

# MONTHLY REPORT

DEC. 2021

**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.

## Glovers Neighborhood Water Rehab Project



The Glovers Water Rehabilitation Project is located east of S. Gilbert Street, between Ash and Elm avenues. This project will replace the aging and undersized potable water distribution piping in the Glovers subdivision. This subdivision has had a significant number of main breaks in recent years with approximately two to three main breaks per year in the previous four years. This project will be constructed in two phases. Phase 1 will include the southern portion of the neighborhood and has been completed. Phase 2 will replace the water mains in the northern portion of the neighborhood and will be constructed in 2022.

The project shifted with changing conditions. During the construction of the new water mains, the existing pavement began to fail. The original pavement was less than 3 inches thick in most areas, and appeared to be original pavement. The existing pavement was not holding up well to the street cuts and heavy equipment and was no longer a candidate for patching back. The area was scheduled for reconstruction under the Pavement Maintenance Program (PMP) managed by Public Works (PW) in 2027. CRW was planning a follow-up project in 2025 to replace aging sewer service laterals in advance of the future road reconstruction by PW. However, with the pavement scope expanded to require full replacement now in the Phase 1 project area, CRW decided to expedite the replacement of the sewer service laterals and include them in the project scope of work for completion now, in advance of



repaving at completion of the project. This would avoid having a patched roadway network if the sewer service laterals are delayed to a future year.

The project was awarded to T Lowell. The total project cost was \$3,025,215 and was completed within the approved budget. Public Works will reimburse Castle Rock Water \$656,346 for the road and sidewalk rehabilitation. The project was completed ahead of schedule.



## Award winning water provider

Castle Rock Water's Plum Creek Water Purification Facility along with consultant Burns & McDonnell were recognized for the Advanced Treatment processes constructed in 2021 with two prestigious engineering awards and a water industry award. ACEC Colorado's Engineering Excellence Awards (EEA) program annually recognizes consulting engineering firms for projects that demonstrate an exceptional degree of innovation, complexity, achievement, and value. Engineering News-Record (ENR) reports on the top architect and engineer design firms, and the top construction companies as well as projects in the U.S. and around the world. ENR awarded PCWPF the 2021 ENR Best Water/Environment Project. Earlier in 2021, the Rocky Mountain Section of American Water Works Association awarded PCWPF with the Outstanding Water Treatment Plant award.



With the goal to utilize renewable water sources as the primary supply for the Town's water demand, Castle Rock Water, with design consultant Burns & McDonnell, developed a unique drinking water plant that treats both groundwater and surface water sources. The development and construction of Advanced Treatment entailed piloting, design and onsite construction coordination. PCWPF now can purify multiple raw water sources to meet drinking water standards, including renewable indirect reuse water and direct reuse water. The plant began processing indirect reuse water in February 2022 and Castle Rock Water plans to be the first water provider in the State to introduce direct potable reuse water.



## O&M had a very busy month



*Collections staff assisted at a Sewer System Overflow (SSO) that occurred in Crystal Valley Ranch. They found that the sewer main had been blocked by a plug that was left in line by the developer's contractor.*



*A failed Diamond Ridge outfall was restored by the Stormwater team. The highly eroded site was restored with over 60 yards of fill to bring it up to grade. Erosion fabric and rip rap rock were used to support the outfall, which will help reduce erosion during high flow events.*

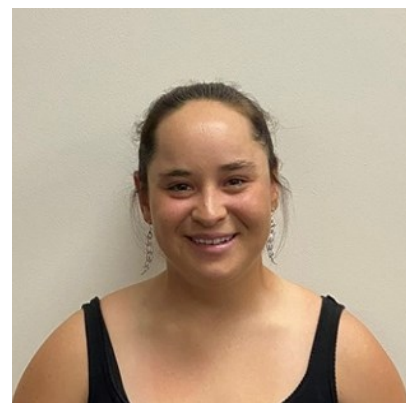


# Good job!

Welcome  
**NEW HIRES**



**Ed Allbright**  
Water Operator IV



**Erika Corvera**  
Meters Services Specialist

## **NEW CERTIFICATIONS**

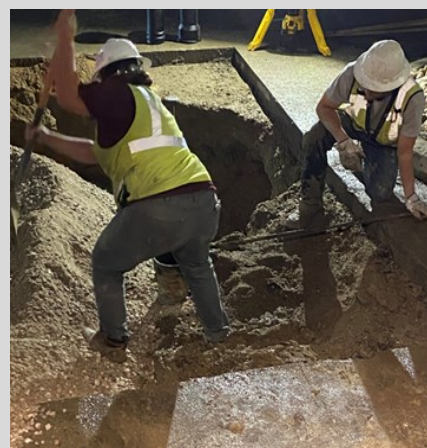
Staff tested for and received 26 new Colorado Certified Water Professional (CCWP) operator certifications in 2021.



