Terrain - Founders Sewer Project

By: Matt Hayes, Project Manager

Castle Rock Water recently completed the Terrain-Founders sewer project. The new sewer main will eliminate the need for the Ray Waterman Regional Water Treatment Facility (RWRWTF) temporary lift station. Sanitary flows from the RWRWTF and Founders Marketplace will flow into the existing collection system located within the Terrain Subdivision.

The project consisted of the installation of 1,680 feet of 10-inch polyvinyl chloride (PVC) pipe, six new manholes, modifications to two existing manholes, and the abandonment of the RWRWTF temporary lift station. The design of the new sanitary sewer main was coordinated with the Founders Marketplace Filing 1, Amendment 2 site improvements design. The alignment paralleled a new storm water main to minimize the impact to the developer's property.

Iron Woman Construction completed the project at the end of November. The project was completed ahead of schedule and under budget. The overall project cost was $333,882.

2018 Water Demands

By: Lauren Moore, Water Resources Program Analyst

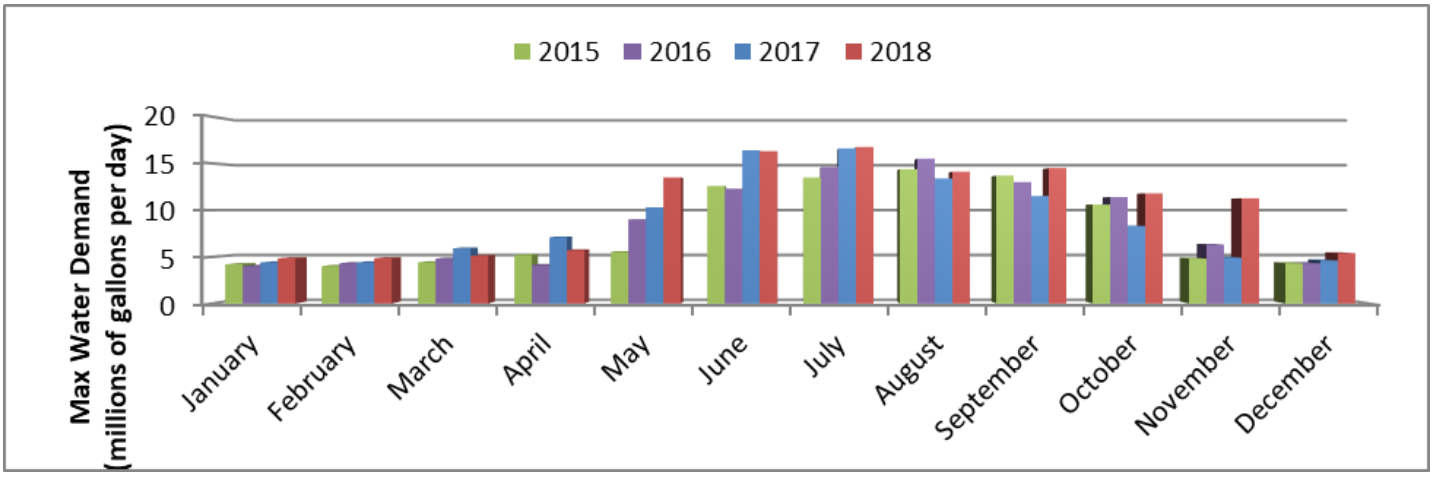
The maximum daily water demands are plotted by month from 2015 to the current month. As observed by the data, the maximum demand for the month of December was 5.4 million gallons per day (MGD) which was 14% greater than the 5-year average maximum daily demand for the month. Maximum demands inform us 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. The water demand total for December was 143.9 million gallons (MG), which was about a 1.6% decrease from the November 2018 total of 146.2 MG, and a 12.9% increase from the December 2017 demand of 127.4 MG.

The CR-1 diversion produced an average of 0.53 MGD for the month of December. The Town's thirteen alluvial wells and CR-1 produced a total of 37.8 MG of renewable water. WISE water supplied an additional 18.2 MG of renewable water. In total, renewable supplies accounted for 38.8% of the total water supply for the month (144 MG or 443 acre-feet) and 29.4% of the annual water supply (2,918 MG or 8,954 acre-feet).

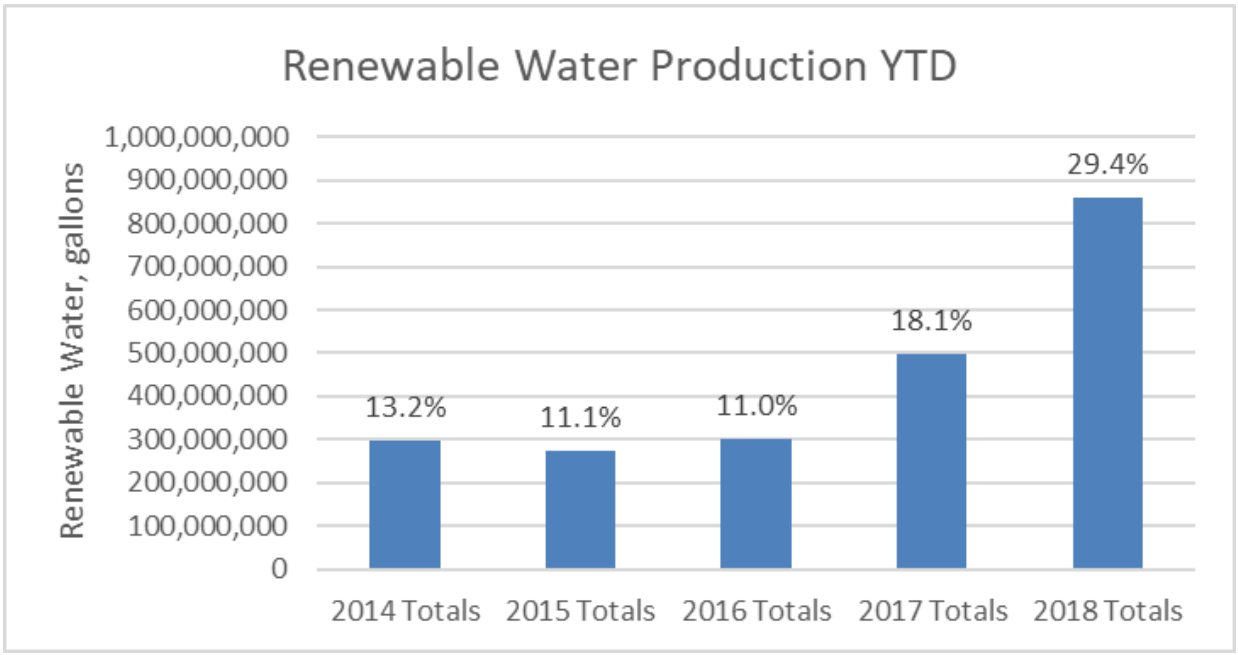
Continued on next page

Water Demands, continued

By: Lauren Moore, Water Resources Program Analyst



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 2018 through December is 31.6% with 19.1% of available reusable supplies being used in the month of December.

