

CASTLE ROCK WATER COUNCIL STUDY SESSION

FEBRUARY 19, 2019



AGENDA

DETAILS

- New 5 Year Strategic Plan
 - Key items include AMI, Direct Potable Reuse, Coloradoscapes,
 - Apprenticeship Program, Renewable Energy, Stormwater,
 - Rehabilitation/Replacements, Water Quality, and Partnerships
- Long Term Water Plan
 - Review renewable and conservation goals
 - Policy questions related to additional renewable water
 - Storage and groundwater goals
 - Investments to date and planned
- Rates and Fees
 - Five year outlook
 - Rate and fee strategies for next five years
- Upcoming items

NEW 5 YEAR STRATEGIC PLAN

MISSION / VISION / STRATEGIES

- Vision – Be a national leader
- Mission – Provide our community with exceptional service

Strategies

- Strategy 1 – Ensure long-term water
 - Strategy 2 – Engage and inspire our team to improve and develop our organization
 - Strategy 3 – Enhance customer satisfaction
 - Strategy 4 – Maintain financial sustainability
 - Strategy 5 – Optimize infrastructure performance
 - Strategy 6 – Demonstrate industry leadership
-
- Coming to Council May 2019

STRATEGIC PLAN

KEY TACTICS – ADVANCED METERING INFRASTRUCTURE – WHAT IS IT

- Benefits
 - More educated water efficient customers (e.g. 20% savings on Tier 3 water would be worth \$4.8M)
 - Could be a big step towards our Town wide conservation goal
 - Cost savings in meter reading (final reads, transfers, monthly reads, leak checks) ~ \$70k savings per year
 - Ability to get alerts for abnormal consumption patterns and approaching budget
 - Find leaks more quickly for customers avoid leak adjustments ~ \$35k savings per year plus lost water
 - Data to operate facilities more efficiently (e.g. find non-revenue water – savings unknown at this point)
- Disadvantages
 - Some customers will not like it (perceptions)
 - Huge amounts of data to handle (may need a data handling staff to realize value / cut into our savings)
- Options
 - Customer driven – ongoing pilot study
 - Utility driven (this is our current plan)
- Current five year budget = \$3,000,000
- Estimated Costs = \$3 to \$5M – currently studying to get better estimate on total cost (for more \$s could get remote shutoff capability)
- Timeframe = maybe in next 3 years (community survey asking if these are wanted)

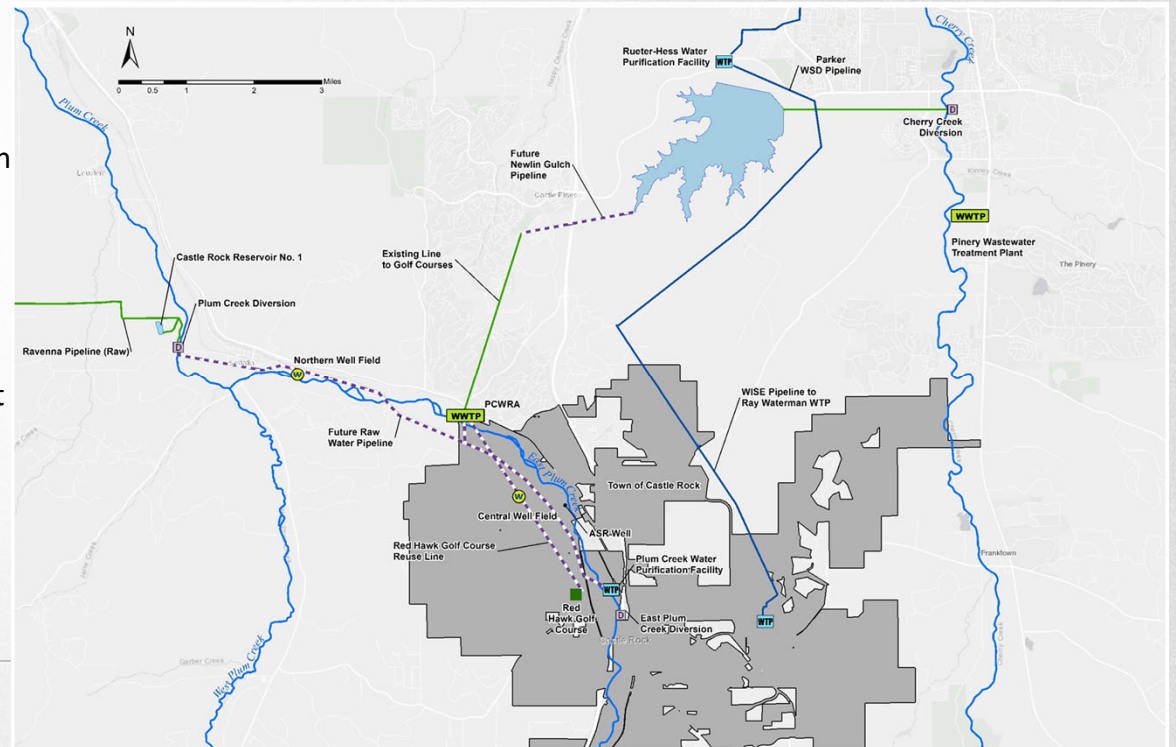


STRATEGIC PLAN

KEY TACTICS – DIRECT POTABLE REUSE



- What is it?
- Benefits
 - Competitive operational costs
 - Drought reliability
 - Quality (not subject to changes in creek)
 - Good for the environment
 - Maximizes water resources
- Next steps
 - Complete indirect potable reuse
 - Develop experience with indirect reuse
 - Work with State to develop regulatory framework
 - Continue customer and stakeholder outreach