**David Madsen**  
Distribution 1 Operator  
Certification

*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.*

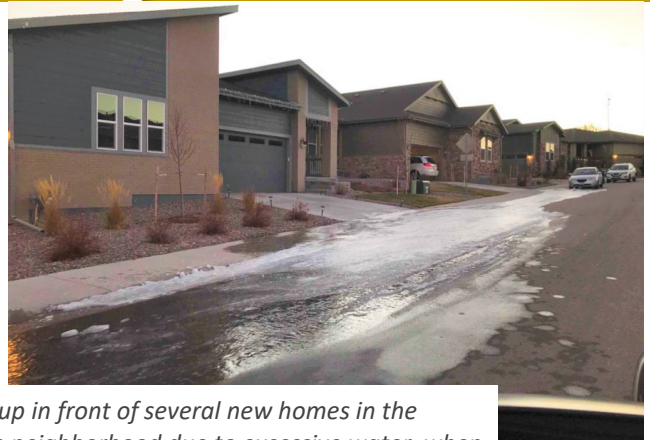
## **IN THE FIELD**



# Stormwater Compliance

As an integral part of the Town's vision of providing residents the highest quality services at the best value, the Stormwater Division manages stormwater runoff to minimize flooding hazards and to protect water quality in our watersheds. Services the Stormwater Division provides include:

- Construction site inspections
- Spill reporting
- Public education and outreach
- Pond maintenance oversight
- Floodplain management



*Ice quickly built up in front of several new homes in the Sunstone Village neighborhood due to excessive water when temps finally dropped below freezing. The homebuilder is responsible for management and a permanent solution since this project is still under warranty.*

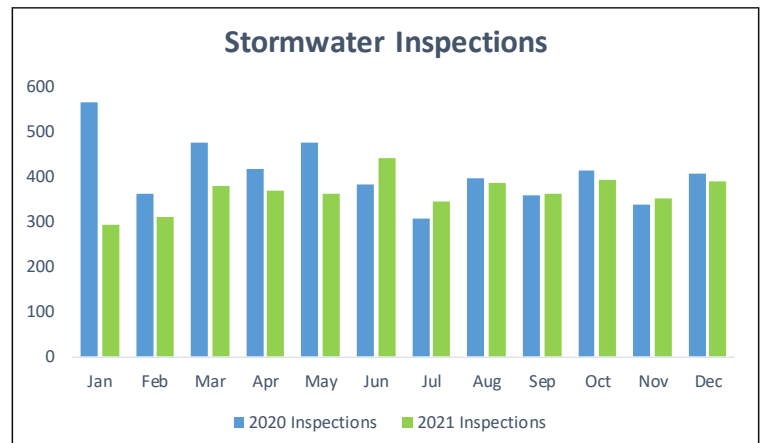
## Inspections

The inspection team regulates permitted residential and commercial properties.

The transition from DESC to TESC began in 2020 and was still underway in 2021, leading to a 17% drop in inspections.

Over 4,300 inspections were performed in 2021.

In addition, the team completed 335 pond and outfall inspections.

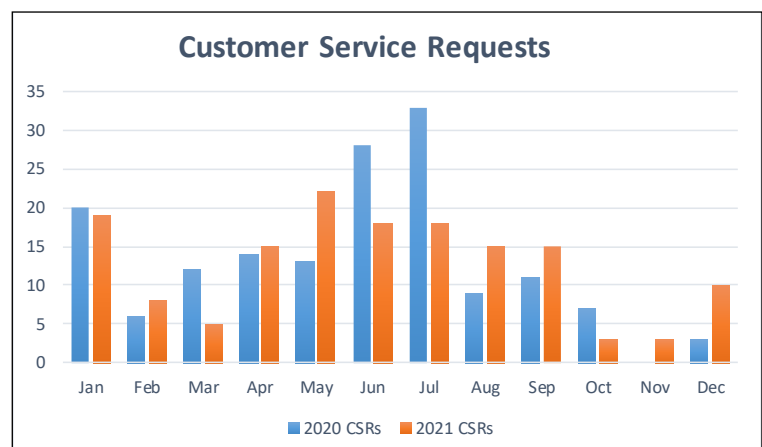


## Customer Service

The Stormwater Division receives various customer concerns from nuisance groundwater and illicit discharges to dust to maintenance of infrastructure. Complaints often rise and fall with weather patterns.

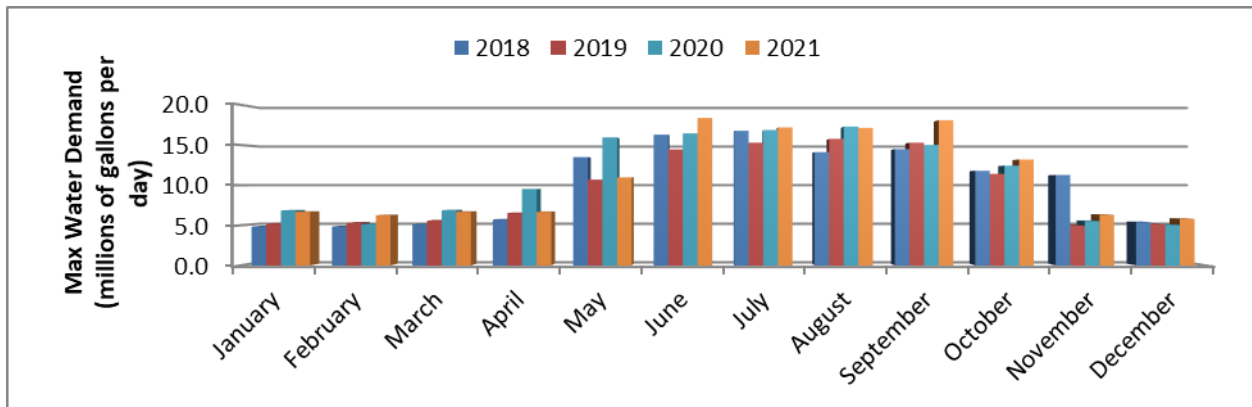
Total customer service requests were about the same as last year and fluctuated with weather patterns.

Castle Rock was unusually warm and very dry during the last quarter of 2021 with temperatures 5.6 degrees above normal and precipitation 1.65" (71%) below normal.



