8,000 gallons per month. This will bring this block closer to the average residential usage (6,000 gallons/month) which will help make the volumetric charges more accurately reflect the cost of service. In addition, BC&A would recommend moving the first block division point for customers who have not connected to the pressurized irrigation system from 6,000 to 8,000 gallons per month to be consistent with the other customer groups.
- **Customize Block Sizes by Meter Size –** The most difficult aspect of an increasing block rate structure is fairly establishing block division points for different sized customers. Currently, the City uses the same block division points for all customers. To be more consistent with cost-of-service principles, BC&A would recommend increasing the block division points for all meters larger than 3/4-inch in proportion to the AWWA equivalent meter ratios for cost-of-service.
- **Break Existing Storm Drain Fee into a Base and Volume Charge** – Storm drain fees are currently charged at a fixed rate per ERU. Like all of the other rates discussed in this report, storm drain rates will be better aligned with cost-of-service if they are divided into two components: monthly base charges and volumetric charges based on lot size.

Adopt the Recommended Rate Increases: It is recommended that the Cedar Hills City adopt the proposed rate increases as summarized below in Tables 6-1 through 6-4. This equates to approximately a 3.7 percent increase in rate revenue in the first year, and approximately 4.0 percent increase in rate revenue in subsequent years.

Table 6-1
Recommended Culinary Water Rates

Monthly Base Rate ($/month)

Meter Size	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
3/4 and smaller	$6.06	$6.41	$6.80	$7.21	$7.68	$8.10
1	$7.57	$8.01	$8.51	$9.02	$9.60	$10.14
1 1/2	$9.59	$10.15	$10.79	$11.43	$12.17	$12.86
2	$15.15	$16.04	$17.06	$18.07	$19.23	$20.32
3	$56.05	$59.38	$63.24	$66.92	$71.22	$75.31
4	$71.21	$75.43	$80.35	$85.01	$90.47	$95.68
6	$106.56	$112.88	$120.26	$127.23	$135.40	$143.20
8	$146.96	$155.68	$165.88	$175.48	$186.74	$197.51
10	$202.51	$214.53	$228.60	$241.82	$257.34	$272.19

Block Volume Rates ($/kgal)

Customers Connected to Pressurized Irrigation System

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate	$1.31	$1.40	$1.49	$1.59	$1.69	$1.80
Block 2 Rate	$2.15	$2.31	$2.45	$2.63	$2.79	$2.99
Block 3 Rate	$3.18	$3.41	$3.62	$3.89	$4.13	$4.43
Block 4 Rate	$4.21	$4.51	$4.79	$5.15	$5.48	$5.88

Customers with No Pressurized Irrigation Available

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate	$1.31	$1.40	$1.49	$1.59	$1.69	$1.80
Block 2 Rate	$2.15	$2.31	$2.45	$2.63	$2.79	$2.99
Block 3 Rate	$2.50	$2.50	$2.50	$2.50	$2.50	$2.50
Block 4 Rate	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50

Customers Not Connected to Pressurized Irrigation System

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate	$2.10	$2.24	$2.38	$2.54	$2.70	$2.88
Block 2 Rate	$3.23	$3.47	$3.68	$3.95	$4.19	$4.49
Block 3 Rate	$4.24	$4.55	$4.83	$5.19	$5.51	$5.91
Block 4 Rate	$5.26	$5.64	$5.99	$6.44	$6.85	$7.35

Table 6-2
Recommended Pressurized Irrigation Rates

Utility Fees (per month)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Base Rate						
1-inch connection	$15.95	$15.95	$15.95	$15.95	$15.95	$15.95
1 1/2-inch connection	$31.90	$31.90	$31.90	$31.90	$31.90	$31.90
2-inch connection	$51.04	$51.04	$51.04	$51.04	$51.04	$51.04
3-inch connection	$95.70	$95.70	$95.70	$95.70	$95.70	$95.70
4-inch connection	$159.50	$159.50	$159.50	$159.50	$159.50	$159.50
Lot size-1/4 acre or less	$12.98	$12.98	$12.98	$12.98	$12.98	$12.98
1/4 acre to 1/3 acre	$17.30	$17.30	$17.30	$17.30	$17.30	$17.30
1/3 acre to 1/2 acre	$25.95	$25.95	$25.95	$25.95	$25.95	$25.95
Larger lots ($/acre)	$51.90	$51.90	$51.90	$51.90	$51.90	$51.90

Table 6-3
Recommended Sewer Rates

Monthly Base Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
3/4-inch water meter	$13.50	$13.50	$13.50	$13.50	$13.50	$13.56
1-inch water meter	$17.18	$17.18	$17.18	$17.18	$17.18	$17.26
1 1/2-inch water meter	$22.09	$22.09	$22.09	$22.09	$22.09	$22.20
2-inch water meter	$35.59	$35.59	$35.59	$35.59	$35.59	$35.76
3-inch water meter	$135.00	$135.00	$135.00	$135.00	$135.00	$135.64
4-inch water meter	$171.82	$171.82	$171.82	$171.82	$171.82	$172.63
6-inch water meter	$257.73	$257.73	$257.73	$257.73	$257.73	$258.95
8-inch water meter	$355.91	$355.91	$355.91	$355.91	$355.91	$357.60
10-inch water meter	$490.91	$490.91	$490.91	$490.91	$490.91	$493.24
Total Volume Rate ($/kgal)						
All Customers	$3.13	$3.43	$3.74	$4.06	$4.41	$4.77

Table 6-4
Recommended Storm Drain Rates

Utility Fees (per month)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$7.69	$8.18	$8.71	$9.27	$9.86	$10.50
Commercial & Institutional						
0.3 acres or less	$7.69	$8.18	$8.71	$9.27	$9.86	$10.50
Larger lots						
Base Rate	$3.37	$3.46	$3.55	$3.64	$3.74	$3.83
$/acre based on lot size	$14.40	$15.74	$17.19	$18.75	$20.42	$22.21

For comparison purposes, Tables 6-5 through 6-7 show the existing and proposed future rates for Cedar Hills City and other communities along the Wasatch Front. The tables show the average annual bill that each municipality charges a residential connection for water (culinary & pressurized irrigation), sewer, and storm drain, respectively. For Cedar Hills City, the future rate shown assumes the City adopts the rates recommended in this report. For all other cities, future rates are simply based on a constant annual inflation of 3 percent. This likely underestimates future rates for most cities, but provides a starting point for comparison. This same information is shown graphically in Figures 6-1 through 6-3.

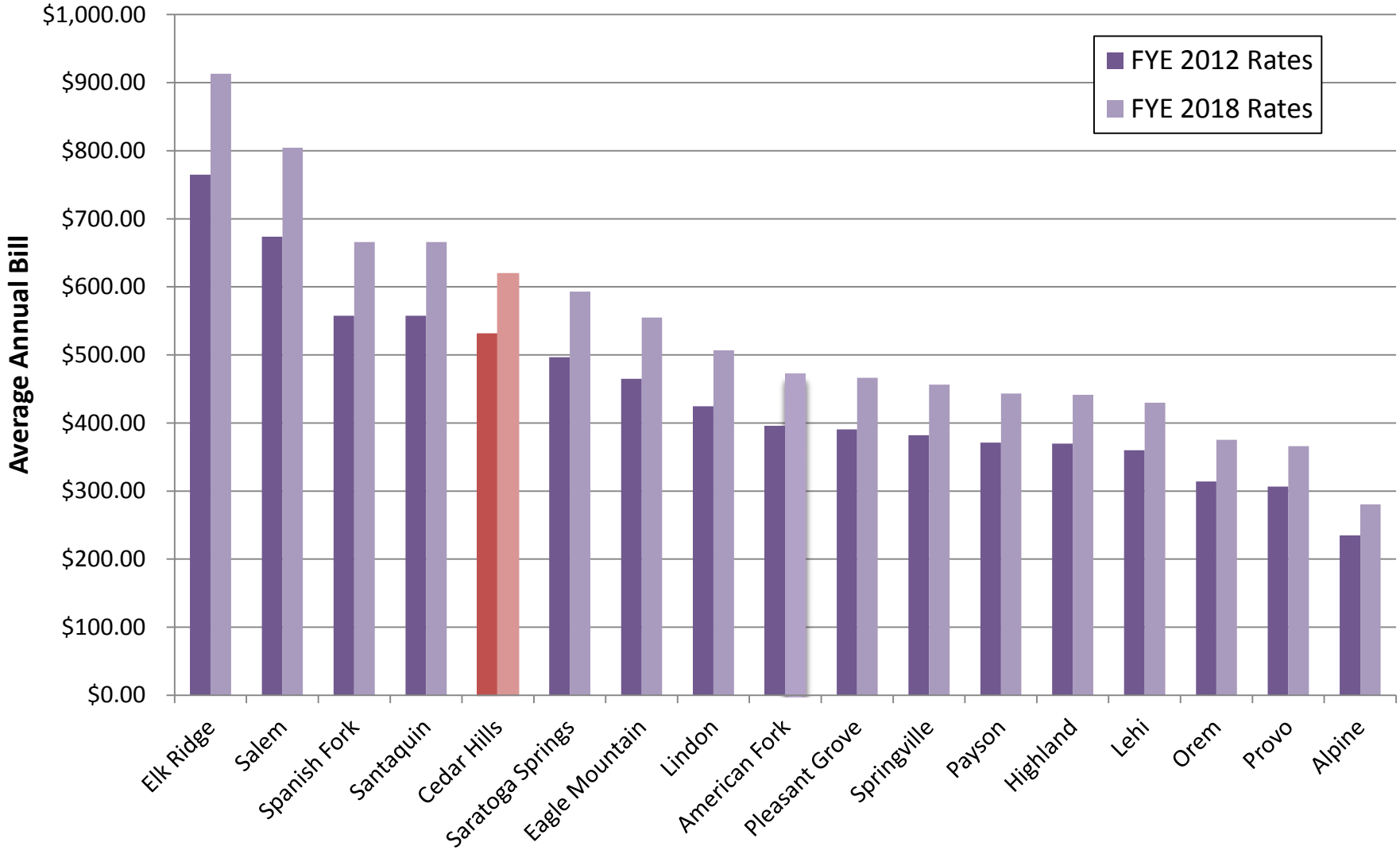
Table 6-5
Water Rate Comparison

City	Cost per Average Residential Connection[1] for FYE 2012	Cost per Average Residential Connection for FYE 2018[2]
Elk Ridge	$764.67	$913.06
Salem	$673.62	$804.34
Spanish Fork	$557.56	$665.76
Santaquin	$557.56	$665.76
Cedar Hills	**$530.76**	**$619.08**
Saratoga Springs	$496.66	$593.03
Eagle Mountain	$464.74	$554.92
Lindon	$424.44	$506.81
American Fork	$395.52	$472.27
Pleasant Grove	$390.58	$466.37
Springville	$382.13	$456.28
Payson	$371.29	$443.34
Highland	$369.69	$441.43
Lehi	$359.92	$429.77
Orem	$314.19	$375.16
Provo	$306.40	$365.86
Alpine	$234.94	$280.53

[1] Based on 8,000 gal/month indoor and 8,000 gal/month May and October, 26,000 gal/month June and September and 50,000 gal/month July and August outdoor (if metered) per average residential connection

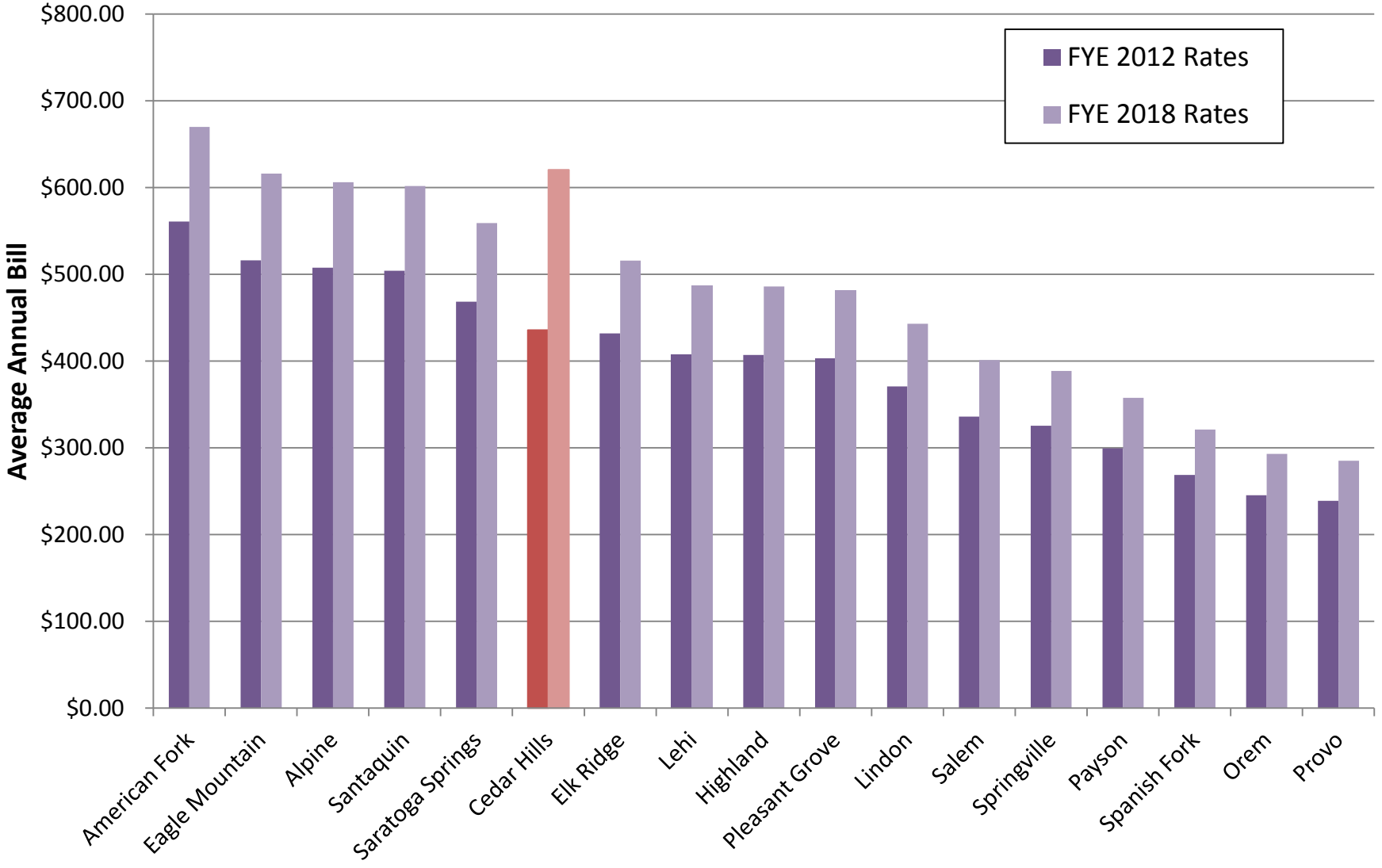
[2] Assumes other City rates are inflated at 3.0% annually

Figure 6-1
Comparison of Annual Water Rates, Average Residential Customer



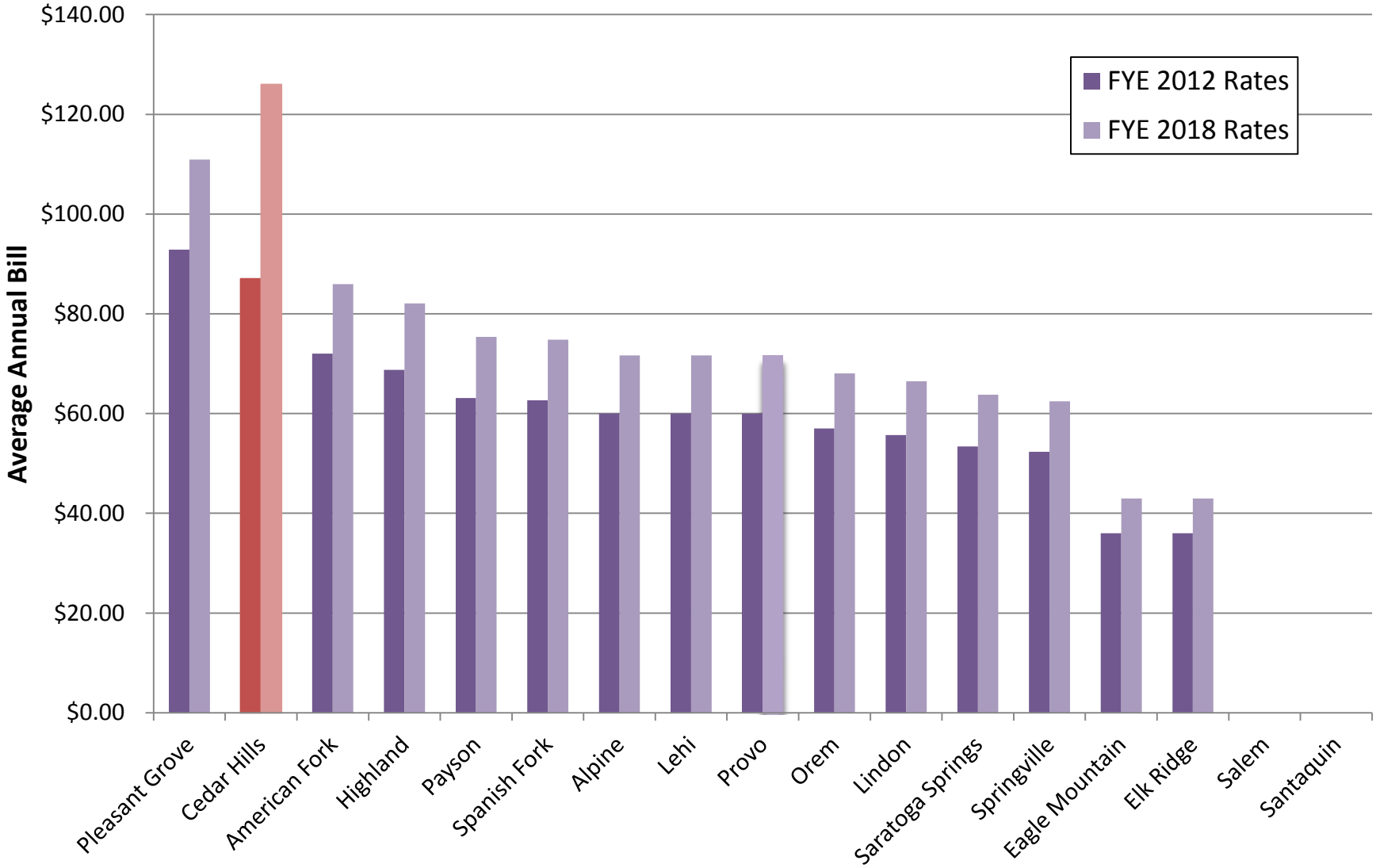
*FYE 2018 rates based on annual increase to account for inflation only (3%) except for Pleasant Grove where published rates were available through 2014.