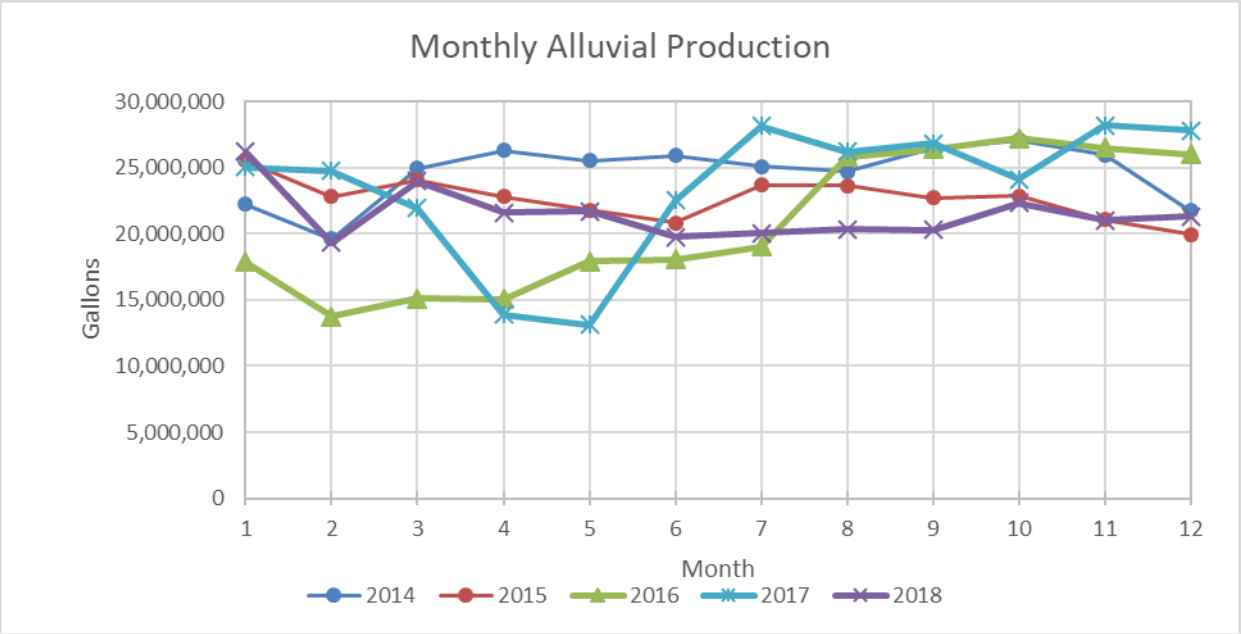


The percentage shown on top of the bars is the amount of renewable water relative to total water production.

The following graph shows the monthly production of the Town's alluvial well system. The production from the alluvial wells in December 2018 was 21.3 MG, which is less than the second half of 2017. Lower production combined with decreasing water levels is primarily due to low stream flows in East Plum Creek. Well rehabilitation is scheduled for this winter.

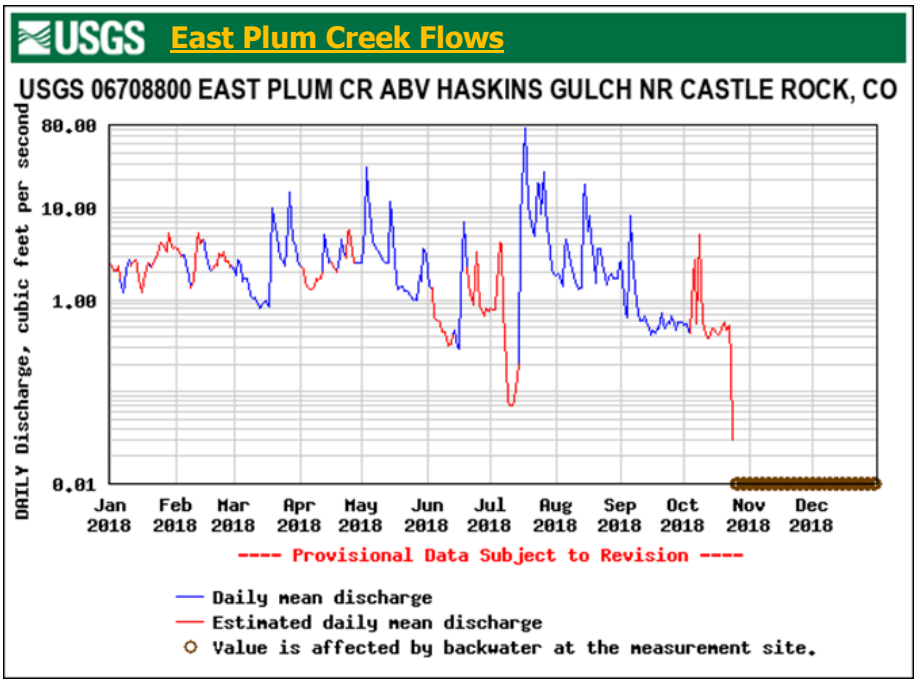
Continued on next page

Water Demands, continued



The flow hydrograph represents stream flows in East Plum Creek taken from the stream gauge located above Haskins Gulch. As the graph illustrates, data for the month is not available due to backwater at the measurement site. The U.S.G.S. is currently working on this issue.

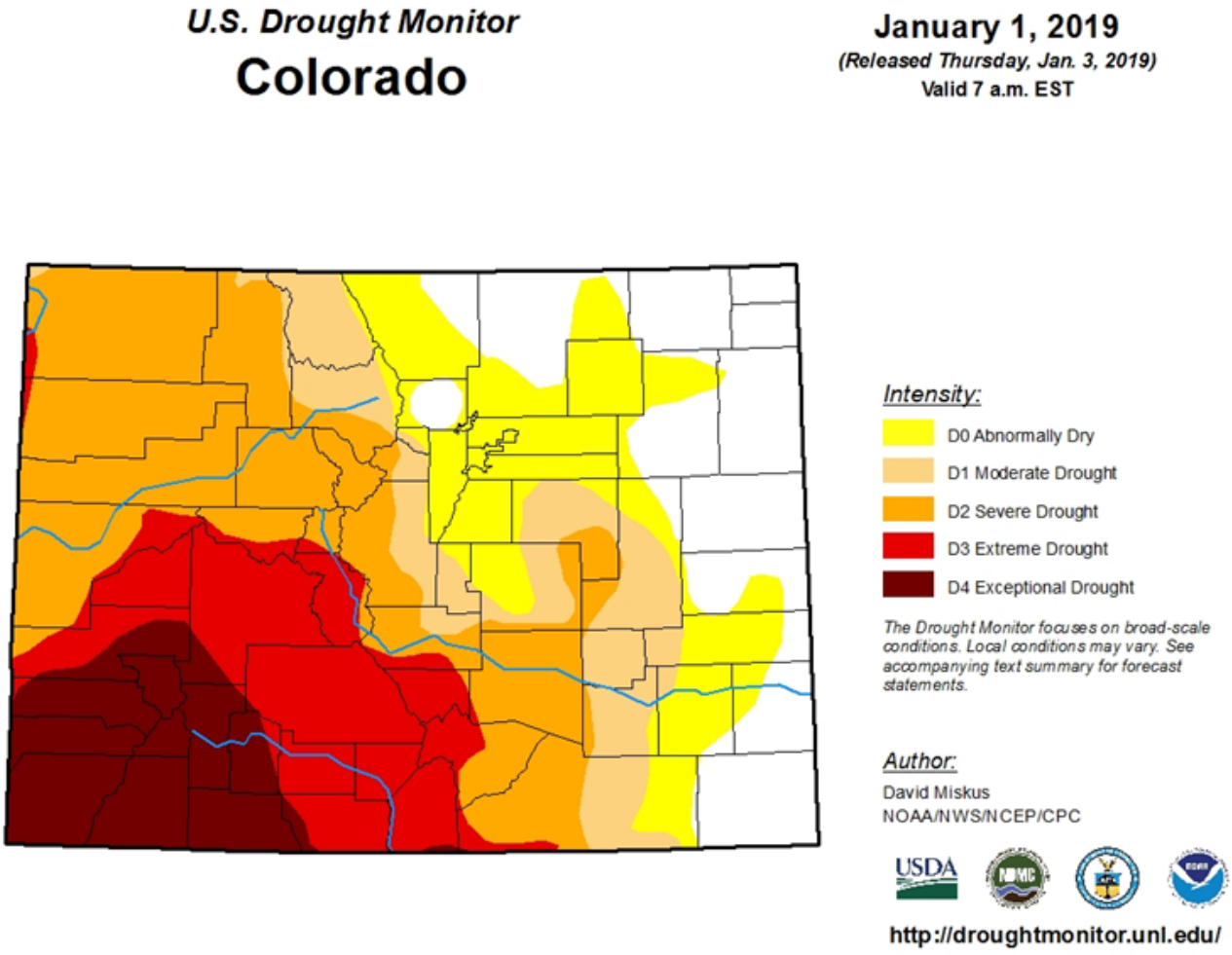
There were active calls on the South Platte River in December. Some of the active calls have had a more senior water right than some of the Town's water rights. This means that those diversions are out -of-priority, so the stream depletions will be covered by non-tributary return flows. This also means 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.