The official weather station in Denver recorded 0.3 inches of snow on Dec. 10, 2021, smashing the previous record for latest snowfall to start the season. The previous record for latest measurable snow was Nov. 21 which occurred in 1934. That means the record was broken by nearly three weeks! Measurable snow is defined as 0.1" or greater. Meanwhile, there were 232 consecutive days without measurable snowfall at Denver. This number of dry days is tied with 1887 for the longest streak in recorded history. Snowfall records began in 1882.

# 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. 2021**                      **5.8 million gallons/day**  
 Dec. 5 yr. avg.              5.2 million gallons/day  
*12% higher than average*

**Max daily water demand in 2021**  
 18.1 MGD (Sept.)

## Water demand total

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

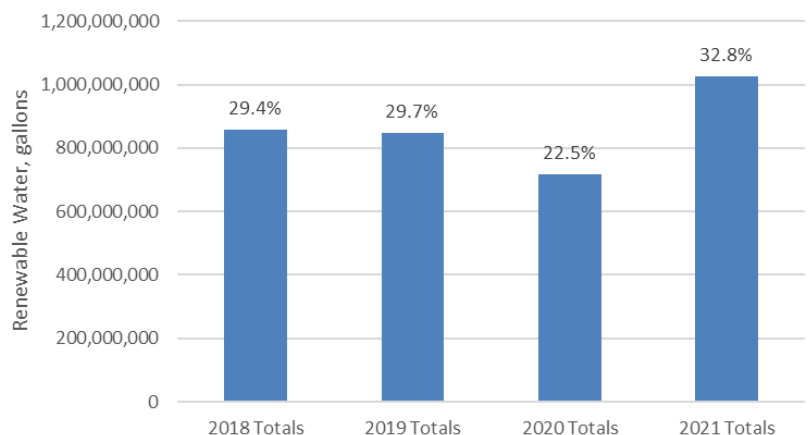
**Dec. 2021**                      **165.3 million gallons**  
 Dec. 2020                      147 million gallons  
*12.5% increase from last year*

**Water demand total for 2021**  
 3,260.6 MG

## Renewable water supply

- The CR-1 diversion produced an average of 0.17 MGD for the month of December.
- The Town's fourteen alluvial wells, the CR-1 diversion, and the Plum Creek Raw Water Return Line (PCRWRL) delivered a total of 92.9 MG (285.1AF) of renewable water (and an average of 3.0 MGD).
- In total, renewable supplies accounted for 56.8% of the total water supply for the month and **32.8% of the annual water supply (3,124 MG or 9584.1 AF) to date.**

### Renewable Water Production YTD



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

*Note: In 2020, renewable water production was down due to the construction of Advanced Treatment processes to the Plum Creek Water Purification Facility.*



# Water Demand

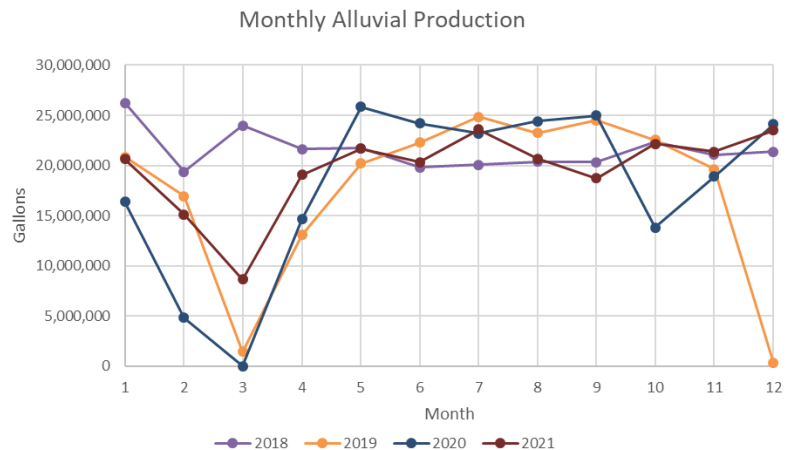
Renewable supplies are those water sources that are replenished by precipitation (think of our alluvial wells and CR-1 diversion), whereas reusable supplies are those waters that are either from the non-tributary Denver Basin (deep wells) or imported supplies (such as WISE) that can be used over and over, to extinction.

**The average reusable supplies used by Castle Rock for 2021 through December is 45.5%.**

## Alluvial supply

**Dec. 2021 production: 23.5 MG/72.1 AF**

- The graph shows the monthly production of the Town's alluvial well system, which helps to supply PCWPF. The production from the alluvial wells in Dec. was 23.5 MG.
- We had three alluvial well rehabilitations completed this year.



## East Plum Creek Flows

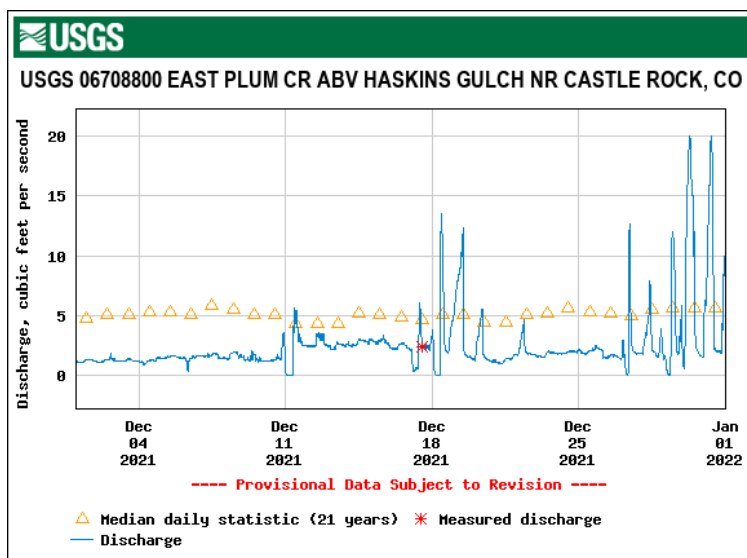
**Average Dec. streamflow: 2.5 cfs**

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 0 and 20 cubic feet per second (cfs) during the month of December, with

an average streamflow of 2.5 cfs. This month's average streamflow of 2.5 cfs is below the 20-year median of 5.0 cfs.