STRATEGIC PLAN

KEY TACTICS – COLORADOSCAPES PLAN

Challenge

- Outdoor watering makes up about 50% of our water use still ~ 4,500 acre feet per year
- Total irrigable area in Town ~ 129,000,000 sq. ft. or 2,961 acres
- Estimated cost per sq. ft. ~ \$3.50 total (rebate ~ \$1)
- Cost per acre ~ \$150,000 (rebate ~ \$43,560)

Changing our mindset

- Want big reductions in irrigated areas for future development (most cost effective way to achieve goal reduce future irrigated areas by 50 to 60% plus over historical)
- Have to change look of community going forward
 - No more KBG starting in 2018
 - Marketing efforts: e.g. Parade of homes, ColoradoScape makeover
 - Continue and increase Smartscape renovation program (build momentum for new development)
 - Road right of ways and public spaces – native plants only
 - Additional ballfields with synthetic turf
 - Development specific Water Efficiency Plans



STRATEGIC PLAN

KEY TACTICS – APPRENTICESHIP PROGRAM

Challenge

- Difficult to find qualified staff
- Water industry facing labor shortage and mass retirements

Why an Apprenticeship Program?

- Apprenticeship is a well-suited strategy for the water sector
- Most water workers require less formal education, with about half having a high school diploma or less (national statistic)
- Instead, they require more extensive on-the-job training and familiarity with a variety of tools and technologies
- No other utilities doing this yet (in Colorado)

Summary of program

- Partnership with Collaboration Campus, ACC, PWSD, CRWA, PCWRA
- Start in fall 2019 with 1 student to start
- Student takes 900 hours of college classes (Associate in Applied Sciences)
- Student gets 3,000 hours of paid work (1,500 hours per year) / progressive pay scale
- Castle Rock pays ½ tuition (~\$2,500/year) towards school 100% of certifications (\$240)
- Student obtains up to 4 certifications
- Commit to work one year for Castle Rock Water

STRATEGIC PLAN

KEY TACTICS – RENEWABLE ENERGY

Challenge

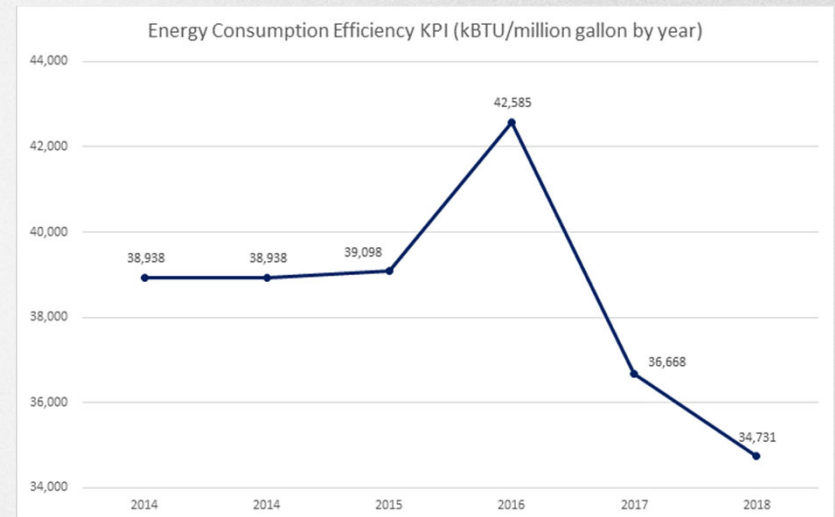
- Energy costs are second largest operational cost after labor ~ \$3,000,000 per year
- Energy / water nexus
- Loss of power is huge risk for operations
- We use ~ 27,900 MWH per year

Goal

- Reduce energy costs

Options

- Think off the grid for water plants
- Energy management plan (already in place and functioning)
- Solar panels at our plant sites and administrative site
 - E.g. have ~ 4 acres of available land at Ray Waterman
 - Need about 2.5 acres per MW
 - Capital cost ~ \$1M per MW
 - Considering for roof at future Administrative Building as well
 - If rate neutral or better then look to partner with IREA