Figure 6-2
Comparison of Annual Sewer Rates, Average Residential Customer



*FYE 2018 rates based on annual increase to account for inflation only (3%)

Figure 6-3
Comparison of Annual Storm Drain Rates, Average Residential Customer



*FYE 2018 rates based on annual increase to account for inflation only (3%)

Table 6-6
Sewer Rate Comparison

City	Cost per Average Residential Connection[1] for FYE 2012	Cost per Average Residential Connection for FYE 2018[2]
American Fork	$561.00	$669.86
Eagle Mountain	$516.00	$616.13
Alpine	$507.60	$606.10
Santaquin	$504.00	$601.80
Saratoga Springs	$468.36	$559.25
Cedar Hills	**$435.60**	**$620.64**
Elk Ridge	$432.00	$515.83
Lehi	$408.00	$487.17
Highland	$406.92	$485.88
Pleasant Grove	$403.56	$481.87
Lindon	$370.92	$442.90
Salem	$336.00	$401.20
Springville	$325.44	$388.59
Payson	$299.52	$357.64
Spanish Fork	$268.80	$320.96
Orem	$245.28	$292.88
Provo	$238.80	$285.14

[1] Based on 8,000 gal/month indoor per average residential connection

[2] Assumes other City rates are inflated at 3.0% annually

Table 6-7
Storm Drain Rate Comparison

City	Cost per Average Residential Connection for FYE 2012	Cost per Average Residential Connection for FYE 2018[1]
Pleasant Grove	$92.88	$110.90
Cedar Hills	**$87.00**	**$126.00**
American Fork	$72.00	$85.97
Highland	$68.76	$82.10
Payson	$63.12	$75.37
Spanish Fork	$62.64	$74.80
Alpine	$60.00	$71.64
Lehi	$60.00	$71.64
Provo	$60.00	$71.64
Orem	$57.00	$68.06
Lindon	$55.68	$66.48
Saratoga Springs	$53.40	$63.76
Springville	$52.32	$62.47
Eagle Mountain	$36.00	$42.99
Elk Ridge	$36.00	$42.99
Salem	$0.00	$0.00
Santaquin	$0.00	$0.00

[1] Assumes other City rates are inflated at 3.0% annually

[2] Salem and Santaquin do not charge residents for storm drain.

As can be seen in the tables, Cedar Hills City currently has rates right around the upper third or so for both water and sewer when compared with other cities in Utah County. Even with the proposed increases identified in this report, it is expected that Cedar Hills City will remain at about the same spot compared to the other communities surveyed.

Cedar Hills City currently charges one of the highest storm drain fees in the area. This is likely due to the unpopularity of a fee for storm drain utilities amongst residents. Because of this, many cities tend to subsidize their storm drain utilities by paying for their storm drain infrastructure with money collected from other utilities or through taxes. The storm drain rates calculated in this report are based on the assumption that Cedar Hills wants to move toward charging the actual cost-of-service for storm drain. As a result the rates are higher than the subsidized rates in other cities.

Consider Multiple Year Rate Schedules: It is recommended that Cedar Hills City pursue adopting multiple year rate schedules (up to the full rate schedules above). By adopting multiple year rate schedules, the City can program small annual increases to the water rates consistent with the results of this report. This will help avoid large rate increases in future years and minimizes the potential for "rate shock" to customers. Small, affordable changes in rate levels and rate structures are more acceptable to the public and benefit the utility in terms of financial stability. If small changes are needed to this multiyear schedule in the future, the City can always revise these rates at that time.

Update This Rate Study Periodically: After the implementation of any change to the rate structure, we would suggest that the City monitor customer responses and demand patterns for a period of one year. Following this initial observation period, the change should be re-examined to determine if there should be any subsequent adjustments. A comprehensive review of this rate study should also be performed in three to five years. The projections, assumptions, and data contained in this report may need to be revised over time. For these reasons, it is prudent to update water and sewer rates to ensure they are sufficient to meet system requirements, as well as maintain cost-of-service equity in charges to customers.

APPENDIX A

DETAILED WATER RATE MODEL TABLES

10-Year Budget Plan - Water

	Historic Year			Projected Year					
	FYE 2010	**FYE 2011**	**FYE 2012**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Total Accounts	2,237	2,237	2,365	2,383	2,401	2,419	2,439	2,459	2,479
% Growth from Previous Year	-	0.00%	5.72%	0.76%	0.76%	0.75%	0.83%	0.82%	0.81%
Expenditures									
O&M	$380,244	$396,539	$447,040	$462,150	$477,771	$493,895	$510,762	$528,204	$546,190
Debt Service	$182,720	$182,777	$183,224	$182,086	$183,364	$183,501	$183,054	$182,995	$182,322
Total Capital Expenditures	$32,308	$8,394	$258,300	$31,128	$32,298	$333,510	$134,793	$36,126	$37,502
Total Expenditures	*$595,272*	*$587,710*	*$888,564*	*$675,364*	*$693,433*	*$1,010,906*	*$828,609*	*$747,325*	*$766,014*
Capital Expenditures from Bond Proceeds	$0	$0	$0	$0	$0	$0	$0	$0	$0
Capital Expenditures from Reserves	$32,308	$8,394	$258,300	$31,128	$32,298	$333,510	$134,793	$36,126	$37,502
Income									
Water Lateral Inspections	$1,050	$825	$1,050	$1,058	$1,066	$1,074	$1,083	$1,092	$1,101
Water Meters	$5,250	$650	$7,250	$7,523	$7,805	$8,098	$8,408	$8,730	$9,063
Connection Fees	$35,207	$21,670	$25,800	$30,109	$30,109	$30,109	$33,455	$33,455	$33,455
Other Non-Rate	$78,524	$216,753	$191,603	$194,333	$197,019	$190,513	$195,196	$189,437	$194,127
Sales - Existing Rates	$438,462	$431,147	$440,000	$443,349	$446,698	$450,047	$453,767	$457,488	$461,209
Projected Income - Existing Rates	*$558,493*	*$671,045*	*$665,703*	*$676,371*	*$682,698*	*$679,841*	*$691,910*	*$690,203*	*$698,955*
System Investment Goal	$308,081	$317,323	$345,000	$357,976	$371,419	$385,346	$400,092	$415,376	$431,216
Recommended Long-term Level of Funding	$688,325	$713,863	$792,040	$820,126	$849,190	$879,241	$910,854	$943,580	$977,406
Recommended Rate Increases				6.4%	6.4%	6.4%	6.4%	6.4%	6.4%
Sales Revenue With Increase	$438,462	$431,147	$440,000	$471,723	$505,705	$542,104	$581,567	$623,862	$669,188
Projected Income - Recommended Rates	*$558,493*	*$671,045*	*$665,703*	*$704,746*	*$741,705*	*$771,898*	*$819,710*	*$856,576*	*$906,933*

Table 1

Cedar Hills - Water Rate Study
Historical Water Use
(kgal)

	FYE 2010			*FYE 2011*			*FYE 2012*				
Customer Class	**Use**	**Accounts**	**Use per Account**	**Use**	**Accounts**	**Use per Account**	**Use**	**Accounts**	**Use per Account**	**Planning Use/Acct.**	**Use/Acct. (kgal/month)**
Residential	162,990	2,221	73.4	162,990	2,221	73.4	172,383	2,349	73.4	73.4	6.1
Commercial	5,453	7	779.0	5,453	7	779.0	5,453	7	779.0	779.0	64.9
Institutional	7,682	9	853.6	7,682	9	853.6	2,682	9	298.0	298.0	24.8
Total	**176,125**	**2,237**	**78.7**	**176,125**	**2,237**	**78.7**	**180,518**	**2,365**	**76.3**	**76.3**	**6.4**

Table 2

Cedar Hills - Water Rate Study
Projected Accounts

		Number					
Customer Class		**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
	% Growth	**0.76%**	**0.76%**	**0.75%**	**0.83%**	**0.83%**	**0.81%**
Residential		2,367	2,385	2,403	2,423	2,443	2,463
Commercial		7	7	7	7	7	7
Institutional		9	9	9	9	9	9
Total		**2,383**	**2,401**	**2,419**	**2,439**	**2,459**	**2,479**
Additional Connections/Year		*18*	*18*	*18*	*20*	*20*	*20*

Table 3

Cedar Hills - Water Rate Study
Projected Annual Water Use

	Planning	**Amount (kgal)**					
Customer Class	**Use/Acct.**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	73.4	173,704	175,025	176,346	177,814	179,282	180,749
Commercial	779.0	5,453	5,453	5,453	5,453	5,453	5,453
Institutional	298.0	2,682	2,682	2,682	2,682	2,682	2,682
Total		**181,839**	**183,160**	**184,481**	**185,949**	**187,417**	**188,884**

Table 4

Cedar Hills - Water Rate Study
Peaking Factors

Customer Class	Max. Mo./ Avg. Mo.	Est. Peak Day Factor
Residential	1.18	1.18
Commercial	1.18	1.18
Institutional	1.18	1.18
System	1.18	1.18

System Peak Day to Average Day Factor	1.18

Table 5

Cedar Hills - Water Rate Study
Projected Water Peaking Characteristics

	Estimated Peak Day (kgal)						Excess Over Average (kgal)					
Customer Class	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	561.56	565.84	570.11	574.85	579.60	584.34	85.66	86.31	86.97	87.69	88.41	89.14
Commercial	17.63	17.63	17.63	17.63	17.63	17.63	2.69	2.69	2.69	2.69	2.69	2.69
Institutional	8.67	8.67	8.67	8.67	8.67	8.67	1.32	1.32	1.32	1.32	1.32	1.32
Total	**587.86**	**592.13**	**596.41**	**601.15**	**605.89**	**610.64**	**89.67**	**90.33**	**90.98**	**91.70**	**92.42**	**93.15**

Table 6

Cedar Hills - Water Rate Study
Projected Summer Water Use (May through October)

Number of Summer Months = 6

	Summer	Summer Use (kgal)					
Customer Class	**Percent**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	52.4%	91,027	91,719	92,411	93,180	93,949	94,718
Commercial	52.4%	2,858	2,858	2,858	2,858	2,858	2,858
Institutional	52.4%	1,405	1,405	1,405	1,405	1,405	1,405
Total		**95,290**	**95,982**	**96,674**	**97,443**	**98,212**	**98,981**

Table 7

Cedar Hills - Water Rate Study
Block Water Use

All Users

	Upper Block Limits (kgal)				2011 Total Use by Block			
Meter Size	**Block 1**	**Block 2**	**Block 3**	**Block 4**	**Block 1**	**Block 2**	**Block 3**	**Block 4**
3/4" and smaller	8	12	18	+	130,252	17,921	5,239	6,987
1"	10	15	23	+	600	300	480	522
1 1/2"	13	20	29	+	1,560	840	1,080	269
2"	21	32	47	+	0	0	0	0
3"	80	120	180	+	960	480	720	821
4"	102	153	229	+	0	0	0	0
6"	153	229	344	+	0	0	0	0
8"	211	316	475	+	0	0	0	0
10"	291	436	655	+	0	0	0	0
Total	--	--	--	--	**133372**	**19541**	**7519**	**8600**
Percentage of Total Use	--	--	--	--	**78.9%**	**11.6%**	**4.4%**	**5.1%**

Summary

FYE 2012	**Total Use By Block**				**Percentage of Total Use**			
Customer Class	**Block 1**	**Block 2**	**Block 3**	**Block 4**	**Block 1**	**Block 2**	**Block 3**	**Block 4**
Residential	136,017	19,928	7,668	8,770	78.9%	11.6%	4.4%	5.1%
Commercial	4,303	630	243	277	78.9%	11.6%	4.4%	5.1%
Institutional	2,116	310	119	136	78.9%	11.6%	4.4%	5.1%
Total	**142,436**	**20,869**	**8,030**	**9,184**	**78.9%**	**11.6%**	**4.4%**	**5.1%**

Table 8
Cedar Hills - Water Rate Study
Meters and Equivalent Meters

Meters **FYE 2012**

Customer Class	Size (Inches) 3/4 and smaller	1	1 1/2	2	3	4	6	8	10	Total	% of Total
Residential	2,349	0	0	0	0	0	0	0	0	2,349	99.3%
Commercial	0	5	1	0	1	0	0	0	0	7	0.3%
Institutional	0	0	9	0	0	0	0	0	0	9	0.4%
All Classes	**2,349**	**5**	**10**	**0**	**1**	**0**	**0**	**0**	**0**	**2,365**	**100.0%**
% of Total	**99.3%**	**0.2%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	

AWWA Equiv. Meter Ratios	1.0	1.3	1.6	2.6	10.0	12.7	19.1	26.4	36.4

Equivalent Meters

Customer Class	Size (Inches) 3/4 and smaller	1	1 1/2	2	3	4	6	8	10	Total	% of Total
Residential	2,349	0	0	0	0	0	0	0	0	2,349	98.6%
Commercial	0	6	2	0	10	0	0	0	0	18	0.8%
Institutional	0	0	15	0	0	0	0	0	0	15	0.6%
All Classes	**2,349**	**6**	**16**	**0**	**10**	**0**	**0**	**0**	**0**	**2,382**	**100.0%**
% of Total	**98.6%**	**0.3%**	**0.7%**	**0.0%**	**0.4%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**100.0%**	

Table 9
Cedar Hills - Water Rate Study
Projected Number of Equivalent Meters by Size

Customer Class	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	2,367	2,385	2,403	2,423	2,443	2,463
Commercial	18	18	18	18	18	18
Institutional	15	15	15	15	15	15
All Classes	**2,400**	**2,418**	**2,436**	**2,456**	**2,476**	**2,496**

Table 10
Cedar Hills - Water Rate Study
Connection Fee Revenue

Size of Meter	2012 Impact Fee	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
3/4 and smaller	$1,661		$29,696	$29,696	$29,696	$32,995	$32,995	$32,995
1	$2,114		$80	$80	$80	$89	$89	$89
1 1/2	$2,718		$207	$207	$207	$230	$230	$230
2	$4,379		$0	$0	$0	$0	$0	$0
3	$16,610		$126	$126	$126	$140	$140	$140
4	$21,140		$0	$0	$0	$0	$0	$0
6	$31,710		$0	$0	$0	$0	$0	$0
8	$43,790		$0	$0	$0	$0	$0	$0
10	$60,400		$0	$0	$0	$0	$0	$0
Total Impact Fee Revenue		**$25,800**	**$30,109**	**$30,109**	**$30,109**	**$33,455**	**$33,455**	**$33,455**

Table 11
Cedar Hills - Water Rate Study
Non-Rate Revenue (Including Connection Fees)