There were active calls on the South Platte River in December. Some of the active calls had a more senior water right than some of the Town's water rights. This means that some the Town's diversions were out-of-priority, so the stream depletions were replenished by non-tributary return flows. This also means that the Town had slightly less reusable water going down Plum Creek during the active calls. 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.

As a participant in the Chatfield Storage Reallocation Project, the Town is able to store up to 2,000 AF of water in Chatfield Reservoir. This means that our reusable water that flows down Plum Creek and past the Plum Creek Diversion can be captured and stored at Chatfield for later use. First storage started on May 15, 2020 and as of the **end of December, the Town of Castle Rock has approximately 793.1 AF of water stored in Chatfield.**



# 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 100% of Colorado is experiencing Moderate Drought (D1) to Exceptional Drought (D4) conditions, with Severe and Extreme Drought conditions in Douglas County. 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 Precipitation Report

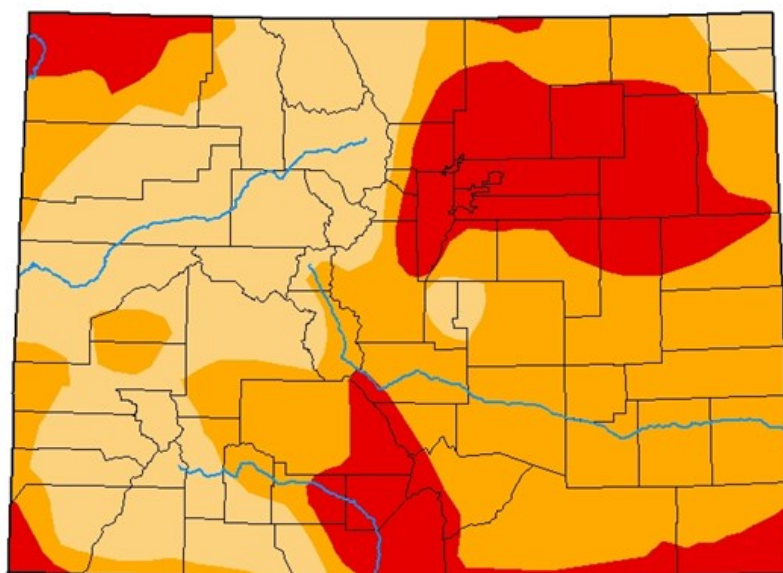
Jan. 4, 2022

South Platte River Basin:

- YTD precipitation is at 112% of average
- Snow Water Equivalent (SWE) at 109% of average

## U.S. Drought Monitor Colorado

**December 28, 2021**  
(Released Thursday, Dec. 30, 2021)  
Valid 7 a.m. EST



### Intensity:

- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme 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](https://droughtmonitor.unl.edu)

# Water Demand

## Conservation - 2021 Season Summary

### Water Wiser workshop

12 Water Wiser Workshops held via WebEx  
New participants: 396  
Renewal participants: 153

*Current number of active Water Wiser households  
(not individuals): 3,497*

### ColoradoScape workshop

2 ColoradoScape Workshops held via WebEx

### Winterization workshop

1 Winterization Workshop held via WebEx

### Qualified Water Efficient Landscaper (QWEL) training

4 three-day QWEL trainings for registered  
landscapers held in-person.

### School Presentations

No school presentations were completed due to  
ongoing pandemic concerns.

### Rebates

Residential ColoradoScape Renovation rebates: 48  
Amount refunded: \$42,193.20  
Square feet renovated: 45,353  
*Avg. water savings since 2013: 17%*

Non-Res. ColoradoScape Renovation rebates: 4  
Amount refunded: \$35,894.50  
Square feet renovated: 39,324  
*Avg. water savings since 2018: 29%*

Smart Controller rebates: 94  
Amount refunded: \$8,364.19

Rotary Nozzle rebates: 24  
Amount refunded: \$1,652.80

Toilet rebate participants: 13 (27 toilets)  
Amount refunded: \$2,700

Whole-Home Water Monitoring Systems: 9  
Amount refunded: \$1,697.05

2021 Residential Total: \$56,607.24

2021 Non-Residential Total: \$35,894.50

2021 Grand Total: \$92,501.74

### Inspections (Residential and non-residential combined)

Total inspections: 1,948

Pre-con: 35  
Point of connection inspection: 37  
Point of connection re-inspection: 16  
Soil inspection: 1,053  
Soil re-inspection: 657  
Sub-surface inspection: 12  
Sub-surface re-inspection: 3  
Site visits: 10  
Landscape final inspection: 32  
Irrigation final inspection: 31  
Landscape final re-inspection: 30  
Irrigation final re-inspection: 32

### Sprinkler System Assessments

Total assessments: 16

### Exemptions

Total sod/seed/plant material exemptions: 693

### Watering Violations

Total violations; 2,361 / \$49,050 collected

Residential total: 2,056 / \$10,750

1<sup>st</sup> Violation: 1,731  
2<sup>nd</sup> Violation: 255 violations / \$5,900  
3<sup>rd</sup> Violation: 49 violations / \$2,250  
4<sup>th</sup> Violation: 13 violations / \$1,200  
5<sup>th</sup> Violation: 4 violations / \$800  
Subsequent Violations: 4 violations / \$600

