FINAL REPORT

Water, Sewer, and Stormwater Tap Fees and Rates Study

Prepared for

Sterling Ranch Community Authority Board

November 2016

CH2M HILL, Inc.
9193 South Jamaica St.
Englewood, CO 80112

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List of Acronyms

AFY	**Acre-Feet per Year**
AWC	**Average Winter Consumption**
AWWA	**American Water Works Association**
CAB	**Sterling Ranch Community Authority Board**
CFE	**Chatfield Valley Framework Entities**
CIP	**Capital Improvements**
DWSD	**Dominion Water and Sanitation District**
EQR	**Equivalent Residential Unit**
O&M	**Operations and Maintenance**
SDC	**System Development Charge**
SFA	**Single Family Attached**

1.0 Introduction

The Sterling Ranch Community Authority Board (CAB) contracted with CH2M in 2016 to prepare this CAB water, sewer, and stormwater tap fee and rates study (CAB Rate Study). The purpose of this study is to document the assumptions and methodology CH2M employed to establish water, sewer, and stormwater system tap fees and retail rates for the CAB in support of its water, sewer, and stormwater enterprises.

1.1 Background

The Sterling Ranch Development (Sterling Ranch or development) is a 3,400-acre planned development in Northwest Douglas County that receives its water, sewer, and stormwater services from Dominion Water and Sanitation District (DWSD or District) and the CAB. Sterling Ranch Development Company (Developer) and Sterling Ranch, LLC (Land Owner) with common ownership as the Developer own or control a significant portion of the property comprising Sterling Ranch. DWSD is the wholesale provider of water and sewer services to the CAB. The CAB is the retail water, sewer, and stormwater provider to customers within Sterling Ranch.

The first filing of Sterling Ranch, which includes approximately 800 homes, began construction in 2015. DWSD is currently delivering construction water to the CAB, and is scheduled to begin delivery of potable water and sewer services in 2017 when the first homes are occupied. At that point, the CAB will start providing water and sewer services to customers.

An initial Sterling Ranch Rate Study, entitled *System Development Charge and Cost-of-Service Water Rates Study* (2014 Rate Study) was prepared by Honey Creek Resources, Inc. In the 2014 Rate Study, Honey Creek Resources recommended the initial Sterling Ranch system development fees, or tap fees, as well as the initial water and sewer rates and associated rate structures.

The initial Sterling Ranch tap fees were calculated with combined CAB and DWSD assets. At that time, the delineation between DWSD and CAB assets had not yet been established. Since then, CAB assets and DWSD assets have been defined; the DWSD assets include surface storage reservoirs, water tanks (potable and non-potable), water and wastewater treatment plants, pump or lift stations including transmission lines and force mains, and other facilities necessary to convey water or sewer flows to/from the wholesale customer. The CAB assets include the system network of pipes and related appurtenances for water distribution and sewer collection. As a part of this 2016 Rate Study, CH2M calculated tap fees for CAB assets. These tap fees were approved by the CAB board in mid-2016, and are assessed to CAB customers. Similarly, a separate tap fee for DWSD assets was developed as discussed in the "Water and Sewer Tap Fees and Rates Study" (DWSD Rate Study). The Sterling Ranch tap fee is the sum of the DWSD and CAB tap fees.

The 2014 Rate Study provided retail rates for water and sewer services. CH2M calculated the CAB retail water, sewer and stormwater rates as a part of the 2016 Rate Study. These rates were presented to the CAB board in mid-2016. Since that time, development assumptions and the water and sewer capital improvements plan (CIP) have changed, and the District and the CAB requested an updated analysis of the tap fees and rates. As a part of this updated analysis, the CAB requested updated documentation of the methodology and assumptions behind the tap fees and rates, and recommendations regarding the tap fees and rates for 2017, which are provided in this report. The changes in the development plan and CIP resulted in no increase to the CAB tap fees or water, sewer and stormwater rates for 2017.

1.2 Scope of Services

CH2M developed CAB tap fees and retail water, sewer, and stormwater rates. The CAB rates include monthly water and sewer availability charges, volumetric indoor and outdoor tiered water rates, a volumetric sewer rate based on indoor water use, and an annual stormwater fee.

Three rate models were built for this study to analyze the various CAB and DWSD enterprises through buildout. Since CAB and DWSD are dependent on each other, the water and sewer rate models each include a financial analysis of the respective CAB and DWSD enterprises. The stormwater rate model is simpler in that currently stormwater services are provided through the CAB, and therefore only one entity is modeled.

Financial projections included in this study are provided for a near-term forecast period (2016-2021). In addition, the fees and rate analysis is consistent with the CAB's long-term business plan through buildout (2040). Forecasted revenues and expenditures are expressed in current 2016 dollars for ease of comparison.

In providing opinions of cost, financial analyses, economic feasibility projections, and schedules for DWSD and the CAB, CH2M has no control over cost or price of labor and materials; unknown or latent conditions of existing equipment or structures that may affect operation or maintenance costs; competitive bidding procedures and market conditions; time or quality of performance by operating personnel or third parties; and other economic and operational factors that may materially affect the ultimate Project cost or schedule. Therefore, CH2M makes no warranty that DWSD and the CAB' s actual costs, financial aspects, economic feasibility, or schedules will not vary from CH2M's opinions, analyses, projections, or estimates.

1.3 Structure of Funds

Currently, the CAB manages six funds in total: the CAB Water Capital Fund and Operating Fund, the CAB Wastewater Capital Fund and Operating Fund, and the CAB Stormwater Capital Fund and Operating Fund. The general structure of the Capital and Operating funds is briefly discussed below:

- **CAB Capital Funds** – These funds include capital expenditures related to water, sewer, or stormwater infrastructure owned by the CAB. The source of revenue for the capital funds are generated through the collection of CAB tap fees at the time new taps are purchased. Interest income on cash reserves is also accrued in this fund.

- **CAB Operating Funds** – The operating funds include operations and maintenance (O&M) expenses for the water, sewer, or stormwater systems. As each system approaches buildout, non-growth capital expenditures related to the existing systems will also be included in these funds. Revenue for this fund is generated through service fees and charges, investment income, and other miscellaneous revenue.

The projected tap fee revenue generated for the capital funds are based on development projections discussed herein and the tap fees discussed in the following sections. Operating Fund revenue generated through water, sewer, and stormwater user charges is projected based on the assumptions and analysis discussed in the following sections.

1.4 Sterling Ranch Community Authority Board Customers

The CAB customers are be comprised of both residential and non-residential classes, with residential customers accounting for over 95 percent of all customers under the conservative development plan that was used for this study. Non-residential customer classes include schools, commercial, irrigation and construction.

Under a conservative development plan provided by the Developer of Sterling Ranch, approximately 9,700 residential units will be built by 2040. It should be noted that Sterling Ranch has zoning entitlements for up to 12,050 residential units, and that development plans will change as buildout continues. The Developer intends to ultimately develop a plan for Sterling Ranch that will incorporate substantially all of the 12,050 units that it has received approval for. It should also be noted that the number of non-residential customers in the current development plan is based on what the Developer believes are conservative estimates of commercial space and other non-residential uses. The estimated number of commercial customers and commercial space is expected to change as development continues. The number of customers and/or number of Equivalent Residential Units (EQR) used in this CAB Rate Study are for planning purposes, and are referenced as such throughout this report and accompanying documents.

The CAB and DWSD should review their rates and fees annually as development assumptions change. The customer characteristics of the development are discussed below.

