

CASTLE ROCK WATER

SERVICES AGREEMENT WITH CDM SMITH FOR ON-CALL WATER QUALITY CONSULTING SERVICES

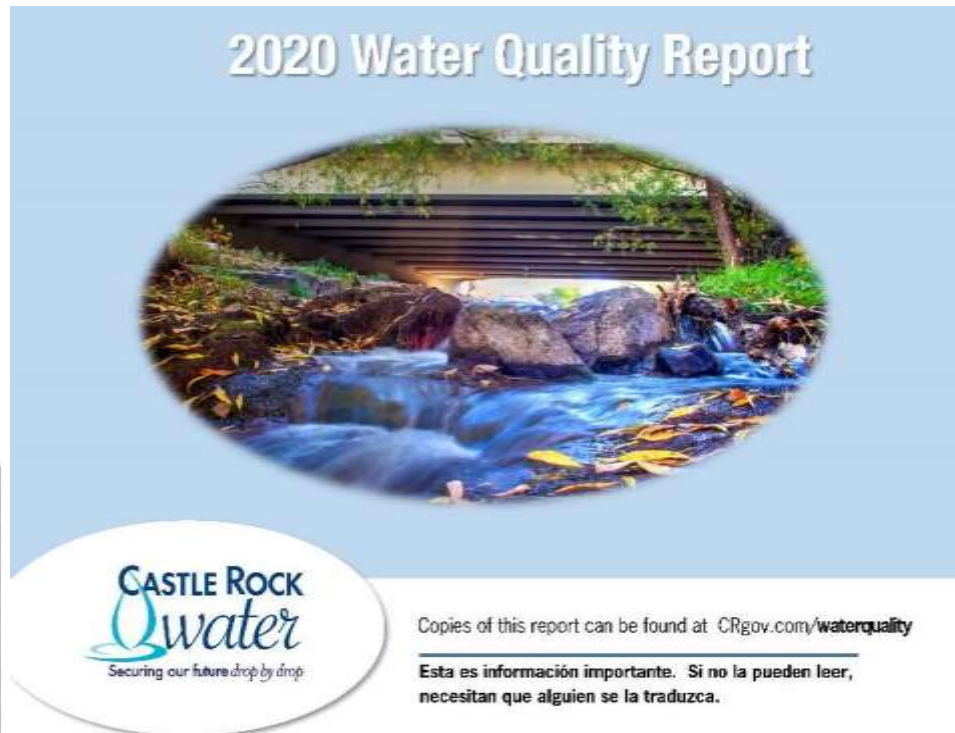
FEBRUARY 16, 2021



ON-CALL WQ CONSULTING SERVICES

PHILOSOPHY ON WATER QUALITY

- Castle Rock Water Vision
 - National Leader
- Annual Report
 - Provides summary of all the testing
 - <https://crgov.com/2803/Water-Quality-Report>
- Awards
 - Commitment Award
 - Pursuing Excellence Gold Award
 - Environmental Leadership Program Gold Award
 - Best Tasting Water 2015/Runner Up 2016



ON-CALL WQ CONSULTING SERVICES

BACKGROUND

- Castle Rock drinking water program
 - Goal of 75% renewable water by 2050
 - Reuse water will comprise 36% of future water supply
- Water quality consultant
 - Need for expertise in water reuse and blending of different water supplies
 - Competitive RFP process → CDM Smith selected
 - Extensive reuse expertise worldwide and nationally
 - Contributed to *Guidelines for Direct Potable Reuse in Colorado*
- Contract
 - Executed agreement in 2019 with option for 2 renewals
 - Excellent work over past 2 years
 - Key work products – water quality goals, distribution modeling, lab assessment, monitoring plan review, operations/treatment process review, and water quality database



