



MONTHLY REPORT

DECEMBER 2019



CASTLE ROCK
Water
Securing our future *drop by drop*

Our Vision: We will be a national leader among water utilities, focused on customer satisfaction and delivering outstanding quality and value.

Red Hawk Reuse Project

By: Joshua Hansen



The Red Hawk Reuse Project was identified in 2018 to bring new reuse water supply to the Red Hawk Ridge Golf Course. During dry months, Castle Rock Water has supplemented the golf course's groundwater well with raw water from other deep groundwater and alluvial wells. The new source of supply is the Town's treated effluent water from the Plum Creek Water Reclamation Authority (PCWRA). This historically has been discharged from PCWRA directly to East Plum Creek or sent to other golf courses in Castle Pines. On average, over 4 million gallons per day of the Town's wastewater is reclaimed at PCWRA, which can be reused beneficially for irrigation and other uses. The Red Hawk Reuse System was designed and constructed to deliver more than 650,000 gallons per day to meet the golf course's peak day demand.

The Reuse Project Team developed a pipeline alignment for a new dedicated 8" reuse waterline between PCWRA and the golf course. Global Underground was selected as the contractor to construct the project utilizing minimal design documents to accelerate the project schedule.

Global began constructing the pipeline in May of 2019 while staff finalized easement agreements with landowners along the alignment. Six horizontal directionally drilled crossings under roads and creeks were required as well as an auger bore under the railroad. Nearly 1 mile of the total 3.5 miles was constructed utilizing trenchless construction. The pipeline was substantially completed in October.

Throughout 2019, Castle Rock Water staff also worked with Burns & McDonnell Engineering and Moltz Construction to design and construct a new reuse pump station facility located at PCWRA. A design was developed and constructed to retrofit the existing reuse pump station at PCWRA with a new Red Hawk Reuse pump, motor, piping and appurtenances, and electrical and controls equipment.

The Red Hawk Reuse System began delivering reclaimed water to Red Hawk Ridge Golf Course in November 2019. The total cost of the project (pipeline and pump station) was approximately \$2.5 million. The new reuse system will help the Town maximize reuse water rights, reduce demands on the municipal water system, supply sustainable irrigation water for the golf course and additional nutrients for the turf, reduce irrigation pumping costs, and increase community familiarity with reuse.



Lanterns 1 Well Facility and Raw Waterline

Project Managers: Heather Justus, P.G. and Matt Hayes, P.E.

Three new deep groundwater wells were constructed in an open area south of Crystal Valley Parkway at Plum Creek Boulevard, on a parcel dedicated to the Town. The wells were needed to accommodate growth-related peak demand during the irrigation season. The project consists of the three wells, controls and meter facilities, as well as a transmission pipeline to convey the water to the Plum Creek Water Purification Facility. Drilling of the wells began shortly after council approval in October of 2018, and completion is expected by Spring 2020. The wells, in the Dawson, Denver and Arapahoe formations, are expected to produce an average of 1.2 million gallons per day. The project was being funded through system development fees.



The raw water transmission pipeline from the new Lanterns Well Facility will connect to an existing raw water transmission main located on the west side of East Plum Creek. Phase 1 of the raw water transmission main construction was awarded to Hudick Excavating, Inc. in January of 2019. The first 650 feet of the transmission main is located under the new trail. Global Underground was awarded the construction contract for Phase 2 of the raw water transmission pipeline. Phase 2 of the transmission main had some unique challenges associated with the pipeline construction. The new pipeline crosses the Union Pacific Railroad (UPRR) and East Plum Creek. The creek and railroad are within 100-feet of each other but have an elevation difference of about thirty feet. A Horizontal Directionally Drilled (HDD) pipe installation was identified as the only reasonable method to cross these obstructions. The UPRR regulations required that the new pipeline be installed within a steel casing pipe under their right-of-way. For this project, the casing pipe and carrier pipe were assembled above ground and installed together in a single pull. The raw water transmission pipeline was completed in May 2019.



The contractors on this project were Hydro Resources Rocky Mountain (well drilling), Leonard Rice Engineers (hydrogeological professional services), Rocky Mountain Excavating (facilities construction), and Dewberry Engineering (facility design).

The total cost of the project was \$5.5 million.

ACEC Award for WISE Project

By: Walt Schwarz



A current source of imported, renewable water to the Town is from the Water Infrastructure and Supply Efficiency (WISE) Project. WISE water deliveries are received through a 5.2-mile-long, 36-inch diameter, pipeline installed from the Parker Water & Sanitation District water distribution system along Outter Marker Rd.

Every year the American Council of Engineering Companies (ACEC) recognizes engineering firms for projects that demonstrate an exceptional degree of innovation, complexity, achievement, and value. Burns & McDonnell Engineering Company are the design engineer on record for this infrastructure project and were awarded a 2019 Engineering Excellence, Honor Award by ACEC in the Water Resources Category. A team approach during design phase and contributions by CRW staff helped ensure a successful project that was constructed on schedule and under budget.