Continued on next page

Water Demands, continued

According to the U.S. Drought Monitor from USDA, Douglas County is abnormally dry, while roughly 60% of Colorado is experiencing Moderate to Exceptional drought. 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 average WSI for December was 3.5, well above the 1.1 trigger level, which is considered "good." The NRCS Colorado SNOTEL report for January 3, 2019 shows the snow/precipitation for the South Platte River Basin is at 113% of average and the snow water equivalent (SWE) is at 111% of median.



What's New in Water?

Castle Rock Water wants you to know what's happening around town and in your local neighborhood. Check back here each month for a list of upcoming projects, or visit us at CRgov.com/waterprojects.

Highway 85 Transmission Project

Planned for construction in 2019, the Highway 85 transmission line project will complete about 2,100 linear feet of 20-inch potable water transmission line in a stretch beginning near the Meadows Boulevard intersection, extending south towards Justice Way. The project is needed to efficiently move water around the town to make best use of WISE water being distributed by the Ray Waterman Regional Water Treatment Center. Project survey is underway. The estimated cost is $703,000.

2019 Water Meter Replacement Project

This project will rehabilitate meter pits at several apartment complexes to improve accessibility for meters crews to perform maintenance and replace aging metering infrastructure. Several old fire hydrants will be replaced, and a new one added to increase fire protection in the apartment neighborhood complex. Work to begin in 2019 at a cost estimate of $250,000.

Lanterns Raw Waterline

The Lanterns Raw Waterline will move raw water from new deep groundwater wells being constructed in the Lanterns, to an existing pipeline to the Plum Creek Water Purification Facility (PCWPF) for treatment. The 1,700 linear feet of new 8-inch raw water pipeline will be partly constructed under the new Plum Creek Trail, then will be directionally bored under the railroad and the East Plum Creek to a connection to an existing raw waterline**.** Target dates for completion of the new wells, well facilities and pipeline is mid-July. Cost estimate for the pipeline portion is $375,000.

Red Hawk Reuse Line

The Red Hawk reuse line is a planned 3.1 miles-long, 8-inch diameter reuse line to take treated effluent from the Plum Creek Water Reclamation Authority plant to the Red Hawk Golf Course so the reuse water can be beneficially used for golf course irrigation. The Red Hawk Golf Course has its own well for irrigation water, but in the height of summer heat, often needs supplemental irrigation water from Castle Rock Water. This is a high priority project for 2019. Estimated costs are $2.45 million.

Plum Creek Sewer Interceptor Project

The work is generally near the intersection of Highway 85 and Meadows Parkway. The work consists of installation of 2,066 linear feet of 30-inch diameter PVC sewer pipeline as a new parallel sewer interceptor to increase overall conveyance capacity of the Town's wastewater collection system. The project is bidding in January 2019, with construction to begin in March 2019, with completion by the end of the year. Estimated costs: $1.8 million.

Gordon Drive Infrastructure Improvements

Construction to begin in March to replace water, sewer, storm Sewer and roadway infrastructure on Gordon Drive. This project is driven by poor drainage on the street resulting in damage to pavement, temporary disruption to traffic and flood hazards. Project will bring streets and utilities up to current design standards and reduce public safety hazards. Outreach efforts are on-going with residents through March to communicate temporary impacts due to construction. Estimate for construction is $2,100,000.

East Plum Creek Reach 6 Stream Stabilization

This project is currently under design and scheduled for construction in the Fall 2019. Stream improvements to reduce bank erosion and channel migration will span from the lower Town limits near the Plum Creek Water Reclamation Facility up to the new Castle Rock Parkway bridge. This project will enhance riparian habitat and water quality in the stream

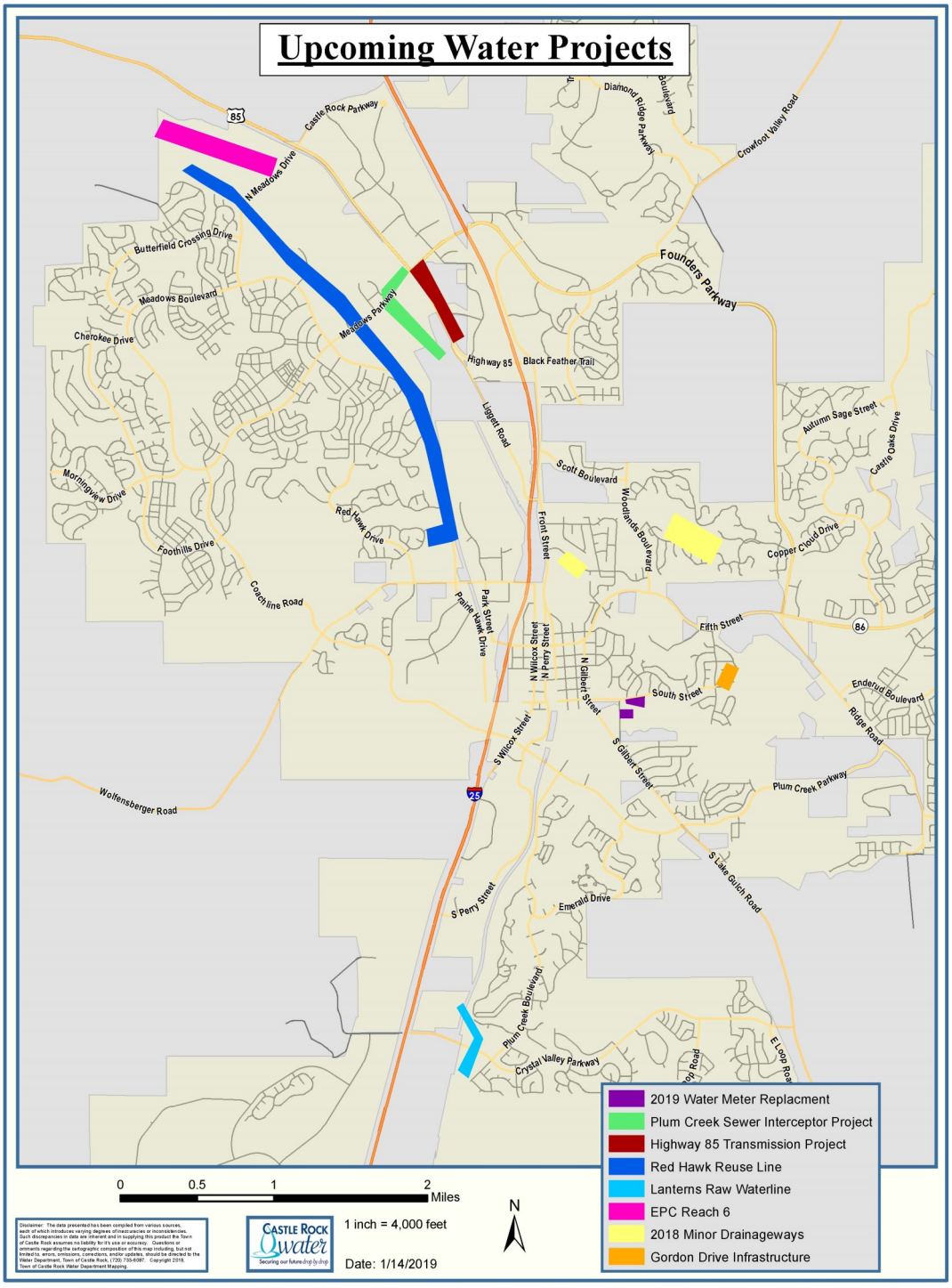
Continued on next page

What's New in Water, continued

system. The Town is partnering with US Geological Survey to improve readings at an existing stream gage that currently experiences frequent loss of data due to the migrating stream. Estimate for construction is $1,000,000.