STRATEGIC PLAN

KEY TACTICS – STORMWATER

Challenges

- Capital Improvement Plans Master Plan – larger than funding capacity
 - Anticipated shortfall over next ten years 25% or \$7 million
- Private detention ponds – lack of maintenance – how to enforce
 - ~100 public ponds (well maintained)
 - ~250 private ponds (often not maintained)
- Excessive surfacing groundwater – impacting streets and sidewalks – how to manage
 - Average annual complaints over last three years: 64



Pond Wall Collapsed due to poor maintenance



Sediment accumulation due to lack of maintenance

STRATEGIC PLAN

KEY TACTICS – STORMWATER

Options

- CIP Master Plan –
 - Increase rates and fees to account for higher costs to maintain current schedule
 - Consider issuing bonds to maintain or accelerate current schedule
 - Join Urban Drainage and Flood Control District (Current mill levy for Douglas County = 0.82)
 - Additional prioritization and maintenance to address hot spots under current funding
- Ponds –
 - Offer technical assistance to HOAs
 - Evaluate taking over private detention ponds – undoubtedly would increase our operational costs
- Excessive water -
 - Responsibility lies with homeowners to resolve
 - Chase drain assistance currently not solving root issue
 - Exploring underdrains in partnership with Public Works to protect streets and reduce maintenance burden on sidewalks
 - Exploring new criteria to eliminate lot-to-lot drainage or require underdrains by developers



6400 South Tributary Before CIP



6400 South Tributary After CIP

STRATEGIC PLAN

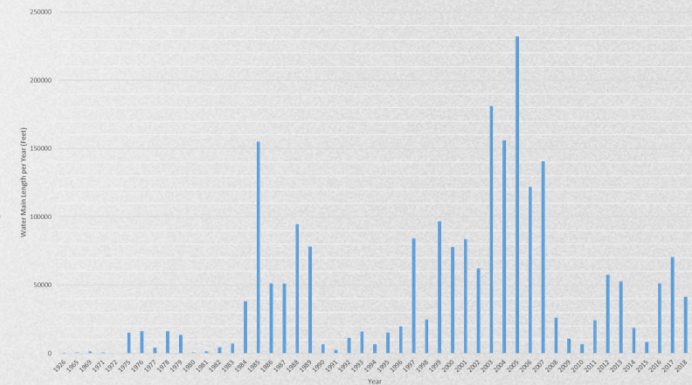
KEY TACTICS – REHABILITATION AND REPLACEMENTS

Challenge

- Water / sewer pipelines aging / average age now ~ 18 years
- Currently spending ~ \$0.5M per year
- \$600M in assets with critical items as follows
 - \$128M in waterlines
 - \$163M in sewerlines
 - \$42M in Denver Basin Wells
 - SCADA equipment
- Five year plan has \$1.1M per year on water/sewer pipes
- Need to spend closer to \$3 to \$6M on pipes

Plan

- Ramp up annual rehabilitation and replacements over next five years with focus on waterlines, sewerlines and wells
- Focus on SCADA Master Plan
 - Evaluating move from Bristol Babcock to Allen Bradley
 - Cost estimated at around \$1,200,000



STRATEGIC PLAN

KEY TACTICS – EXCEED REGULATORY WATER QUALITY REQUIREMENTS

Challenges

- Changing regulatory standards (e.g. lead, PFOAs)
- New health based water quality goals issued by Federal and State governments
- Total dissolved solids – snow (near term) and future water quality in Colorado (long term)
- Hardness – changes seasonally – East Plum Creek

Plan

- Monitor and achieve health based water quality goals that go beyond federal and state standards
- Work with PW (snow) and WISE (long term infrastructure) on total dissolved solids
- Monitor hardness and educate customers
- Participate American Water Works Association benchmarking
- Participate in Colorado Pursuing Excellence Program annually
- Participate in US EPA Partnership for Safe Water

New Requirement

- Two consumer confidence reports per year going forward



STRATEGIC PLAN

KEY TACTICS – PARTNERSHIPS

- SMWSA / WISE (many partners)
- Dominion Water (Sterling Ranch)
 - Firming
 - Others
- Castle Pines Metro
 - Potential wholesale or capital buy-in
- Denver Water
 - Chatfield pump back
- Aurora Water
 - Lost Creek ASR, Lost Creek water rights, oil and gas partnership
- Parker Water
 - Rueter Hess Reservoir treatment
 - Cherry Creek diversion
- Roxborough / Lochbuie
 - Lease agreements
- Irrigation districts
 - Alternative transfer mechanisms
 - Infrastructure sharing

Tactic is to look for opportunities to share infrastructure and gain economies of scale and reduce our costs wherever possible.