Employee Recognition

NEW CERTIFICATIONS

The water, wastewater and stormwater utility business is highly technical and regulated. As such, Castle Rock Water has to maintain an extensive staff of professionally licensed individuals which requires specialized education, state testing, and continuing education.

Certifications earned this month:



*Kevin Moore
Operator B Certification
Distribution Operator 2
Certification*



*Kristin Reaves
Distribution Operator 3
Certification*



*Eric Crawford
CDOT/CDL License*



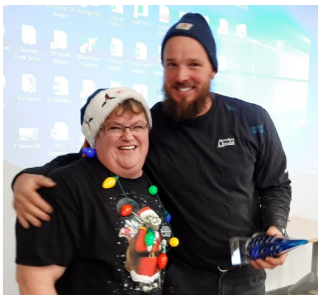
*Joe Compton
Distribution 1 Operator
Certification*



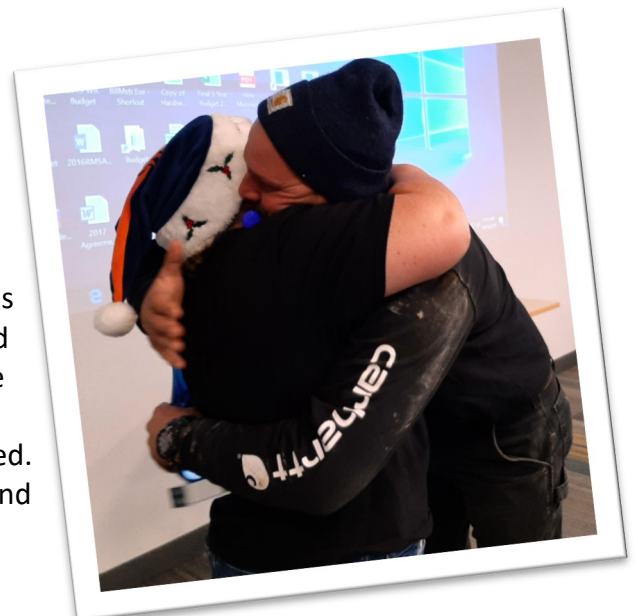
*John Whitesel
Distribution 3 Operator
Certification*

Water Star Award

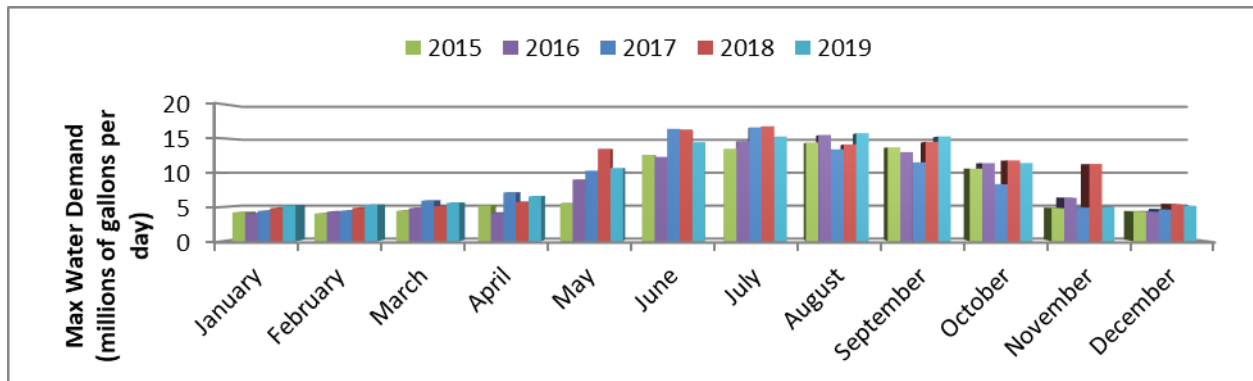
The Water Star Award recognizes a coworker within Castle Rock Water for doing an excellent job in fulfilling the Department's Vision and Mission.



Jonathon Cornwell, Sr. Water Distribution Operator, received the Water Star Award from Kris Julseth, for his positive and jovial attitude in all that he does. He eagerly jumps in and helps whenever needed. Johnny is never negative and so much fun to be around! *And, he's a hugger!*



Water Demand



Max daily water demand

Maximum demands inform us of the size of the infrastructure necessary to provide water service over short periods of time and help us to plan future water resources needs.

Dec. 2019	5.1 million gallons/day
Dec. 5 yr. avg	4.7 million gallons/day
Difference	8% higher

Max daily water demand in 2019
15.8 MGD in August

Water demand total

Water demand total is how much water was used over the entire month. Population and weather changes can significantly affect usage.