2018 Minor Drainageway Improvements

This project will address several priority areas where minor drainage systems have failed due to lack of infrastructure. Improvements in two residential neighborhoods including Woodlands and Escavera will convert open space erosional areas to underground storm sewer. These improvements will protect open space and private property. Improvements along Canyon Drive in the Rock Park open space will also contain erosional flow in a pipe and armor channel banks where they threaten the roadway system. Construction is scheduled for April 2019 based on available budget. Current estimates exceed available budget at $1,300,000.



Plan Review Update

By Tina Close, Plan Review Supervisor

Castle Rock Water reviewed 72 applications (see below) this month which compares to 80 during the same time period in 2017. The average assigned due date by Development Services was 13.6 days, and Castle Rock Water completed the reviews in an average of 12.9 days.

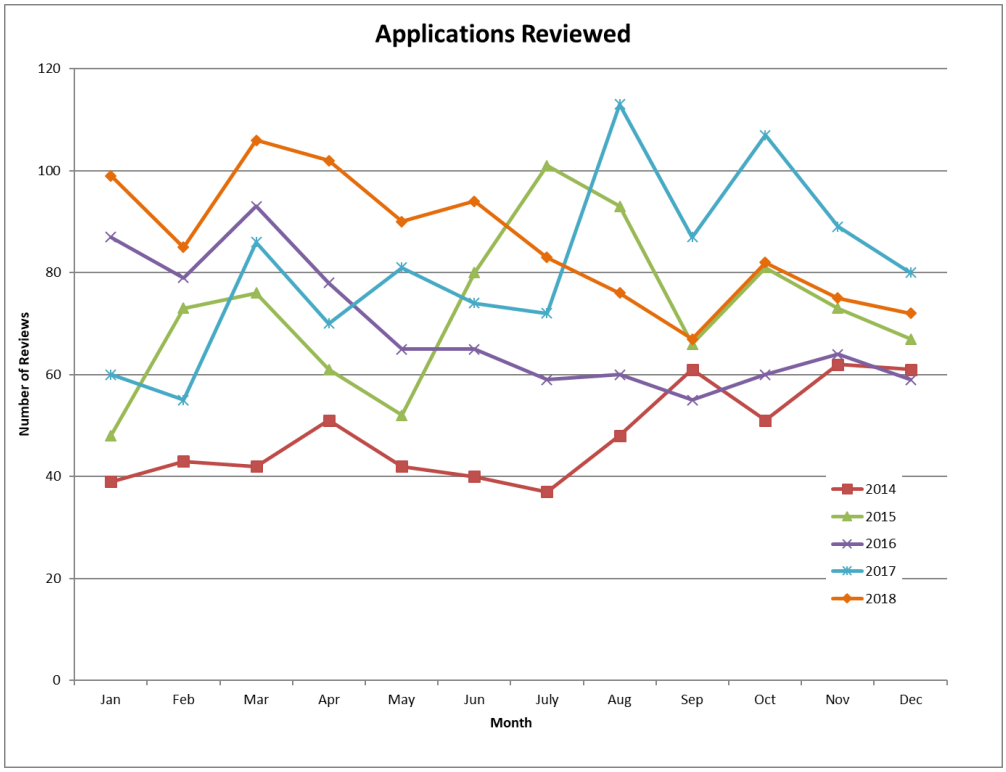
- 4 Agreements
- 10 Field Change Orders
- 5 Grading, Erosion, and Sediment Control (GESC) Plans
- 1 Floodplain Development
- 1 Planned Development
- 2 Capital Improvement Projects (CIP)
- 5 Plats
- 5 Preliminary Project Applications
- 7 Construction Drawings
- 19 Site Development Plans
- 10 Technical Criteria Variances
- 2 Miscellaneous
- 1 Use by Special Review

The applications reviewed consisted of:

- 41 1st submittals
- 14 2nd submittals
- 9 3rd submittals
- 8 Special reviews
- 15 Completed late
- 57 Completed on-time as scheduled

In addition, Castle Rock Water completed 57 building permit reviews and associated system development fees.

Castle Rock Water provides plan review for all water, wastewater and stormwater projects submitted through the development review process. The line graph (below) shows development activity data (by month and year) since 2014.



Welcome to our Team!

Vicki Knopp
Billing Support Specialist

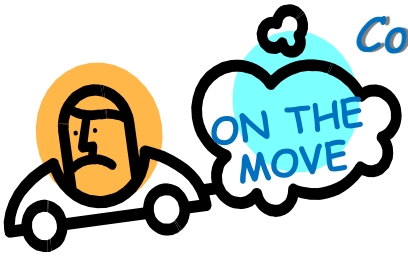
New Certifications

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. Most of these licenses require specialized education and the passing of state testing, as well as proof of continuing education. Below is a list of those passing various certifications this month:

Brent Pickrell
Water Treatment
C Operators

Kevin Moore
Water Treatment
C Operators

John Whitesell
Water Treatment
C Operators



Congratulations on your recent promotion!

Mike Wilder
Sr. Grounds & Facilities
Maintenance Technician

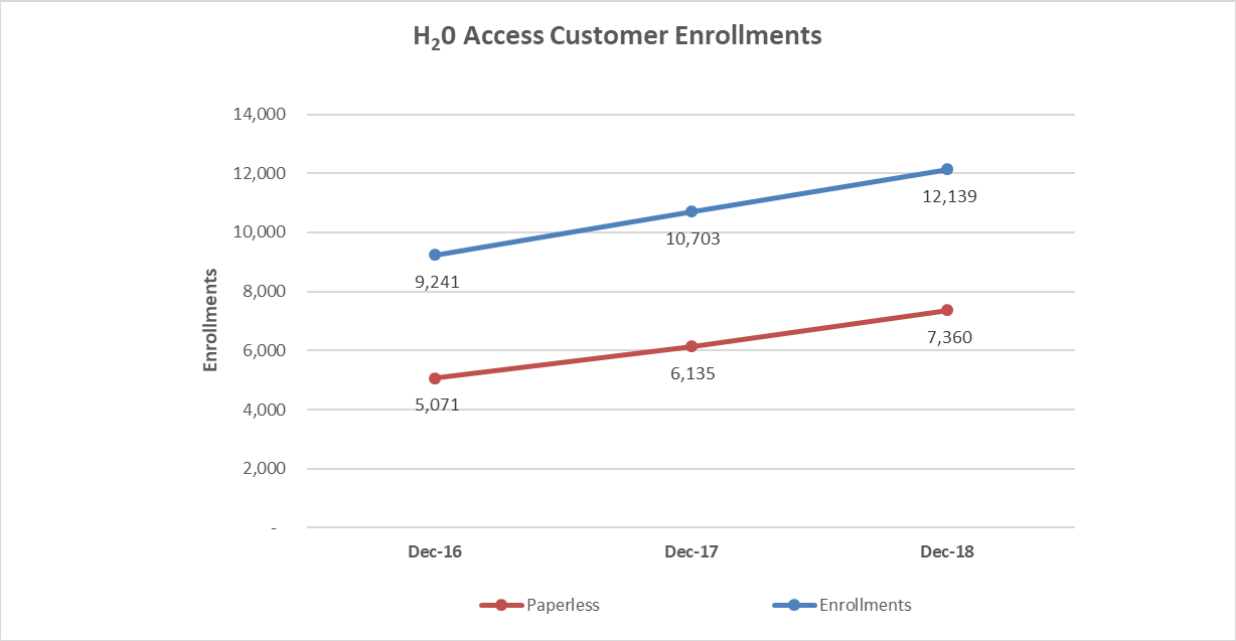
Clayton Baker
Sr. Meter Service
Technician