Non-residential total: 305 / \$38,300

1<sup>st</sup> Violation: 171  
2<sup>nd</sup> Violation: 60 violations / \$5,900  
3<sup>rd</sup> Violation: 34 violations / \$6,800  
4<sup>th</sup> Violation: 16 violations / \$6,400  
5<sup>th</sup> Violation: 7 violations / \$5,600  
Subsequent Violation: 17 violations / \$13,600

*Violations are  
used to help  
fund rebates!*





# Plan Review

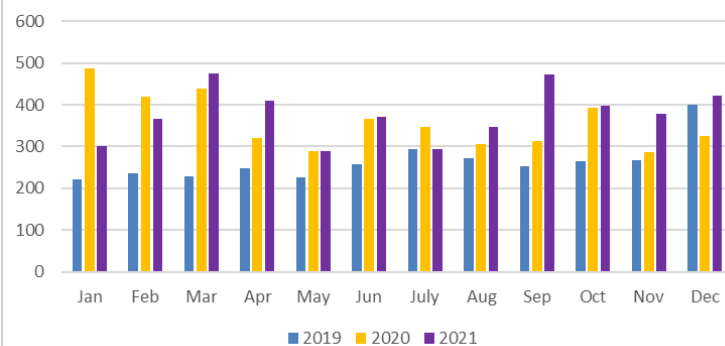
For each commercial and residential project submitted for development review, Castle Rock Water provides plan review, as appropriate, for:

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

Castle Rock Water reviews site plans, construction drawings and technical reports for each project to ensure the public infrastructure built by the developer is following the criteria set by the Town.



CRWater Plan Review  
DS projects reviews + BLDG permit reviews

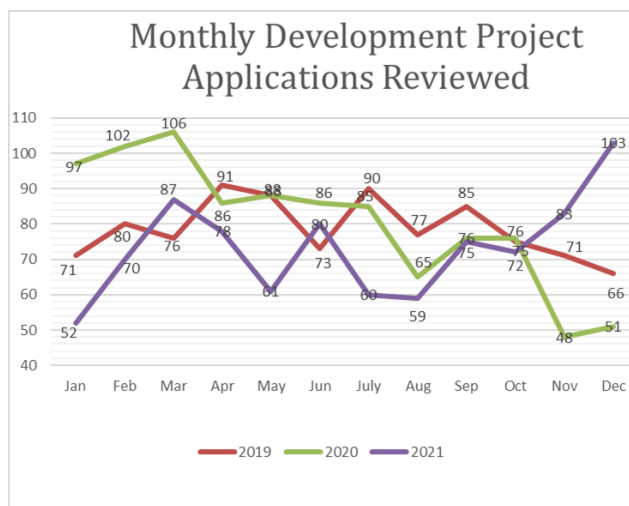


2021 Project & Permit Reviews Total: 4,522

231 Development Services PROJECT plan reviews  
191 Building PERMIT reviews for  
103 separate projects

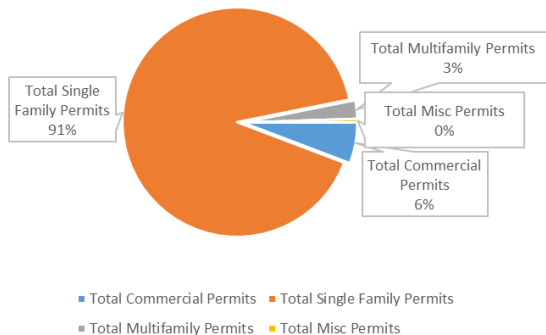
	December			Annual
Total Distinct Projects	2020: 51	2021: 103	Increased 102%	<u>2021 total</u> 880
Total Dev Review project reviews	2020: 123	2021: 231	Increased 88%	<u>2021 total</u> 2,150
Total Building permit reviews	2020: 201	2021: 191	Decreased 5%	<u>2021 total</u> 2,372

Building permits are reviewed to calculate the system development fees for each lot, as determined by the number of fixtures, irrigated area, meter size, etc. This is necessary for



2021 Applications Reviewed Total: 880

Castle Rock Water Building Permit Reviews  
DECEMBER 2021



## Service levels

The average number of days assigned to review: 16.9 days  
The average days to complete assigned reviews: 16.3 days

Plan Review: 88% of the reviews were completed on-time

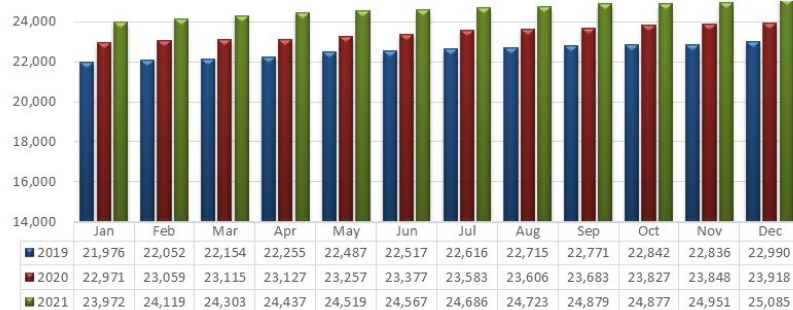
*Review time for each plan is 1 to 5 weeks,  
a permit is 3-5 days.*