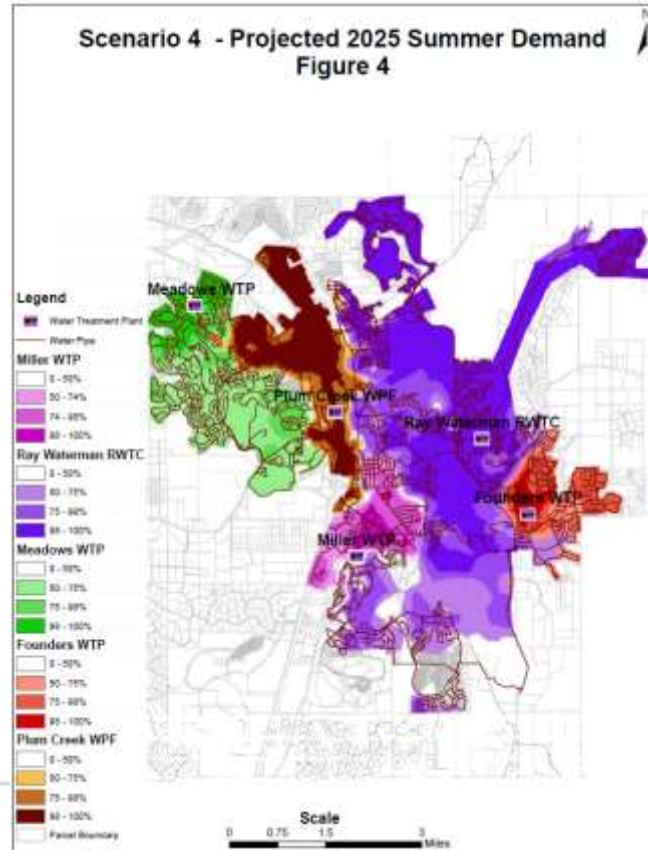
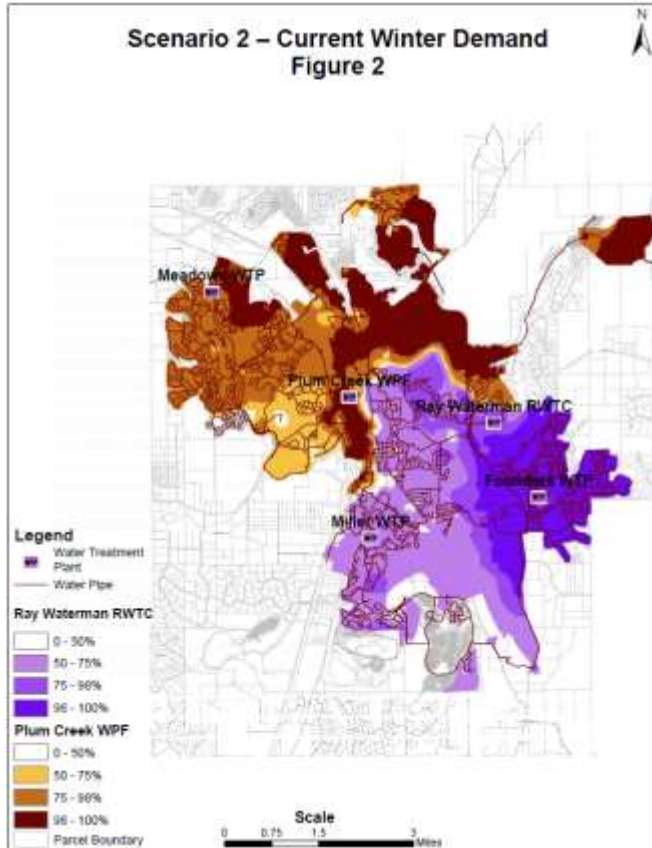
ON-CALL WQ CONSULTING SERVICES

EXAMPLE WORK PRODUCTS – WATER QUALITY GOALS

Process	Water Quality Parameter	Online or Grab Sampling	Water Quality Goal	Action Level	Reference/Citation
Granular Activated Carbon	Bromate	Grab	< 5 µg/L	8 µg/L	Goal at 50% of primary MCL, action at 80% of primary MCL
	AOC	Grab	< 120 µg-C/L	300 µg-C/L	WRF 4312 (LeChevallier et al. 2016)
	Threshold Odor Number	Grab	≤ 1.5	2.4	Goal at 50% of secondary MCL of 3, action at 80% of secondary MCL
	Removal of CECs: atenolol, iohexol, trimethoprim, and/or PFHpA	Grab	> 90% removal	25% removal	NWRI DPR Panel (2019); lower action level proposed due to low acute risk due to CECs
UV Disinfection	Pathogen Disinfection LRVs	Online (CT) and Calculated	—	Virus LRV (log): 1 <i>Giardia</i> LRV: 4 <i>Crypto</i> LRV: 4	Basis of Design Report (CH2M Hill 2017) validated dose is 58 mJ/cm ² for 1-log virus removal. <i>Giardia</i> and <i>Cryptosporidium</i> LRVs >4-log
Chlorine Disinfection	Pathogen Disinfection LRV Contact-Time (CT): Free Chlorine, Temperature, and pH	Online	—	Virus LRV: 5-log 6 mg/L-min at 10 °C and 12 mg/L-min at 5 °C at pH 6 to 9 SU	Surface Water Treatment Rule and <i>Guidance Manual for Compliance with the Filtration and Disinfection Requirements for Public Water Systems Using Surface Water Sources</i> (EPA 1991)
	Disinfection Byproducts (DBP)	Grab	40 µg/L TTHM 30 µg/L HAA ₅	40 µg/L TTHM 30 µg/L HAA ₅	Goal of 50% of primary MCL; action if exceeds goal. The purpose is to track treatment performance. <i>Note that historical distribution system TTHMs and HAAs are typically below 50% of the MCL.</i>
Finished Water	Chlorine: Ammonia (as N) Ratio	Online (Free Cl ₂ and ammonia)	3:1 to 4:1	5:1	Industry best practice, ratios ≥ 5:1 result in destruction of monochloramine
	Ammonia	Online	0.5 mg-N/L	1 mg-N/L	Industry best practice, Basis of Design Report (CH2M Hill 2017)
	Total Chlorine Residual	Online	2 mg/L to 3 mg/L	<1.5 mg/L OR >3.5 mg/L	Industry best practice (75% of US utilities are between 1 and 3 mg/L and the primary MCL is 4 mg/L). Historical distribution system DBPs are less than 50% of the MCL.