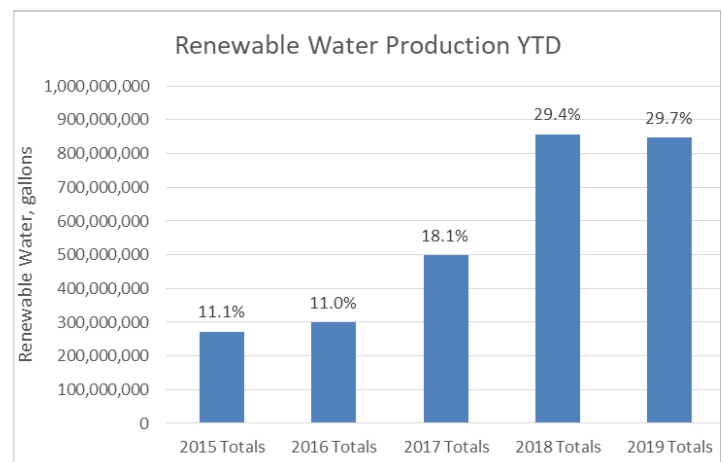
Dec. 2019	140.3 million gallons
Dec. 2018	143.9 million gallons
Difference	2.5% decrease

Water demand total for 2019
2,838.5 MG
(1.5% decrease from 2018 total)

Renewable water supply

- The CR-1 diversion produced an average of 0.01 MGD for the month of December. This low production was due to shut down and maintenance of Plum Creek Water Purification Facility.
- The Town's thirteen alluvial wells and CR-1 produced a total of .53 MG of renewable water (and an average of 0.02 MGD).
- In total, renewable supplies accounted for 2.6% of the total water supply for the month and 29.7% of the annual water supply (2,860 MG or 8,778 acre-feet) to date.

Our goal is to reach 75% renewable water by 2050.

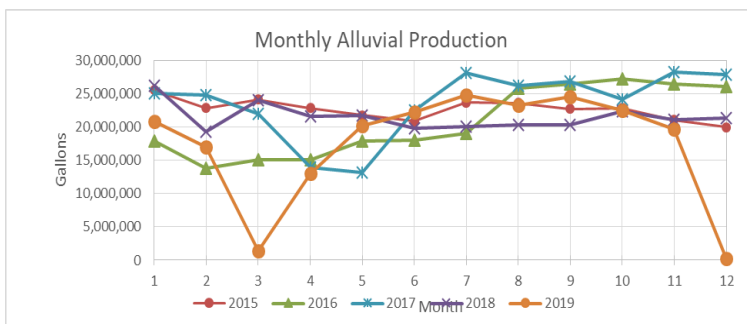


Water Demand

Renewable supplies are those water sources that are replenished by precipitation (think of our alluvial wells, CR-1, and WISE), whereas reusable supplies are those waters that are either from the Denver Basin (deep wells) or imported supplies (such as WISE and RHR) that can be used over and over, to extinction. The average reusable supplies used by Castle Rock for 2019 through December is 18.4% with 2.7% of available reusable supplies used in the month of December.

Alluvial supply

Dec. 2019 production: .30 MG

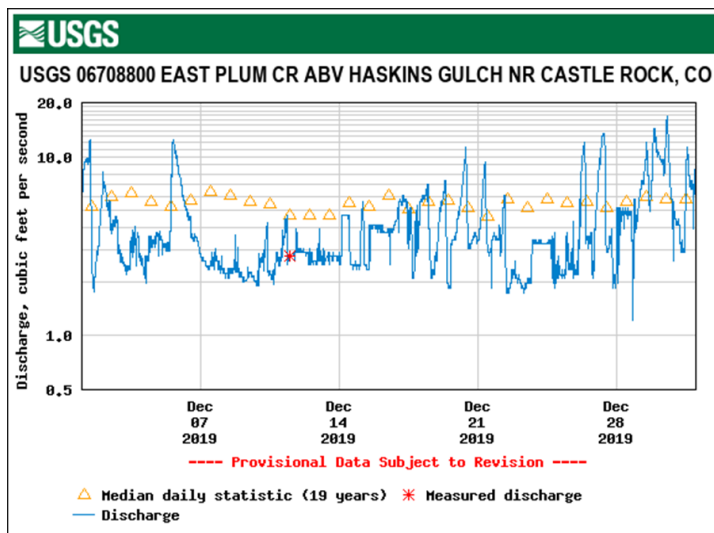


The low production corresponds to PCWPF shut down and maintenance activities at the start of the month.

We completed three rehabilitation projects this past spring and five more are scheduled for this winter.

East Plum Creek Flows

Dec. 2019 avg flow: 4.1 cfs



The flow hydrograph represents stream flows in East Plum Creek (EPC) taken from the stream gauge located above Haskins Gulch. The hydrograph shows that estimated flows in the East Plum Creek basin ranged between 1.2 and 16.8 cubic feet per second (cfs) during the month of December, with an average streamflow of 4.1 cfs. This month's average streamflow of 4.1 cfs is below the 19 year median of 5.5 cfs.