# Business Solutions

## Customer Service & Billing



# of Accounts Billed



1,167 new accounts

### 2021/Q4 statistics

- 17,413 (70%) have an online account
- 11,188 (64%) are paperless

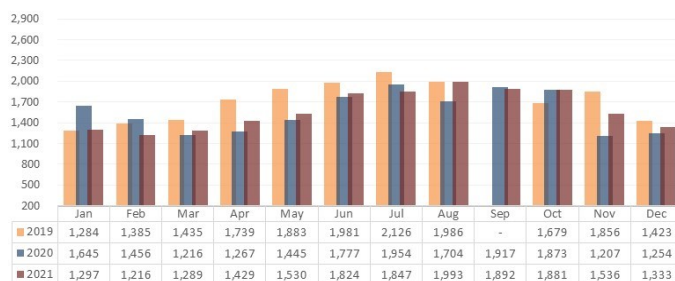
Customers benefit from having an online H2Oaccess account with 24/7 access to statement information, 12 months of statement history, helpful email account reminders and safe and secure online payment options. Customers are encouraged to use paperless billing to reduce clutter, be environmentally friendly and save mailing costs.

Transfers of Water Service



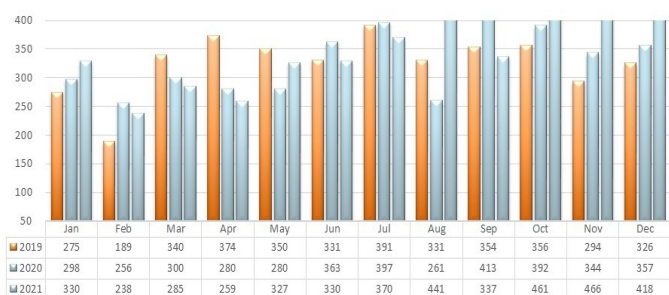
5% increase over 2020

Customer Phone Calls



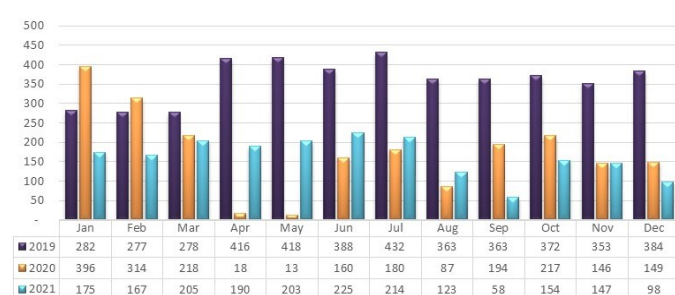
8% increase over 2020

Mywaterbill Email Inquiries



14% increase over 2020

Walk-In Customers



4% decrease from 2020

## Customer Outreach

### Keeping customers informed about the value of water.

Though messaging tends to focus on conservation, the value of water is about the importance of our most valuable resource and how best to use and protect it.



### Water Outreach Social Media Stats

### REACH

Winter watering—Dec. 1	9,482 people
Water conscious gifts—Dec. 8	1,988 people
Stay hydrated—Dec. 15	2,601 people
Poop Fairy: Cooper—Dec. 22	5,746 people
Pipe insulation—Dec. 29	4,487 people
EMAIL: It's a dry one, Mr. Grinch	13,334 opened (50% open rate)



# 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.

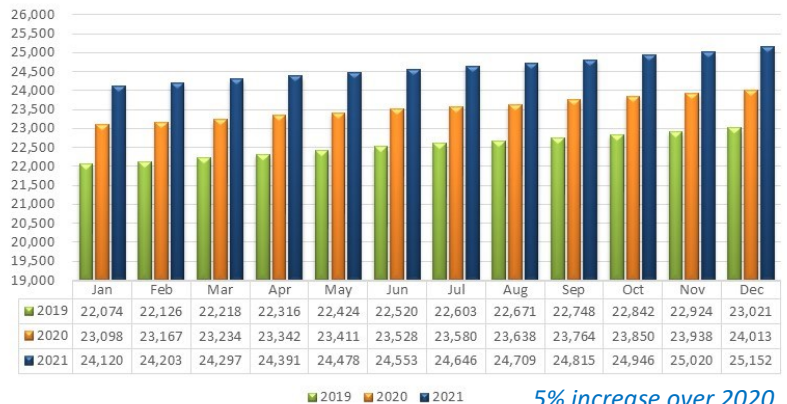
## Skipped Reads

**Dec. 2021:** 0.53% 2021 avg: 0.53%

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.*

Meters Read

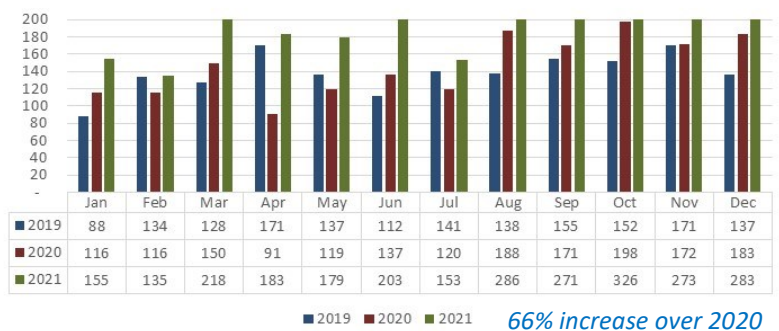


## Meter Set Inspections

**Re-inspections:** 66% 2021 avg: 58%

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.