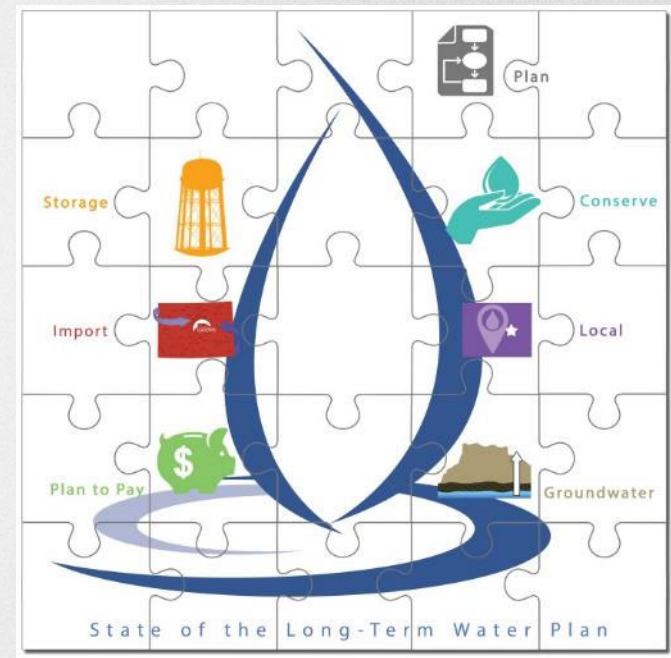
LONG TERM WATER PLAN

SUMMARY

Goal: 75% renewable water by 2050 and continue working towards 100%. We were 29.4% in 2018.

Plan:

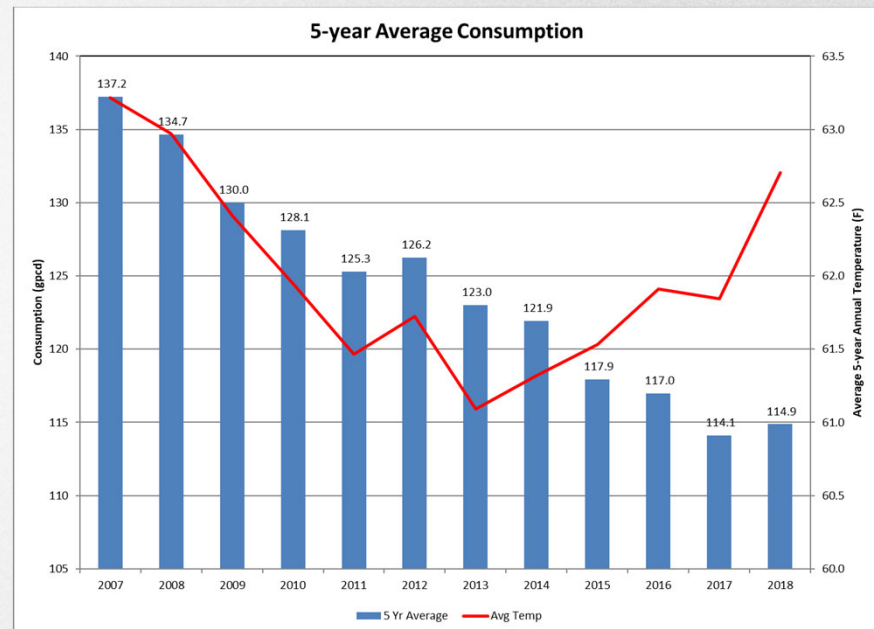
1. Conserve water and get below 100 gallons per capita per day by 2050.
2. Fully utilize local renewable water rights.
3. Fully utilize our reuseable water.
4. Partner with others to import additional renewable supplies.
5. Manage our reservoir storage to optimize storing of supplies when not needed.
6. Continue to maintain, develop and protect our Denver Basin groundwater.
7. Work within a sustainable financial plan to meet the long term water plan.



LONG TERM WATER PLAN

CONSERVATION

- Goal: 100 gallons per day per capita or 18% reduction over today
- This is ~>2,600 acre feet of demand reduction needed in future or 1,300 acre feet based on current population
- Cost = Highly dependent on how
- Lost Revenue = Could be \$120M to \$190M through 2055 (\$3.4M to \$5.4M/year)
- Value = \$50 to \$90M in water rights / capital investment
- How
 - Coloradoscapes for future houses & commercial
 - Coloradoscapes for current houses & commercial
 - Graywater pilot testing
 - Toilet replacement pilot testing