Assumed Inflation Rate = 3.0%

Item	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
Operations							
Water Fees - American Fork City	$18,000	$18,677	$19,379	$20,106	$20,876	$21,675	$22,501
Water Fees - Contractors	$2,100	$2,179	$2,261	$2,346	$2,436	$2,529	$2,625
Transfer from PI	$171,503	$173,477	$175,380	$168,062	$171,885	$165,233	$169,001
Total Operations Non-Rate Revenue	$191,603	$194,333	$197,019	$190,513	$195,196	$189,437	$194,127
Non-Operations							
Connection Fees	$25,800	$30,109	$30,109	$30,109	$33,455	$33,455	$33,455
Water Lateral Inspections	$1,050	$1,058	$1,066	$1,074	$1,083	$1,092	$1,101
Water Meters	$7,250	$7,523	$7,805	$8,098	$8,408	$8,730	$9,063
Total Non-Operations Non-Rate Revenue	**$34,100**	**$38,690**	**$38,981**	**$39,282**	**$42,946**	**$43,277**	**$43,619**
Total Non-Rate Revenue	**$225,703**	**$233,023**	**$236,000**	**$229,795**	**$238,143**	**$232,714**	**$237,746**

Table 12
Cedar Hills - Water Rate Study
Revenue Requirements
Cash Basis

Item	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
O&M							
Salary & Wages (Full-Time)	$129,840	$134,229	$138,766	$143,449	$148,348	$153,414	$158,637
Overtime	$2,010	$2,078	$2,148	$2,221	$2,297	$2,375	$2,456
Salary & Wages (Part-Time)	$6,090	$6,296	$6,509	$6,728	$6,958	$7,196	$7,441
Employee Benefits	$74,880	$77,411	$80,027	$82,728	$85,554	$88,475	$91,488
Dues & Subscriptions	$1,200	$1,241	$1,282	$1,326	$1,371	$1,418	$1,466
Education & Training	$2,100	$2,171	$2,244	$2,320	$2,399	$2,481	$2,566
Computer Expenses	$1,800	$1,861	$1,924	$1,989	$2,057	$2,127	$2,199
Office Equipment	$600	$620	$641	$663	$686	$709	$733
Tools & Equipment	$2,700	$2,791	$2,886	$2,983	$3,085	$3,190	$3,299
Utilities	$162,000	$167,476	$173,136	$178,980	$185,092	$191,413	$197,930
Blue Stakes	$900	$930	$962	$994	$1,028	$1,063	$1,100
Communications & Telephone	$1,200	$1,241	$1,282	$1,326	$1,371	$1,418	$1,466
Engineering Services	$600	$620	$641	$663	$686	$709	$733
Professional & Technical	$3,600	$3,722	$3,847	$3,977	$4,113	$4,254	$4,398
Insurance	$7,500	$7,754	$8,016	$8,286	$8,569	$8,862	$9,163
Credit Card Fees	$7,200	$7,443	$7,695	$7,955	$8,226	$8,507	$8,797
Trustee Fees	$2,820	$2,915	$3,014	$3,116	$3,222	$3,332	$3,445
Water Supplies	$3,500	$3,618	$3,741	$3,867	$3,999	$4,135	$4,276
Meter Installation & Maintenance	$30,000	$31,014	$32,062	$33,144	$34,276	$35,447	$36,654
Water Testing	$6,500	$6,720	$6,947	$7,181	$7,427	$7,680	$7,942
Total O&M	**$447,040**	**$462,150**	**$477,771**	**$493,895**	**$510,762**	**$528,204**	**$546,190**
Debt Service							
2006 Excise Tax Bond - PWB (60% of 1/2)	$46,279	$45,499	$46,189	$46,819	$45,919	$46,489	$45,499
2007 Utility Revenue Bond - Well	$136,945	$136,588	$137,176	$136,683	$137,135	$136,506	$136,824
Total Debt Service	**$183,224**	**$182,086**	**$183,364**	**$183,501**	**$183,054**	**$182,995**	**$182,322**
Capital Improvements							
Growth Related							
Water Construction Projects	$30,000	$31,128	$32,298	$33,510	$34,793	$36,126	$37,502
Well Purchase/Construction	$0	$0	$0	$0	$0	$0	$0
Migratory Meter Read Project	$0	$0	$0	$0	$100,000	$0	$0
4800 West Water Main Installation	$81,300	$0	$0	$0	$0	$0	$0
4500 West Sewer Relocation*	$147,000	$0	$0	$0	$0	$0	$0
Manilla Water Upgrades (estimate)		$0	$0	$300,000	$0	$0	$0
Irrigation Pump Pond 12		$0	$0	$0	$0	$0	$0
Irrigation Pump Pond 10		$0	$0	$0	$0	$0	$0
Harvey Well Chlorination Station		$0	$0	$0	$0	$0	$0
Cottonwood Well Chlorination Station		$0	$0	$0	$0	$0	$0
Bond Revenue							
Transfer to/(from) Reserve Fund	($222,862)	$29,382	$48,272	($239,008)	($8,899)	$109,251	$140,919
Total Capital Outlays	**$ 35,438**	**$60,510**	**$80,570**	**$94,502**	**$125,894**	**$145,376**	**$178,421**
Gross Revenue Requirements	**$ 665,703**	**$704,746**	**$741,705**	**$771,898**	**$819,710**	**$856,576**	**$906,933**
LESS:							
Operations Non-Rate Revenue	$191,603	$194,333	$197,019	$190,513	$195,196	$189,437	$194,127
Expansion Non-Rate Revenue	$34,100	$38,690	$38,981	$39,282	$42,946	$43,277	$43,619
Net Revenue Requirements	**$ 440,000**	**$ 471,723**	**$ 505,705**	**$ 542,104**	**$ 581,567**	**$ 623,862**	**$ 669,188**

Table 13
Cedar Hills - Water Rate Study
Cost Allocation Percentages to Service Characteristics

Item	Average Demand	Peak Day	Billing & Collection	Meters & Services	Total
O&M					
Salary & Wages (Full-Time)	50%	5%	5%	40%	100%
Overtime	50%	5%	5%	40%	100%
Salary & Wages (Part-Time)	50%	5%	5%	40%	100%
Employee Benefits	50%	5%	5%	40%	100%
Dues & Subscriptions	50%	5%	5%	40%	100%
Education & Training	50%	5%	5%	40%	100%
Computer Expenses	0%	0%	100%	0%	100%
Office Equipment	0%	0%	100%	0%	100%
Tools & Equipment	60%	20%	0%	20%	100%
Utilities	55%	15%	0%	30%	100%
Blue Stakes	0%	0%	50%	50%	100%
Communications & Telephone	0%	0%	100%	0%	100%
Engineering Services	50%	5%	5%	40%	100%
Professional & Technical	50%	5%	5%	40%	100%
Insurance	50%	5%	5%	40%	100%
Credit Card Fees	0%	0%	100%	0%	100%
Trustee Fees	50%	5%	5%	40%	100%
Water Supplies	70%	30%	0%	0%	100%
Meter Installation & Maintenance	0%	0%	0%	100%	100%
Water Testing	50%	5%	5%	40%	100%

Table 14
Cedar Hills - Water Rate Study
Fixed Assets Allocations to Service Characteristics

		Percent					*Allocated Amount*				
Item	Assets	Average Demand	Peak Day	Billing & Collection	Meters & Services	Total	Average Demand	Peak Day	Billing & Collection	Meters & Services	Total
Booster Stations	$154,624	60%	20%	0%	20%	100%	$92,774	$30,925	$0	$30,925	$154,624
Land	$46,300	20%	20%	40%	20%	100%	$9,260	$9,260	$18,520	$9,260	$46,300
Main Lines	$5,365,118	60%	15%	0%	25%	100%	$3,219,071	$804,768	$0	$1,341,280	$5,365,118
Meters and Hydrants	$418,657	0%	0%	0%	100%	100%	$0	$0	$0	$418,657	$418,657
Storage Tanks	$1,566,830	50%	30%	0%	20%	100%	$783,415	$470,049	$0	$313,366	$1,566,830
Wells	$2,696,813	55%	20%	0%	25%	100%	$1,483,247	$539,363	$0	$674,203	$2,696,813
Total	**$10,248,342**						**$5,587,767**	**$1,854,364**	**$18,520**	**$2,787,691**	**$10,248,342**
Percent							**54.5%**	**18.1%**	**0.2%**	**27.2%**	**100.0%**

Table 15
Cedar Hills - Water Rate Study
Allocation of O&M Costs to Service Characteristics

	FYE 2013					FYE 2014					FYE 2015					FYE 2016					FYE 2017					FYE 2018				
Item	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**
O&M																														
Salary & Wages (Full-Time)	$67,114	$6,711	$6,711	$53,691	$134,229	$69,383	$6,938	$6,938	$55,506	$138,766	$71,724	$7,172	$7,172	$57,380	$143,449	$74,174	$7,417	$7,417	$59,339	$148,348	$76,707	$7,671	$7,671	$61,365	$153,414	$79,318.72	$7,932	$7,932	$63,455	$158,637
Overtime	$1,039	$104	$104	$831	$2,078	$1,074	$107	$107	$859	$2,148	$1,110	$111	$111	$888	$2,221	$1,148	$115	$115	$919	$2,297	$1,187	$119	$119	$950	$2,375	$1,228	$123	$123	$982	$2,456
Salary & Wages (Part-Time)	$3,148	$315	$315	$2,518	$6,296	$3,254	$325	$325	$2,603	$6,509	$3,364	$336	$336	$2,691	$6,728	$3,479	$348	$348	$2,783	$6,958	$3,598	$360	$360	$2,878	$7,196	$3,720	$372	$372	$2,976	$7,441
Employee Benefits	$38,705	$3,871	$3,871	$30,964	$77,411	$40,014	$4,001	$4,001	$32,011	$80,027	$41,364	$4,136	$4,136	$33,091	$82,728	$42,777	$4,278	$4,278	$34,221	$85,554	$44,238	$4,424	$4,424	$35,390	$88,475	$45,744	$4,574	$4,574	$36,595	$91,488
Dues & Subscriptions	$620	$62	$62	$496	$1,241	$641	$64	$64	$513	$1,282	$663	$66	$66	$530	$1,326	$686	$69	$69	$548	$1,371	$709	$71	$71	$567	$1,418	$733	$73	$73	$586	$1,466
Education & Training	$1,085	$109	$109	$868	$2,171	$1,122	$112	$112	$898	$2,244	$1,160	$116	$116	$928	$2,320	$1,200	$120	$120	$960	$2,399	$1,241	$124	$124	$993	$2,481	$1,283	$128	$128	$1,026	$2,566
Computer Expenses	$0	$0	$1,861	$0	$1,861	$0	$0	$1,924	$0	$1,924	$0	$0	$1,989	$0	$1,989	$0	$0	$2,057	$0	$2,057	$0	$0	$2,127	$0	$2,127	$0	$0	$2,199	$0	$2,199
Office Equipment	$0	$0	$620	$0	$620	$0	$0	$641	$0	$641	$0	$0	$663	$0	$663	$0	$0	$686	$0	$686	$0	$0	$709	$0	$709	$0	$0	$733	$0	$733
Tools & Equipment	$1,675	$558	$0	$558	$2,791	$1,731	$577	$0	$577	$2,886	$1,790	$597	$0	$597	$2,983	$1,851	$617	$0	$617	$3,085	$1,914	$638	$0	$638	$3,190	$1,979	$660	$0	$660	$3,299
Utilities	$92,112	$25,121	$0	$50,243	$167,476	$95,225	$25,970	$0	$51,941	$173,136	$98,439	$26,847	$0	$53,694	$178,980	$101,800	$27,764	$0	$55,528	$185,092	$105,277	$28,712	$0	$57,424	$191,413	$108,862	$29,690	$0	$59,379	$197,930
Blue Stakes	$0	$0	$465	$465	$930	$0	$0	$481	$481	$962	$0	$0	$497	$497	$994	$0	$0	$514	$514	$1,028	$0	$0	$532	$532	$1,063	$0	$0	$550	$550	$1,100
Communications & Telephone	$0	$0	$1,241	$0	$1,241	$0	$0	$1,282	$0	$1,282	$0	$0	$1,326	$0	$1,326	$0	$0	$1,371	$0	$1,371	$0	$0	$1,418	$0	$1,418	$0	$0	$1,466	$0	$1,466
Engineering Services	$310	$31	$31	$248	$620	$321	$32	$32	$256	$641	$331	$33	$33	$265	$663	$343	$34	$34	$274	$686	$354	$35	$35	$284	$709	$367	$37	$37	$293	$733
Professional & Technical	$1,861	$186	$186	$1,489	$3,722	$1,924	$192	$192	$1,539	$3,847	$1,989	$199	$199	$1,591	$3,977	$2,057	$206	$206	$1,645	$4,113	$2,127	$213	$213	$1,701	$4,254	$2,199	$220	$220	$1,759	$4,398
Insurance	$3,877	$388	$388	$3,101	$7,754	$4,008	$401	$401	$3,206	$8,016	$4,143	$414	$414	$3,314	$8,286	$4,285	$428	$428	$3,428	$8,569	$4,431	$443	$443	$3,545	$8,862	$4,582	$458	$458	$3,665	$9,163
Credit Card Fees	$0	$0	$7,443	$0	$7,443	$0	$0	$7,695	$0	$7,695	$0	$0	$7,955	$0	$7,955	$0	$0	$8,226	$0	$8,226	$0	$0	$8,507	$0	$8,507	$0	$0	$8,797	$0	$8,797
Trustee Fees	$1,458	$146	$146	$1,166	$2,915	$1,507	$151	$151	$1,206	$3,014	$1,558	$156	$156	$1,246	$3,116	$1,611	$161	$161	$1,289	$3,222	$1,666	$167	$167	$1,333	$3,332	$1,723	$172	$172	$1,378	$3,445
Water Supplies	$2,533	$1,085	$0	$0	$3,618	$2,618	$1,122	$0	$0	$3,741	$2,707	$1,160	$0	$0	$3,867	$2,799	$1,200	$0	$0	$3,999	$2,895	$1,241	$0	$0	$4,135	$2,993	$1,283	$0	$0	$4,276
Meter Installation & Maintenance	$0	$0	$0	$31,014	$31,014	$0	$0	$0	$32,062	$32,062	$0	$0	$0	$33,144	$33,144	$0	$0	$0	$34,276	$34,276	$0	$0	$0	$35,447	$35,447	$0	$0	$0	$36,654	$36,654
Water Testing	$3,360	$336	$336	$2,688	$6,720	$3,473	$347	$347	$2,779	$6,947	$3,591	$359	$359	$2,873	$7,181	$3,713	$371	$371	$2,971	$7,427	$3,840	$384	$384	$3,072	$7,680	$3,971	$397	$397	$3,177	$7,942
Total	**$218,897**	**$39,023**	**$23,888**	**$180,342**	**$462,150**	**$226,296**	**$40,342**	**$24,695**	**$186,438**	**$477,771**	**$233,933**	**$41,703**	**$25,529**	**$192,730**	**$493,895**	**$241,922**	**$43,128**	**$26,401**	**$199,312**	**$510,762**	**$250,183**	**$44,600**	**$27,302**	**$206,118**	**$528,204**	**$258,702**	**$46,119**	**$28,232**	**$213,137**	**$546,190**
Percent	**47.4%**	**8.4%**	**5.2%**	**39.0%**	**100.0%**	**47.4%**	**8.4%**	**5.2%**	**39.0%**	**100.0%**	**47.4%**	**8.4%**	**5.2%**	**39.0%**	**100.0%**	**47.4%**	**8.4%**	**5.2%**	**39.0%**	**100.0%**	**47.4%**	**8.4%**	**5.2%**	**39.0%**	**100.0%**	**47.4%**	**8.4%**	**5.2%**	**39.0%**	**100.0%**

Table 16
Cedar Hills - Water Rate Study
Revenue Requirements by Service Characteristics