There were active calls on the South Platte River in December. Some of the active calls have had a more senior water right than some of the Town's water rights. This means that those diversions are out-of-priority, so the stream depletions will be covered by non-tributary return flows. This also means that the Town will have slightly less reusable water going down Plum Creek during an active call. The priority date on a river call may change each day depending on the stream flow available and the seniority of the diversions that need water on that day.

Water Demand

Drought Monitor

The average WSI for December was 3.7, well above the 1.1 trigger level, which is considered “good.”

According to the U.S. Drought Monitor maintained by the United States Department of Agriculture (USDA), approximately 68% of Colorado is experiencing Abnormally Dry (D0) to Severe Drought (D2) conditions. The Town of Castle Rock Drought Management Plan uses a Water Supply Index (WSI) for the Town that is similar to the U.S. Drought Monitor in that it provides us an indicator to drought level; however, the WSI accounts for local conditions relative to the Town’s capability to address our water resources and daily water demands. The WSI is calculated by taking the sum of our supply (deep groundwater, alluvial wells, surface water, and WISE) and dividing that by our maximum daily demand. We generally want to see a WSI above 1.1, which means that we have enough resources to meet our demands. Anything below a 1.1 will trigger a drought stage relative to its severity.

The NRCS Colorado SNOTEL Report

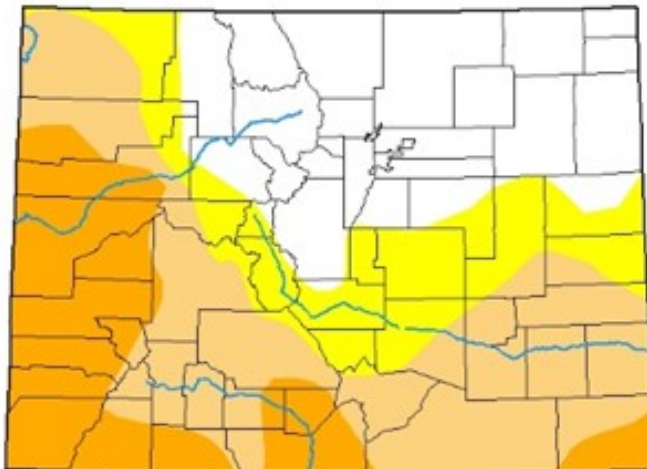
Jan. 2, 2020

108% above average

127% Snow Water

Equivalent

U.S. Drought Monitor Colorado



December 31, 2019

(Released Thursday, Jan. 2, 2020)

Valid 7 a.m. EST

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	31.72	68.28	51.19	20.11	0.00	0.00
Last Week 12-24-2019	31.72	68.28	51.19	20.11	0.00	0.00
3 Months Ago 10-01-2019	30.14	69.86	27.53	0.00	0.00	0.00
Start of Calendar Year 01-01-2019	17.94	82.06	66.26	54.91	27.11	11.22
Start of Water Year 10-01-2019	30.14	69.86	27.53	0.00	0.00	0.00
One Year Ago 01-01-2019	17.94	82.06	66.26	54.91	27.11	11.22

Intensity:

None	D2 Severe Drought
D0 Abnormally Dry	D3 Extreme Drought
D1 Moderate Drought	D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>

Author:

Brad Pugh
CPC/NOAA



droughtmonitor.unl.edu

Plan Review



For each commercial and residential project submitted for development review, Castle Rock Water provides plan review, as appropriate, for:

- Water
- Sanitary sewer
- Stormwater
- Landscape/irrigation
- Temporary erosion and sedimentary control

Projects submitted

Dec. 2019	66
Dec. 2018	72

Plans reviewed

Dec. 2019	170
Dec. 2018	155

Permits reviewed

Dec. 2019	230
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Permits are system development fees assessed for each individual unit after the project is completed including the number of fixtures, irrigated area, meter size, etc. This is necessary for proper billing.

Service levels

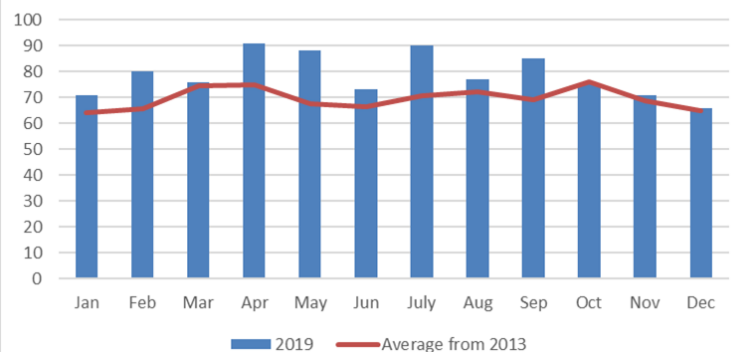
The average number of days assigned to review: 11.1 days
The average days to complete assigned reviews: 7.8 days