Business Solutions

Customer Statistics

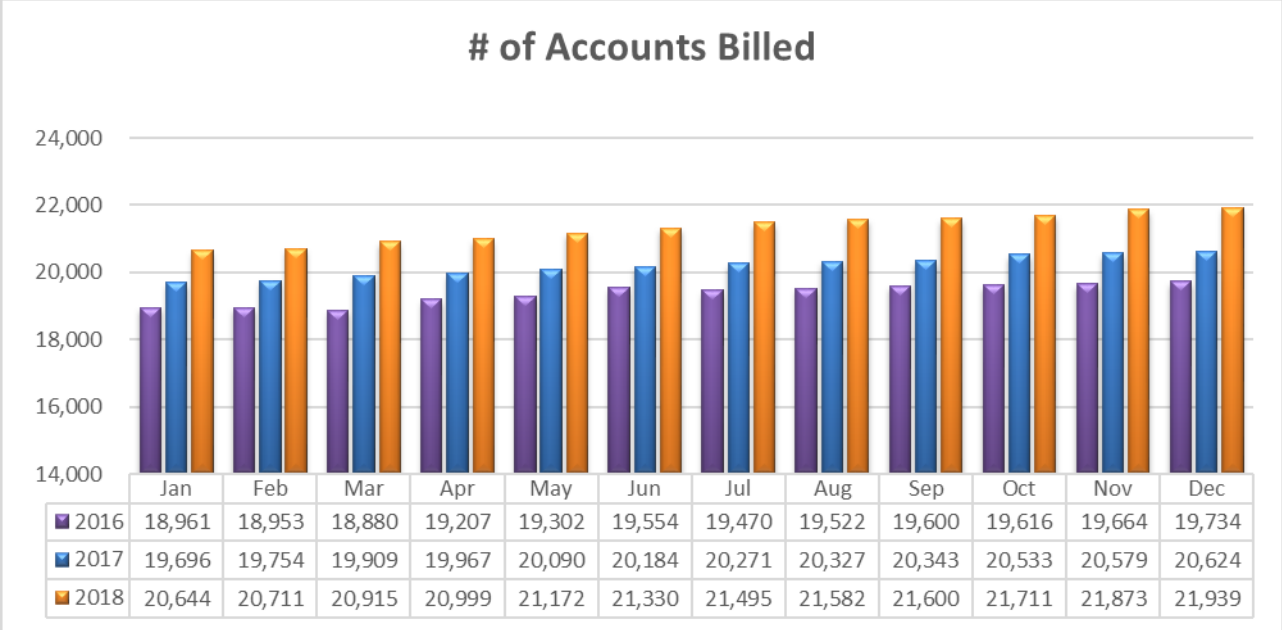
By: Anne Glassman, Business Solutions Manager

Our Business Solutions Team continues to track a host of statistics and data as we evaluate our levels of service and look for efficient ways to improve on these levels.



Updated quarterly - Data reported quarter ending 12/2018

The number of customers enrolled in paperless billing has remained steady at 57 percent over the last several months.

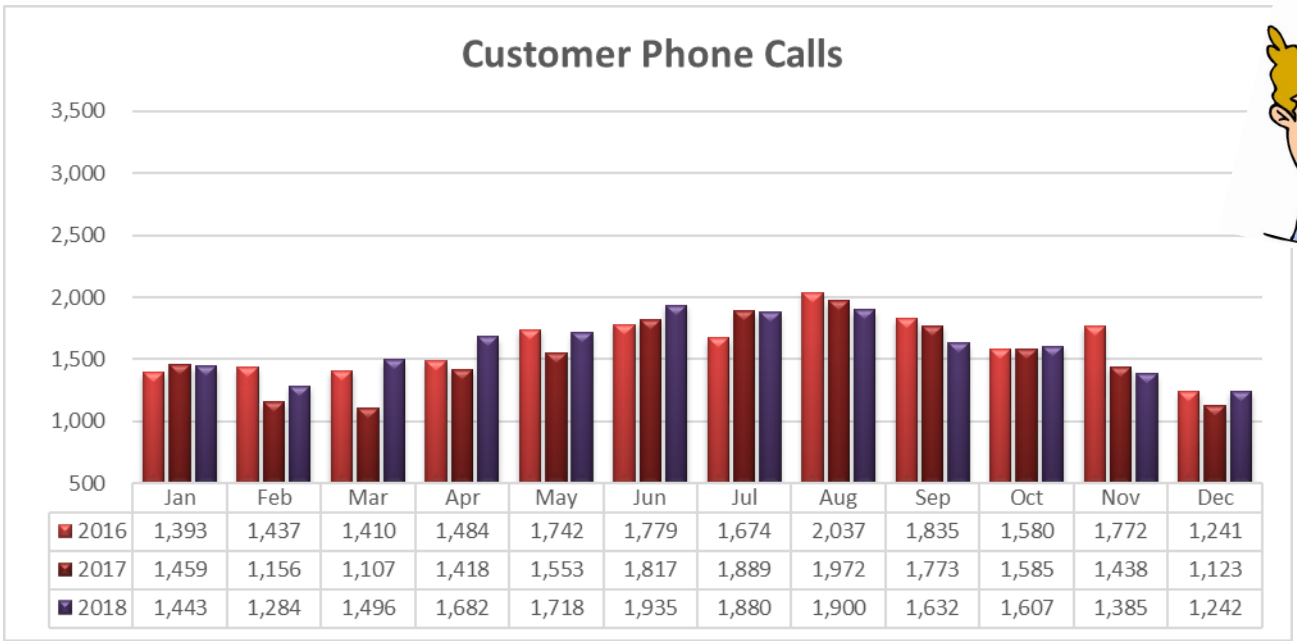


	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	18,961	18,953	18,880	19,207	19,302	19,554	19,470	19,522	19,600	19,616	19,664	19,734
2017	19,696	19,754	19,909	19,967	20,090	20,184	20,271	20,327	20,343	20,533	20,579	20,624
2018	20,644	20,711	20,915	20,999	21,172	21,330	21,495	21,582	21,600	21,711	21,873	21,939

The number of accounts billed continues to increase year over year due to new residential and commercial growth.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	376	336	361	378	379	392	372	416	400	345	434	256
2017	318	287	327	388	347	378	330	411	329	349	298	325
2018	411	348	355	400	417	369	390	424	324	396	297	312

Walk-in customers are consistent with this time of year.



	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2016	1,393	1,437	1,410	1,484	1,742	1,779	1,674	2,037	1,835	1,580	1,772	1,241
2017	1,459	1,156	1,107	1,418	1,553	1,817	1,889	1,972	1,773	1,585	1,438	1,123
2018	1,443	1,284	1,496	1,682	1,718	1,935	1,880	1,900	1,632	1,607	1,385	1,242

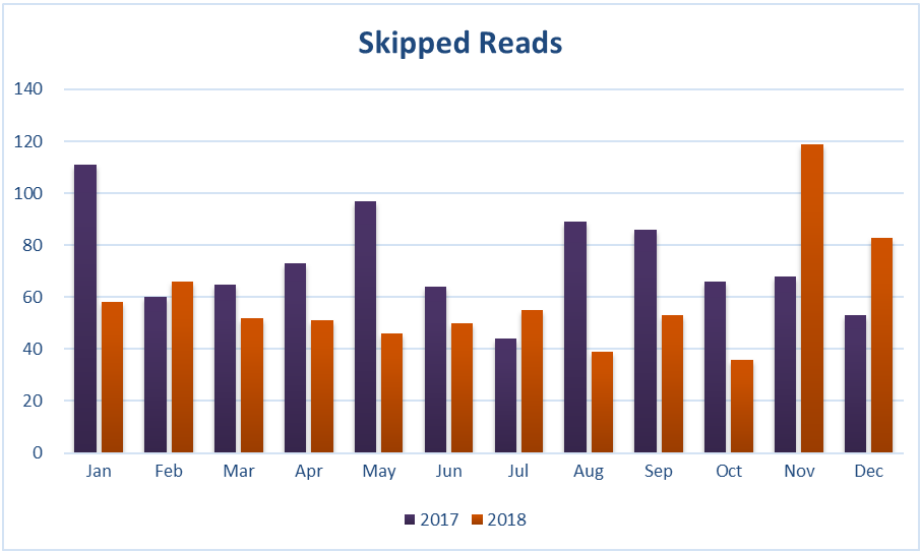
Customer phone calls are consistent with this time of year.