	FYE 2013					FYE 2014					FYE 2015					FYE 2016					FYE 2017					FYE 2018				
Item	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**
O&M	$218,897	$39,023	$23,888	$180,342	$462,150	$226,296	$40,342	$24,695	$186,438	$477,771	$233,933	$41,703	$25,529	$192,730	$493,895	$241,922	$43,128	$26,401	$199,312	$510,762	$250,183	$44,600	$27,302	$206,118	$528,204	$258,702	$46,119	$28,232	$213,137	$546,190
Debt Service	$99,280	$32,947	$329	$49,530	$182,086	$99,977	$33,178	$331	$49,878	$183,364	$100,052	$33,203	$332	$49,915	$183,501	$99,808	$33,122	$331	$49,793	$183,054	$99,776	$33,112	$331	$49,777	$182,995	$99,408.70	$32,989.90	$329.48	$49,594.17	$182,322
Capital Outlays	$32,992	$10,949	$109	$16,459	$60,510	$43,930	$14,579	$146	$21,916	$80,570	$51,526	$17,099	$171	$25,706	$94,502	$68,642	$22,780	$228	$34,245	$125,894	$79,264	$26,305	$263	$39,544	$145,376	$97,282	$32,284	$322	$48,533	$178,421
Less: Operations Non-Rate Revenue	$92,045	$16,409	$10,045	$75,833	$194,333	$93,318	$16,636	$10,184	$76,882	$197,019	$90,236	$16,086	$9,847	$74,343	$190,513	$92,455	$16,482	$10,089	$76,170	$195,196	$89,727	$15,996	$9,792	$73,923	$189,437	$91,948	$16,392	$10,034	$75,753	$194,127
Less: Expansion Non-Rate Revenue	$21,095	$7,001	$70	$10,524	$38,690	$21,254	$7,053	$70	$10,603	$38,981	$21,418	$7,108	$1,111	$10,685	$40,322	$23,416	$7,771	$78	$11,682	$42,946	$23,596	$7,831	$78	$11,772	$43,277	$23,782.50	$7,892.49	$78.82	$11,864.89	$43,619
Total	**$238,028**	**$59,509**	**$14,212**	**$159,974**	**$471,723**	**$255,630**	**$64,410**	**$14,918**	**$170,746**	**$505,705**	**$273,856**	**$68,812**	**$15,073**	**$183,323**	**$541,064**	**$294,501**	**$74,777**	**$16,792**	**$195,498**	**$581,567**	**$315,900**	**$80,190**	**$18,026**	**$209,745**	**$623,862**	**$339,662**	**$87,109**	**$18,771**	**$223,646**	**$669,188**

Table 17
Cedar Hills - Water Rate Study
Cost Allocations to Customer Classes

	FYE 2013					FYE 2014					FYE 2015					FYE 2016					FYE 2017					FYE 2018				
	Average Demand	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**	**Average Demand**	**Peak Day**	**Billing & Collection**	**Meters & Services**	**Total**
Residential	$227,379	$56,847	$14,116	$157,792	$456,135	$244,277	$61,549	$14,819	$168,435	$489,079	$261,780	$65,777	$14,973	$180,860	$523,390	$281,617	$71,505	$16,682	$192,892	$562,696	$302,188	$76,710	$17,908	$206,972	$603,779	$325,033	83,357.14	$18,650	$220,713	$647,753
Commercial	$7,138	$1,785	$42	$1,200	$10,164	$7,611	$1,918	$43	$1,271	$10,843	$8,095	$2,034	$44	$1,355	$11,527	$8,636	$2,193	$48	$1,433	$12,310	$9,191	$2,333	$51	$1,525	$13,101	$9,806	2,514.79	$53	$1,613	$13,987
Institutional	$3,511	$878	$54	$982	$5,424	$3,743	$943	$56	$1,040	$5,782	$3,981	$1,000	$56	$1,108	$6,146	$4,248	$1,079	$62	$1,172	$6,561	$4,521	$1,148	$66	$1,248	$6,982	$4,823	1,236.87	$68	$1,320	$7,448
Total	**$238,028**	**$59,509**	**$14,212**	**$159,974**	**$471,723**	**$255,630**	**$64,410**	**$14,918**	**$170,746**	**$505,705**	**$273,856**	**$68,812**	**$15,073**	**$183,323**	**$541,064**	**$294,501**	**$74,777**	**$16,792**	**$195,498**	**$581,567**	**$315,900**	**$80,190**	**$18,026**	**$209,745**	**$623,862**	**$339,662**	**$87,109**	**$18,771**	**$223,646**	**$669,188**
Allocation Basis	**Avg. Demand**	**Pk. Demand**	**Accounts**	**Equiv. Meter**		**Avg. Demand**	**Pk. Demand**	**Accounts**	**Equiv. Meter**		**Avg. Demand**	**Pk. Demand**	**Accounts**	**Equiv. Meter**		**Avg. Demand**	**Pk. Demand**	**Accounts**	**Equiv. Meter**		**Avg. Demand**	**Pk. Demand**	**Accounts**	**Equiv. Meter**		**Avg. Demand**	**Pk. Demand**	**Accounts**	**Equiv. Meter**	

Table 18
Cedar Hills - Water Rate Study
Existing Rates

Utility Fees	**Rates**	
Water (No PI Available)		
Base Rate (Per ERU)	$6.00	per month
1-10,000	$1.25	per 1,000 gal.
10,000-12,000	$2.00	per 1,000 gal.
12,000-18,000	$2.50	per 1,000 gal.
18,000+	$1.50	per 1,000 gal.
Water (PI Available)		
Base Rate (Per ERU)	$6.00	per month
1-10,000	$1.25	per 1,000 gal.
10,000-12,000	$2.00	per 1,000 gal.
12,000-18,000	$3.00	per 1,000 gal.
18,000+	$4.00	per 1,000 gal.
Water (PI Not Connected)		
Base Rate (Per ERU)	$6.00	per month
1-6,000	$2.00	per 1,000 gal.
6,000-12,000	$3.00	per 1,000 gal.
12,000-18,000	$4.00	per 1,000 gal.
18,000+	$5.00	per 1,000 gal.

Table 19
Cedar Hills - Water Rate Study
Calculated Rates

Meter Size	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential						
3/4 and smaller	$ 6.06	$ 6.41	$ 6.80	$ 7.21	$ 7.68	$ 8.10
1	$ 7.57	$ 8.01	$ 8.51	$ 9.02	$ 9.60	$ 10.14
1 1/2	$ 9.59	$ 10.15	$ 10.79	$ 11.43	$ 12.17	$ 12.86
2	$ 15.15	$ 16.04	$ 17.06	$ 18.07	$ 19.23	$ 20.32
3	$ 56.05	$ 59.38	$ 63.24	$ 66.92	$ 71.22	$ 75.31
4	$ 71.21	$ 75.43	$ 80.35	$ 85.01	$ 90.47	$ 95.68
6	$ 106.56	$ 112.88	$ 120.26	$ 127.23	$ 135.40	$ 143.20
8	$ 146.96	$ 155.68	$ 165.88	$ 175.48	$ 186.74	$ 197.51
10	$ 202.51	$ 214.53	$ 228.60	$ 241.82	$ 257.34	$ 272.19
Commercial						
3/4 and smaller	$ 6.06	$ 6.41	$ 6.80	$ 7.21	$ 7.68	$ 8.10
1	$ 7.57	$ 8.01	$ 8.51	$ 9.02	$ 9.60	$ 10.14
1 1/2	$ 9.59	$ 10.15	$ 10.79	$ 11.43	$ 12.17	$ 12.86
2	$ 15.15	$ 16.04	$ 17.06	$ 18.07	$ 19.23	$ 20.32
3	$ 56.05	$ 59.38	$ 63.24	$ 66.92	$ 71.22	$ 75.31
4	$ 71.21	$ 75.43	$ 80.35	$ 85.01	$ 90.47	$ 95.68
6	$ 106.56	$ 112.88	$ 120.26	$ 127.23	$ 135.40	$ 143.20
8	$ 146.96	$ 155.68	$ 165.88	$ 175.48	$ 186.74	$ 197.51
10	$ 202.51	$ 214.53	$ 228.60	$ 241.82	$ 257.34	$ 272.19
Institutional						
3/4 and smaller	$ 6.06	$ 6.41	$ 6.80	$ 7.21	$ 7.68	$ 8.10
1	$ 7.57	$ 8.01	$ 8.51	$ 9.02	$ 9.60	$ 10.14
1 1/2	$ 9.59	$ 10.15	$ 10.79	$ 11.43	$ 12.17	$ 12.86
2	$ 15.15	$ 16.04	$ 17.06	$ 18.07	$ 19.23	$ 20.32
3	$ 56.05	$ 59.38	$ 63.24	$ 66.92	$ 71.22	$ 75.31
4	$ 71.21	$ 75.43	$ 80.35	$ 85.01	$ 90.47	$ 95.68
6	$ 106.56	$ 112.88	$ 120.26	$ 127.23	$ 135.40	$ 143.20
8	$ 146.96	$ 155.68	$ 165.88	$ 175.48	$ 186.74	$ 197.51
10	$ 202.51	$ 214.53	$ 228.60	$ 241.82	$ 257.34	$ 272.19

Flat and Seasonal Volume Rates ($/kgal)

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Flat Volume Rate						
Residential	$ 1.64	$ 1.75	$ 1.86	$ 1.99	$ 2.12	$ 2.26
Commercial	$ 1.64	$ 1.75	$ 1.86	$ 1.99	$ 2.12	$ 2.26
Institutional	$ 1.64	$ 1.75	$ 1.86	$ 1.99	$ 2.12	$ 2.26
Winter Rate						
Residential	$ 1.31	$ 1.40	$ 1.49	$ 1.59	$ 1.69	$ 1.80
Commercial	$ 1.31	$ 1.40	$ 1.49	$ 1.59	$ 1.69	$ 1.80
Institutional	$ 1.31	$ 1.40	$ 1.49	$ 1.59	$ 1.69	$ 1.80
Summer Rate						
Residential	$ 1.94	$ 2.08	$ 2.21	$ 2.36	$ 2.51	$ 2.69
Commercial	$ 1.94	$ 2.08	$ 2.21	$ 2.36	$ 2.51	$ 2.69
Institutional	$ 1.94	$ 2.08	$ 2.21	$ 2.36	$ 2.51	$ 2.69

Block Volume Rates ($/kgal)

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate						
Residential	$ 1.31	$ 1.40	$ 1.49	$ 1.59	$ 1.69	$ 1.80
Commercial	$ 1.31	$ 1.40	$ 1.49	$ 1.59	$ 1.69	$ 1.80
Institutional	$ 1.31	$ 1.40	$ 1.49	$ 1.59	$ 1.69	$ 1.80
Block 2 Rate						
Residential	$ 2.15	$ 2.31	$ 2.45	$ 2.63	$ 2.79	$ 2.99
Commercial	$ 2.15	$ 2.31	$ 2.45	$ 2.63	$ 2.79	$ 2.99
Institutional	$ 2.15	$ 2.31	$ 2.45	$ 2.63	$ 2.79	$ 2.99
Block 3 Rate						
Residential	$ 3.18	$ 3.41	$ 3.62	$ 3.89	$ 4.13	$ 4.43
Commercial	$ 3.18	$ 3.41	$ 3.62	$ 3.89	$ 4.13	$ 4.43
Institutional	$ 3.18	$ 3.41	$ 3.62	$ 3.89	$ 4.13	$ 4.43
Block 4 Rate						
Residential	$ 4.21	$ 4.51	$ 4.79	$ 5.15	$ 5.48	$ 5.88
Commercial	$ 4.21	$ 4.51	$ 4.79	$ 5.15	$ 5.48	$ 5.88
Institutional	$ 4.21	$ 4.51	$ 4.79	$ 5.15	$ 5.48	$ 5.88

Table Rates 20
Cedar Hills - Water Rate Study
Recommended Rates (PI Connected)

Meter Size	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
3/4 and smaller	$ 6.06	$ 6.41	$ 6.80	$ 7.21	$ 7.68	$ 8.10
1	$ 7.57	$ 8.01	$ 8.51	$ 9.02	$ 9.60	$ 10.14
1 1/2	$ 9.59	$ 10.15	$ 10.79	$ 11.43	$ 12.17	$ 12.86
2	$ 15.15	$ 16.04	$ 17.06	$ 18.07	$ 19.23	$ 20.32
3	$ 56.05	$ 59.38	$ 63.24	$ 66.92	$ 71.22	$ 75.31
4	$ 71.21	$ 75.43	$ 80.35	$ 85.01	$ 90.47	$ 95.68
6	$ 106.56	$ 112.88	$ 120.26	$ 127.23	$ 135.40	$ 143.20
8	$ 146.96	$ 155.68	$ 165.88	$ 175.48	$ 186.74	$ 197.51
10	$ 202.51	$ 214.53	$ 228.60	$ 241.82	$ 257.34	$ 272.19

Block Volume Rates ($/kgal)

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate	$1.31	$1.40	$1.49	$1.59	$1.69	$1.80
Block 2 Rate	$2.15	$2.31	$2.45	$2.63	$2.79	$2.99
Block 3 Rate	$3.18	$3.41	$3.62	$3.89	$4.13	$4.43
Block 4 Rate	$4.21	$4.51	$4.79	$5.15	$5.48	$5.88

Block Division Points by Meter Size

	Upper Block Limits (kgal)			
Meter Size	**Block 1**	**Block 2**	**Block 3**	**Block 4**
3/4" and smaller	8	12	18	+
1"	10	15	23	+
1 1/2"	13	20	29	+
2"	21	32	47	+
3"	80	120	180	+
4"	102	153	229	+
6"	153	229	344	+
8"	211	316	475	+
10"	291	436	655	+

Table 21
Cedar Hills - Water Rate Study
Recommended Rates (PI Not Available)

Meter Size	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
3/4 and smaller	$ 6.06	$ 6.41	$ 6.80	$ 7.21	$ 7.68	$ 8.10
1	$ 7.57	$ 8.01	$ 8.51	$ 9.02	$ 9.60	$ 10.14
1 1/2	$ 9.59	$ 10.15	$ 10.79	$ 11.43	$ 12.17	$ 12.86
2	$ 15.15	$ 16.04	$ 17.06	$ 18.07	$ 19.23	$ 20.32
3	$ 56.05	$ 59.38	$ 63.24	$ 66.92	$ 71.22	$ 75.31
4	$ 71.21	$ 75.43	$ 80.35	$ 85.01	$ 90.47	$ 95.68
6	$ 106.56	$ 112.88	$ 120.26	$ 127.23	$ 135.40	$ 143.20
8	$ 146.96	$ 155.68	$ 165.88	$ 175.48	$ 186.74	$ 197.51
10	$ 202.51	$ 214.53	$ 228.60	$ 241.82	$ 257.34	$ 272.19

Block Volume Rates ($/kgal)

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate	$1.31	$1.40	$1.49	$1.59	$1.69	$1.80
Block 2 Rate	$2.15	$2.31	$2.45	$2.63	$2.79	$2.99
Block 3 Rate	$2.50	$2.50	$2.50	$2.50	$2.50	$2.50
Block 4 Rate	$1.50	$1.50	$1.50	$1.50	$1.50	$1.50

Block Division Points by Meter Size

	Upper Block Limits (kgal)			
Meter Size	**Block 1**	**Block 2**	**Block 3**	**Block 4**
3/4" and smaller	8	12	18	+
1"	10	15	23	+
1 1/2"	13	20	29	+
2"	21	32	47	+
3"	80	120	180	+
4"	102	153	229	+
6"	153	229	344	+
8"	211	316	475	+
10"	291	436	655	+

Table 22
Cedar Hills - Water Rate Study
Recommended Rates (PI Not Connected)

Meter Size	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
3/4 and smaller	$ 6.06	$ 6.41	$ 6.80	$ 7.21	$ 7.68	$ 8.10
1	$ 7.57	$ 8.01	$ 8.51	$ 9.02	$ 9.60	$ 10.14
1 1/2	$ 9.59	$ 10.15	$ 10.79	$ 11.43	$ 12.17	$ 12.86
2	$ 15.15	$ 16.04	$ 17.06	$ 18.07	$ 19.23	$ 20.32
3	$ 56.05	$ 59.38	$ 63.24	$ 66.92	$ 71.22	$ 75.31
4	$ 71.21	$ 75.43	$ 80.35	$ 85.01	$ 90.47	$ 95.68
6	$ 106.56	$ 112.88	$ 120.26	$ 127.23	$ 135.40	$ 143.20
8	$ 146.96	$ 155.68	$ 165.88	$ 175.48	$ 186.74	$ 197.51
10	$ 202.51	$ 214.53	$ 228.60	$ 241.82	$ 257.34	$ 272.19

Block Volume Rates ($/kgal)

	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Block 1 Rate	$2.10	$2.24	$2.38	$2.54	$2.70	$2.88
Block 2 Rate	$3.23	$3.47	$3.68	$3.95	$4.19	$4.49
Block 3 Rate	$4.24	$4.55	$4.83	$5.19	$5.51	$5.91
Block 4 Rate	$5.26	$5.64	$5.99	$6.44	$6.85	$7.35

Block Division Points by Meter Size

	Upper Block Limits (kgal)			
Meter Size	**Block 1**	**Block 2**	**Block 3**	**Block 4**
3/4" and smaller	8	12	18	+
1"	10	15	23	+
1 1/2"	13	20	29	+
2"	21	32	47	+
3"	80	120	180	+
4"	102	153	229	+
6"	153	229	344	+
8"	211	316	475	+
10"	291	436	655	+