LONG TERM WATER PLAN

RENEWABLE AND REUSEABLE WATER

Current

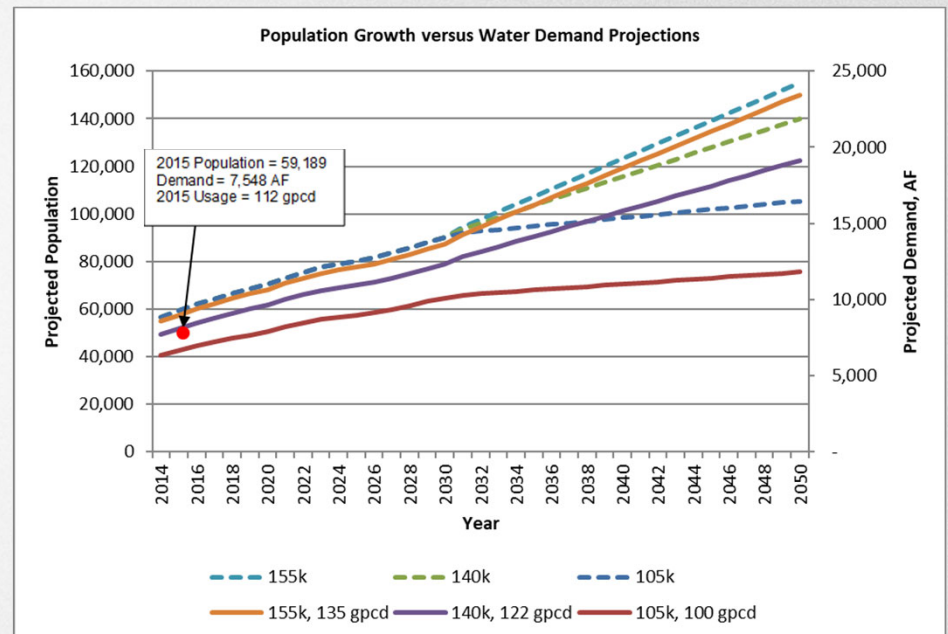
- Local = 1,440 acre feet (partially developed)
- WISE = 2,000 acre feet (developed)
- Box Elder
 - Rothe = 770 acre feet (undeveloped)
 - Lost Creek = 1,035 acre feet (undeveloped)
- Reusable wastewater = 4,090 to 7,630 acre feet (undeveloped)
- **Total to date = 9,335 to 12,875 acre feet**

Planned future acquisitions

- Box Elder (Lost Creek) = 695 acre feet
- **Total current + planned = 10,030 to 13,570 acre feet**

Need

- **Could be 11,800 to 23,500 acre feet not including additional annexations and unincorporated County**
- Does not account for climate change projections which could reduce renewable supplies by 4 to 11% or more



LONG TERM WATER PLAN

POLICY QUESTIONS

Recommendations

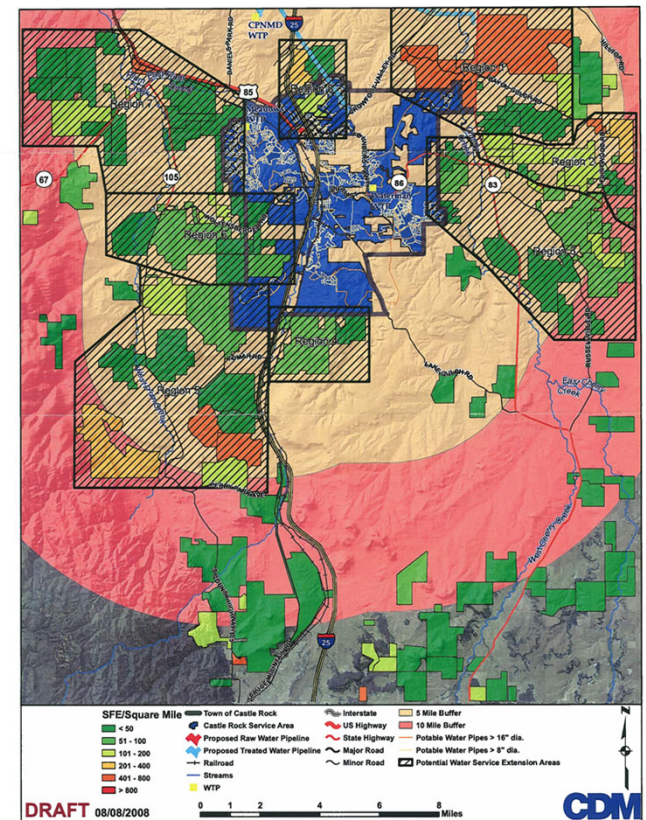
- We will shoot for 100% renewable water for 155k by 2050 (adjusting as population estimate changes) if it fits financial plan.
- We will plan for potential service to existing residents in unincorporated Douglas County where it is cost appropriate and they are willing to pay their way.
- We will plan/prepare for at least some level of future annexations
- We will clearly identify any potential rate impacts positive or negative for these recommendations.

Opportunities

- Cherry Creek
- More Lost Creek
- San Luis Valley
- Fort Morgan

TOWN OF CASTLE ROCK

Excellence · Dedication · Service



LONG TERM WATER PLAN

STORAGE

Current

- Rueter Hess Reservoir = 8,000 acre feet
- Chatfield Reservoir = 461 acre feet
- Castle Rock Reservoir 1 = 140 acre feet
- Aquifer Storage and Recovery in Castle Rock = 235 acre feet per year

Planned

- Chatfield Reservoir = 1,539 acre feet
- Expansion of Castle Rock Reservoir 1 = 370 acre feet
- Castle Rock Reservoir 2 = 1,130 acre feet
- Aquifer storage and recovery in Castle Rock = 235 acre feet
- Newlin Gulch pipeline (to fill RHR)
- Cherry Creek diversion upgrades (to fill RHR)