1.4.1 Customer Classes

The following major customer classes are anticipated for the CAB water, sewer, and stormwater utilities:

- Single Family Detached – Traditional single family residential, detached from adjacent homes
- Single Family Detached (Small) - Traditional single family homes, detached from adjacent homes, but smaller in size
- Single Family Attached – Single family residential, with zero-lot lines or otherwise attached to adjacent homes
- Multi-Family Residential
- Commercial - non-residential including office, retail, schools, and other non-residential private and public users
- Irrigation (Water Customer Only)
- Construction (Water Customer Only)

1.4.2 Number of Customers and Meter Equivalents

The anticipated number of residential customers in each customer class was provided by the Developer through buildout. The anticipated absorption of these units was analyzed by MetroStudy for DWSD. The absorptions used in this study are approximately 23% below the absorptions predicted by MetroStudy. It should also be noted that prior to this 2016 Rate Study, total non-residential demand (acre- feet/year [AFY]) was estimated by Element Water Consulting, Inc. (Element) based on preliminary land planning information provided by the Developer, but not the number of non-residential customers. For this analysis, it has been assumed that the breakdown of non-residential demand by customers and meter size is proportionately similar to that of the Castle Rock Water Utility (serving the nearby Town of Castle Rock, Colorado). Similarly, the number of irrigation customers was not estimated prior to this 2016 Rate Study Update, but rather the expected number of irrigated acres was used by Element to compute a total irrigation demand. An assumption of the number of irrigation customers was made in order to estimate the total number of customers within the development.

Meter equivalents were calculated using meter size capacity ratios as a proxy for water demand and capacity requirements. Meter equivalents are expressed in terms of single family residential equivalent units, which are typically characterized by a 3/4” x 3/4” connection. Older single family residences and multi-family units tend to use smaller meters, 5/8” x 3/4” or 5/8” x 5/8”.

For Sterling Ranch, it was assumed that all detached single-family residences will have 3/4”x 3/4" meters, with each 3/4” meter representing one single family equivalent unit, or EQR. All single-family attached and multi-family units are assumed to have 5/8” x 5/8” meters, with each representing 0.75 single-family units, or EQR. The EQRs for commercial and irrigation customers were estimated based on an assumed distribution of meter sizes, using American Water Works Association (AWWA) meter capacity ratios.

The planned year-end number of customers, equivalent meters, and anticipated annual billable water usage is summarized by customer class, for years 2016 through 2021 in Table A-1 (Appendix A). The anticipated breakdown at buildout of customers by meter sizes and corresponding equivalent meters, or EQRs, is provided in Table A-2 (Appendix A). It should be noted that the Chatfield Valley Framework Entities (CFE) customers are not included in the CAB summary of planned residential customers. The CFE customers are customers outside of Sterling Ranch that may potentially be served by DWSD. Since the financial modeling between CAB and DWSD is so closely related, the CFE customers are included in the summary tables of number customers and equivalent meters, but CFE customers are only included in calculations DWSD fees and rates.

After applying the breakdown of meter sizes and the equivalent meter factors, and removing the irrigation and CFE EQRs the total number of EQRs, the planning number of water and sewer system EQRs is 9,558 by buildout. The current planning number of stormwater EQRs by buildout is 10,446 EQRs, which assumes all residential units have the same impact on the stormwater system. That is, the single family and multifamily units are assumed as 1 EQR, rather than the 0.75 EQRs used for the water and sewer system single-family attached and multifamily customers.

1.5 Methodology

The water, sewer, and stormwater fees and rates summarized in this document include one-time System Development Charges (SDC), or tap fees, for new construction, and estimated monthly usage charges.

CH2M followed guidelines established by Colorado State Law 29-20-104.5. Impact Fees and by the AWWA M1 Manual: Principles of Water Rates, Fees and Charges, 2014, sixth edition for estimating tap fees and rates, as summarized in the following steps:

1. Estimating the amount and timing of anticipated capital expenditures necessary to develop the systems required to serve the project

2. Identifying and estimating the type and number of customers and determining the estimated number of EQRs

3. Calculating the SDCs based on anticipated future capital expenditures and the anticipated number of EQRs

4. Developing a long-term Financial Plan that incorporates projected tap fee revenues, expenditures, financing, and fund balances available for expenditures in future periods

5. From the Financial Plan, determining revenue requirements that identify how much revenue needs to be generated through monthly usage charges to customers to fund O&M and other expenses

6. Identifying and classifying the anticipated customer base in terms of numbers of EQRs by class

7. Allocating Revenue Requirements across the various customer classes

8. Designing rates that are equitable and that generate sufficient revenues from each customer class to sustain the District through buildout and beyond

The steps listed above were followed in the 2014 Rate Study in order to establish the water and

wastewater rate structures. This 2016 update maintains essentially the same rate structure but with updated rates and charges that reflect current assumptions regarding the pace of development, capital plans, water supply sources, agreements with other entities, etc.

1.6 Organization of Report

This report includes recommended tap fees and rates to be assessed by the CAB to the Sterling Ranch customers. By their nature, utility rate studies are table intensive, and supporting text may be easily lost by the reader. In order to present the rate study findings with more clarity, the text and supporting tables have been separated. Summary tables providing the recommended CAB 2016 fees and rates are included within the body of the report, but the supporting computation tables are included in the appendices. This allows the reader to view both the tables and text side-by-side. A brief description of the report section and corresponding appendices is as follows:

Section 1 – Introduction: Discussion of CAB's services and customer characteristics, and description of the methodology for setting tap fees and rates. The tables corresponding to the customer characteristics discussion are provided in Appendix A – Customer Characteristics.

Section 2 – CAB Tap Fees: Discussion of the methodology and calculation of tap fees for the water, sewer, and stormwater enterprises. The tables corresponding to the calculation of the tap fees are included in Appendix B – CAB Tap Fees

Section 3 – Water Rates: Discussion of the manner in which rates were set for the water system and the corresponding tables are included in Appendix C – CAB Water Rates.

Section 4 – Sewer Rates: Discussion of the manner in which rates were set for the sewer system and the corresponding tables are included in Appendix D – CAB Sewer Rates.

Section 5 - Stormwater Rates: Discussion of the manner in which rates were set for the stormwater system, and the corresponding tables are included in Appendix E – CAB Stormwater Rates.

2.0 Community Authority Board (CAB) Tap Fees

This section presents the recommended 2017 tap fees that the CAB will charge new customers within the Sterling Ranch Development. Tap fees are intended to recover the capital cost of the water, sewer, and stormwater infrastructure. The tap fee could equivalently be termed an SDC, impact fee, connection fee, or other terms intended to account for the up-front cost of joining the utility. Tap fees typically have two components:

- A buy-in, or equity, component requiring new customers to reimburse existing customers for available capacity in the existing system
- A growth, or improvement, component to recover the cost of additional capacity needed to serve new customers, on the basis that "growth pays for growth"

A buy-in component is not needed for the CAB because it is a relatively new development with few assets to buy into. As a result, all capital costs will be allocated to growth.

There are two components to the Sterling Ranch tap fee. The first is the tap fee required to recover the DWSD water and sewer system capital costs, and the second is the tap fee required to recover CAB capital costs. The sum of these two comprise the Sterling Ranch Development tap fee.

Based on CH2M's review and analysis of the customer characteristics and capital improvement costs, tap fees were calculated for the water, sewer and stormwater systems. The following section presents the recommended 2017 tap fees that DWSD will charge new customers within the DWSD service area. Since initial approval of the DWSD tap fees in mid-2016, the CIP and development assumptions have changed. The tap fees were reevaluated with these new assumptions and it was determined that the 2017 tap fees would remain at the approved 2016 levels.

2.1 Capital Improvement Program

The CAB CIP includes the acquisition, development, and construction of all major capital assets needed through the build-out of the water, sewer and stormwater systems internal to the Sterling Ranch Planned Development. These expenditures are anticipated to be incurred during the period 2016-2040 and include costs for water distribution, sewer collection, and stormwater collection within the Sterling Ranch Development.

The CAB plans to invest, approximately $8.9 million for water system infrastructure, $4.7 million for sewer infrastructure, and $39.9 million for stormwater infrastructure (measured in 2016 dollars) through buildout. The majority of these expenditures will occur within the next 10 years. In order to complete its infrastructure investment program, near-term financing will be required. As a result, financing costs are a component of the tap fees and of user rates and charges.