APPENDIX B

DETAILED PRESSURIZED IRRIGATION RATE MODEL TABLES

10-Year Budget Plan - Pressurized Irrigation

	Historic Year			Projected Year					
	FYE 2010	**FYE 2011**	**FYE 2012**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Total ERUs	2,164	2,307	2,401	2,419	2,437	2,456	2,477	2,497	2,517
% Growth from Previous Year	-	6.61%	4.07%	0.75%	0.74%	0.78%	0.86%	0.81%	0.80%
Expenditures									
O&M	$374,509	$384,342	$409,060	$422,886	$437,180	$451,935	$467,368	$483,329	$499,786
Debt Service	$521,430	$469,135	$486,938	$483,579	$480,032	$485,835	$480,938	$485,842	$480,046
Total Capital Expenditures	$33,230	$11,611	$15,000	$15,114	$15,229	$15,343	$15,470	$15,599	$15,725
Total Expenditures	*$929,169*	*$865,087*	*$910,998*	*$921,579*	*$932,440*	*$953,112*	*$963,777*	*$984,769*	*$995,557*
Capital Expenditures from Bond Proceeds	$0	$0	$0	$0	$0	$0	$0	$0	$0
Capital Expenditures from Reserves	$33,230	$11,611	$15,000	$15,114	$15,229	$15,343	$15,470	$15,599	$15,725
Income									
Other Non-Rate	$143,995	$145,481	$147,500	$153,046	$158,801	$164,756	$171,066	$177,618	$184,385
Sales - Existing Rates	$848,287	$904,423	$935,000	$942,010	$949,019	$956,418	$964,596	$972,384	$980,173
Projected Income - Existing Rates	*$992,282*	*$1,049,904*	*$1,082,500*	*$1,095,056*	*$1,107,820*	*$1,121,174*	*$1,135,662*	*$1,150,002*	*$1,164,558*
System Investment Goal	$178,933	$196,125	$210,000	$217,874	$226,032	$234,575	$243,618	$252,894	$262,506
Recommended Long-term Level of Funding	$553,442	$580,467	$619,060	$640,761	$663,212	$686,510	$710,986	$736,222	$762,292
Recommended Rate Increases				0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Sales Revenue With Increase	$848,287	$904,423	$935,000	$942,010	$949,019	$956,418	$964,596	$972,384	$980,173
Projected Income - Recommended Rates	*$992,282*	*$1,049,904*	*$1,082,500*	*$1,095,056*	*$1,107,820*	*$1,121,174*	*$1,135,662*	*$1,150,002*	*$1,164,558*

Table 1
Cedar Hills - Pressurized Irrigation Rate Study
Historic Irrigated Acreage
(acres)

	FYE 2010			*FYE 2011*			*FYE 2012*				
Customer Class	**Lot Size**	**ERUs**	**Acres per ERU**	**Lot Size**	**ERUs**	**Acres per ERU**	**Lot Size**	**ERUs**	**Acres per ERU**	**Planning Acres/ERU.**	**Acres/ERU. (per month)**
Residential	683	2,136	0.3	683	2,277	0.3	707	2,353	0.30	0.3	0.025
Commercial	15	11	1.4	17	12	1.4	17	19	0.89	0.9	0.074
Institutional	36	17	2.1	38	18	2.1	39	29	1.37	1.4	0.114
Total	**734**	**2,164**	**0.3**	**738**	**2,307**	**0.3**	**763**	**2,401**	**0.32**	**0.3**	**0.026**

Table 2
Cedar Hills - Pressurized Irrigation Rate Study
Projected ERUs

		Number					
Customer Class		**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
	% Growth	**0.76%**	**0.76%**	**0.75%**	**0.83%**	**0.83%**	**0.81%**
Residential		2,371	2,389	2,407	2,427	2,447	2,467
Commercial		19	19	20	20	20	20
Institutional		29	29	29	30	30	30
Total		**2,419**	**2,437**	**2,456**	**2,477**	**2,497**	**2,517**

Table 3
Cedar Hills - Pressurized Irrigation Rate Study
Projected Irrigated Acreage

		Amount (acres)					
Customer Class	**Acres/ERU.**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	0.3	712	718	723	729	735	741
Commercial	0.9	17	17	18	18	18	18
Institutional	1.4	40	40	40	41	41	41
Total		**769**	**774**	**781**	**788**	**794**	**800**

Table 4
Cedar Hills - Pressurized Irrigation Rate Study
Connection Fee Revenue

Size of Meter	Impact Fee ($/ERU)	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
Per ERU	$0.00		$0	$0	$0	$0	$0	$0
Total Impact Fee Revenue		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Table 5
Cedar Hills - Pressurized Irrigation Rate Study
Non-Rate Revenue (Including Connection Fees)

Assumed Inflation Rate = 3.0%

Item	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
Operations							
CUP Fees	$147,500	$153,046	$158,801	$164,756	$171,066	$177,618	$184,385
Total Operations Non-Rate Revenue	$147,500	$153,046	$158,801	$164,756	$171,066	$177,618	$184,385
Expansion and Replacement							
Total Expansion Non-Rate Revenue	$0	$0	$0	$0	$0	$0	$0
Total Non-Rate Revenue	**$147,500**	**$153,046**	**$158,801**	**$164,756**	**$171,066**	**$177,618**	**$184,385**

Table 6
Cedar Hills - Pressurized Irrigation Rate Study
Revenue Requirements
Cash Basis

Item	% Growth	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
O&M								
Salary & Wages (Full-Time)		$86,560	$89,486	$92,510	$95,633	$98,898	$102,276	$105,758
Overtime		$1,340	$1,385	$1,432	$1,480	$1,531	$1,583	$1,637
Salary & Wages (Part-Time)		$4,060	$4,197	$4,339	$4,486	$4,639	$4,797	$4,960
Employee Benefits		$49,920	$51,607	$53,352	$55,152	$57,036	$58,983	$60,992
Dues & Subscriptions		$800	$827	$855	$884	$914	$945	$977
Education & Training		$1,400	$1,447	$1,496	$1,547	$1,600	$1,654	$1,711
Computer Expenses		$1,200	$1,241	$1,282	$1,326	$1,371	$1,418	$1,466
Office Equipment		$400	$414	$427	$442	$457	$473	$489
Tools & Equipment		$1,800	$1,861	$1,924	$1,989	$2,057	$2,127	$2,199
Utilities		$108,000	$111,650	$115,424	$119,320	$123,395	$127,608	$131,954
Blue Stakes		$600	$620	$641	$663	$686	$709	$733
Communications & Telephone		$800	$827	$855	$884	$914	$945	$977
Engineering Services		$400	$414	$427	$442	$457	$473	$489
Professional & Technical		$2,400	$2,481	$2,565	$2,652	$2,742	$2,836	$2,932
Insurance		$5,000	$5,169	$5,344	$5,524	$5,713	$5,908	$6,109
Credit Card Fees		$4,800	$4,962	$5,130	$5,303	$5,484	$5,671	$5,865
Trustee Fees		$1,880	$1,944	$2,009	$2,077	$2,148	$2,221	$2,297
Water Purchases - American Fork		$0	$0	$0	$0	$0	$0	$0
Water Purchases - Pleasant Grove Irrigation		$17,700	$18,298	$18,917	$19,555	$20,223	$20,914	$21,626
Supplementary Water		$120,000	$124,056	$128,249	$132,577	$137,105	$141,787	$146,615
Total O&M		**$409,060**	**$422,886**	**$437,180**	**$451,935**	**$467,368**	**$483,329**	**$499,786**
Debt Service								
2006 Utility Revenue Bond - PI		$404,525	$402,963	$401,213	$403,813	$401,013	$403,013	$399,613
2009 Utility Revenue Bond - PI 2		$82,413	$80,616	$78,819	$82,022	$79,925	$82,829	$80,433
Total Debt Service		**$486,938**	**$483,579**	**$480,032**	**$485,835**	**$480,938**	**$485,842**	**$480,046**
Expansion and Replacement		**2012**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Pressurized Irrigation Projects		$15,000	$15,114	$15,229	$15,343	$15,470	$15,599	$15,725
Transfer to/(from) Reserve Fund		$171,503	$173,477	$175,380	$168,062	$171,885	$165,233	$169,001
Total Capital Outlays		**$186,503**	**$188,591**	**$190,608**	**$183,405**	**$187,356**	**$180,832**	**$184,726**
Total Revenue Requirements		**$1,082,500**	**$1,095,056**	**$1,107,820**	**$1,121,174**	**$1,135,662**	**$1,150,002**	**$1,164,558**
LESS:								
Operations Non-Rate Revenue		$147,500	$153,046	$158,801	$164,756	$171,066	$177,618	$184,385
Expansion Non-Rate Revenue		$0	$0	$0	$0	$0	$0	$0
Net Revenue Requirements		**$935,000**	**$942,010**	**$949,019**	**$956,418**	**$964,596**	**$972,384**	**$980,173**

Table 7
Cedar Hills - Pressurized Irrigation Rate Study
Cost Allocation Percentages to Service Characteristics

Item	Volume	Customer	Total
O&M			
Salary & Wages (Full-Time)	20%	80%	100%
Overtime	20%	80%	100%
Salary & Wages (Part-Time)	20%	80%	100%
Employee Benefits	20%	80%	100%
Dues & Subscriptions	20%	80%	100%
Education & Training	20%	80%	100%
Computer Expenses	0%	100%	100%
Office Equipment	0%	100%	100%
Tools & Equipment	20%	80%	100%
Utilities	20%	80%	100%
Blue Stakes	20%	80%	100%
Communications & Telephone	0%	100%	100%
Engineering Services	20%	80%	100%
Professional & Technical	20%	80%	100%
Insurance	20%	80%	100%
Credit Card Fees	0%	100%	100%
Trustee Fees	20%	80%	100%
Water Purchases - American Fork	75%	25%	100%
Water Purchases - Pleasant Grove Irrigation	75%	25%	100%
Supplementary Water	75%	25%	100%

Table 8
Cedar Hills - Pressurized Irrigation Rate Study
Fixed Assets Allocations to Service Characteristics

		Percent			*Allocated Amount*		
Item	**Assets**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**
Main Lines	$8,809,100	50%	50%	100%	$4,404,550	$4,404,550	$8,809,100
Water Stock	$3,311,559	75%	25%	100%	$2,483,669	$827,890	$3,311,559
Total	**$12,120,659**				**$6,888,219**	**$5,232,440**	**$12,120,659**
Percent					**56.8%**	**43.2%**	**100.0%**

Table 9
Cedar Hills - Pressurized Irrigation Rate Study
Allocation of O&M Costs to Service Characteristics

	FYE 2013			FYE 2014			FYE 2015			FYE 2016			FYE 2017			FYE 2018		
Item	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**
O&M																		
Salary & Wages (Full-Time)	$17,897	$71,589	$89,486	$18,502	$74,008	$92,510	$19,127	$76,506	$95,633	$19,780	$79,119	$98,898	$20,455	$81,821	$102,276	$21,152	$84,607	$105,758
Overtime	$277	$1,108	$1,385	$286	$1,146	$1,432	$296	$1,184	$1,480	$306	$1,225	$1,531	$317	$1,267	$1,583	$327	$1,310	$1,637
Salary & Wages (Part-Time)	$839	$3,358	$4,197	$868	$3,471	$4,339	$897	$3,588	$4,486	$928	$3,711	$4,639	$959	$3,838	$4,797	$992	$3,968	$4,960
Employee Benefits	$10,321	$41,286	$51,607	$10,670	$42,681	$53,352	$11,030	$44,122	$55,152	$11,407	$45,629	$57,036	$11,797	$47,187	$58,983	$12,198	$48,793	$60,992
Dues & Subscriptions	$165	$662	$827	$171	$684	$855	$177	$707	$884	$183	$731	$914	$189	$756	$945	$195	$782	$977
Education & Training	$289	$1,158	$1,447	$299	$1,197	$1,496	$309	$1,237	$1,547	$320	$1,280	$1,600	$331	$1,323	$1,654	$342	$1,368	$1,711
Computer Expenses	$0	$1,241	$1,241	$0	$1,282	$1,282	$0	$1,326	$1,326	$0	$1,371	$1,371	$0	$1,418	$1,418	$0	$1,466	$1,466
Office Equipment	$0	$414	$414	$0	$427	$427	$0	$442	$442	$0	$457	$457	$0	$473	$473	$0	$489	$489
Tools & Equipment	$372	$1,489	$1,861	$385	$1,539	$1,924	$398	$1,591	$1,989	$411	$1,645	$2,057	$425	$1,701	$2,127	$440	$1,759	$2,199
Utilities	$22,330	$89,320	$111,650	$23,085	$92,339	$115,424	$23,864	$95,456	$119,320	$24,679	$98,716	$123,395	$25,522	$102,087	$127,608	$26,391	$105,563	$131,954
Blue Stakes	$124	$496	$620	$128	$513	$641	$133	$530	$663	$137	$548	$686	$142	$567	$709	$147	$586	$733
Communications & Telephone	$0	$827	$827	$0	$855	$855	$0	$884	$884	$0	$914	$914	$0	$945	$945	$0	$977	$977
Engineering Services	$83	$331	$414	$85	$342	$427	$88	$354	$442	$91	$366	$457	$95	$378	$473	$98	$391	$489
Professional & Technical	$496	$1,985	$2,481	$513	$2,052	$2,565	$530	$2,121	$2,652	$548	$2,194	$2,742	$567	$2,269	$2,836	$586	$2,346	$2,932
Insurance	$1,034	$4,135	$5,169	$1,069	$4,275	$5,344	$1,105	$4,419	$5,524	$1,143	$4,570	$5,713	$1,182	$4,726	$5,908	$1,222	$4,887	$6,109
Credit Card Fees	$0	$4,962	$4,962	$0	$5,130	$5,130	$0	$5,303	$5,303	$0	$5,484	$5,484	$0	$5,671	$5,671	$0	$5,865	$5,865
Trustee Fees	$389	$1,555	$1,944	$402	$1,607	$2,009	$415	$1,662	$2,077	$430	$1,718	$2,148	$444	$1,777	$2,221	$459	$1,838	$2,297
Water Purchases - American Fork	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Water Purchases - Pleasant Grove Irrigation	$13,724	$4,575	$18,298	$14,188	$4,729	$18,917	$14,666	$4,889	$19,555	$15,167	$5,056	$20,223	$15,685	$5,228	$20,914	$16,219	$5,406	$21,626
Supplementary Water	$93,042	$31,014	$124,056	$96,187	$32,062	$128,249	$99,433	$33,144	$132,577	$102,829	$34,276	$137,105	$106,340	$35,447	$141,787	$109,961	$36,654	$146,615
Total	**$161,383**	**$261,503**	**$422,886**	**$166,838**	**$270,342**	**$437,180**	**$172,469**	**$279,466**	**$451,935**	**$178,359**	**$289,009**	**$467,368**	**$184,450**	**$298,879**	**$483,329**	**$190,730**	**$309,056**	**$499,786**
Percent	**38.2%**	**61.8%**	**100.0%**	**38.2%**	**61.8%**	**100.0%**	**38.2%**	**61.8%**	**100.0%**	**38.2%**	**61.8%**	**100.0%**	**38.2%**	**61.8%**	**100.0%**	**38.2%**	**61.8%**	**100.0%**

Table 10
Cedar Hills - Pressurized Irrigation Rate Study
Revenue Requirements by Service Characteristics

	FYE 2013			FYE 2014			FYE 2015			FYE 2016			FYE 2017			FYE 2018		
Item	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**
O&M	$161,383	$261,503	$422,886	$166,838	$270,342	$437,180	$172,469	$279,466	$451,935	$178,359	$289,009	$467,368	$184,450	$298,879	$483,329	$190,730	$309,056	$499,786
Debt Service	$274,820	$208,759	$483,579	$272,804	$207,228	$480,032	$276,102	$209,733	$485,835	$273,319	$207,619	$480,938	$276,106	$209,736	$485,842	$272,811.79	$207,233.71	$480,046
Capital Outlays	$107,177	$81,414	$188,591	$108,324	$82,285	$190,608	$104,230	$79,175	$183,405	$106,475	$80,881	$187,356	$102,767	$78,064	$180,832	$104,980	$79,745	$184,726
Less: Operations Non-Rate Revenue	$58,406	$94,640	$153,046	$60,602	$98,198	$158,801	$62,875	$101,881	$164,756	$65,283	$105,783	$171,066	$67,783	$109,834	$177,618	$70,366	$114,019	$184,385
Less: Expansion Non-Rate Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00	$0.00	$0
Total	**$484,974**	**$457,036**	**$942,010**	**$487,363**	**$461,656**	**$949,019**	**$489,926**	**$466,493**	**$956,418**	**$492,870**	**$471,726**	**$964,596**	**$495,540**	**$476,845**	**$972,384**	**$498,157**	**$482,016**	**$980,173**

Table 11
Cedar Hills - Pressurized Irrigation Rate Study
Cost Allocations to Customer Classes