Plan Review: 91% of the reviews were completed on-time

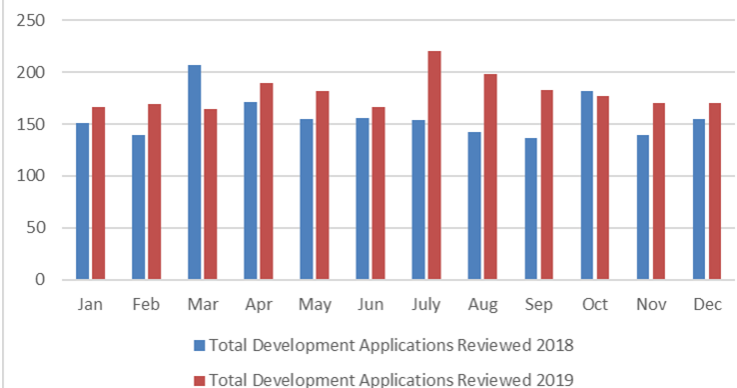
Permit Review: 96% completed on-time

Review time for each plan is 1 to 5 weeks, a permit is 3 days.

Monthly Projects Reviewed 2019
Average monthly reviews since 2013



Total Plan Application Reviews



The Town reviews the plans for each project to ensure the public infrastructure built by the developer is following the criteria set by the Town.

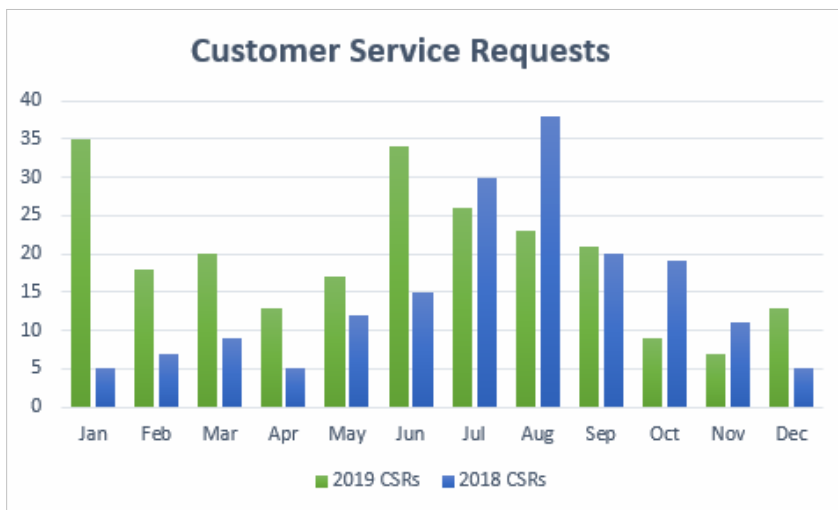
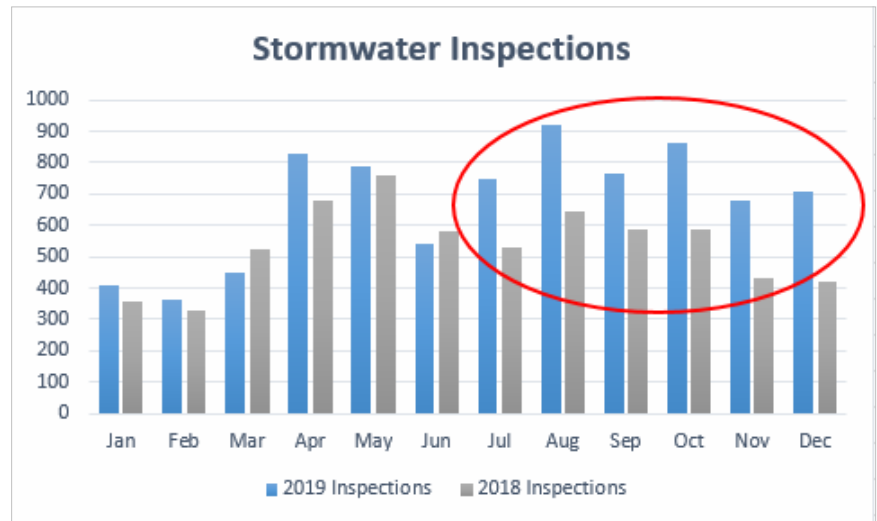
Stormwater

Stormwater Inspections

The inspection team regulates permitted residential and commercial properties.

In 2019, there was an overall 25% increase in inspections over 2018.

However, this past July, new inspection frequencies were implemented due to State permit requirements causing a **46%** increase (1460 additional inspections) over the last half of the year compared to the same period in 2018.



Customer Service Requests

The Stormwater Division receives various customer concerns (CSRs) from excessive water to dust to maintenance of infrastructure. Complaints often rise and fall with weather patterns.

2019 ended with a downward trend as irrigation was shut off and rain turned to snow and caused fewer issues.