2.2 Residential Equivalent Units and Build-out

Since the CAB CIP includes costs through build-out, the calculated tap fees are based on the buildout number of EQRs.[1] For purposes of the Study, the estimated number of EQRs served by each system are

[1] An equivalent residential unit (EQR) is a method of normalizing capacity measures across customer classes. For instance, a 3/4" metered single family residence is typically considered 1 EQR. Multi-family housing units are expressed in fractions of EQR, such as 0.75 EQR/unit, and commercial customers are expressed as multiples of EQRs. Most commonly these equivalents are based on the hydraulic capacity of their meter size relative to 3/4".

as follows, water system: 9,558 EQRs, sewer system: 9,558 EQRs, and stormwater system: 10,446 EQRs through buildout - in year 2040.

2.3 CAB Tap Fees

Tap fees are simply the result of the total capital investment divided by the number of EQRs at buildout. The initial calculation does not include any contingencies or financing costs. The second calculation adds financing costs to the initial tap fee calculation. Several of the capital assets for each system will be financed, and the growth-related financing costs will be recovered through tap fees. The 2017 tap fees remain at the 2016 levels. The current (2016) and proposed (2017) tap fees are listed in Table 2-1 for each customer class. The 2016 and 2017 tap fees include the cost of financing a portion of the capital improvement projects. The tables detailing the tap fee calculation for each enterprise are provided in Appendix B.

Table 2-1
CAB Tap Fees

Description	Current Tap Fees (2016)	Proposed Tap Fees (2017)
Residential		
Single Family Water Tap (per EQR)	$1,500	$1,500
Single Family Sanitary Sewer Tap (per EQR)	$700	$700
Multi-Family Water Tap, per unit	$1,125	$1,125
Multi-Family Sanitary Sewer Tap, per unit	$525	$525
Non-Residential		
Indoor Water Tap (per EQR)	$1,500	$1,500
Irrigation (Non-Residential)		
5/8”	$1,005	$1,005
3/4”	$1,500	$1,500
1”	$2,505	$2,505
1-1/2”	$4,995	$4,995
2”	$10,005	$10,005
3”	$25,005	$25,005
Sanitary Sewer Tap (per EQR)	$700	$700
Residential Stormwater Tap (per unit)	$4,500	$4,500
Non-Residential Stormwater Tap	**	**

**Calculated on a case-by-case basis dependent on impervious area.

The total CAB tap fee for a single family resident is $6,700, the sum of the water, sewer and stormwater tap fees. The Sterling Ranch Development tap fees are the sum of the DWSD tap fees and the CAB tap fees (above). While the 2017 and 2018 CAB tap fees are projected to remain at the 2016 levels, DWSD tap fees are expected to increase in 2018, as discussed in the DWSD Rate Study. The current (2016), proposed (2017), and projected (2018) Sterling Ranch Development tap fees are listed in Table 2-2.

Table 2-2
Sterling Ranch Development Tap Fees

Description	Current Tap Fees (2016)	Proposed Tap Fees (2017)	Projected Tap Fees (2018)
Residential			
Single Family Water Tap (per EQR)	$24,000	$24,000	$27,500
Single Family Sanitary Sewer Tap (per EQR)	$8,000	$8,000	$8,500
Multi-Family Water Tap, per unit	$18,000	$18,000	$20,625
Multi-Family Sanitary Sewer Tap, per unit	$6,000	$6,000	$6,375
Pool Tap	$12,500	$12,500	$13,000
Non-Residential			
Indoor Water Tap (per EQR)	$24,000	$24,000	$27,500
Irrigation (Non-Residential)			
5/8”	$16,080	$16,080	$18,425
3/4”	$24,000	$24,000	$27,500
1”	$40,080	$40,080	$45,925
1-1/2”	$79,920	$79,920	$91,575
2”	$160,080	$160,080	$183,425
3”	$400,080	$400,080	$458,425
Sanitary Sewer Tap (per EQR)	$8,000	$8,000	$8,500
Residential Stormwater Tap (per unit)	$4,500	$4,500	$4,500
Non-Residential Stormwater Tap	**	**	**

**Calculated on a case-by-case basis dependent on impervious area.

The total Sterling Ranch tap fee for a single-family resident under current tap fees in 2017 is $36,500 (sum of water, sewer and stormwater tap fees), and is projected to increase to $40,500 in 2018. Tap fee increases, consistent with other regional districts, in future years is expected and has been included in the financial models. As Sterling Ranch continues to develop, these tap fees should be revisited each year to capture changes in the CIP, adjustments due to inflation, or changes in development assumptions.

3.0 Water Rates

3.1 Introduction

The water rates were established to meet the CAB water enterprise revenue requirements within a 20 to 25-year forecast period in order to satisfy the long-term business plan for the CAB. The revenue requirements are based on a wide range of assumptions as discussed in the following sections.

3.2 Revenue Requirements

Revenue requirements define the annual revenue needed to operate the water system while meeting all operating, maintenance, and capital expenses. User charge revenue requirements define the revenue needed from water rates, net of other sources of revenue. The revenue requirements will be recovered from the water system customers of various classes using the base-extra capacity cost allocation method, as established in the 2014 Rate Study. The near-term revenue requirements for the CAB are simply the estimated O&M expenses.

3.2.1 Operation and Maintenance Expenses

CAB is responsible for operating and maintaining the water distribution system within the Sterling Ranch Development, which consists primarily of water distribution lines to deliver water from DWSD infrastructure to CAB's retail customers. CAB is also responsible for the billing system and other district administrative expenses. O&M expenses were estimated using various sources of information. It was assumed annual O&M expenses were two percent of CAB's capital costs. Administration expenses for DWSD and CAB were estimated by DWSD as a whole, meaning administration expenses included the costs for DWSD Water and Sewer, and CAB Water, Sewer, and Stormwater enterprises. These administration expenses were proportioned to the various entities, and it was assumed CAB Water administration was approximately 45 percent of the total for all of the DWSD and CAB enterprises.

Since water is supplied by DWSD, the largest component of CAB O&M expenses is wholesale water purchases from DWSD. Therefore, CAB's annual O&M expenses are highly dependent on the wholesale water rates charged by DWSD. The majority of water purchased will be for residential and non-residential uses for which CAB will charge retail water rates to recover costs. However, CAB is also responsible for irrigation of the parks and other common areas. In the initial filings, the number of irrigated acres is approximately 35, and by buildout, it was assumed the total number of irrigated acres for the development will be approximately 163 acres. Estimated water use per irrigated acre was provided by Element, which is assumed to be 2 AFY/acre. The costs associated with irrigating parks and open spaces were assumed to benefit all customers, so these costs are recovered through the rates of all retail customers.

Estimated annual O&M expenses are shown in Table C-1 (Appendix C) for the years 2016 through 2021.

3.2.2 Capital-Related Expenditures

For purposes of financial planning, capital expenditures and revenues were evaluated. Capital revenues include tap fees, proceeds from debt issuance, Developer and/or Land Owner advances, interest income on cash reserves, potential transfers from the Operating Fund, and other miscellaneous sources. The Sterling Ranch development plan provides the estimated home closings by year and projected annual tap fee revenue was estimated based upon the estimated absorption rate. Uses of capital funds include annual CIP expenditures and transfers to the Operating Fund to cover some portion of debt service. This rate study assumes at this time that all transfers to the Operating Fund are restricted for the repayment of advances from the Developer or Land Owner and are not used for payment of operating expenses.

The structure of the CAB Water Capital Fund and the cash flow projections for 2016 through 2021 are shown in Table C-2 (Appendix C).

3.2.2.1 Irrigation Taps

In addition to the capital infrastructure of the water system, CAB is responsible for purchasing irrigation taps from DWSD for common areas within the development. It was assumed the irrigation tap fee expenses would be recovered through water rates, and are therefore shown in the Operating Fund Cash Flow (Table C-3, Appendix C).