	FYE 2013			FYE 2014			FYE 2015			FYE 2016			FYE 2017			FYE 2018		
	Volume	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**
Residential	$449,288	$447,966.69	$897,255	$451,752	$452,563	$904,315	$453,523	$457,185	$910,708	$456,069	$462,204	$918,273	$458,819	$467,296	$926,115	$461,519.62	$472,441	$933,960
Commercial	$10,688	$3,590	$14,278	$10,666	$3,599	$14,265	$11,187	$3,799	$14,986	$11,157	$3,809	$14,966	$11,133	$3,819	$14,952	$11,107.33	$3,830	$14,937
Institutional	$24,998	$5,479	$30,477	$24,945	$5,494	$30,439	$24,856	$5,508	$30,364	$25,644	$5,713	$31,358	$25,588	$5,729	$31,317	$25,529.99	$5,745	$31,275
Total	**$484,974**	**$457,036**	**$942,010**	**$487,363**	**$461,656**	**$949,019**	**$489,566**	**$466,493**	**$956,058**	**$492,870**	**$471,726**	**$964,596**	**$495,540**	**$476,845**	**$972,384**	**$498,157**	**$482,016**	**$980,173**
Allocation Basis	Irr. Acreage	Account		Irr. Acreage	Account		Irr. Acreage	Account		Irr. Acreage	Account		Irr. Acreage	Account		Irr. Acreage	Account	

Table 12
Cedar Hills - Pressurized Irrigation Rate Study
Existing Rates and Projected Revenue

Base Rate	Existing	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$15.95	$453,809	$457,255	$460,700	$464,528	$468,356	$472,184
Commercial	$15.95	$3,637	$3,637	$3,828	$3,828	$3,828	$3,828
Institutional	$15.95	$5,551	$5,551	$5,551	$5,742	$5,742	$5,742

Volume Rate (per acre lot size)	Existing	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$49.12	$419,774	$422,960	$426,147	$429,688	$433,229	$436,770
Commercial	$49.12	$9,986	$9,986	$10,512	$10,512	$10,512	$10,512
Institutional	$49.12	$23,356	$23,356	$23,356	$24,161	$24,161	$24,161

Revenue - Existing Rates	$916,112	$922,744	$930,093	$938,458	$945,827	$953,196
Revenue Required	$942,010	$949,019	$956,418	$964,596	$972,384	$980,173
Surplus/(Shortfall)	($25,898)	($26,275)	($26,325)	($26,138)	($26,557)	($26,977)

Table 13
Cedar Hills - Pressurized Irrigation Rate Study
Calculated Rates

Monthly Base Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$15.74	$15.79	$15.83	$15.87	$15.91	$15.96
Commercial	$15.74	$15.79	$15.83	$15.87	$15.91	$15.96
Institutional	$15.74	$15.79	$15.83	$15.87	$15.91	$15.96

Volume Rate (per month per acre)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$52.57	$52.46	$52.28	$52.14	$52.02	$51.90
Commercial	$52.57	$52.46	$52.28	$52.14	$52.02	$51.90
Institutional	$52.57	$52.46	$52.28	$52.14	$52.02	$51.90

Table 14
Cedar Hills - Pressurized Irrigation Rate Study
Recommended Rates

Utility Fees (per month)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Base Rate						
1-inch connection	$15.95	$15.95	$15.95	$15.95	$15.95	$15.95
1 1/2-inch connection	$31.90	$31.90	$31.90	$31.90	$31.90	$31.90
2-inch connection	$51.04	$51.04	$51.04	$51.04	$51.04	$51.04
3-inch connection	$95.70	$95.70	$95.70	$95.70	$95.70	$95.70
4-inch connection	$159.50	$159.50	$159.50	$159.50	$159.50	$159.50
Lot size-1/4 acre or less	$12.98	$12.98	$12.98	$12.98	$12.98	$12.98
1/4 acre to 1/3 acre	$17.30	$17.30	$17.30	$17.30	$17.30	$17.30
1/3 acre to 1/2 acre	$25.95	$25.95	$25.95	$25.95	$25.95	$25.95
Larger Lots ($/acre)	$51.90	$51.90	$51.90	$51.90	$51.90	$51.90

APPENDIX C

DETAILED SEWER RATE MODEL TABLES

10-Year Budget Plan - Sewer

	Historic Year			Projected Year					
	FYE 2010	**FYE 2011**	**FYE 2012**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Total ERUs	2,387	2,387	2,387	2,405	2,423	2,441	2,462	2,482	2,502
% Growth from Previous Year	-	0.00%	0.00%	0.77%	0.75%	0.74%	0.86%	0.81%	0.81%
Expenditures									
O&M	$644,941	$777,011	$824,400	$861,499	$900,313	$940,911	$983,501	$1,028,069	$1,074,678
Debt Service	$30,833	$30,353	$30,853	$30,333	$30,793	$31,213	$30,613	$30,993	$30,333
Total Capital Expenditures	$0	$764	$382,500	$10,076	$410,153	$10,229	$260,314	$10,399	$410,483
Total Expenditures	*$675,774*	*$808,128*	*$1,237,753*	*$901,907*	*$1,341,258*	*$982,352*	*$1,274,427*	*$1,069,461*	*$1,515,494*
Capital Expenditures from Bond Proceeds	$0	$0	$0	$0	$0	$0	$0	$0	$0
Capital Expenditures from Reserves	$0	$764	$382,500	$10,076	$410,153	$10,229	$260,314	$10,399	$410,483
Income									
Connection Fees	$4,979	$920	$3,850	$4,899	$4,826	$4,826	$5,631	$5,363	$5,363
Other Non-Rate	$1,050	$825	$1,050	$1,089	$1,130	$1,173	$1,218	$1,264	$1,313
Sales - Existing Rates	$687,287	$872,247	$880,000	$886,736	$893,373	$900,010	$907,752	$915,127	$922,501
Projected Income - Existing Rates	*$693,316*	*$873,992*	*$884,900*	*$892,725*	*$899,330*	*$906,009*	*$914,601*	*$921,754*	*$929,176*
System Investment Goal	$346,404	$356,796	$367,500	$381,338	$395,632	$410,440	$426,285	$442,536	$459,378
Recommended Long-term Level of Funding	$991,345	$1,133,807	$1,191,900	$1,242,837	$1,295,945	$1,351,351	$1,409,786	$1,470,605	$1,534,057
Recommended Rate Increases				5.5%	5.5%	5.5%	5.5%	5.5%	5.5%
Sales Revenue With Increase	$687,287	$872,247	$880,000	$935,507	$994,346	$1,056,829	$1,124,546	$1,196,034	$1,271,983
Projected Income - Recommended Rates	*$693,316*	*$873,992*	*$884,900*	*$941,495*	*$1,000,303*	*$1,062,828*	*$1,131,395*	*$1,202,661*	*$1,278,659*

Table 1
Cedar Hills - Sewer Rate Study
Historic Indoor Water Use
(kgal)

	FYE 2010			*FYE 2011*			*FYE 2012*				
Customer Class	**Use**	**ERUs**	**Use per ERUs**	**Use**	**ERUs**	**Use per ERUs**	**Use**	**ERUs**	**Use per ERUs**	**Planning Use/ERU**	**Use/ERU (kgal/month)**
Residential	96,030	2,354	40.8	160,174	2,354	68.0	161,206	2,354	68.5	68.5	5.7
Commercial	4,696	18	260.9	5,569	18	309.4	6,594	18	366.3	366.3	30.5
Institutional	4,377	15	297.2	4,258	15	289.0	5,301	15	359.9	359.9	30.0
Total	**105,103**	**2,387**	**44.0**	**170,001**	**2,387**	**71.2**	**173,101**	**2,387**	**72.5**	**72.5**	**6.0**

Table 2
Cedar Hills - Sewer Rate Study
Projected ERUs

		Number					
Customer Class		**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
	% Growth	**0.76%**	**0.76%**	**0.75%**	**0.83%**	**0.83%**	**0.81%**
Residential		2,372	2,390	2,408	2,428	2,448	2,468
Commercial		18	18	18	19	19	19
Institutional		15	15	15	15	15	15
Total		**2,405**	**2,423**	**2,441**	**2,462**	**2,482**	**2,502**

Table 3
Cedar Hills - Sewer Rate Study
Projected Annual Indoor Water Use

		Amount (kgal)					
Customer Class	**Use/ERU.**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	68.5	162,439	163,671	164,904	166,274	167,643	169,013
Commercial	366.3	6,594	6,594	6,594	6,960	6,960	6,960
Institutional	359.9	5,398	5,398	5,398	5,398	5,398	5,398
Total		**174,431**	**175,664**	**176,896**	**178,632**	**180,002**	**181,371**

Table 4
Cedar Hills - Sewer Rate Study
Projected Total Wastewater Flow

	2011
Total Flow at Treatment Plant (mgd)=	**0.6457**

		Amount (mgd)					
Customer Class		**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential		0.61	0.61	0.62	0.62	0.63	0.63
Commercial		0.02	0.02	0.02	0.03	0.03	0.03
Institutional		0.02	0.02	0.02	0.02	0.02	0.02
Total		**0.65**	**0.66**	**0.66**	**0.67**	**0.67**	**0.68**

Table 5
Cedar Hills - Sewer Rate Study
Peaking Factors

Customer Class	**Est. Peak Hour Factor**
Residential	1.90
Commercial	1.90
Institutional	1.90

Table 6
Cedar Hills - Sewer Rate Study
Projected Flow Peaking Characteristics

	Estimated Peak Hour (mgd)					
Customer Class	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	0.85	0.85	0.86	0.87	0.87	0.88
Commercial	0.03	0.03	0.03	0.04	0.04	0.04
Institutional	0.03	0.03	0.03	0.03	0.03	0.03
Total	**0.91**	**0.91**	**0.92**	**0.93**	**0.94**	**0.94**

	Excess Over Average Day (mgd)					
Customer Class	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	0.40	0.40	0.41	0.41	0.41	0.42
Commercial	0.02	0.02	0.02	0.02	0.02	0.02
Institutional	0.01	0.01	0.01	0.01	0.01	0.01
Total	**0.43**	**0.43**	**0.44**	**0.44**	**0.44**	**0.45**

Table 7
Cedar Hills - Sewer Rate Study
Strength

Customer Class	BOD (mg/L)	TSS (mg/L)
Residential	225	221
Commercial	225	221
Institutional	225	221
Approximate Cost Division	57%	43%

Table 8
Cedar Hills - Sewer Rate Study
Projected Strength Characteristics

	BOD (lbs/year)					
Customer Class	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	414,816	417,964	421,112	424,609	428,107	431,604
Commercial	16,839	16,839	16,839	17,774	17,774	17,774
Institutional	13,785	13,785	13,785	13,785	13,785	13,785
Total	**445,440**	**448,588**	**451,736**	**456,168**	**459,666**	**463,163**

	TSS (lbs/year)					
Customer Class	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	407,433	410,525	413,616	417,052	420,487	423,923
Commercial	16,539	16,539	16,539	17,458	17,458	17,458
Institutional	13,540	13,540	13,540	13,540	13,540	13,540
Total	**437,512**	**440,604**	**443,695**	**448,050**	**451,485**	**454,921**

	Weighted Average (lbs/year)					
Customer Class	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	411,661	414,785	417,909	421,380	424,851	428,322
Commercial	16,711	16,711	16,711	17,639	17,639	17,639
Institutional	13,680	13,680	13,680	13,680	13,680	13,680
Total	**442,052**	**445,176**	**448,300**	**452,699**	**456,170**	**459,641**

Table 9
Cedar Hills - Sewer Rate Study
Connection Fee Revenue

Size of Meter	Impact Fee ($/ERU)	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
Per ERU	$268.13		$4,899	$4,826	$4,826	$5,631	$5,363	$5,363
Total Impact Fee Revenue		**$3,850**	**$4,899**	**$4,826**	**$4,826**	**$5,631**	**$5,363**	**$5,363**

Table 10
Cedar Hills - Sewer Rate Study
Non-Rate Revenue (Including Connection Fees)

Assumed Inflation Rate = 3.0%

Item	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
Operations							
Sewer Lateral Inspections	$1,050	$1,089	$1,130	$1,173	$1,218	$1,264	$1,313
Total Operations Non-Rate Revenue	$1,050	$1,089	$1,130	$1,173	$1,218	$1,264	$1,313
Expansion and Replacement							
Connection Fees	$3,850	$4,899	$4,826	$4,826	$5,631	$5,363	$5,363
Total Expansion Non-Rate Revenue	$3,850	$4,899	$4,826	$4,826	$5,631	$5,363	$5,363
Total Non-Rate Revenue	**$4,900**	**$5,988**	**$5,957**	**$5,999**	**$6,849**	**$6,627**	**$6,675**

Table 11
Cedar Hills - Sewer Rate Study
Revenue Requirements
Cash Basis

Item	% Growth	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
O&M								
Salary & Wages (Full-Time)		$141,600	$146,386	$151,334	$156,441	$161,784	$167,309	$173,006
Overtime		$2,100	$2,171	$2,244	$2,320	$2,399	$2,481	$2,566
Salary & Wages (Part-Time)		$7,950	$8,219	$8,497	$8,783	$9,083	$9,393	$9,713
Employee Benefits		$79,950	$82,652	$85,446	$88,330	$91,346	$94,466	$97,682
Sewer Supplies		$1,000	$1,034	$1,069	$1,105	$1,143	$1,182	$1,222
Education & Training		$1,500	$1,551	$1,603	$1,657	$1,714	$1,772	$1,833
Computer Expenses		$1,800	$1,861	$1,924	$1,989	$2,057	$2,127	$2,199
Tools & Equipment		$1,000	$1,034	$1,069	$1,105	$1,143	$1,182	$1,222
Utilities		$2,000	$2,068	$2,137	$2,210	$2,285	$2,363	$2,444
Postage		$1,500	$1,551	$1,603	$1,657	$1,714	$1,772	$1,833
Blue Stakes		$0	$0	$0	$0	$0	$0	$0
Communnications & Telephone		$1,500	$1,551	$1,603	$1,657	$1,714	$1,772	$1,833
Professional & Technical		$2,000	$2,068	$2,137	$2,210	$2,285	$2,363	$2,444
Engineering Services		$1,000	$1,034	$1,069	$1,105	$1,143	$1,182	$1,222
TSSD Fees		$570,000	$598,500	$628,425	$659,846	$692,839	$727,480	$763,855
TSSD Billing		$0	$0	$0	$0	$0	$0	$0
Sewer Television Expenses		$2,000	$2,068	$2,137	$2,210	$2,285	$2,363	$2,444
Insurance		$7,500	$7,754	$8,016	$8,286	$8,569	$8,862	$9,163
Total O&M		**$824,400**	**$861,499**	**$900,313**	**$940,911**	**$983,501**	**$1,028,069**	**$1,074,678**
Debt Service								
2006 Excise Tax Bond - PWB (40% of 1/2)		$30,853	$30,333	$30,793	$31,213	$30,613	$30,993	$30,333
Total Debt Service		**$30,853**	**$30,333**	**$30,793**	**$31,213**	**$30,613**	**$30,993**	**$30,333**
Expansion and Replacement		**2012**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Sewer Construction Projects		$ 10,000	$10,076	$10,153	$10,229	$10,314	$10,399	$10,483
4800 West Sewer Improvement		$ 72,500						
American Fork Sewer Upgrades		$ 300,000						
Canyon Road Sewer Improvements				$ 400,000				
4000 West Sewer Improvements						$ 250,000		
4600 West Sewer Upgrade								$ 400,000
Cedar Hills Drive Sewer Upgrade								
Sewer Outfall Line Extension								
Transfer to/(from) Reserve Fund		$ (352,853)	$ 39,588	$ (340,955)	$ 80,476	$ (143,033)	$ 133,200	$ (236,836)
Total Capital Outlays		**$ 29,648**	**$49,664**	**$69,198**	**$90,705**	**$117,281**	**$143,599**	**$173,648**
Total Revenue Requirements		**$ 884,900**	**$941,495**	**$1,000,303**	**$1,062,828**	**$1,131,395**	**$1,202,661**	**$1,278,659**
LESS:								
Operations Non-Rate Revenue		$1,050	$1,089	$1,130	$1,173	$1,218	$1,264	$1,313
Expansion Non-Rate Revenue		$3,850	$4,899	$4,826	$4,826	$5,631	$5,363	$5,363
Net Revenue Requirements		**$ 880,000**	**$ 935,507**	**$ 994,346**	**$ 1,056,829**	**$ 1,124,546**	**$ 1,196,034**	**$ 1,271,983**

Table 12
Cedar Hills - Sewer Rate Study
Cost Allocation Percentages to Service Characteristics

Item	Volume	Capacity	Strength	Customer	Total
O&M					
Salary & Wages (Full-Time)	20%	0%	0%	80%	100%
Overtime	20%	0%	0%	80%	100%
Salary & Wages (Part-Time)	20%	0%	0%	80%	100%
Employee Benefits	20%	0%	0%	80%	100%
Sewer Supplies	20%	0%	0%	80%	100%
Education & Training	20%	0%	0%	80%	100%
Computer Expenses	20%	0%	0%	80%	100%
Tools & Equipment	20%	0%	0%	80%	100%
Utilities	20%	0%	0%	80%	100%
Postage	20%	0%	0%	80%	100%
Blue Stakes	20%	0%	0%	80%	100%
Communnications & Telephone	20%	0%	0%	80%	100%
Professional & Technical	20%	0%	0%	80%	100%
Engineering Services	20%	0%	0%	80%	100%
TSSD Fees	80%	0%	20%	0%	100%
TSSD Billing	80%	0%	20%	0%	100%
Sewer Television Expenses	20%	0%	0%	80%	100%
Insurance	20%	0%	0%	80%	100%