We will see what January 2020 brings since we saw a **600%** increase in January 2019 due to ice complaints from a long freeze/thaw pattern.

Trends

The Stormwater Division saw a sharp 33% rise in customer service requests (61 additional requests) this past year.

Inspections have increased 75% (3451 additional inspections) over the past 4 years. This is likely due to Castle Rock being one of the fastest growing cities in America.

The Stormwater Division is anticipating that overall inspections will decrease in 2020 due to the phasing out of the DESC program which required each house to be inspected under a separate permit. The new TESC program requires only one permit per builder in a neighborhood. This will eliminate hundreds of inspections annually and increase efficiency for the inspection team.



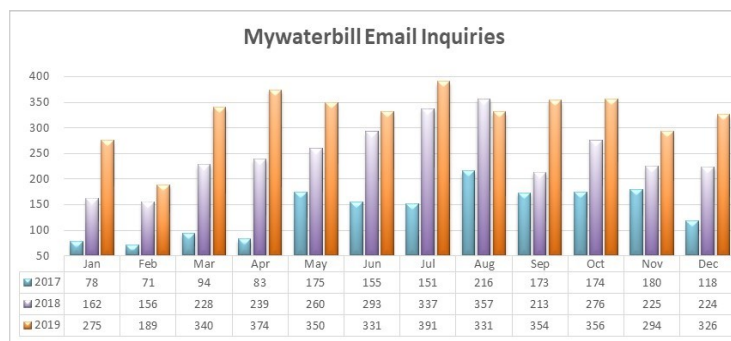
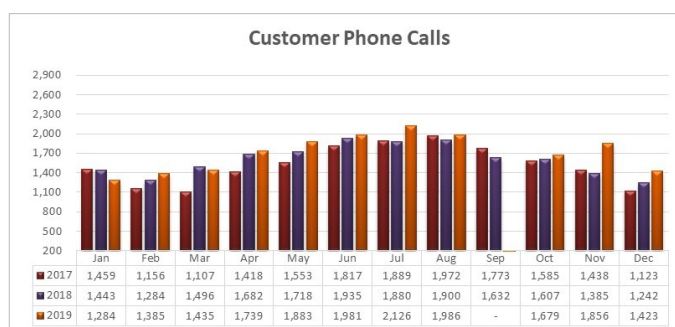
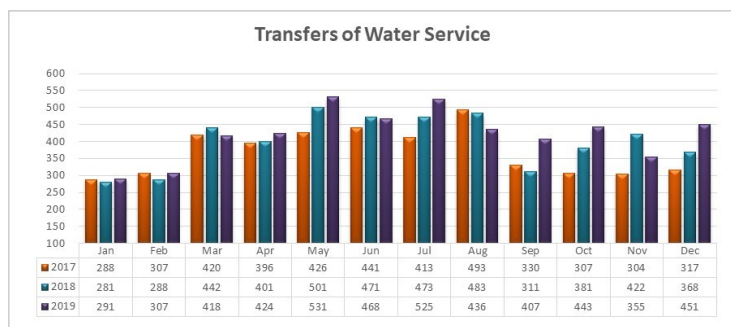
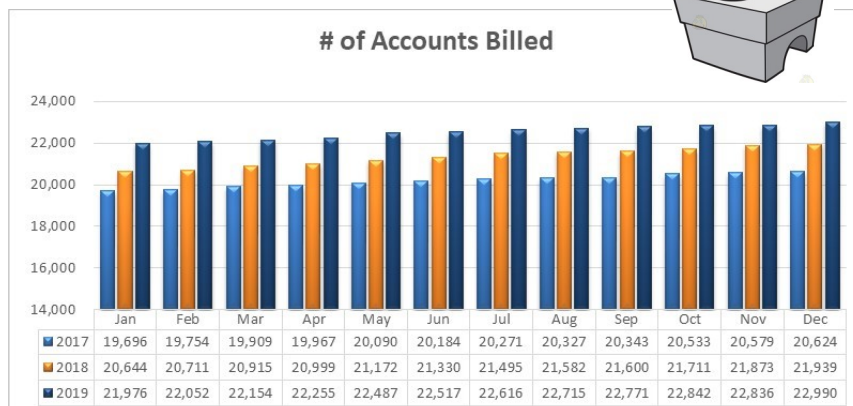
Business Solutions