3.2.2.2 Debt Service

Approximately $5.6 million in net financing proceeds is needed to fund CAB capital expenditures in the early years of the development, which is shown as financing proceeds in 2016 in the Capital Fund cash flow table. The assumptions for this financing are a 25-year term at an interest rate of 7 percent with issuance costs of 2 percent of principal, and repayments beginning within 2 years of issuance. The annual debt service for this financing is funded through tap fee revenue, and a portion of these financing costs are included in the tap fee as discussed above.

3.3 Water Cost of Service Analysis

Since essentially the same rate structure is maintained from the 2014 Rate Study, the revenue requirements as discussed above were updated, as well as the water usage assumptions as discussed in the following sections.

3.3.1 Annual Billable Usage

Water use for the Sterling Ranch Development was estimated by Element by customer class for buildout. This estimate was used along with the development schedule provided by MetroStudy to estimate the annual water usage. It was assumed that home closings will occur ratably throughout the year so, for purposes of estimating the number of customers each year, homes closed in the current year were assumed to require an average 6 months of service in such year. The estimated annual water usage by customer class, in AFY, is shown in Table A-1 (Appendix A) for 2016 through 2021. It is important to note that this is customer usage at the meter and forms the basis for calculating water charges. Overall system demands would also include transmission and distribution system losses.

3.3.2 Monthly Water Usage

Water use is delineated between indoor and outdoor since both will be metered for each customer. The usage factors were developed with the assistance of Element, and applied to the annual usage billable usage to determine the monthly billable usage by customer class.

3.4 Rate Design

Rate design addresses how customer class revenue requirements are recovered within each class, that is, how much of the cost is recovered from the customer through fixed monthly charges and how much is recovered through volume charges on a $/1,000-gallon basis. The rate structure proposed in the 2014 Rate Study was adopted in the 2015 Rules and Regulations. This adopted rate structure incorporates tiered rates designed to manage water usage through a combination of cost of service principles and conservation incentives. The rate structure includes a base fixed monthly charge plus indoor and outdoor tiered volumetric usage charges. This rate structure was maintained for this rate study, and the base and volumetric charges were evaluated against the revenue requirements using the water usages assumptions discussed in the previous section.

3.4.1 Recommended Water Rates

The CAB rates were designed in order to generate sufficient revenue over a 20 to 25-year period to fund O&M expenses and future debt service, and to begin to establish an operating reserve. Recommended water rates are ultimately cost of service-based, but in order to encourage water stewardship, rates within most customer classes are tiered, with each successive tier charged at a higher price per unit. As a result, cost of service drives the overall customer class cost allocation. Each customer class pays their fair share of costs, but within the customer class, some latitude is given to rate designs that accomplish water usage goals.

It is important to note that water service customers will have two water meters, one for water used indoors and one for water used outdoors. Considering this, tiered rates will need to be set in a manner that ensures customers are not encouraged to use outdoor-metered water indoors and vice versa. It is also important to note that there is likely an infinite number of combinations of tiers and tier prices. The analyst needs to simultaneously consider the overall costs allocated to the customer classes, the "elasticity," or responsiveness, of water demand to water price, and the water charges for nearby benchmark utilities.

A water budget approach is used to establish water usage tiers unique to each water user. However, since there are not yet customers in the system nor historical data regarding individual customer water usage, tiered rates are based upon the monthly water usage estimates presented earlier.

The CAB water rates include a monthly Water Service Availability Charge and tiered Water Consumption Charges for indoor and outdoor use. The Water Service Availability Charges include both the indoor and outdoor meters required for single family homes. As previously discussed, the costs associated with purchasing wholesale water from DWSD were incorporated into CAB's revenue requirements. The existing and proposed water retail rates are provided in Table 3-1 by customer class.

Table 3-1
CAB Retail Water Service Availability Charge

Description	Current (2016)	Proposed (2017)
Residential		
Single Family ($/month, per unit)	$56.00	$56.00
Multifamily ($/month, per unit)	$42.00	$42.00
Non-Residential		
3/4”	$56.00	$56.00
1”	$66.00	$66.00
1-1/2”	$71.50	$71.50
2”	$110.00	$110.00
3”	$248.00	$248.00
4”	$496.00	$496.00
Irrigation (Non-Residential)		
3/4”	$56.00	$56.00
1”	$66.00	$66.00
1-1/2”	$71.50	$71.50
2”	$110.00	$110.00
3”	$248.00	$248.00
4”	$496.00	$496.00

The proposed water service availability charge is unchanged from 2016.

Volumetric water consumption rates were designed for indoor and for outdoor water use. The current indoor water consumption rate is an increasing block structure. The rate structure assumes an individualized water budget using the average winter consumption (AWC). The AWC is the customer's actual water use for the months of December, January, and February. This approach can be used for all customer classes and is based on a customer’s individual water consumption characteristics. The current and proposed rates are provided in Table 3-2.

Table 3-2
CAB Indoor Consumption Charge

Tier	Current (2016) Fee per 1,000 gallons	Proposed (2017) Fee per 1,000 gallons
<100% of AWC	$6.65	$6.65
100% to 120% AWC	$8.20	$8.20
>120% of allocated budget	$12.25	$12.25

No changes in the water rates are proposed for 2017. Accounts without an AWC history will be assigned 8,000 gallons per month as an initial AWC.

The current and proposed outdoor consumption charge is summarized in Table 3-3.

Table 3-3
CAB Outdoor Consumption Charge

Tier	Current (2016) Fee per 1,000 gallons	Proposed (2017) Fee per 1,000 gallons
Annual Water Allotment <100%	$8.20	$8.20
Annual Water Allotment 100% - 120%	$12.25	$12.25
Annual Water Allotment 120% - 140%	$16.35	$16.35
Annual Water Allotment >140%	$20.00	$20.00
Construction Water	N/A	$11.75

The proposed 2017 rates remained unchanged from the 2016 rates; however, a new CAB construction water rate is proposed in 2017 to recover costs for construction water from metered locations in the potable distribution system. These rates should be reviewed annually to ensure that operations and maintenance expenses are recovered as development continues to grow. An annual rate increase, consistent with other regional districts, in future years is expected and has been included in the financial model.

3.4.1.1 Revenue and Cash Flow

The Operating Fund cash flow is provided in Appendix C (Table C-3), which summarizes rate revenue at the proposed rates. The annual rate increases have been modeled at 1 percent in excess of inflation. In the early years of the development, the revenue from the small number of customers will not be sufficient to fully recover operating expenses, as shown on the Operating Fund Cash Flow table. Operating shortfalls are expected to be financed through Developer Advances, Land Owner Advances, or other financing sources available to the CAB.

3.4.1.2 Residential Monthly Bills at Proposed Rates

The residential monthly bill at proposed rates for the average single-family resident is estimated to be approximately $81 per month for indoor use or winter use. During summer months, such as June, July, or August, when outdoor usage tends to be at its peak, the monthly bill is estimated to be approximately $134, which includes both indoor and outdoor usage. This calculation assumes an AWC of 3,800 gallons per month and outdoor consumption of 6,390 gallons per month.

4.0 Sewer Rates

4.1 Introduction

The sewer rates were established to meet the CAB water enterprise revenue requirements within a 20 to 25-year forecast period in order to satisfy the long-term business plan for the CAB. The revenue requirements are based on a wide range of assumptions as discussed in the following sections.

4.2 Revenue Requirements

Revenue requirements define the annual revenue needed to operate the CAB Sewer enterprise while meeting all operating, maintenance, and capital expenses. User charge revenue requirements define the revenue needed from sewer rates, net of other sources of revenue. These costs will be recovered from the sewer system customers of various classes. The near-term revenue requirements for the CAB are simply the estimated O&M expenses.