METERS

Skipped Reads

The American Water Works Association (AWWA) standard for skipped reads is 2 percent, so at 0.38 percent in December, we still continue to stay well below the industry average. This is a result of continued maintenance and repair efforts on meter infrastructure.

The skipped reads in November were up due to batteries dying from cold weather. Some batteries that are at the end of their life cycle will go dead with the onset of cold weather.

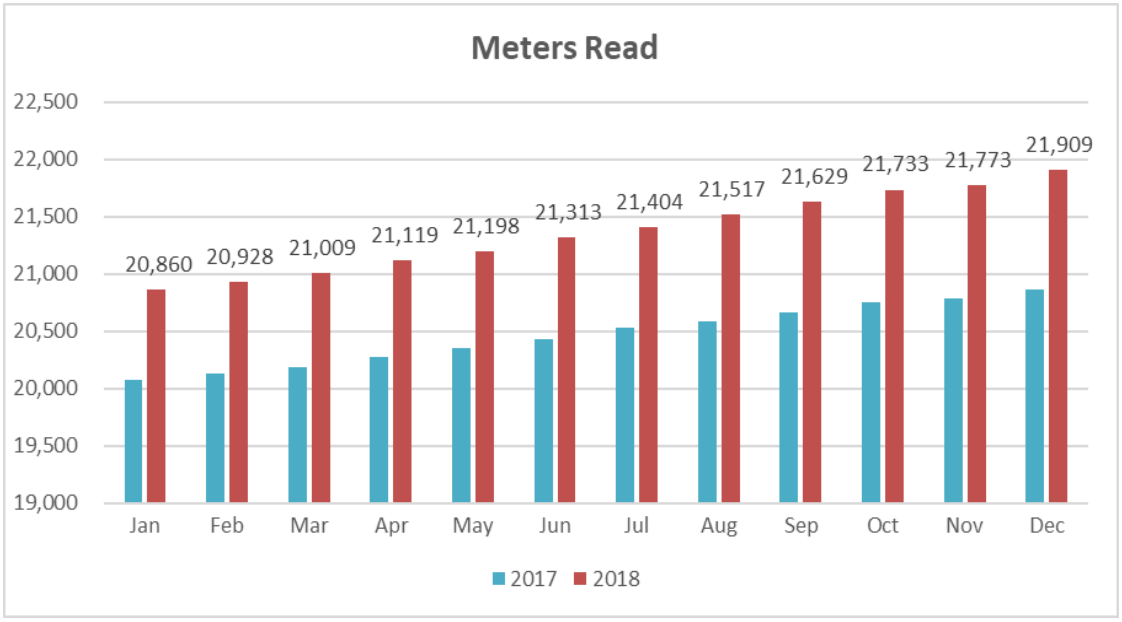


WHY IS THIS IMPORTANT?

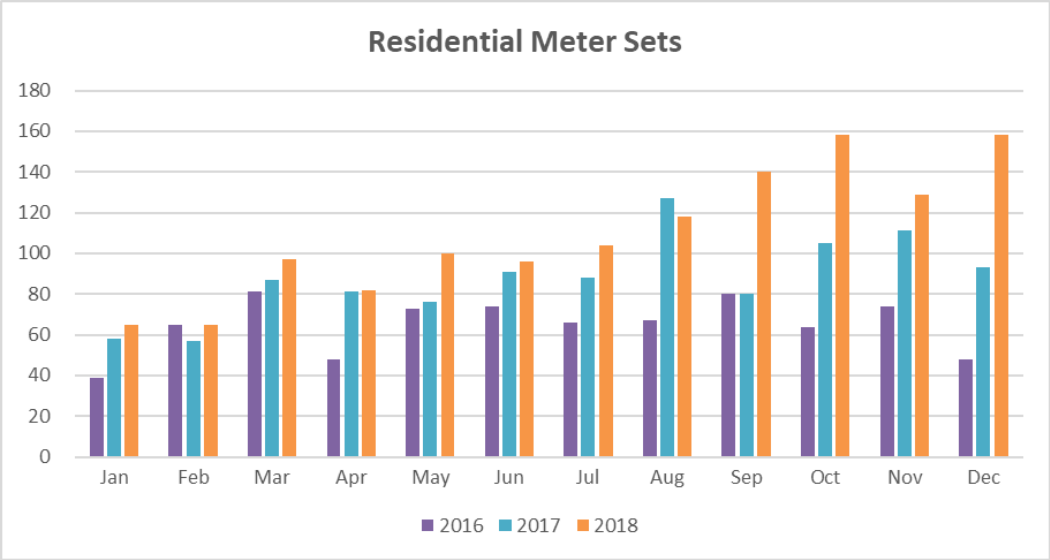
It is a strong indication of the level of preventative maintenance being done by our team. A skipped read is indicative of a problem with the metering infrastructure (i.e. battery, wiring, etc.). Fewer skipped reads means more properly working meters, which is good for all our customers.