All Meter Set Inspections  
(includes all re-inspections)

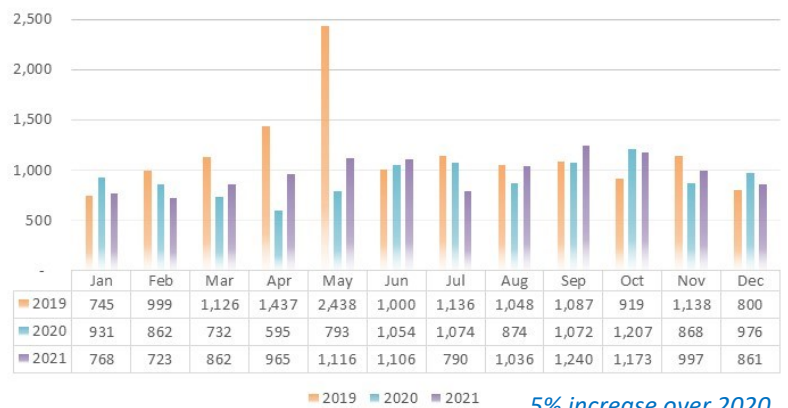


## Work Orders

**Dec. 2021:** 861 2021 total: 11,637

Meter services performs a variety of service work orders every month beyond meter reading. These include curb stop maintenance, meter replacement and repair, final reads for transfers of service, disconnection and reconnections, meter set inspections, and more.

ALL SERVICE WORK ORDERS



# Operations & Maintenance

LEVELS OF SERVICE		Dec. 2021
<b>Drinking Water Compliance</b>	Castle Rock Water will deliver water that meets or surpasses the requirements of both Primary Drinking Water Regulations and Secondary Maximum Contaminant Levels 100% of the time.	<p><b>Ninety routine samples were completed.</b></p> <p><i>One of the samples tested positive for total coliform. As a result, three additional samples were tested and all three samples were negative for coliform, satisfying the regulatory requirements set forth by the Safe Drinking Water Act and Colorado Drinking Water Standards. The positive test result was attributed to sample contamination and/or laboratory error and was not an indication that drinking water within the Town's water system was contaminated. Total chlorine residual at the time of sample collection was 2.20 mg/L, which is well above the minimum level of 0.28 mg/L.</i></p>
<b>Pressure Adequacy</b>	< 1% of our customers will experience less than 43 pounds per square inch (psi) of pressure at the meter during normal operations.	<b>There were no water pressure issues in December.</b>
<b>Sewer System Effectiveness</b>	<1% of our customers will experience a sewer backup caused by the utility's sewer system per year. Castle Rock Water remains in the Top Quartile for least number of sewer backups based on the AWWA benchmarking.	<b>There was one sewer system issues this month.</b>
<b>Drinking Water Supply Outages</b>	<p>&lt;5% of our customers will experience water outages for one or more events totaling more than 30 hours/year.</p> <p>Castle Rock Water remains in the Top Quartile for water system integrity based on the American Water Works Association benchmarking.</p>	<p><b>There were four water system integrity issues and one issue on a raw waterline in December.</b></p> <p><i>A malfunctioning SCADA controlled system valve caused 29 residents in the Terrain to have little to no pressure for less than two hours. Operations was able to manually operate the valve and restore system pressure.</i></p> <p><i>The Distribution Team replaced a service line on Coach House Loop, the service line had been installed improperly. Nine homes were out of water for less than 10 minutes during the repair.</i></p> <p><i>An irrigation service line and curb stop were replaced in the Promenade area and no customers were affected during the repair.</i></p> <p><i>A contractor conducting the CIP project in the Glovers neighborhood hit a 4" cast iron pipe main causing two beam breaks. Eleven homes had little to no water pressure for less than four hours. The next day, the contractor's repair began leaking and the contractor replaced a section of line with ductile iron pipe.</i></p> <p><i>A contractor working in the Meadows hit the 8" reuse waterline, releasing approximately 7,200 gallons of reuse water into the storm sewer system, it did not discharge into Plum Creek.</i></p>
<b>Water Quality Complaints</b>	Castle Rock Water remains in the Top Quartile for water quality complaints based on the AWWA benchmarking.	<b>There were no water quality issues in December. There were no customer education visits.</b>