Opportunities (we need more)

- Walker Reservoir
- Tewes Reservoir
- Aquifer storage and recovery in Lost Creek



LONG TERM WATER PLAN

GROUNDWATER

Current

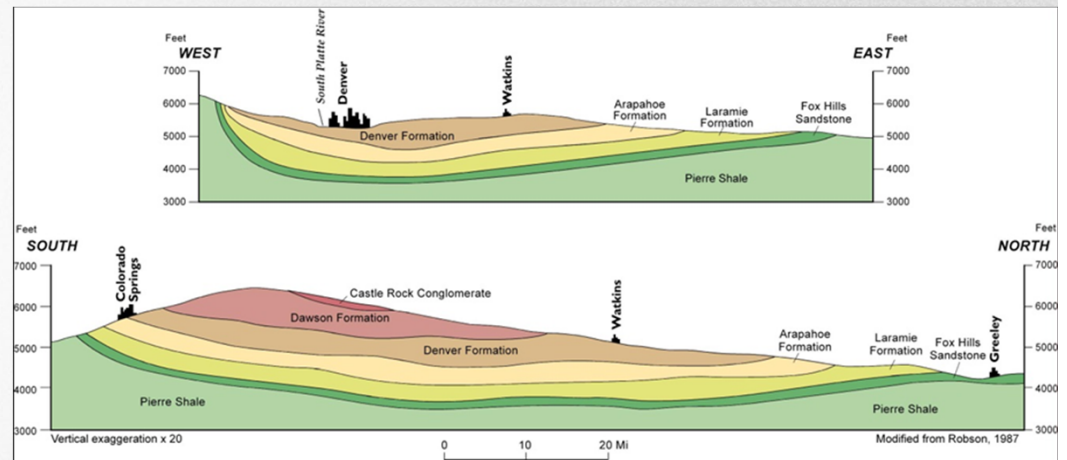
- Paper water rights ~ 43,000 AF
- 55 Denver Basin Wells
- Current production capacity ~ 15.1 MGD
- Estimated annual decrease = 3% (or 0.440 MGD)

Planned

- Lanterns Wellfield (1.2 MGD) online for 2019 irrigation season
- Red Hawk golf course online for 2019 irrigation season (0.47 MGD)
- Replacement of wells 217, 218, and 149
- Ridge Road Wellfield (0.9 MGD)
- Crystal Valley Wellfield (1.2 MGD)

Opportunities

- Bell Mountain tie-in



LONG TERM WATER PLAN

INVESTMENTS

Current/In Progress

- Conservation = \$0.39M
- Local = \$27.63M
- WISE = \$40.03M
- Box Elder = \$29.33M
- Reuse = \$61.47M
- Storage = \$48.95M
- Total = \$207.8M

Planned Future Investments (2020-2055)

- Conservation = \$8.84M
- Local = \$90.88M
- WISE = \$107.94M
- Box Elder = \$59.85M
- Reuse = \$53.09M
- Storage = \$28.52M
- Total = \$349.12M

LONG TERM WATER PLAN

PLANNED INVESTMENTS NEXT FIVE YEARS

Conservation

- Coloradoscape = \$0.725M (maybe need to invest more)

WISE

- Required upcoming investments = \$5.87M
- Additional WISE core infrastructure = \$17.22M
- NEW WISE Core opportunities = \$6.9M