4.2.1 Operation and Maintenance Expenses

CAB is responsible for operating and maintaining the sewer collection system within the Sterling Ranch Development, which is primarily collection lines that convey wastewater to the DWSD lift stations. CAB is also responsible for the billing system and other administrative expenses. O&M expenses were estimated using various sources of information. Annual O&M expenses on collection lines within the development were assumed at 2 percent of the capital costs. Administration expenses for DWSD and CAB were estimated by DWSD as a whole, meaning administration expenses included the costs for DWSD Water and Sewer, and CAB Water, Sewer, and Stormwater enterprises. These administration expenses were proportioned to the various entities, and it was assumed CAB Sewer administration was approximately 25 percent of the total for all of the DWSD and CAB enterprises.

The CAB receives sewer services such as sewer transmission and treatment from DWSD, which equates to the largest component of the CAB sewer system O&M expenses. CAB is charged a wholesale sewer rate by DWSD based on the estimated plant influent measured at the sewer treatment plant as estimated by Element. At buildout, Element estimated the plant influent to be approximately 1,555 AFY. The build-out plant influent was scaled by year using the current conservative development plan provided by the Developer to determine the annual plant influent expected from 2017 through buildout. Similar to the assumption used in the water rate analysis, it was assumed that home closings will occur ratably throughout the year so, for purposes of estimating the number of customers each year, homes closed in the current year were assumed to require an average 6 months of service in such year. The DWSD charges to CAB for sewer services was determined by multiplying the annual plant influent by the DWSD wholesale sewer rate. Estimated O&M expenses are shown in Table D-1 (Appendix D) for the years 2016 through 2021.

4.2.2 Capital-Related Expenditures

For purposes of financial planning, capital expenditures and revenues were evaluated. Capital revenues include tap fees, proceeds from debt issuance, Developer and Land Owner advances, interest income on cash reserves, potential transfers from the Operating Fund, and other miscellaneous sources. The MetroStudy report provides the estimated home closings by year and projected annual tap fee revenue was estimated based upon the estimated absorption rate. Uses of funds include annual CIP expenditures and transfers to the Operating Fund to cover some portion of debt service. Transfers to the Operating Fund are restricted for the repayment of advances from the Developer and the Land Owner and are not used for payment of operating expenses. The structure of the CAB Sewer Capital Fund is demonstrated in Table D-2 (Appendix D).

4.2.2.1 Debt Service

Approximately $1.2 million is needed to fund CAB capital expenditures in early years, which is shown as financing proceeds in 2016 in the Capital Fund cash flow table. The assumptions for this financing are a 25-year term at an interest rate of 7 percent, with issuance costs of 2 percent of principal, and repayments beginning within 2 years of issuance. The annual debt service for this financing is funded through tap fee revenue, and a portion of these financing costs are included in the tap fee as discussed above.

4.3 Sewer Rate Design

Sewer rate structures can vary from fixed flat rates, charges based on a percentage of water use, or charges based on annual indoor water usage estimates. From the 2014 Rate Study effort, a preliminary sewer rate structure was proposed, which was adopted in the 2015 CAB Rules and Regulations. The rate structure includes a base fixed monthly charge plus a volumetric usage charge. This rate structure was maintained for this rate study, and the fixed charge and volumetric charges were evaluated against the revenue requirements discussed in the previous section.

4.3.1 Recommended Sewer Rates

The CAB rates were designed in order to generate sufficient revenue over a 20 to 25-year period to fund O&M expenses and future debt service, and to begin to establish an operating reserve. User charge revenue is the sum of the base fixed revenue and the revenue generated from the volumetric charge. The annual base fixed revenue is determined by multiplying the base fixed charge to each customer by 12 months. The annual volumetric user charge revenue is determined by multiplying the indoor water use, as used in the water model, by the fee per 1,000 gallons.

CAB Sewer has three customer classes, Single Family Residential, Multi-Family or Single Family Attached (SFA) Residential, and Non-Residential. For each class, the sewer charges are comprised of a monthly base fixed charge plus a volumetric usage charge. Since indoor water use will be metered separate from outdoor water use, the sewer usage charge is calculated using only the metered indoor water use. The current and 2017 proposed sewer charges are summarized by customer class in Table 4-1.

Table 4-1
CAB Sewer Charge

Customer Class	Current (2016)		Proposed (2017)	
	Base Fixed Charge	Fee per 1,000 gallons of Indoor Use	Base Fixed Charge	Fee per 1,000 gallons of Indoor Use
Single Family	$31.00	$6.65	$31.00	$6.65
Multi Family or SFA	$31.00	$6.65	$31.00	$6.65
Non-Residential	$52.00	$7.15	$52.00	$7.15

The proposed 2017 rates are unchanged from the current rates. These rates should be reviewed annually to ensure that operations and maintenance expenses are recovered as development continues to grow. An annual rate increase, consistent with other regional districts, in future years is expected and has been included in the financial model.

4.3.1.1 Revenue and Cash Flow

The Operating Fund cash flow is provided in Appendix D (Table D-3), which summarizes rate revenue at the proposed rates. The annual rate increases have been modeled at the rate of inflation. In the early years of the development, the revenue from the small number of customers will not be sufficient to fully

recover operating expenses, as shown on the Operating Fund Cash Flow table. Operating shortfalls are expected to be financed through Developer Advances, Land Owner Advances, or other financing sources available to the CAB

4.3.1.2 Residential Monthly Bills at Proposed Rates

The residential monthly bill at proposed rates is estimated for the average single-family resident to be approximately $56 per month. This calculation assumes indoor consumption of 3,800 gallons per month.

5.0 Stormwater Rates

5.1 Introduction

The stormwater system is owned, operated, and maintained by CAB, without additional stormwater services currently provided by DWSD. Therefore, the CAB Stormwater rates are based on O&M costs, capital costs, and financing costs of the stormwater system. The stormwater rate structure is an annual flat fee for stormwater customers, as adopted in mid-2016 by the CAB board.

5.2 Revenue Requirements

Revenue requirements define the annual revenue needed to operate the CAB Stormwater enterprise while meeting all operating, maintenance, and capital expenses. User charge revenue requirements define the revenue needed from stormwater rates, net of other sources of revenue. These costs will be recovered from the stormwater customers of various classes. The near-term revenue requirements for the CAB are simply the estimated O&M expenses.

5.2.1 Operation and Maintenance Expenses

CAB is responsible for operating and maintaining the stormwater system within the Sterling Ranch Development, which consists primarily of drainage channels and detention ponds. CAB is also responsible for the billing system and other administrative expenses related to the stormwater system. Annual O&M expenses within the development were assumed at 1 percent of the stormwater capital costs. Administration expenses for DWSD and CAB were estimated by DWSD as a whole, meaning administration expenses included the costs for DWSD Water and Sewer, and CAB Water, Sewer, and Stormwater enterprises. These administration expenses were proportioned to the various entities, and it was assumed CAB Stormwater administration was approximately 5 percent of the total for all of the DWSD and CAB enterprises. Given the nature of stormwater systems, administration and O&M were considered minor compared to the water and sewer systems. Estimated O&M expenditures are shown in Table E-1 (Appendix E) for the years 2016 through 2021.

5.2.2 Capital-Related Expenditures

For purposes of financial planning, capital expenditures and revenues were evaluated. Capital revenues include tap fees, proceeds from debt issuances, Developer and Land Owner Advances, interest income on cash reserves, potential transfers from the Operating Fund, and other miscellaneous sources. The MetroStudy Report provides a basis to estimate the home closings by year and projected annual tap fee revenue was estimated based upon the estimated absorption rate. Uses of capital funds include annual CIP expenditures and transfers to the Operating Fund to cover some portion of debt service and to provide for rate stabilization when necessary. At this time, transfers to the Operating Fund are restricted for the repayment of advances from the Developer and Land Owner, and are not used for payment of operating expenses. The structure of the Capital Fund is demonstrated in Table E-2 (Appendix E) with an estimate of the total expenditures for CAB's major stormwater enterprise assets.