ON-CALL WQ CONSULTING SERVICES

EXAMPLE WORK PRODUCTS – DISTRIBUTION SYSTEM MODELING



ON-CALL WQ CONSULTING SERVICES

2021 SCOPE OF WORK AND FEE

- 2021 Scope
 - Emphasis on Advanced Treatment process
 - Blending Studies
 - Operating criteria document
 - Laboratory Information Management System
 - Sedalia reservoir management
 - On-Call tasks
- Fees
 - 2021 Not To Exceed \$189,700
 - Total amount over three years \$364,700





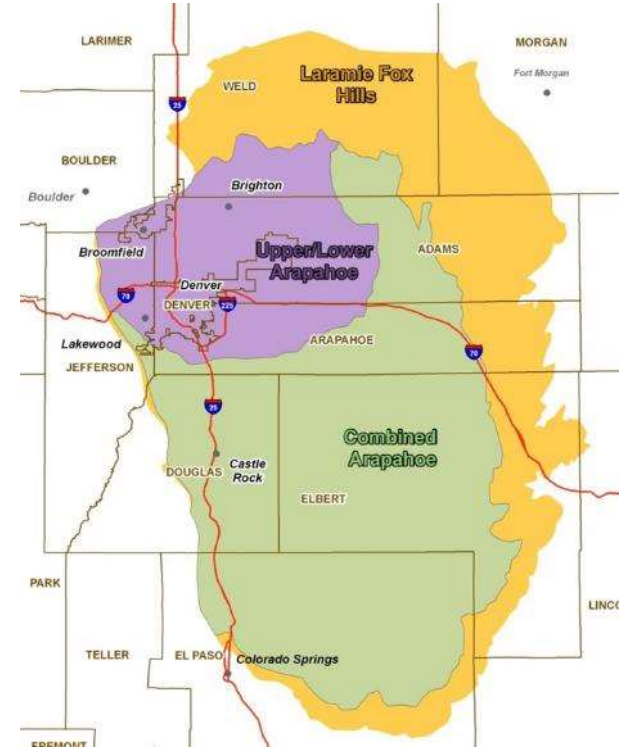
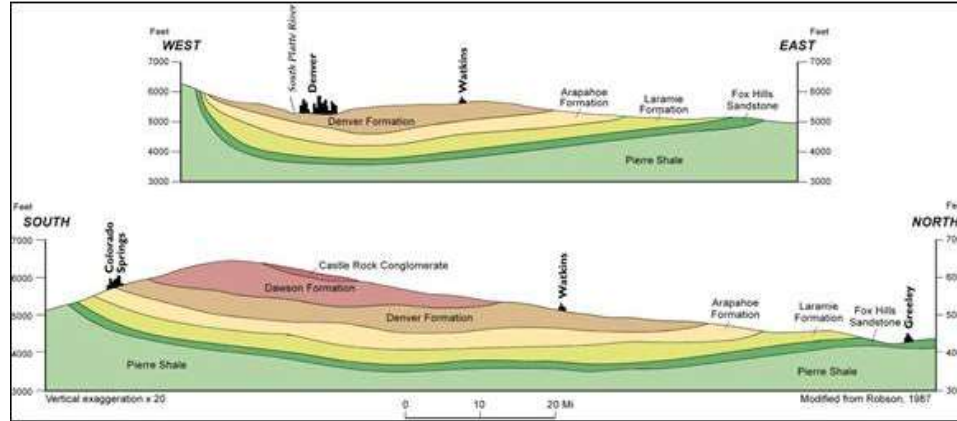
THANK YOU

QUESTIONS

NON-TRIBUTARY GROUNDWATER RULES

PROPOSED CHANGES TO THE RULES BY STATE ENGINEER

- Current Rules
 - Sets annual amount but no long term limit
 - Annual amount based on assumed 100 year supply
- Proposed Rules
 - Add total volumetric maximum
 - Based off of annual amount times 100 years



PURIFIED REUSE WATER

ADVANCED TREATMENT FACILITIES COMPLETE