Customer Service

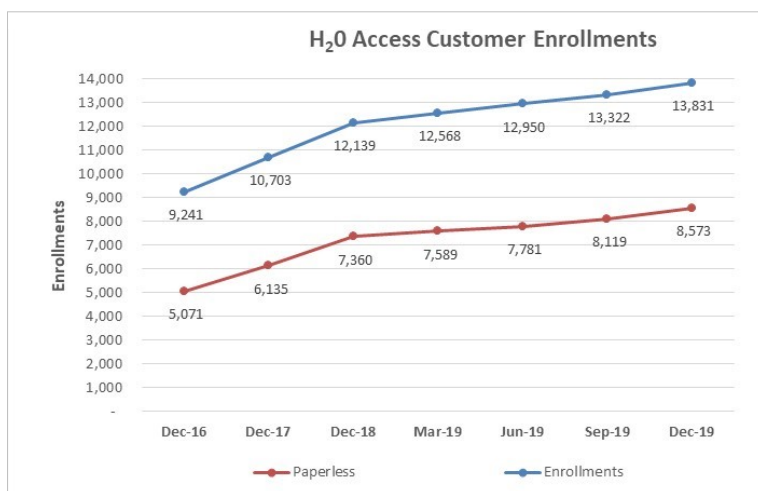
The Business Solutions Team tracks a host of statistics and data as we evaluate our levels of service and look for efficient ways to improve on these levels. **Levels are consistently rising due to the growing number of accounts.**

Accounts billed

Dec. 2019	22,990
Dec. 2018	21,939



- Paperless customers increased to 61% for the quarter.
- Paperless billing provides significant cost savings.
- Online enrollment is encouraged so customers have access to their account 24/7.



Meters



Meters Read

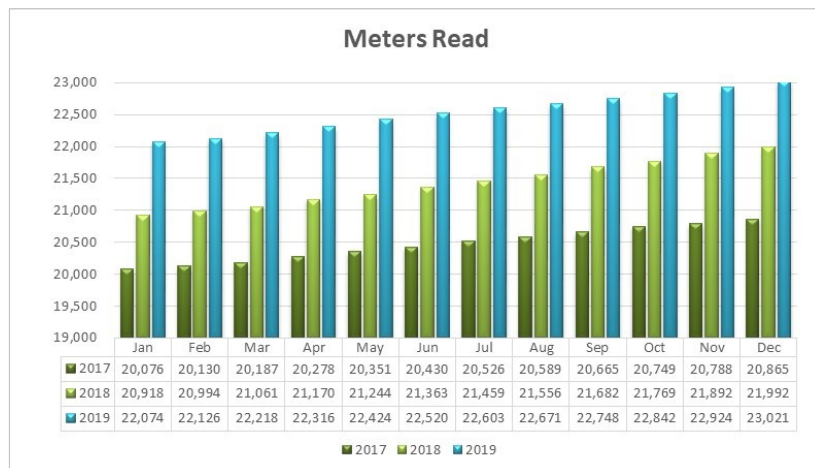
Meters are read the first three days of every month. The number of meters read continues to increase month to month and is a significant increase over last year.

Skipped Reads

Dec. 2019: 0.31%

Measuring skipped reads is a strong indication of the level of preventative maintenance being done by our team. A skipped read is indicative of a problem with the metering infrastructure (i.e. battery, wiring, etc.). Fewer skipped reads means more properly working meters, which is good for all our customers.

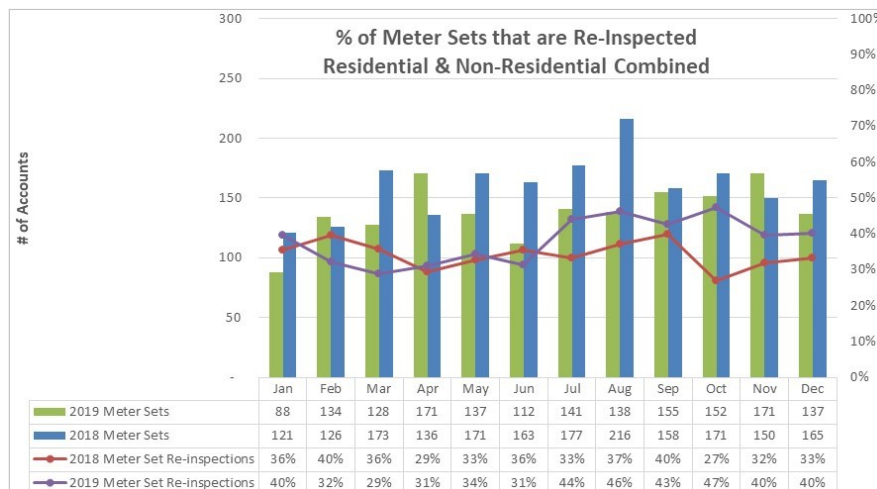
The AWWA standard is 2%, so we still continue to stay well below the industry average.