Box Elder

- Additional water rights = \$7.51M

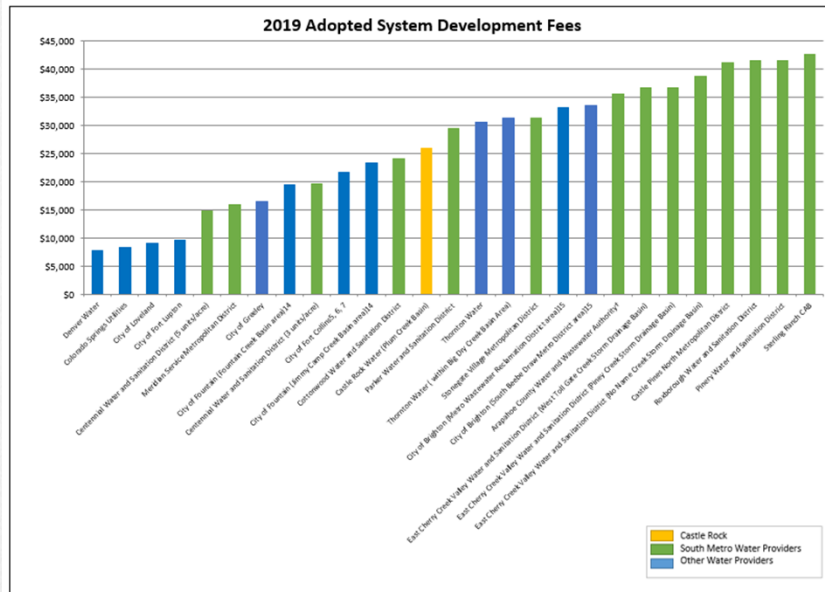
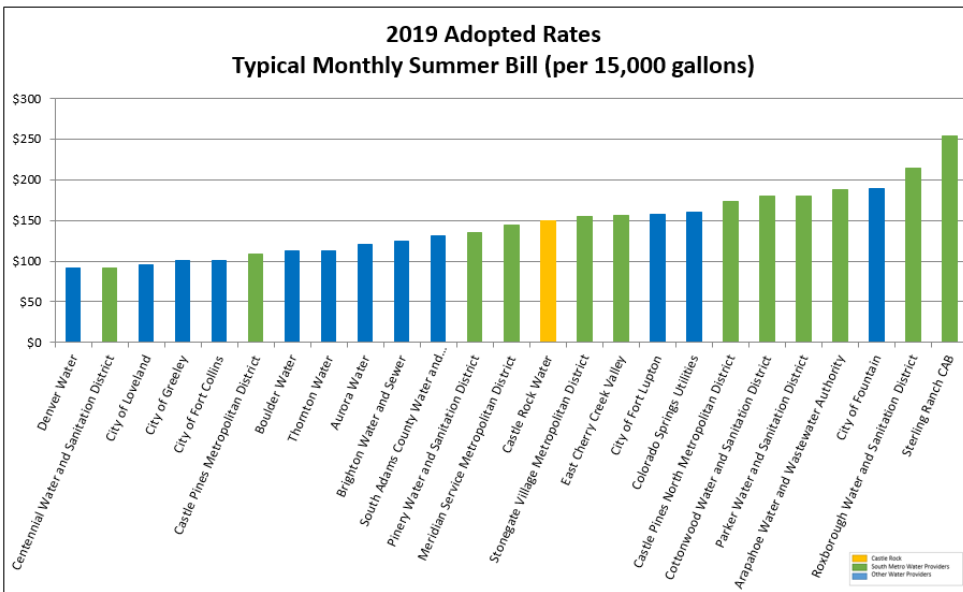
Storage (current issue is these are more than 5 yrs out in budget plan – need to bring forward)

- Castle Rock Reservoir 1 Expansion = \$3.7M
- Castle Rock Reservoir 2 = \$11.3M
- Aquifer storage and recovery wells = \$2M
- Newlin Gulch pipeline = \$7.02M

Other

- Ridge Road Deep Wells ~ \$4M
- Crystal Valley Deep Wells ~ \$5.5M + cost of dual pipeline

RATES AND FEES



RATES AND FEES

2019 RATES AND FEES

Rates

Fund	2018 Adopted Rates	2018 Study Proposed 2019 Rates	\$ Increase (Decrease)	% Change
Water, Fixed	\$9.54	\$9.54	\$0.00	0%
Tier 1, Volumetric	\$2.82	\$2.82	\$0.00	0%
Tier 2, Volumetric	\$5.53	\$5.74	\$0.21	4%
Tier 3, Volumetric	\$8.29	\$8.56	\$0.27	3%
Surcharge, Volumetric*	\$8.29	\$8.56	\$0.27	3%
Water Resources, Fixed	\$26.15	\$26.15	\$0.00	0%
Wastewater, Fixed	\$9.30	\$9.30	\$0.00	0%
Volumetric	\$6.59	\$6.59	\$0.00	0%
Stormwater, Fixed	\$7.12	\$7.12	\$0.00	0%
Total Fixed Charges	\$52.11	\$52.11	\$0.00	0%

System development fees

Fund	2018 Adopted SDFs	2018 Study Proposed 2019 SDFs	\$ Increase (Decrease)	% Change
Water	\$3,510	\$3,557	\$47	1.3%
Water Resources	\$15,248	\$17,031	\$1,783	11.7%
Wastewater	\$3,959	\$4,023	\$64	1.6%
Stormwater, Plum Creek	\$1,317	\$1,317	\$0	0.0%
TOTAL Plum Creek	\$24,034	\$25,928	\$1,894	7.9%
Stormwater, Cherry Creek	\$843	\$843	\$0	0.00%
TOTAL Cherry Creek	\$23,560	\$25,454	\$1,894	8.0%

RATES AND FEES

FIVE YEAR OUTLOOK FOR CUSTOMER RATES

Rate Strategy

- Focus on outdoor watering rates for any needed increases
- Update outdoor water budgets to actual values based on area and landscape type (commercial first, then residential)
- Generate extraterritorial service revenue to help spread costs of service
- Lease excess renewable/reusable water
- Reduce operational costs
 - Energy (e.g. Renewable energy and reductions renewable water pumping costs)
 - Advanced metering infrastructure?