5.2.2.1 Debt Service

Approximately $20 million in net financing proceeds is needed to fund CAB capital expenditures in the near-term, which is shown as financing proceeds in 2016 in the Capital Fund cash flow table. The assumptions for this financing are a 25-year term at an interest rate of 7 percent, with issuance costs of 2 percent of principal, and repayments beginning within 2 years of issuance. The Stormwater tap fee, as discussed in Section 2, does not cover the full cost of financing the Stormwater CIP. Therefore, a portion

of the financing costs associated with the CAB stormwater capital plan are included in the revenue requirements for the stormwater rates.

5.3 Rate Design

The stormwater rate structure adopted in the 2015 Rules and Regulations was a flat monthly fee per customer class. The stormwater rate structure was changed to a flat annual fee when the rates were presented to the CAB Board in mid-2016. The stormwater rates were reevaluated following changes to the development plan and CIP.

5.3.1 Recommended Stormwater Rates

The CAB stormwater rates were designed in order to generate sufficient revenue over a 20 to 25-year period to fund O&M expenses and future debt service, and to begin to establish an operating reserve. Similar to the assumption used in the water rate analysis, it was assumed that home closings will occur ratably throughout the year so, for purposes of estimating the number of customers each year, homes closed in the current year were assumed to require an average 6 months of service in such year. The current and proposed stormwater rates are summarized by customer class in Table 5-1.

Table 5-1
CAB Stormwater Charge

Customer Class	Current (2016) Minimum Annual Charge	Proposed (2017) Minimum Annual Charge
Single Family	$150	$150
Multi Family (per unit)	$150	$150
Non-Residential (per user)	$365	$365

No change to the stormwater charge are recommended for 2017. These rates should be reviewed annually to ensure that operations and maintenance expenses are recovered as development continues to grow. An annual rate increase, consistent with other regional districts, in future years is expected and has been included in the financial model. As Sterling Ranch continues to develop, a rate structure that considers impervious area should be considered for the non-residential customer class. The current rate design methodology will be further refined in future rate study updates.

5.3.1.1 Revenue and Cash Flow

The Operating Fund cash flow is provided in Appendix E (Table E-3), which summarizes rate revenue at the proposed rates. The annual rate increases have been modeled at 1 percent in excess of inflation. In the early years of the development, the revenue from the small number of customers will not be sufficient to fully recover operating expenses, as shown on the Operating Fund Cash Flow table. Operating shortfalls are expected to be financed through Developer Advances, Land Owner Advances, or other financing sources available to the CAB.

5.3.1.2 Residential Monthly Bills at Proposed Rates

Given the nature of the stormwater rate structure, calculation of the residential bill is simple. The annual residential obligation for stormwater is proposed to be $150.00 per residential customer.

6.0 Conclusions and Recommendations

This CAB Rate Study included setting 2017 tap fees for the CAB water, sewer, and stormwater assets. The CAB tap fees are added to the DWSD tap fees to arrive at the total Sterling Ranch Development tap fee. The total tap fees in 2017 for a detached single-family resident, including water, sewer, and stormwater is $36,500. Tap fee increases, consistent with other regional districts, in future years is expected and has been included in the financial models.

The CAB water, sewer, and stormwater rates were also evaluated as a part of this study. The rate structures of each of the enterprises are generally consistent with the 2014 Rate Study and the CAB Rules and Regulations adopted in 2015. The water rates consist of a fixed monthly charge and volumetric rates for both indoor and outdoor water use based on individualized water budgets using either the customer's irrigated area (outdoor irrigation) or the customer's AWC (indoor use). The outdoor budget will depend on approved landscaping plans. The sewer rate consists of a fixed monthly charge and volumetric rates based on indoor water usage, and the stormwater rate is a fixed annual charge. Following evaluation of recent changes to the development plan, and the CIP for each system, no change in 2017 rates is recommended from the rates approved by the CAB board mid-2016. Annual rate increases, consistent with what other regional districts have been imposing, in future years is expected and has been included in the financial model. These rate increases have been modeled for the various services between 0 and 2 percent in excess of the rate of inflation. Finally, The CAB and the underlying metropolitan districts are anticipated to levy 30 mills for CAB operations and maintenance, parks and recreation facilities, and administrative costs. These anticipated costs and revenues were not evaluated as part of this rate study.

It is recommended that CAB review all tap fees and rates each year. This is especially important in the early years of development, as assumptions change regarding enterprise CIPs, development assumptions, water supply sources, etc. are subject to change.

Appendix A
Customer Characteristics

Table A-1
Sterling Ranch Community Authority Board
Customers, EQRs and Water Usage by Year

Description	2016 Projected	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Number of Customers (cumulative)						
Single family detached	-	172	482	760	1,050	1,360
Single family detached (small)	-	44	153	240	300	360
Single family attached	-	-	96	246	356	446
MF Attached	-	-	-	-	60	120
Commercial		5	5	18	41	41
Irrigation*		3	8	13	18	23
Chatfield Valley Framework (CFE) Customers*					5	10
Total Customers, Ex. CFE	**-**	**224**	**744**	**1,277**	**1,825**	**2,350**
Total Customers, Inc. CFE	**-**	**224**	**744**	**1,277**	**1,830**	**2,360**
Equivalent meters (cumulative)						
Single family detached	-	172	482	760	1,050	1,360
Single family detached (small)	-	44	153	240	300	360
Single family attached	-	-	72	185	267	335
MF Attached	-	-	-	-	45	90
Commercial	-	11	11	44	100	100
Irrigation*	-	12	31	51	70	89
CFE*	-	-	-	-	5	10
Total EQRs, Ex. CFE	**-**	**239**	**749**	**1,279**	**1,832**	**2,334**
Total EQRs, Inc. CFE	**-**	**239**	**749**	**1,279**	**1,837**	**2,344**
Annual Water Usage (acre-feet)						
Single family detached	-	49.88	140	220	305	394
Single family detached (small)	-	9	31	48	60	72
Single family attached	-	-	11	27	39	49
MF Attached	-	-	-	-	5	9
Commercial	-	4	4	17	39	39
Irrigation*	-	70	70	70	86	102
Construction Water*	350	250	250	250	250	250
Total billable AF usage (Exc. Construction)	**-**	**133**	**255**	**382**	**533**	**665**
Total billable AF usage (Inc. Construction)	**350**	**383**	**505**	**632**	**783**	**915**

*Dominion Water and Sanitation District Customers only

Table A-2
Sterling Ranch Community Authority Board
Anticipated Meters by Customer Class

Customer class	5/8"x 3/4"	3/4"	1"	1 1/2"	2"	3"	Total	% of total
Single family detached		4,977					4,977	49%
Single family detached (small)		1,136					1,136	11%
Single family attached	1,704						1,704	17%
MF Attached	1,850						1,850	18%
Non-residential units		145	84	58	30	6	322	3%
Irrigation*			21	21	21		63	1%
CFE*		100					100	1%
Total	***3,554***	***6,358***	***105***	***79***	***51***	***6***	***10,153***	***100%***

Water and Sewer CAB EQRs

Equivalent meters	5/8"x 3/4"	3/4"	1"	1 1/2"	2"	3"	Total	% of total
Equivalent meter factor	*0.75*	*1.00*	*1.67*	*3.33*	*6.67*	*16.67*		
Single family detached	-	4,977	-	-	-	-	4,977	50%
Single family detached (small)	-	1,136	-	-	-	-	1,136	11%
Single family attached	1,278	-	-	-	-	-	1,278	13%
MF Attached	1,388	-	-	-	-	-	1,388	14%
Non-residential units	-	145	140	193	200	100	779	8%
Sub-Total (CAB EQRs)	**2,666**	**6,258**	**140**	**193**	**200**	**100**	**9,558**	
Irrigation*	-	-	35	70	140	-	245	2%
CFE*	-	100	-	-	-	-	100	1%
Total	***2,666***	***6,358***	***175***	***263***	***340***	***100***	***9,903***	***100%***