Table 13
Cedar Hills - Sewer Rate Study
Fixed Assets Allocations to Service Characteristics

	Percent						*Allocated Amount*				
Item	**Assets**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**
Main Lines	$6,668,417	20%	0%	0%	80%	100%	$1,333,683	$0	$0	$5,334,734	$6,668,417
Total	**$6,668,417**						**$1,333,683**	**$0**	**$0**	**$5,334,734**	**$6,668,417**
Percent							**20.0%**	**0.0%**	**0.0%**	**80.0%**	**100.0%**

Table 14
Cedar Hills - Sewer Rate Study
Allocation of O&M Costs to Service Characteristics

	FYE 2013					FYE 2014					FYE 2015					FYE 2016					FYE 2017					FYE 2018				
Item	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**
O&M																														
Salary & Wages (Full-Time)	$29,277	$0	$0	$117,109	$146,386	$30,267	$0	$0	$121,067	$151,334	$31,288	$0	$0	$125,153	$156,441	$32,357	$0	$0	$129,427	$161,784	$33,462	$0	$0	$133,847	$167,309	$34,601	$0	$0	$138,405	$173,006
Overtime	$434	$0	$0	$1,737	$2,171	$449	$0	$0	$1,795	$2,244	$464	$0	$0	$1,856	$2,320	$480	$0	$0	$1,919	$2,399	$496	$0	$0	$1,985	$2,481	$513	$0	$0	$2,053	$2,566
Salary & Wages (Part-Time)	$1,644	$0	$0	$6,575	$8,219	$1,699	$0	$0	$6,797	$8,497	$1,757	$0	$0	$7,027	$8,783	$1,817	$0	$0	$7,267	$9,083	$1,879	$0	$0	$7,515	$9,393	$1,943	$0	$0	$7,771	$9,713
Employee Benefits	$16,530	$0	$0	$66,122	$82,652	$17,089	$0	$0	$68,357	$85,446	$17,666	$0	$0	$70,664	$88,330	$18,269	$0	$0	$73,077	$91,346	$18,893	$0	$0	$75,573	$94,466	$19,536	$0	$0	$78,146	$97,682
Sewer Supplies	$207	$0	$0	$827	$1,034	$214	$0	$0	$855	$1,069	$221	$0	$0	$884	$1,105	$229	$0	$0	$914	$1,143	$236	$0	$0	$945	$1,182	$244	$0	$0	$977	$1,222
Education & Training	$310	$0	$0	$1,241	$1,551	$321	$0	$0	$1,282	$1,603	$331	$0	$0	$1,326	$1,657	$343	$0	$0	$1,371	$1,714	$354	$0	$0	$1,418	$1,772	$367	$0	$0	$1,466	$1,833
Computer Expenses	$372	$0	$0	$1,489	$1,861	$385	$0	$0	$1,539	$1,924	$398	$0	$0	$1,591	$1,989	$411	$0	$0	$1,645	$2,057	$425	$0	$0	$1,701	$2,127	$440	$0	$0	$1,759	$2,199
Tools & Equipment	$207	$0	$0	$827	$1,034	$214	$0	$0	$855	$1,069	$221	$0	$0	$884	$1,105	$229	$0	$0	$914	$1,143	$236	$0	$0	$945	$1,182	$244	$0	$0	$977	$1,222
Utilities	$414	$0	$0	$1,654	$2,068	$427	$0	$0	$1,710	$2,137	$442	$0	$0	$1,768	$2,210	$457	$0	$0	$1,828	$2,285	$473	$0	$0	$1,890	$2,363	$489	$0	$0	$1,955	$2,444
Postage	$310	$0	$0	$1,241	$1,551	$321	$0	$0	$1,282	$1,603	$331	$0	$0	$1,326	$1,657	$343	$0	$0	$1,371	$1,714	$354	$0	$0	$1,418	$1,772	$367	$0	$0	$1,466	$1,833
Blue Stakes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Communnications & Telephone	$310	$0	$0	$1,241	$1,551	$321	$0	$0	$1,282	$1,603	$331	$0	$0	$1,326	$1,657	$343	$0	$0	$1,371	$1,714	$354	$0	$0	$1,418	$1,772	$367	$0	$0	$1,466	$1,833
Professional & Technical	$414	$0	$0	$1,654	$2,068	$427	$0	$0	$1,710	$2,137	$442	$0	$0	$1,768	$2,210	$457	$0	$0	$1,828	$2,285	$473	$0	$0	$1,890	$2,363	$489	$0	$0	$1,955	$2,444
Engineering Services	$207	$0	$0	$827	$1,034	$214	$0	$0	$855	$1,069	$221	$0	$0	$884	$1,105	$229	$0	$0	$914	$1,143	$236	$0	$0	$945	$1,182	$244	$0	$0	$977	$1,222
TSSD Fees	$478,800	$0	$119,700	$0	$598,500	$502,740	$0	$125,685	$0	$628,425	$527,877	$0	$131,969	$0	$659,846	$554,271	$0	$138,568	$0	$692,839	$581,984	$0	$145,496	$0	$727,480	$611,084	$0	$152,771	$0	$763,855
TSSD Billing	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sewer Television Expenses	$414	$0	$0	$1,654	$2,068	$427	$0	$0	$1,710	$2,137	$442	$0	$0	$1,768	$2,210	$457	$0	$0	$1,828	$2,285	$473	$0	$0	$1,890	$2,363	$489	$0	$0	$1,955	$2,444
Insurance	$1,551	$0	$0	$6,203	$7,754	$1,603	$0	$0	$6,412	$8,016	$1,657	$0	$0	$6,629	$8,286	$1,714	$0	$0	$6,855	$8,569	$1,772	$0	$0	$7,089	$8,862	$1,833	$0	$0	$7,331	$9,163
Total	**$531,400**	**$0**	**$119,700**	**$210,399**	**$861,499**	**$557,118**	**$0**	**$125,685**	**$217,510**	**$900,313**	**$584,090**	**$0**	**$131,969**	**$224,851**	**$940,911**	**$612,403**	**$0**	**$138,568**	**$232,530**	**$983,501**	**$642,102**	**$0**	**$145,496**	**$240,471**	**$1,028,069**	**$673,248**	**$0**	**$152,771**	**$248,659**	**$1,074,678**
Percent	**61.7%**	**0.0%**	**13.9%**	**24.4%**	**100.0%**	**61.9%**	**0.0%**	**14.0%**	**24.2%**	**100.0%**	**62.1%**	**0.0%**	**14.0%**	**23.9%**	**100.0%**	**62.3%**	**0.0%**	**14.1%**	**23.6%**	**100.0%**	**62.5%**	**0.0%**	**14.2%**	**23.4%**	**100.0%**	**62.6%**	**0.0%**	**14.2%**	**23.1%**	**100.0%**

Table 15
Cedar Hills - Sewer Rate Study
Revenue Requirements by Service Characteristics

	FYE 2013					FYE 2014					FYE 2015					FYE 2016					FYE 2017					FYE 2018				
Item	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**
O&M	$531,400	$0	$119,700	$210,399	$861,499	$557,118	$0	$125,685	$217,510	$900,313	$584,090	$0	$131,969	$224,851	$940,911	$612,403	$0	$138,568	$232,530	$983,501	$642,102	$0	$145,496	$240,471	$1,028,069	$673,248	$0	$152,771	$248,659	$1,074,678
Debt Service	$6,067	$0	$0	$24,266	$30,333	$6,159	$0	$0	$24,634	$30,793	$6,243	$0	$0	$24,970	$31,213	$6,123	$0	$0	$24,490	$30,613	$6,199	$0	$0	$24,794	$30,993	$6,066.50	$0.00	$0.00	$24,266.00	$30,333
Capital Outlays	$9,933	$0	$0	$39,731	$49,664	$13,840	$0	$0	$55,358	$69,198	$18,141	$0	$0	$72,564	$90,705	$23,456	$0	$0	$93,825	$117,281	$28,720	$0	$0	$114,879	$143,599	$34,730	$0	$0	$138,918	$173,648
Less: Operations Non-Rate Revenue	$672	$0	$151	$266	$1,089	$700	$0	$158	$273	$1,130	$728	$0	$164	$280	$1,173	$758	$0	$172	$288	$1,218	$790	$0	$179	$296	$1,264	$822	$0	$187	$304	$1,313
Less: Expansion Non-Rate Revenue	$980	$0	$0	$3,919	$4,899	$965	$0	$0	$3,861	$4,826	$965	$0	$0.00	$3,861	$4,826	$1,126	$0	$0	$4,505	$5,631	$1,073	$0	$0	$4,290	$5,363	$1,072.53	$0.00	$0.00	$4,290.14	$5,363
Total	**$545,747**	**$0**	**$119,549**	**$270,211**	**$935,507**	**$575,451**	**$0**	**$125,527**	**$293,368**	**$994,346**	**$606,780**	**$0**	**$131,805**	**$318,244**	**$1,056,829**	**$640,098**	**$0**	**$138,396**	**$346,052**	**$1,124,546**	**$675,158**	**$0**	**$145,317**	**$375,558**	**$1,196,034**	**$712,150**	**$0**	**$152,584**	**$407,249**	**$1,271,983**

Table 16
Cedar Hills - Sewer Rate Study
Cost Allocations to Customer Classes

	FYE 2013					FYE 2014					FYE 2015					FYE 2016					FYE 2017					FYE 2018				
	Volume	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**	**Volume**	**Capacity**	**Strength**	**Customer**	**Total**
Residential	$508,227	$0	$111,330	$266,503	$886,060	$536,166	$0	$116,958	$289,373	$942,497	$565,645	$0	$122,869	$313,941	$1,002,456	$595,813	$0	$128,821	$341,273	$1,065,908	$628,803	$0	$135,340	$370,414	$1,134,557	$663,624.33	$0	$142,187	$401,715	$1,207,527
Commercial	$20,631	$0	$4,519	$2,022	$27,172	$21,601	$0	$4,712	$2,179	$28,492	$22,618	$0	$4,913	$2,347	$29,878	$24,941	$0	$5,392	$2,671	$33,004	$26,107	$0	$5,619	$2,875	$34,601	$27,329.55	$0	$5,856	$3,093	$36,278
Institutional	$16,889	$0	$3,700	$1,685	$22,274	$17,684	$0	$3,857	$1,816	$23,357	$18,517	$0	$4,022	$1,956	$24,494	$19,343	$0	$4,182	$2,108	$25,634	$20,248	$0	$4,358	$2,270	$26,875	$21,195.75	$0	$4,541	$2,442	$28,179
Total	**$545,747**	**$0**	**$119,549**	**$270,211**	**$935,507**	**$575,451**	**$0**	**$125,527**	**$293,368**	**$994,346**	**$606,780**	**$0**	**$131,805**	**$318,244**	**$1,056,829**	**$640,098**	**$0**	**$138,396**	**$346,052**	**$1,124,546**	**$675,158**	**$0**	**$145,317**	**$375,558**	**$1,196,034**	**$712,150**	**$0**	**$152,584**	**$407,249**	**$1,271,983**
Allocation Basis	Avg. Demand	Pk. Demand	Strength	Account		Avg. Demand	Pk. Demand	Strength	Account		Avg. Demand	Pk. Demand	Strength	Account		Avg. Demand	Pk. Demand	Strength	Account		Avg. Demand	Pk. Demand	Strength	Account		Avg. Demand	Pk. Demand	Strength	Account	

Table Rates 17
Cedar Hills - Sewer Rate Study
Existing Rates and Projected Revenue

Base Rate	Existing	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$13.50	$384,264	$387,180	$390,096	$393,336	$396,576	$399,816
Commercial	$13.50	$2,916	$2,916	$2,916	$3,078	$3,078	$3,078
Institutional	$13.50	$2,430	$2,430	$2,430	$2,430	$2,430	$2,430

Volume Rate	Existing	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$2.85	$462,950	$466,463	$469,976	$473,880	$477,783	$481,687
Commercial	$2.85	$18,793	$18,793	$18,793	$19,837	$19,837	$19,837
Institutional	$2.85	$15,385	$15,385	$15,385	$15,385	$15,385	$15,385

Revenue - Existing Rates	$886,738	$893,167	$899,596	$907,946	$915,089	$922,233
Revenue Required	$935,507	$994,346	$1,056,829	$1,124,546	$1,196,034	$1,271,983
Surplus/(Shortfall)	($48,769)	($101,179)	($157,232)	($216,600)	($280,945)	($349,751)

Table Rates 18
Cedar Hills - Sewer Rate Study
Calculated Rates

Monthly Base Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$9.36	$10.09	$10.86	$11.71	$12.61	$13.56
Commercial	$9.36	$10.09	$10.86	$11.71	$12.61	$13.56
Institutional	$9.36	$10.09	$10.86	$11.71	$12.61	$13.56

Volume Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Volume Component						
Residential	*$3.13*	*$3.28*	*$3.43*	*$3.58*	*$3.75*	*$3.93*
Commercial	*$3.13*	*$3.28*	*$3.43*	*$3.58*	*$3.75*	*$3.93*
Institutional	*$3.13*	*$3.28*	*$3.43*	*$3.58*	*$3.75*	*$3.93*
Capacity Component						
Residential	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*
Commercial	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*
Institutional	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*	*$0.00*
Strength Component						
Residential	*$0.69*	*$0.71*	*$0.75*	*$0.77*	*$0.81*	*$0.84*
Commercial	*$0.69*	*$0.71*	*$0.75*	*$0.77*	*$0.81*	*$0.84*
Institutional	*$0.69*	*$0.71*	*$0.75*	*$0.77*	*$0.81*	*$0.84*
Total Volume Rate						
Residential	$3.81	$3.99	$4.18	$4.36	$4.56	$4.77
Commercial	$3.81	$3.99	$4.18	$4.36	$4.56	$4.77
Institutional	$3.81	$3.99	$4.18	$4.36	$4.56	$4.77

Industrial Surcharges	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Volume Surcharge ($/kgal)	$3.13	$3.28	$3.43	$3.58	$3.75	$3.93
Capacity Surcharge ($/gpd)	$0.0000	$0.0000	$0.0000	$0.0000	$0.0000	$0.0000
BOD Surcharge ($/lb)	$0.2093	$0.2182	$0.2275	$0.2366	$0.2465	$0.2569
TSS Surcharge($/lb)	$0.1590	$0.1658	$0.1728	$0.1797	$0.1873	$0.1952

Table Rates 19
Cedar Hills - Sewer Rate Study
Recommended Rates

Monthly Base Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
3/4-inch water meter	$13.50	$13.50	$13.50	$13.50	$13.50	$13.56
1-inch water meter	$17.18	$17.18	$17.18	$17.18	$17.18	$17.26
1 1/2-inch water meter	$22.09	$22.09	$22.09	$22.09	$22.09	$22.20
2-inch water meter	$35.59	$35.59	$35.59	$35.59	$35.59	$35.76
3-inch water meter	$135.00	$135.00	$135.00	$135.00	$135.00	$135.64
4-inch water meter	$171.82	$171.82	$171.82	$171.82	$171.82	$172.63
6-inch water meter	$257.73	$257.73	$257.73	$257.73	$257.73	$258.95
8-inch water meter	$355.91	$355.91	$355.91	$355.91	$355.91	$357.60
10-inch water meter	$490.91	$490.91	$490.91	$490.91	$490.91	$493.24

Total Volume Rate						
Residential	$3.13	$3.43	$3.74	$4.06	$4.41	$4.77
Commercial	$3.13	$3.43	$3.74	$4.06	$4.41	$4.77
Institutional	$3.13	$3.43	$3.74	$4.06	$4.41	$4.77