Table 6
Proposed Rate Revenue Percentage Increases
2019-2023

Year	Water	Water Resources	Wastewater	Stormwater
2019	0%	3%	0%	0%
2020	0-3%	3%	0-3%	0-3%
2021	0-3%	3%	0-3%	0-3%
2022	0-3%	3%	0-3%	0-3%
2023	0-3%	3%	0-3%	0-3%

Estimated Residential Bills by Month						
Month	2018	2019	2020	2021	2022	2023
January	\$ 89.75	\$ 89.75	\$ 89.75	\$ 89.75	\$ 89.75	\$ 89.75
February	\$ 89.75	\$ 89.75	\$ 89.75	\$ 89.75	\$ 89.75	\$ 89.75
March	\$ 89.75	\$ 89.75	\$ 89.75	\$ 89.75	\$ 89.75	\$ 89.75
April	\$ 95.28	\$ 95.49	\$ 95.70	\$ 95.94	\$ 96.19	\$ 96.45
May	\$ 117.40	\$ 118.45	\$ 119.50	\$ 120.70	\$ 121.95	\$ 123.25
June	\$ 128.46	\$ 129.93	\$ 131.40	\$ 133.08	\$ 134.83	\$ 136.65
July	\$ 139.52	\$ 141.41	\$ 143.30	\$ 145.46	\$ 147.71	\$ 150.05
August	\$ 150.58	\$ 152.89	\$ 155.20	\$ 157.84	\$ 160.59	\$ 163.45
September	\$ 145.05	\$ 147.15	\$ 149.25	\$ 151.65	\$ 154.15	\$ 156.75
October	\$ 140.36	\$ 142.27	\$ 144.18	\$ 146.36	\$ 148.64	\$ 151.00
November	\$ 95.28	\$ 95.49	\$ 95.70	\$ 95.94	\$ 96.19	\$ 96.45
December	\$ 86.93	\$ 86.93	\$ 86.93	\$ 86.93	\$ 86.93	\$ 86.93
Total Yearly Bill	\$1,368.11	\$1,379.26	\$1,390.41	\$1,403.15	\$1,416.43	\$1,430.23
Average Monthly Bill						
Average Winter Monthly Bill	\$ 90.29	\$ 90.33	\$ 90.38	\$ 90.42	\$ 90.47	\$ 90.53
Average Irrigation Monthly Bill	\$ 130.95	\$ 132.51	\$ 134.08	\$ 135.86	\$ 137.72	\$ 139.66
Average Monthly Bill	\$ 114.01	\$ 114.94	\$ 115.87	\$ 116.93	\$ 118.04	\$ 119.19
Differences						
Total Yearly Increase		\$ 11.15	\$ 11.15	\$ 12.74	\$ 13.27	\$ 13.81
Total Increase Avg. Winter Monthly Bill		\$ 0.04	\$ 0.04	\$ 0.05	\$ 0.05	\$ 0.05
Total Increase Avg. Irrigation Monthly Bill		\$ 1.56	\$ 1.56	\$ 1.79	\$ 1.86	\$ 1.94
Total Increase Average Monthly Bill		\$ 0.93	\$ 0.93	\$ 1.06	\$ 1.11	\$ 1.15

RATES AND FEES

FIVE YEAR OUTLOOK FOR SYSTEM DEVELOPMENT FEES

Fee Strategy

- Continue to ensure growth pays for growth
- Incentivize lower water using development (e.g. primary employment over residential)
- Create an irrigation SDF component that better captures peaking costs
- Incentivize no outdoor irrigation for new development

Typical Single Family House- 3/4" Meter					
Fund	FY2019	FY2020	FY2021	FY2022	FY2023
Water	3,557	3,664	3,774	3,887	4,004
Water Resources	17,031	17,542	18,068	18,610	19,168
Wastewater	4,023	4,144	4,268	4,396	4,528
Stormwater-Plum Creek Basin	1,317	1,357	1,398	1,440	1,483
Stormwater-Cherry Creek Basin	843	868	894	921	949
Total-Plum Creek Basin	25,928	26,707	27,508	28,333	29,183
Total-Cherry Creek Basin	25,454	26,218	27,004	27,814	28,649
% Increase-Plum Creek Basin	7.9%	3.0%	3.0%	3.0%	3.0%
% Increase-Cherry Creek Basin	8.0%	3.0%	3.0%	3.0%	3.0%

UPCOMING COUNCIL ITEMS

MAJOR PROJECTS

- New Administrative Building Design
 - Rough cost estimate is \$3.3M
 - Funding will be capital reserves collected over last 5 years
 - Design contract to Council in April
 - Construction 2020
- Gordon Drive
 - Estimated cost = \$1.97M
 - Construction contract for Council on 3/5/19
- Lanterns Raw Water Transmission Pipeline
 - Estimated cost = \$256,551 / full project \$5.5M
 - Construction contract for Council on 3/5/19
- Red Hawk Golf Course reuse project
 - Estimated cost = \$2.5M
 - Construction contract for Council on 4/2/19
 - Goal is to complete before height of irrigation season