*Dominion Water and Sanitation District Customers only

Stormwater CAB EQRs

Equivalent meters	5/8"x 3/4"	3/4"	1"	1 1/2"	2"	3"	Total	% of total
Equivalent meter factor	*1.00*	*1.00*	*1.67*	*3.33*	*6.67*	*16.67*		
Single family detached	-	4,977	-	-	-	-	4,977	48%
Single family detached (small)	-	1,136	-	-	-	-	1,136	11%
Single family attached	1,704	-	-	-	-	-	1,704	16%
MF Attached	1,850	-	-	-	-	-	1,850	18%
Non-residential units	-	145	140	193	200	100	779	7%
Total (CAB EQRs)	***3,554***	***6,258***	***140***	***193***	***200***	***100***	***10,446***	***100%***

Appendix B
CAB Tap Fees

Table B-1
Sterling Ranch Community Authority Board, Water Enterprise
Calculated Tap Fee

Total capital investment	$	8,924,400
Equivalent residential units (EQR)		8,762
Calculated Water Tap Fee, not inc. financing costs, $/EQR	**$**	**1,020**
Financing Costs included in tap fee ($/EQR)		$480
Calculated Water Tap Fee, with financing costs, $/EQR	**$**	**1,500**

Table B-2
Community Authority Board, Sewer Enterprise
Calculated Tap Fee

Total capital investment	$	4,746,000
Equivalent residential units (EQR)		8,762
Calculated Wastewater Tap Fee, not inc. financing costs, $/EQR	**$**	**540**
Financing Costs included in tap fee ($/EQR)	$	160
Calculated Wastewater Tap Fee, with financing costs, $/EQR	**$**	**700**

Table B-3
Community Authority Board, Stormwater Enterprise
Calculated Tap Fee

Total capital investment, million	$	39,883,300
Equivalent residential units (EQR)		9,650
Calculated Stormwater Tap Fee, non inc. financing costs, $/EQR	**$**	**4,130**
Financing Costs included in tap fee ($/EQR)	$	370
Calculated SDC, with financing costs, $/EQR	**$**	**4,500**

Notes:
Since Filing 1 construction was underway prior to this Rate Study and prior to the definition between CAB and DWSD assets, Filing 1 capital investment is not included in the Total Capital Investment line for either the water, sewer or stormwater enterprises. Additionally, the EQRs for the water and sewer system shown in these tables are net of the 796 EQRs included in Filing 1. The tap fees for Filing 1 were based on the 2014 Rate Study.

Appendix C
CAB Water Rates

Table C-1
Sterling Ranch Community Authority Board, Water Enterprise
Estimated O&M Expenditures

Description	2016 Budget	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Operations and maintenance expenditures						
Distribution System O&M	$ 10,160	$ 27,008	$ 37,872	$ 41,504	$ 43,504	$ 48,416
Administration	$ 360,000	$ 378,000	$ 397,000	$ 417,000	$ 438,000	$ 459,000
Billing	$ -	$ 30,000	$ 42,000	$ 42,000	$ 54,000	$ 60,000
Water Service from DWSD						
Water service Payment to DWSD - Residential	$ -	$ 84,766	$ 353,066	$ 715,987	$ 1,078,628	$ 1,458,272
Water service Payment to DWSD - Commercial	$ -	$ 5,664	$ 12,261	$ 32,122	$ 85,767	$ 121,885
Water service Payment to DWSD - Irrigation	$ -	$ 205,317	$ 209,423	$ 213,612	$ 267,686	$ 323,838
Water service Payment to DWSD - Construction	$ 684,390	$ 733,275	$ 747,941	$ 762,899	$ 778,157	$ 793,720
Water Service Payments to DWSD	**$ 684,390**	**$ 1,029,022**	**$ 1,322,691**	**$ 1,724,621**	**$ 2,210,238**	**$ 2,697,716**
Total annual O&M expenditures	**$ 1,054,550**	**$ 1,434,030**	**$ 1,757,563**	**$ 2,183,125**	**$ 2,691,742**	**$ 3,205,132**

Table C-2
Sterling Ranch Community Authority Board, Water Enterprise
Capital Fund

Description	2016 Budget	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Sources of funds						
Water System Tap Fee Revenue	$ -	$ 213,000	$ 462,000	$ 774,000	$ 724,500	$ 732,000
Financing proceeds	$ 1,200,000	$ 2,000,000	$ 1,500,000	$ 400,000		$ 500,000
Other sources						
Interest earnings						
Total sources	**$ 1,200,000**	**$ 2,213,000**	**$ 1,962,000**	**$ 1,174,000**	**$ 724,500**	**$ 1,232,000**
Uses of funds						
Water CIP	$ 762,000	$ 1,263,600	$ 814,800	$ 272,400	$ 150,000	$ 368,400
Debt Service	$ -	$ -	$ 102,973	$ 274,594	$ 403,309	$ 437,634
Financing Issuance Cost	$ 24,000	$ 40,000	$ 30,000	$ 8,000	$ -	$ 10,000
Transfer to Operating Fund	$ -	$ -	$ -	$ -	$ -	
Transfer from Operating Fund	$ -	$ -	$ -	$ -	$ -	$ -
Total uses	**$ 786,000**	**$ 1,303,600**	**$ 947,773**	**$ 554,994**	**$ 553,309**	**$ 816,034**
Annual Surplus/(Deficiency)	**$ 414,000**	**$ 909,400**	**$ 1,014,227**	**$ 619,006**	**$ 171,191**	**$ 415,966**
Beginning Fund Balance	**$ -**	**$ 414,000**	**$ 1,323,400**	**$ 2,337,627**	**$ 2,956,634**	**$ 3,127,824**
Ending Fund Balance	**$ 414,000**	**$ 1,323,400**	**$ 2,337,627**	**$ 2,956,634**	**$ 3,127,824**	**$ 3,543,791**

Table C-3
Sterling Ranch Community Authority Board, Water Enterprise
Operating Fund Cash Flow

	2016 Budget	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Operating Revenue						
Water service charges (Retail Rate Revenue)	$ -	$ 155,626	$ 637,300	$ 1,316,893	$ 2,028,569	$ 2,732,989
Construction Water Revenue	$ 684,390	$ 733,275	$ 747,941	$ 762,899	$ 778,157	$ 793,720
Non-rate revenues	-	-	-	-	-	-
Total Operating Revenue	**$ 684,390**	**$ 888,901**	**$ 1,385,241**	**$ 2,079,793**	**$ 2,806,727**	**$ 3,526,709**
Operation and maintenance						
Distribution System (O&M)	$ 10,160	$ 27,008	$ 37,872	$ 41,504	$ 43,504	$ 48,416
CAB Administration	$ 360,000	$ 378,000	$ 397,000	$ 417,000	$ 438,000	$ 459,000
Customer Billing	$ -	$ 30,000	$ 42,000	$ 42,000	$ 54,000	$ 60,000
Water Service Payments to DWSD	$ 684,390	$ 1,029,022	$ 1,322,691	$ 1,724,621	$ 2,210,238	$ 2,697,716
Total Expenses	**$ 1,054,550**	**$ 1,464,030**	**$ 1,799,563**	**$ 2,225,125**	**$ 2,745,742**	**$ 3,265,132**
Other Inflows/(Outflows)						
Irrigation Tap Fees to DWSD	$ -	$ (303,420)	$ (505,700)	$ (505,700)	$ (505,700)	$ (505,700)
Total Other Inflows/(Outflows)	**-**	**(303,420)**	**(505,700)**	**(505,700)**	**(505,700)**	**(505,700)**
Annual Surplus/(Deficiency)	**$ (370,160)**	**$ (878,549)**	**$ (920,022)**	**$ (651,032)**	**$ (444,716)**	**$ (244,122)**
Beginning Fund Balance	**$ -**	**$ (370,160)**	**$ (1,248,709)**	**$ (2,168,731)**	**$ (2,819,763)**	**$ (3,264,479)**
Ending Fund Balance	**$ (370,160)**	**$ (1,248,709)**	**$ (2,168,731)**	**$ (2,819,763)**	**$ (3,264,479)**	**$ (3,508,602)**