APPENDIX D

DETAILED STORM DRAIN RATE MODEL TABLES

10-Year Budget Plan - Storm Drain

	Historic Year			Projected Year					
	FYE 2010	**FYE 2011**	**FYE 2012**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Total Number of Accounts	2,032	2,032	2,365	2,383	2,401	2,419	2,439	2,459	2,479
% Growth from Previous Year	-	0.00%	16.39%	0.76%	0.76%	0.75%	0.83%	0.82%	0.81%
Expenditures									
O&M	$17,461	$207,901	$232,200	$240,048	$248,162	$256,537	$265,298	$274,358	$283,700
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total Capital Expenditures	$0	$46,779	$80,000	$80,000	$80,000	$10,000	$410,300	$10,609	$10,927
Total Expenditures	*$17,461*	*$254,680*	*$312,200*	*$320,048*	*$328,162*	*$266,537*	*$675,598*	*$284,967*	*$294,627*
Capital Expenditures from Bond Proceeds	$0	$0	$0	$0	$0	$0	$0	$0	$0
Capital Expenditures from Reserves	$0	$46,779	$80,000	$80,000	$80,000	$10,000	$410,300	$10,609	$10,927
Income									
Other Non-Rate	$0	$0	$0	$0	$0	$0	$0	$0	$0
Sales - Existing Rates	$166,319	$184,535	$215,000	$216,636	$218,273	$219,909	$221,727	$223,545	$225,364
Projected Income - Existing Rates	*$166,319*	*$184,535*	*$215,000*	*$216,636*	*$218,273*	*$219,909*	*$221,727*	*$223,545*	*$225,364*
System Investment Goal	$91,486	$94,231	$112,500	$116,731	$121,115	$125,656	$130,465	$135,449	$140,614
Recommended Long-term Level of Funding	$108,947	$302,132	$344,700	$356,780	$369,277	$382,194	$395,763	$409,807	$424,314
Recommended Rate Increases				6.5%	6.5%	6.5%	6.5%	6.5%	6.5%
Sales Revenue With Increase	$166,319	$184,535	$215,000	$230,718	$247,570	$265,639	$285,245	$306,277	$328,838
Projected Income - Recommended Rates	*$166,319*	*$184,535*	*$215,000*	*$230,718*	*$247,570*	*$265,639*	*$285,245*	*$306,277*	*$328,838*

Table 1
Cedar Hills - Storm Drain Rate Study
Historic Drainage Area
(acres)

	FYE 2010			*FYE 2011*			*FYE 2012*				
Customer Class	**Lot Size**	**Accounts**	**Acres per Account**	**Lot Size**	**Accounts**	**Acres per Account**	**Lot Size**	**Accounts**	**Acres per Account**	**Planning Acres/Acct.**	**Acres/Acct. (kgal/month)**
Residential	605	2,016	0.3	605	2,016	0.3	705	2,349	0.3	0.3	0.0
Commercial	18	7	2.5	18	7	2.5	18	7	2.5	2.5	0.2
Institutional	49	9	5.5	49	9	5.5	49	9	5.5	5.5	0.5
Total	**672**	**2,032**	**0.3**	**672**	**2,032**	**0.3**	**772**	**2,365**	**0.3**	**0.3**	**0.0**

Table 2
Cedar Hills - Storm Drain Rate Study
Projected Accounts

		Number					
Customer Class		**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
	% Growth	**0.76%**	**0.76%**	**0.75%**	**0.83%**	**0.83%**	**0.81%**
Residential		2,367	2,385	2,403	2,423	2,443	2,463
Commercial		7	7	7	7	7	7
Institutional		9	9	9	9	9	9
Total		**2,383**	**2,401**	**2,419**	**2,439**	**2,459**	**2,479**

Table 3
Cedar Hills - Storm Drain Rate Study
Projected Drainage Area

	Planning	**Amount (acres)**					
Customer Class	**Acres/Acct.**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Residential	0.3	710	715	721	727	733	739
Commercial	2.5	18	18	18	18	18	18
Institutional	5.5	49	49	49	49	49	49
Total		**777**	**783**	**788**	**794**	**800**	**806**

Table 4
Cedar Hills - Storm Drain Rate Study
Connection Fee Revenue

Size of Meter	Impact Fee ($/ERU)	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
Per ERU	$0.00		$0	$0	$0	$0	$0	$0
Total Impact Fee Revenue		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Table 5
Cedar Hills - Storm Drain Rate Study
Non-Rate Revenue (Including Connection Fees)

Assumed Inflation Rate = 3.0%

Item	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
Operations							
Total Operations Non-Rate Revenue	$0	$0	$0	$0	$0	$0	$0
Expansion and Replacement							
Total Expansion Non-Rate Revenue	$0	$0	$0	$0	$0	$0	$0
Total Non-Rate Revenue	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**

Table 6
Cedar Hills - Storm Drain Rate Study
Revenue Requirements
Cash Basis

Item	% Growth	Projected FYE 2012	Projected FYE 2013	Projected FYE 2014	Projected FYE 2015	Projected FYE 2016	Projected FYE 2017	Projected FYE 2018
O&M								
Salary & Wages (Full-Time)		$130,850	$135,273	$139,845	$144,565	$149,502	$154,607	$159,871
Overtime		$2,500	$2,585	$2,672	$2,762	$2,856	$2,954	$3,054
Salary & Wages (Part-Time)		$5,750	$5,944	$6,145	$6,353	$6,570	$6,794	$7,025
Employee Benefits		$76,200	$78,776	$81,438	$84,187	$87,062	$90,035	$93,101
Storm Drain Supplies		$3,000	$3,101	$3,206	$3,314	$3,428	$3,545	$3,665
Dues & Subscriptions		$2,000	$2,068	$2,137	$2,210	$2,285	$2,363	$2,444
Education & Training		$1,000	$1,034	$1,069	$1,105	$1,143	$1,182	$1,222
Computer Expenses		$1,200	$1,241	$1,282	$1,326	$1,371	$1,418	$1,466
Tools & Equipment		$2,000	$2,068	$2,137	$2,210	$2,285	$2,363	$2,444
Communications & Telephone		$1,500	$1,551	$1,603	$1,657	$1,714	$1,772	$1,833
Professional & Technical		$1,000	$1,034	$1,069	$1,105	$1,143	$1,182	$1,222
Testing		$200	$207	$214	$221	$229	$236	$244
Insurance		$5,000	$5,169	$5,344	$5,524	$5,713	$5,908	$6,109
Total O&M		**$232,200**	**$240,048**	**$248,162**	**$256,537**	**$265,298**	**$274,358**	**$283,700**
Debt Service								
Total Debt Service		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
Expansion and Replacement		**2012**	**FYE 2013**	**FYE 2014**	**FYE 2015**	**FYE 2016**	**FYE 2017**	**FYE 2018**
Old Town Storm Drain Retention Project						$ 400,000		
Rehabilitation and Replacement Budget		$ 80,000	$ 80,000	$ 80,000	$ 10,000	$ 10,300	$ 10,609	$ 10,927
Transfer to/(from) Reserve Fund		$ (97,200)	$ (89,331)	$ (80,592)	$ (898)	$ (390,354)	$ 21,309	$ 34,210
Total Capital Outlays		**$ (17,200)**	**($9,331)**	**($592)**	**$9,102**	**$19,946**	**$31,918**	**$45,138**
Total Revenue Requirements		**$ 215,000**	**$230,718**	**$247,570**	**$265,639**	**$285,245**	**$306,277**	**$328,838**
LESS:								
Operations Non-Rate Revenue		$0	$0	$0	$0	$0	$0	$0
Expansion Non-Rate Revenue		$0	$0	$0	$0	$0	$0	$0
Net Revenue Requirements		**$ 215,000**	**$ 230,718**	**$ 247,570**	**$ 265,639**	**$ 285,245**	**$ 306,277**	**$ 328,838**

Table 7
Cedar Hills - Storm Drain Rate Study
Cost Allocation Percentages to Service Characteristics

Item	Volume	Customer	Total
O&M			
Salary & Wages (Full-Time)	60%	40%	100%
Overtime	60%	40%	100%
Salary & Wages (Part-Time)	60%	40%	100%
Employee Benefits	60%	40%	100%
Storm Drain Supplies	100%	0%	100%
Dues & Subscriptions	60%	40%	100%
Education & Training	60%	40%	100%
Computer Expenses	0%	100%	100%
Tools & Equipment	60%	40%	100%
Communications & Telephone	0%	100%	100%
Professional & Technical	60%	40%	100%
Testing	60%	40%	100%
Insurance	60%	40%	100%

Table 8
Cedar Hills - Storm Drain Rate Study
Fixed Assets Allocations to Service Characteristics

		Percent			*Allocated Amount*		
Item	**Assets**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**
Main Lines	$3,126,368	100%	0%	100%	$3,126,368	$0	$3,126,368
Total	**$3,126,368**				**$3,126,368**	**$0**	**$3,126,368**
Percent					**100.0%**	**0.0%**	**100.0%**

Table 9
Cedar Hills - Storm Drain Rate Study
Allocation of O&M Costs to Service Characteristics

	FYE 2013			FYE 2014			FYE 2015			FYE 2016			FYE 2017			FYE 2018		
Item	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**
O&M																		
Salary & Wages (Full-Time)	$81,164	$54,109	$135,273	$83,907	$55,938	$139,845	$86,739	$57,826	$144,565	$89,701	$59,801	$149,502	$92,764	$61,843	$154,607	$95,923	$63,949	$159,871
Overtime	$1,551	$1,034	$2,585	$1,603	$1,069	$2,672	$1,657	$1,105	$2,762	$1,714	$1,143	$2,856	$1,772	$1,182	$2,954	$1,833	$1,222	$3,054
Salary & Wages (Part-Time)	$3,567	$2,378	$5,944	$3,687	$2,458	$6,145	$3,812	$2,541	$6,353	$3,942	$2,628	$6,570	$4,076	$2,718	$6,794	$4,215	$2,810	$7,025
Employee Benefits	$47,265	$31,510	$78,776	$48,863	$32,575	$81,438	$50,512	$33,675	$84,187	$52,237	$34,825	$87,062	$54,021	$36,014	$90,035	$55,860	$37,240	$93,101
Storm Drain Supplies	$3,101	$0	$3,101	$3,206	$0	$3,206	$3,314	$0	$3,314	$3,428	$0	$3,428	$3,545	$0	$3,545	$3,665	$0	$3,665
Dues & Subscriptions	$1,241	$827	$2,068	$1,282	$855	$2,137	$1,326	$884	$2,210	$1,371	$914	$2,285	$1,418	$945	$2,363	$1,466	$977	$2,444
Education & Training	$620	$414	$1,034	$641	$427	$1,069	$663	$442	$1,105	$686	$457	$1,143	$709	$473	$1,182	$733	$489	$1,222
Computer Expenses	$0	$1,241	$1,241	$0	$1,282	$1,282	$0	$1,326	$1,326	$0	$1,371	$1,371	$0	$1,418	$1,418	$0	$1,466	$1,466
Tools & Equipment	$1,241	$827	$2,068	$1,282	$855	$2,137	$1,326	$884	$2,210	$1,371	$914	$2,285	$1,418	$945	$2,363	$1,466	$977	$2,444
Communications & Telephone	$0	$1,551	$1,551	$0	$1,603	$1,603	$0	$1,657	$1,657	$0	$1,714	$1,714	$0	$1,772	$1,772	$0	$1,833	$1,833
Professional & Technical	$620	$414	$1,034	$641	$427	$1,069	$663	$442	$1,105	$686	$457	$1,143	$709	$473	$1,182	$733	$489	$1,222
Testing	$124	$83	$207	$128	$85	$214	$133	$88	$221	$137	$91	$229	$142	$95	$236	$147	$98	$244
Insurance	$3,101	$2,068	$5,169	$3,206	$2,137	$5,344	$3,314	$2,210	$5,524	$3,428	$2,285	$5,713	$3,545	$2,363	$5,908	$3,665	$2,444	$6,109
Total	**$143,595**	**$96,454**	**$240,048**	**$148,448**	**$99,714**	**$248,162**	**$153,458**	**$103,079**	**$256,537**	**$158,699**	**$106,599**	**$265,298**	**$164,119**	**$110,240**	**$274,358**	**$169,707**	**$113,993**	**$283,700**
Percent	**59.8%**	**40.2%**	**100.0%**	**59.8%**	**40.2%**	**100.0%**	**59.8%**	**40.2%**	**100.0%**	**59.8%**	**40.2%**	**100.0%**	**59.8%**	**40.2%**	**100.0%**	**59.8%**	**40.2%**	**100.0%**

Table 10
Cedar Hills - Storm Drain Rate Study
Revenue Requirements by Service Characteristics

	FYE 2013			FYE 2014			FYE 2015			FYE 2016			FYE 2017			FYE 2018		
Item	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**
O&M	$143,595	$96,454	$240,048	$148,448	$99,714	$248,162	$153,458	$103,079	$256,537	$158,699	$106,599	$265,298	$164,119	$110,240	$274,358	$169,707	$113,993	$283,700
Debt Service	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00	$0.00	$0
Capital Outlays	($9,331)	$0	($9,331)	($592)	$0	($592)	$9,102	$0	$9,102	$19,946	$0	$19,946	$31,918	$0	$31,918	$45,138	$0	$45,138
Less: Operations Non-Rate Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Less: Expansion Non-Rate Revenue	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00	$0.00	$0
Total	**$134,264**	**$96,454**	**$230,718**	**$147,857**	**$99,714**	**$247,570**	**$162,560**	**$103,079**	**$265,639**	**$178,646**	**$106,599**	**$285,245**	**$196,037**	**$110,240**	**$306,277**	**$214,844**	**$113,993**	**$328,838**

Table 11
Cedar Hills - Storm Drain Rate Study
Cost Allocations to Customer Classes

	FYE 2013			FYE 2014			FYE 2015			FYE 2016			FYE 2017			FYE 2018		
	Volume	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**	**Volume**	**Customer**	**Total**
Residential	$122,669	$95,806	$218,474	$135,175	$99,049	$234,224	$148,713	$102,397	$251,110	$163,543	$105,900	$269,443	$179,589	$109,522	$289,111	$196,952.46	$113,257	$310,210
Commercial	$3,068	$283	$3,352	$3,356	$291	$3,646	$3,664	$298	$3,962	$3,996	$306	$4,302	$4,352	$314	$4,666	$4,734.23	$322	$5,056
Institutional	$8,527	$364	$8,892	$9,326	$374	$9,700	$10,183	$384	$10,567	$11,106	$393	$11,500	$12,096	$403	$12,499	$13,157.75	$414	$13,572
Total	**$134,264**	**$96,454**	**$230,718**	**$147,857**	**$99,714**	**$247,570**	**$162,560**	**$103,079**	**$265,639**	**$178,646**	**$106,599**	**$285,245**	**$196,037**	**$110,240**	**$306,277**	**$214,844**	**$113,993**	**$328,838**
Allocation Basis	Imp. Area	Account		Imp. Area	Account		Imp. Area	Account		Imp. Area	Account		Imp. Area	Account		Imp. Area	Account	

Table Rates 12
Cedar Hills - Storm Drain Rate Study
Existing Rates and Projected Revenue

Base Rate (per ERU)	Existing	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$7.25	$205,914	$207,480	$209,046	$210,786	$212,526	$214,266
Commercial	$7.25	$5,150	$5,150	$5,150	$5,150	$5,150	$5,150
Institutional	$7.25	$14,314	$14,314	$14,314	$14,314	$14,314	$14,314

Volume Rate	Existing	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Commercial	$ -	$ -	$ -	$ -	$ -	$ -	$ -
Institutional	$ -	$ -	$ -	$ -	$ -	$ -	$ -

Revenue - Existing Rates	$225,379	$226,945	$228,511	$230,251	$231,991	$233,731
Revenue Required	$230,718	$247,570	$265,639	$285,245	$306,277	$328,838
Surplus/(Shortfall)	($5,339)	($20,625)	($37,128)	($54,994)	($74,286)	($95,107)

Table Rates 13
Cedar Hills - Storm Drain Rate Study
Calculated Monthly Rates

Base Rate	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$3.37	$3.46	$3.55	$3.64	$3.74	$3.83
Commercial	$3.37	$3.46	$3.55	$3.64	$3.74	$3.83
Institutional	$3.37	$3.46	$3.55	$3.64	$3.74	$3.83

Volume Rate ($/acre)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$14.40	$15.74	$17.19	$18.75	$20.42	$22.21
Commercial	$14.40	$15.74	$17.19	$18.75	$20.42	$22.21
Institutional	$14.40	$15.74	$17.19	$18.75	$20.42	$22.21

Table Rates 14
Cedar Hills - Storm Drain Rate Study
Recommended Rates

Utility Fees (per month)	FYE 2013	FYE 2014	FYE 2015	FYE 2016	FYE 2017	FYE 2018
Residential	$7.69	$8.18	$8.71	$9.27	$9.86	$10.50
Commercial & Institutional						
0.3 acres or less	$7.69	$8.18	$8.71	$9.27	$9.86	$10.50
Larger lots						
Base Rate	$3.37	$3.46	$3.55	$3.64	$3.74	$3.83
$/acre based on lot size	$14.40	$15.74	$17.19	$18.75	$20.42	$22.21

Draper, Utah Office:
154 East 14000 South
Draper, Utah 84020
Phone: (801) 495-2224
Fax: (801) 495-2225

Eagle, Idaho Office:
776 East Riverside Drive
Suite 250
Eagle, Idaho 83616
Phone: (208) 939-9561
Fax: (208) 939-9571

St. George, Utah Office:
20 North Main
Suite 107
St. George, Utah 84770
Phone: (435) 656-3299
Fax: (435) 656-2190

WWW.BOWENCOLLINS.COM

Bowen Collins
& Associates, Inc.
CONSULTING ENGINEERS