Meter Sets

Month-to-Date 99
Year-to-date 1,152

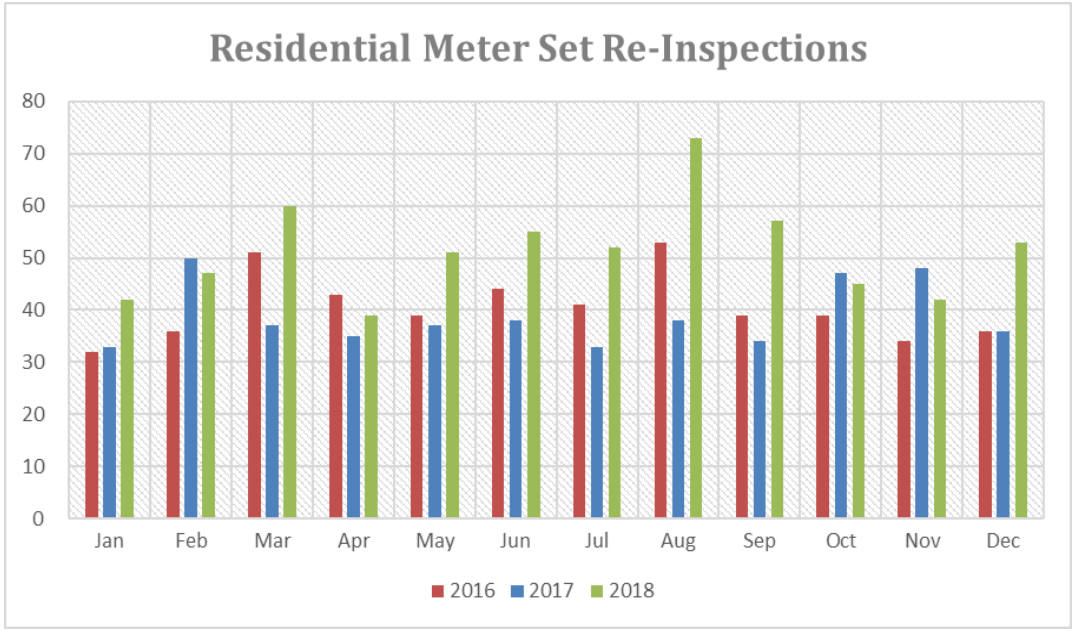


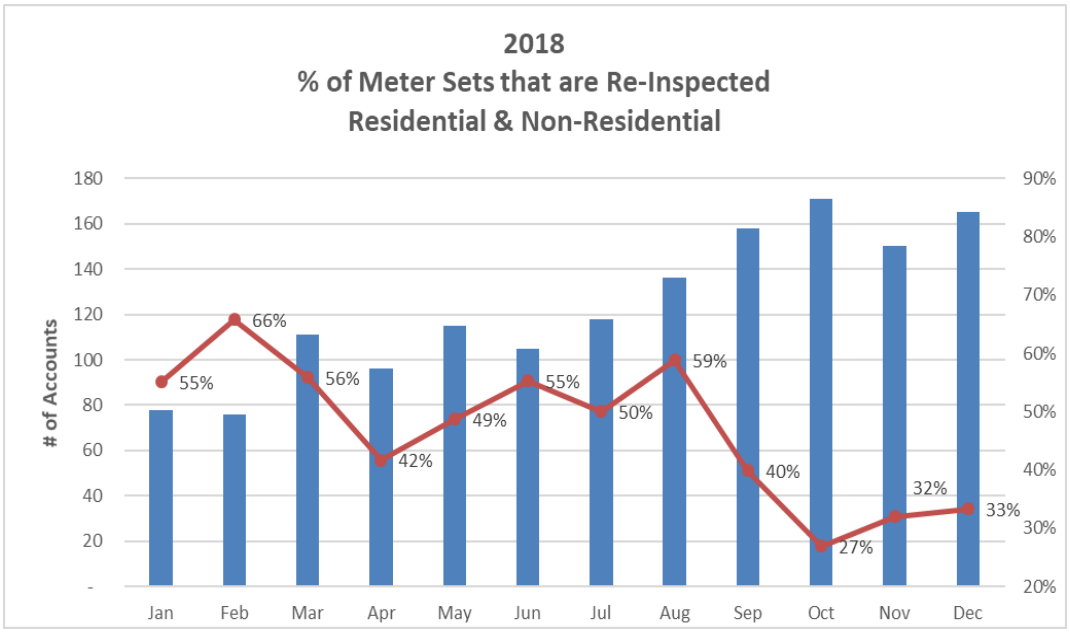
The meters read continues to increase month-to-month due to new residential and commercial accounts, with a significant increase year-over-year.



Residential meter sets continue to remain high due to new residential development.

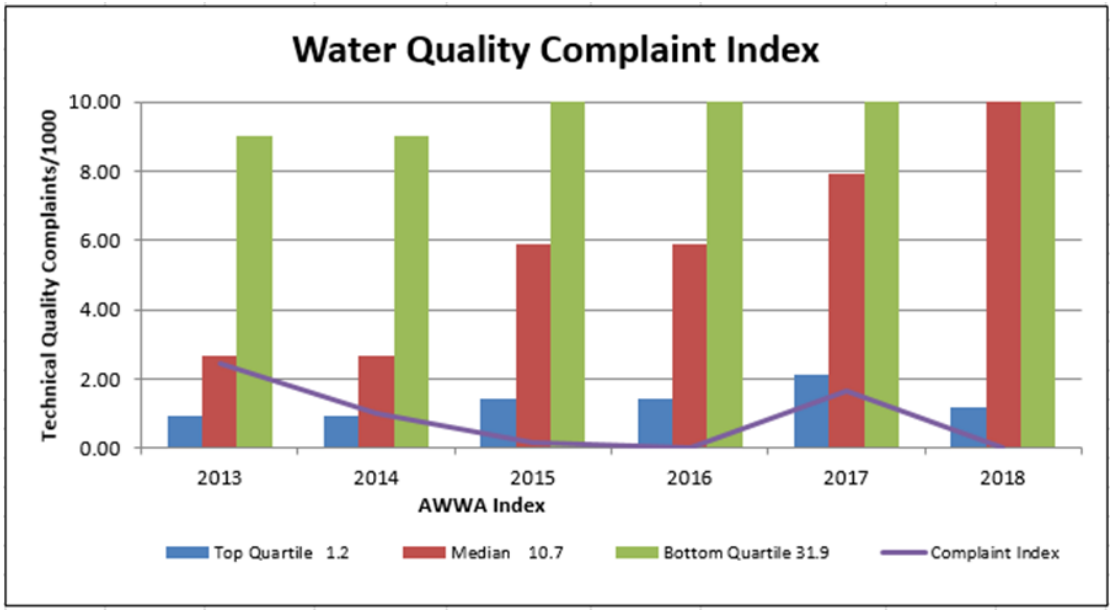
Residential meter set re-inspections are up over previous years, which indicate that meter set re-inspections are not passing on the original inspection and requiring additional resources and site visits.





Overall, meter sets and the number of re-inspected meter sets are consistent with last month. In 2018, on average 45% of the meter sets require at least one re-inspection from the initial inspection. The percent requiring re-inspection is trending down over the last quarter.

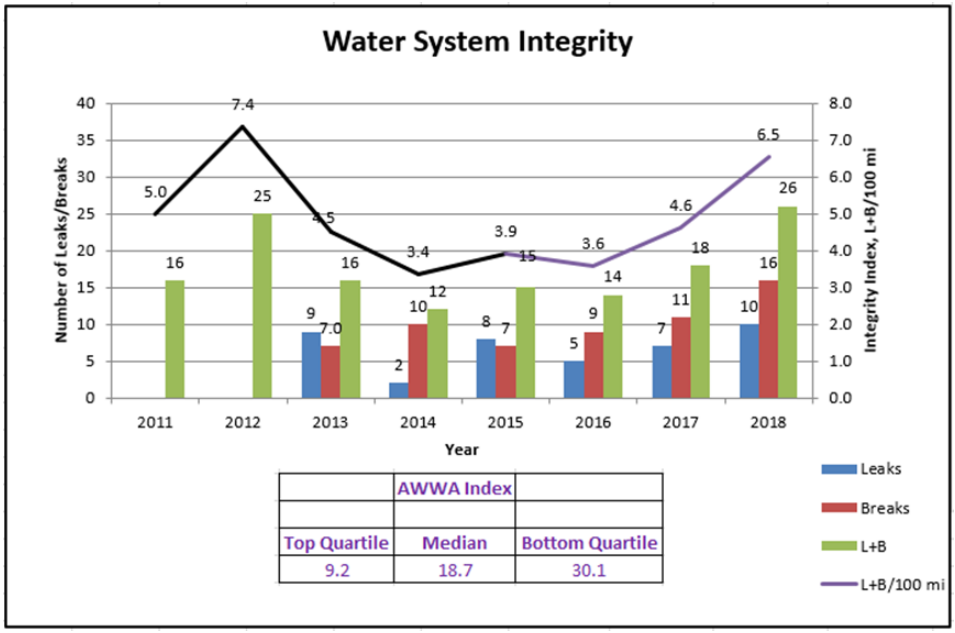
Water Quality Complaints



The Water Quality Complaint index shows that we are doing very well in this category; rating in the top quartile since 2015 according to the American Water Works Association (AWWA). There were no water quality issues in December.

*For more information, view the current water quality report at CRgov.com/**waterqualityreport**.*

Water System Integrity



As the Water System Integrity chart indicates we have consistently remained in the top quartile for water system integrity based on American Water Works Association (AWWA) benchmarking since 2011. There were two water system integrity issues in December.