Appendix D
CAB Sewer Rates

Table D-1
Sterling Ranch Community Authority Board, Sewer Enterprise
Estimated O&M Expenditures

Description	2016 Budget	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Operations and maintenance expenditures						
DSWD Charges	$ -	$ 48,491	$ 196,838	$ 405,584	$ 632,997	$ 853,759
Collection System O&M	$ 5,760	$ 17,304	$ 21,792	$ 26,256	$ 29,544	$ 35,448
District Administration						
Admin cost allocated to WW	$ 200,000	$ 210,000	$ 221,000	$ 232,000	$ 243,000	$ 255,000
Total annual O&M expenditures	**$ 205,760**	**$ 275,795**	**$ 439,630**	**$ 663,840**	**$ 905,541**	**$ 1,144,207**

Table D-2
Sterling Ranch Community Authority Board, Sewer Enterprise
Capital Fund Cash Flow

Description	2016 Budget	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Sources of funds						
Sewer System Tap Fee Revenue	$ 7,700	$ 91,700	$ 215,600	$ 361,200	$ 338,100	$ 341,600
Financing proceeds	$ 490,000	$ 680,000			$ -	$ -
Transfer from Operating Fund	$ -	$ -	$ -	$ -	$ -	$ -
Interest earnings						
Total sources	**$ 497,700**	**$ 771,700**	**$ 215,600**	**$ 361,200**	**$ 338,100**	**$ 341,600**
Uses of funds						
Wastewater CIP	$ 288,000	$ 577,200	$ 224,400	$ 223,200	$ 164,400	$ 295,200
Debt Service	$ -	$ -	$ 42,047	$ 100,398	$ 100,398	$ 100,398
Financing Issuance Cost	$ 9,800	$ 13,600	$ -	$ -	$ -	$ -
Transfer to Operating Fund	$ -	$ -	$ -	$ -	$ -	$ -
Total uses	**$ 297,800**	**$ 590,800**	**$ 266,447**	**$ 323,598**	**$ 264,798**	**$ 395,598**
Annual Surplus/(Deficiency)	**$ 199,900**	**$ 180,900**	**$ (50,847)**	**$ 37,602**	**$ 73,302**	**$ (53,998)**
Beginning Fund Balance	**$ -**	**$ 199,900**	**$ 380,800**	**$ 329,953**	**$ 367,555**	**$ 440,856**
Ending Fund Balance	**$ 199,900**	**$ 380,800**	**$ 329,953**	**$ 367,555**	**$ 440,856**	**$ 386,858**

Table D-3
Sterling Ranch Community Authority Board, Sewer Enterprise
Operating Fund Cash Flow

	2016 Budget	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Operating Revenue						
Wastewater service revenue	$ -	$ 81,000	$ 336,000	$ 695,000	$ 1,075,000	$ 1,443,000
Non-rate revenues						
Total Revenue	**$ -**	**$ 81,000**	**$ 336,000**	**$ 695,000**	**$ 1,075,000**	**$ 1,443,000**
Operation and maintenance						
DSWD Charges	$ -	$ 48,000	$ 197,000	$ 406,000	$ 633,000	$ 854,000
Collection System O&M	$ 6,000	$ 17,000	$ 22,000	$ 26,000	$ 30,000	$ 35,000
Administration	$ 200,000	$ 210,000	$ 221,000	$ 232,000	$ 243,000	$ 255,000
Total O&M Expenses	**$ 206,000**	**$ 275,000**	**$ 440,000**	**$ 664,000**	**$ 906,000**	**$ 1,144,000**
Annual Surplus/(Deficiency)	**$ (206,000)**	**$ (194,000)**	**$ (104,000)**	**$ 31,000**	**$ 169,000**	**$ 299,000**
Beginning Fund Balance	**0**	**$ (206,000)**	**$ (400,000)**	**$ (504,000)**	**$ (473,000)**	**$ (304,000)**
Ending Fund Balance	**$ (206,000)**	**$ (400,000)**	**$ (504,000)**	**$ (473,000)**	**$ (304,000)**	**$ (5,000)**

Appendix E
CAB Stormwater Rates

Table E-1
Sterling Ranch Community Authority Board, Stormwater Enterprise
Estimated O&M Expenses

Description	2016 Budget	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Operations and Maintenance expenditures						
Infrastructure O&M	$ -	$ 83,784	$ 116,304	$ 160,224	$ 178,548	$ 218,400
District Administration	$ 40,000	$ 42,000	$ 44,000	$ 46,000	$ 49,000	$ 51,000
Total Annual O&M Expenditures	**$ 40,000**	**$ 125,784**	**$ 160,304**	**$ 206,224**	**$ 227,548**	**$ 269,400**

Table E-2
Sterling Ranch Community Authority Board, Stormwater Enterprise
Capital Fund

Description	2016 Budget	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Sources of funds						
Stormwater System Development Fee (SD	$ -	$ 747,000	$ 1,552,500	$ 2,515,500	$ 2,340,000	$ 2,340,000
Bond proceeds		$ 8,378,400	$ 3,252,000	$ 4,392,000		$ 3,985,200
Other sources						
Interest earnings						
Transfer from Operating Fund	$ -	$ -	$ -	$ -	$ -	$ -
Total sources	**$ -**	**$ 9,125,400**	**$ 4,804,500**	**$ 6,907,500**	**$ 2,340,000**	**$ 6,325,200**
Uses of funds						
Stormwater CIP expenditures	$ -	$ 8,378,400	$ 3,252,000	$ 4,392,000	$ 1,832,400	$ 3,985,200
Bond Issue Cost	$ -	$ 167,568	$ 65,040	$ 87,840	$ -	$ 79,704
Debt Service	$ -	$ -	$ -	$ 718,955	$ 998,011	$ 1,374,890
Transfer to Operating Fund						
Total uses	**$ -**	**$ 8,545,968**	**$ 3,317,040**	**$ 5,198,795**	**$ 2,830,411**	**$ 5,439,794**
Annual Surplus/(Deficiency)	**$ -**	**$ 579,432**	**$ 1,487,460**	**$ 1,708,705**	**$ (490,411)**	**$ 885,406**
Beginning Fund Balance		**$ -**	**$ 579,432**	**$ 2,066,892**	**$ 3,775,597**	**$ 3,285,187**
Ending Fund Balance	**$ -**	**$ 579,432**	**$ 2,066,892**	**$ 3,775,597**	**$ 3,285,187**	**$ 4,170,592**

Table E-3
Sterling Ranch Community Authority Board, Stormwater Enterprise
Operating Fund

Description	2016 Budget	2017 Projected	2018 Projected	2019 Projected	2020 Projected	2021 Projected
Operating Revenue						
Stormwater service charges	$ -	$ 17,049	$ 73,451	$ 155,464	$ 243,873	$ 331,899
Non-rate revenues						
Total Revenue	**$ -**	**$ 17,049**	**$ 73,451**	**$ 155,464**	**$ 243,873**	**$ 331,899**
Operation and Maintenance Expenses						
Infrastructure O&M	$ -	$ 83,784	$ 116,304	$ 160,224	$ 178,548	$ 218,400
District Administration	$ 40,000	$ 42,000	$ 44,000	$ 46,000	$ 49,000	$ 51,000
Total O&M Expenses	**$ 40,000**	**$ 125,784**	**$ 160,304**	**$ 206,224**	**$ 227,548**	**$ 269,400**
Surplus/(Deficiency)	**$ (40,000)**	**$ (108,735)**	**$ (86,853)**	**$ (50,760)**	**$ 16,325**	**$ 62,499**
Beginning Fund Balance	**$ -**	**$ (40,000)**	**$ (148,735)**	**$ (235,587)**	**$ (286,347)**	**$ (270,022)**
Ending Fund Balance	**$ (40,000)**	**$ (148,735)**	**$ (235,587)**	**$ (286,347)**	**$ (270,022)**	**$ (207,523)**