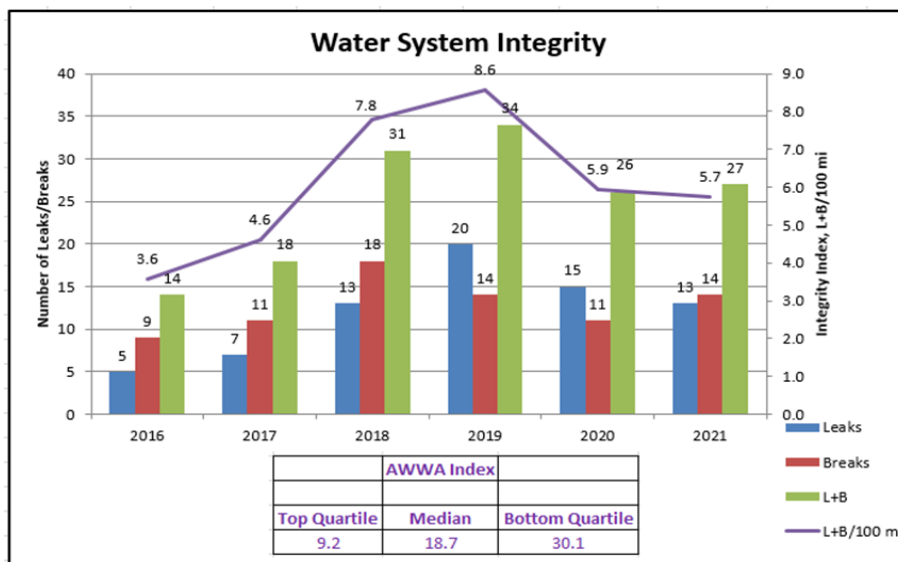


# Operations & Maintenance

## Annual O&M stats

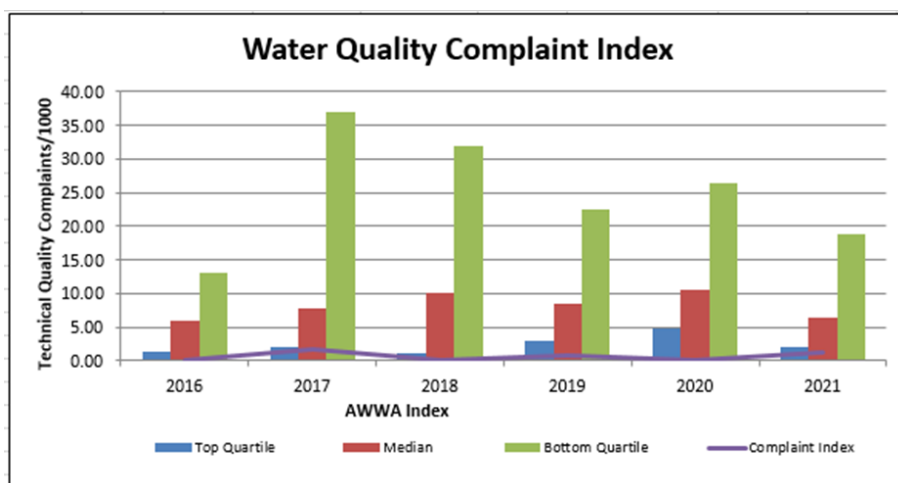
### Water System Integrity

As the Water System Integrity chart indicates we are consistently in the Top quartile for water system integrity based on American Water Works Association benchmarking since 2011.



### Water Quality Complaints

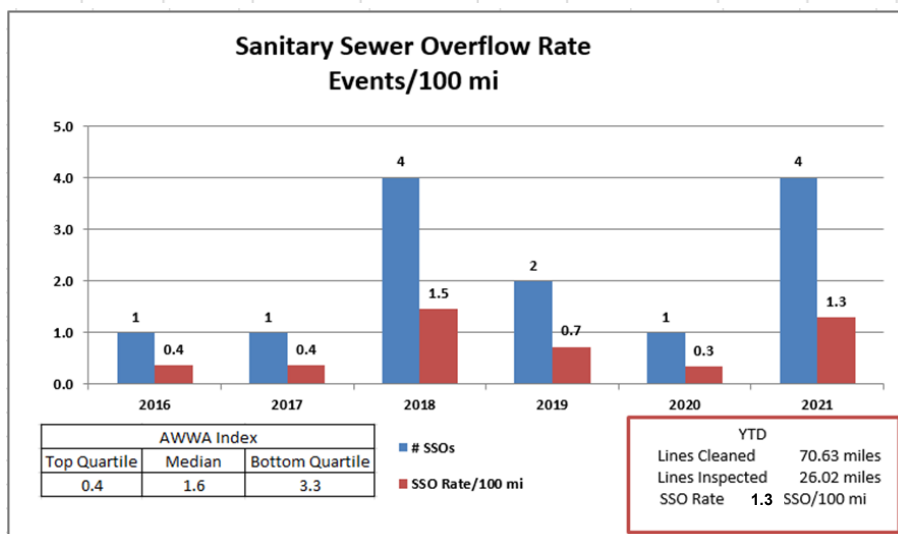
The Water Quality Complaint index shows that we are doing very well in this category; rating in the Top Quartile since 2015 according to the American Water Works Association.



### Sanitary Sewer Overflows

Castle Rock Water tracks within the top quartile in the Sanitary Sewer Overflow rate, according to the American Water Works Association.

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. The goal is to clean and inspect one-fifth of the collection system or 55 miles each year.



# Operations & Maintenance

yourself,  
enter  
it to  
our

## Locate Report



Castle Rock Water's  
locate requests from  
811 have continued to  
rise, year over year.

## ANNUAL UTILITY LOCATES

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
January	577	475	617	1,190	1,289	1,162	1,199	1,334	1,442	1,472	1,612	1,803
February	521	485	538	1,094	1,093	1,383	1,334	1,378	1,293	1,404	1,443	1,958
March	660	552	818	1,437	1,349	1,906	1,625	1,851	1,514	1,560	1,626	2,253
April	838	681	1,025	1,482	1,552	1,784	1,631	1,760	1,856	1,984	2,600	2,524
May	853	863	985	1,541	1,531	1,609	1,809	2,002	1,801	2,122	2,288	2,524
June	969	844	982	1,314	1,399	1,654	2,075	1,872	1,854	1,716	1,931	2,278
July	680	582	859	1,350	1,392	1,477	1,675	1,582	1,556	1,937	1,894	2,311
August	901	723	1,123	1,476	1,468	1,494	1,651	2,001	1,986	1,603	2,096	2,589
September	880	723	1,029	1,240	1,373	1,343	1,701	2,102	1,747	1,979	2,026	2,133
October	715	688	1,155	1,501	1,376	1,314	1,579	1,792	2,064	1,839	1,913	1,962
November	536	518	1,041	1,072	866	1,134	1,131	1,460	1,469	1,649	1,734	2,050
December	415	405	925	1,005	1,043	1,063	1,059	1,277	1,293	1,175	1,859	1,819
<b>Totals</b>	<b>8,545</b>	<b>7,539</b>	<b>11,097</b>	<b>15,702</b>	<b>15,731</b>	<b>17,323</b>	<b>18,469</b>	<b>20,411</b>	<b>19,875</b>	<b>20,440</b>	<b>23,022</b>	<b>26,204</b>

## 5 Year Locate Trend