Meter Set Inspections

Dec. 2019 137
YTD 1,664
Re-inspections 40%

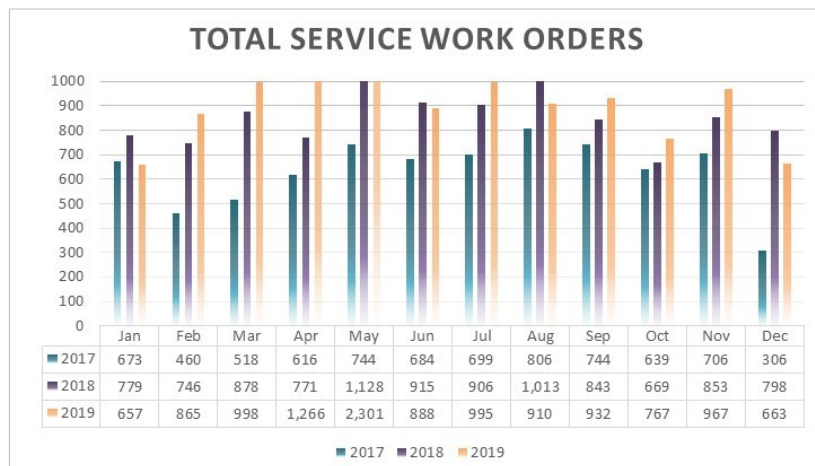
Meter set inspections are required on all new meters installed. This ensures that the meters are installed per specifications and according to Town code. At the time of the inspection, the curb stop is tested for operability and the MXU is installed which provides reading capability for our drive by technology. Re-inspections are needed to ensure installation meets code when original inspections are failed.



Work Orders

Dec. 2019 663

Meter services performs a variety of service orders every month beyond meter reading. These include curb stop maintenance, meter replacement and repair, final reads for transfer of service, disconnection and reconnections, meter set inspections, just to name a few.



Operations & Maintenance

LEVELS OF SERVICE		DEC. 2019
Drinking Water Compliance	Castle Rock Water will deliver water that meets or exceeds the requirements of both Primary Drinking Water Regulations and Secondary Maximum Contaminant Levels 100% of the time.	<i>Ninety routine samples were completed.</i> <i>All samples were within the parameters set forth by the Safe Drinking Water Act and Colorado Drinking Water Standards.</i>
Pressure Adequacy	< 1% of our customers will experience less than 43 pounds per square inch (psi) of pressure at the meter during normal operations.	<i>There were no water pressure issues this month.</i>
Sewer System Effectiveness	<1% of our customers will experience a sewer backup caused by the utility's sewer system per year. <i>Castle Rock Water remains in the Top Quartile for least number of sewer backups based on the American Water Works Association benchmarking.</i>	<i>There were no sewer system issues this month.</i>
Drinking Water Supply Outages	<5% of our customers will experience water outages for one or more events totaling more than 30 hours/year. <i>Castle Rock Water remains in the Top Quartile for water system integrity based on the American Water Works Association benchmarking.</i>	<i>There was one water system integrity issue in December.</i> <i>1. A service line leak in the Castlewood Ranch area was repaired, impacting one resident, who was out of water for less than eight hours.</i>
Water Quality Complaints	<i>Castle Rock Water remains in the Top Quartile for water quality complaints based on the American Water Works Association benchmarking.</i>	<i>There were no water quality issues this month.</i> <i>There was one water quality customer education visit.</i>

Operations & Maintenance



Locate Report

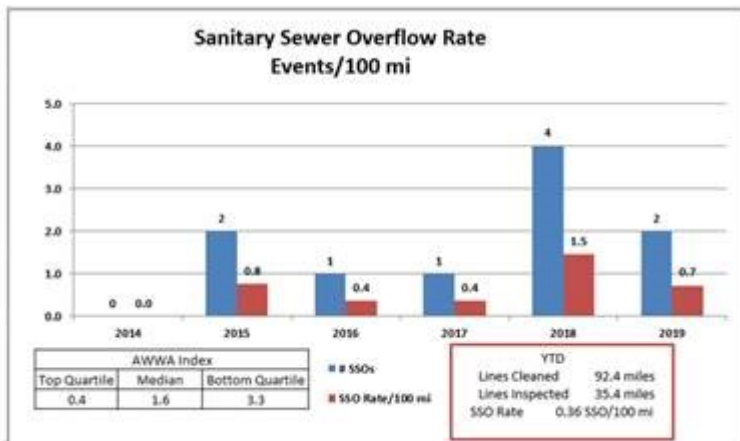
Before you start a project, call 811. Whether you are planning to do it yourself, or hiring a professional, we will help you do it safely. The local 811 Call Center will contact Castle Rock Water and will schedule a time to come out to locate public water, wastewater and stormwater lines in the road and in your project area.

Dec. 2019: 1,175
2019 YTD: 20,440
2018 YTD: 19,975

Castle Rock Water's locate requests from 811 have continued to rise, year over year. To date, there has been **one** incidence of damage to lines, as a result of incorrect locate marks.

Locate requests in 2019 reached an all-time high for Castle Rock Water (with 2017 requiring 20,411 utility locates)

Collections



When not posing for selfies, our amazing Collections team is busy jetting sewer mains. They have already exceeded their 2019 goal of 475,000 ft. of sewer main cleaned!

COLLECTIONS	2019	2018
Lines cleaned	92.4 miles	35.4 miles
Lines inspected	57.1 miles	18.32 miles