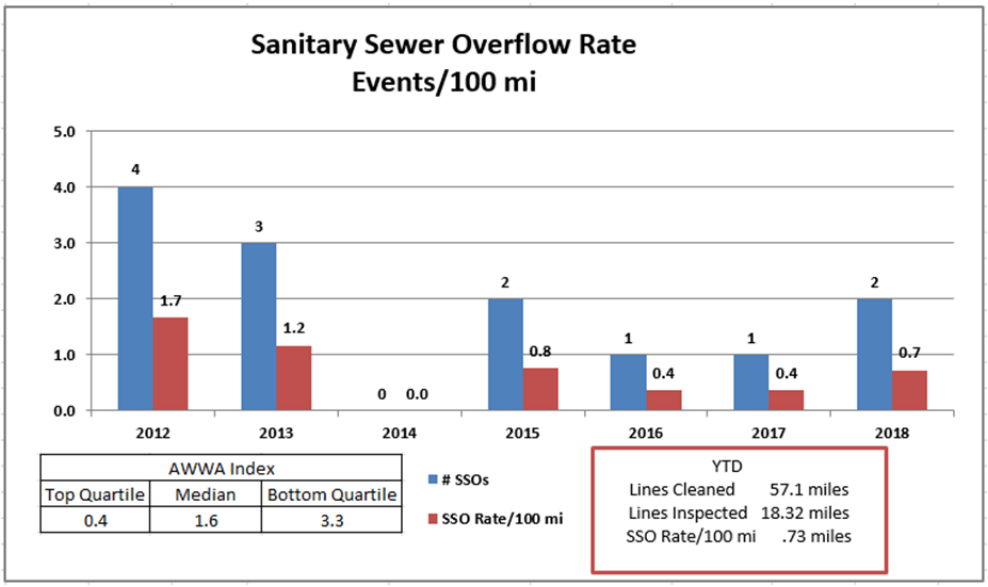
Sanitary Sewer Overflows

We are tracking in the Median Quartile in the Sanitary Sewer Overflow Rate, according to the American Water Works Association (AWWA), showing two incidents for the year. There were no sanitary sewer issues in December.

How do we avoid overflows?

Our team runs a camera through the sewer mains to look for problems. When problems are identified, they are cleared with a high pressure water jet. So far, we have cleaned and inspected 57 and 18 miles, respectively.

The goal this year is to clean and inspect approximately 33 percent of the collection system or about 90 miles.



December Levels of Service

Drinking Water Compliance
Castle Rock Water will deliver water that meets or exceeds both Primary Drinking Water Regulations and Secondary Maximum Contaminant Levels 100% of the time.
Ninety routine samples were completed. All samples were within the parameters set forth by the Safe Drinking Water Act and Colorado Drinking Water Standards. Our annual Consumer Confidence Report is available to view at CRgov.com/waterquality.

Pressure Adequacy
< 1% of our customers will experience less than 43 pounds per square inch (psi) of pressure at the meter during normal operations.
We had one low pressure issue in December in the Red Hawk subdivision. This low pressure issue was caused by a contractor working in close proximity to our distribution system without notifying Castle Rock Water. The issue was exacerbated when the contractor closed several valves on the Town's water distribution system without authorization. This issue was corrected immediately as soon as Castle Rock Water staff became aware of the situation through a customer complaint.

Sewer System Effectiveness
<1% of our customers will experience a sewer backup caused by the utility's sewer system per year.
There were no sewer system issues in December.

Drinking Water Supply Outages
<5% of our customers will experience water outages for one or more events totaling more than 30 hours/year.
In December, this level of service was met. Two water main breaks/leaks occurred in December affecting a total of 135 homes. Thirty homes experienced a service disruption for less than four hours while 105 homes experienced a service disruption for less than eight hours.

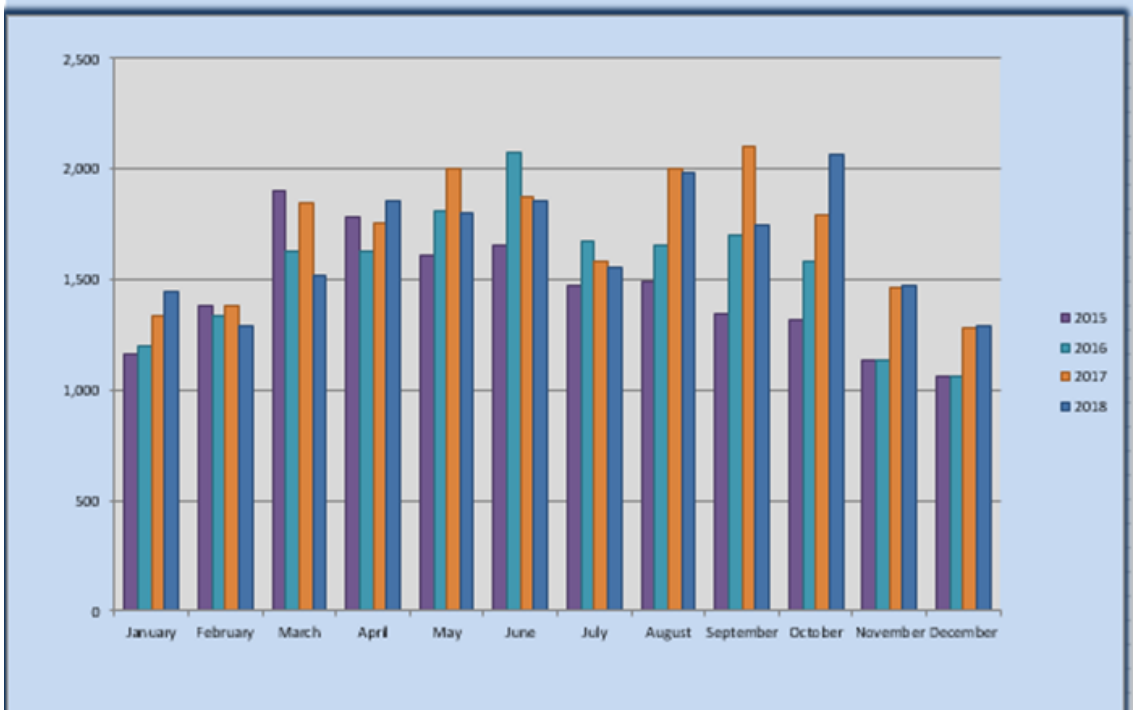
Before you start a project, call 811. Whether you are planning to do it yourself, or hiring a professional, we will help you do it safely. The local 811 Call Center will contact Castle Rock Water. We will schedule a time to come out to locate public water and wastewater lines in the road and in your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

ANNUAL UTILITY LOCATES

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	
January	577	475	617	1,190	1,289	1,162	1,199	1,334	1,442			
February	521	485	538	1,094	1,093	1,383	1,334	1,378	1,293			
March	660	552	818	1,437	1,349	1,906	1,625	1,851	1,514			
April	838	681	1,025	1,482	1,552	1,784	1,631	1,760	1,856			
May	853	863	985	1,541	1,531	1,609	1,809	2,002	1,801			
June	969	844	982	1,314	1,399	1,654	2,075	1,872	1,854			
July	680	582	859	1,350	1,392	1,477	1,675	1,582	1,556			
August	901	723	1,123	1,476	1,468	1,494	1,651	2,001	1,986			
September	880	723	1,029	1,240	1,373	1,343	1,701	2,102	1,747			
October	715	688	1,155	1,501	1,376	1,314	1,579	1,792	2,064			
November	536	518	1,041	1,072	866	1,134	1,131	1,460	1,469			
December	415	405	925	1,005	1,043	1,063	1,059	1,277	1,293			
Totals	8,545	7,539	11,097	15,702	15,731	17,323	18,469	20,411	19,875			

811 Know what's below. Call before you dig.

4 Year Locate Trend



Castle Rock Water's locate requests from 811 have continued to rise, year over year. Our locating team has correctly marked all locate requests. To date, there has not been damage to lines as a result of incorrect locate marks.