



Chatfield

Watershed Authority

2021 Annual Report

The Chatfield Watershed Authority promotes protection of water quality in the Chatfield Watershed for drinking water supplies, recreation, fisheries, and other beneficial uses.

MAY 15, 2022

We Protect the Water You Enjoy

www.chatfieldwatershedauthority.org

The **2021 Annual Report** is the annual water quality summary and status report presented by the Chatfield Watershed Authority to communicate the water quality of Chatfield Reservoir and its watershed, highlighting information required by the Colorado Water Quality Control Commission in Control Regulation #73.

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Chatfield
Watershed Authority

May 15, 2022

Water Quality Control Commission
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80246

Dear Commissioners:

The Chatfield Watershed Authority (CWA or Authority) is pleased to submit this 2021 Annual Report to the Water Quality Control Commission (WQCC) in accordance with the reporting requirements of the Chatfield Reservoir Control Regulations, Regulation #73. 2021 has certainly been a different year, not only due to the continued impacts of Covid 19, but also due to the continued hot and extremely dry climate conditions occurring in the late summer and fall of 2021. Unlike 2020, however, Chatfield Reservoir was in compliance with Regulation 38 (WQCC CCR 1002-38) total phosphorus and chlorophyll- α standards for the 2021 monitoring period

The Authority has been busy in 2021 as is evidenced by the activities reported in this annual report. These activities included finalization of our review of a new wastewater treatment facility site application and unique phosphorus trade application in Douglas County; the continued use of the Chatfield watershed model to evaluate the impact on water quality of the existing and full use of existing wastewater treatment facility's wastewater allocations; the results of a second Colorado School of Mine Field Session which provided an additional snapshot in time of water quality in the Willow Creek and East Plum Creek watersheds; and the continued efforts of our members to promote water quality education and control of water quality from construction activities through their stormwater criteria and MS4 permitting activities, all of which occurred while dealing with the continuing Covid 19 pandemic. The Authority also approved non-point source funding requests for fire mitigation in the Hilldale Pines Subdivision and for preparation of a stream management plan for West Plum Creek. Last, the Board approved a 20% increase in the voluntary dues paid by its member entities for 2022 and beyond to address the continued rising costs of the Authority's ongoing operations while continuing to fund and promote activities and non-point source projects that improve water quality in the Chatfield watershed and Reservoir. We hope you enjoy reading our report and look forward to presenting this report at a future WQCC meeting.

Sincerely,

Lora L. Thomas

2021 Chatfield Watershed Authority Board Chair

CHATFIELD WATERSHED AUTHORITY

The Chatfield Watershed Authority (the Authority) was established in 1984 when the Governor of Colorado designated the Authority as the 208 Management Agency, in accordance with the Federal Clean Water Act. The Authority's mission is to promote protection of water quality in the Chatfield Watershed for recreation, fisheries, drinking water supplies, and other beneficial uses. The Authority preserves these beneficial uses in Chatfield Reservoir and the Watershed through promotion of point source, nonpoint source, and stormwater controls.



The Authority continues to implement Colorado Water Quality Control Commission (WQCC) Chatfield Reservoir Control Regulation, 5 CCR 1002-73 (Control Regulation No. 73); and coordinating with state and federal agencies regarding water quality control measures.

The Authority is comprised of stakeholders within the 400 square mile watershed and is comprised of the Plum Creek basin and portions of the South Platte River basin (from the outfall of Strontia Springs Reservoir to Chatfield Reservoir, including the Massey Draw and Deer Creek sub-basins). The members develop and implement projects to protect the watershed, reservoir health and water quality. Opportunities exist within the watershed to address the chemical, physical and biological constituents (pollutants) that impact the watershed and reservoir. Some examples of this include phosphorus removal in wastewater treatment, stabilizing degraded streambanks, mitigating runoff from agricultural lands, minimizing leachate from septic systems, controlling runoff from wildfire burn areas, and providing public education for reducing contamination from the actions of people.

The Authority members' jurisdictions and service area boundaries as well as the Chatfield watershed boundary are shown on Figure 1. The five-member Board of Directors (Board) is comprised of three elected officials representing Douglas County, Jefferson County, and the Town of Castle Rock; one wastewater district representative; and one representative for other members. The Board continues to implement Control Regulation No. 73. The Board meets regularly to address policy and fiscal issues.

2021 BOARD MEMBERS

Board Chair: Lora L. Thomas, Douglas County Commissioner

Board Vice-Chair: Laura Cavey, Town of Castle Rock

Board Director: Lesley Dahlkemper, Jefferson County Commissioner

Board Director of Water and Sanitation Members: Barbara Biggs, Roxborough Water & Sanitation District Manager

Board Director of Other Members: Alison Witheridge, Denver Water, Watershed Scientist

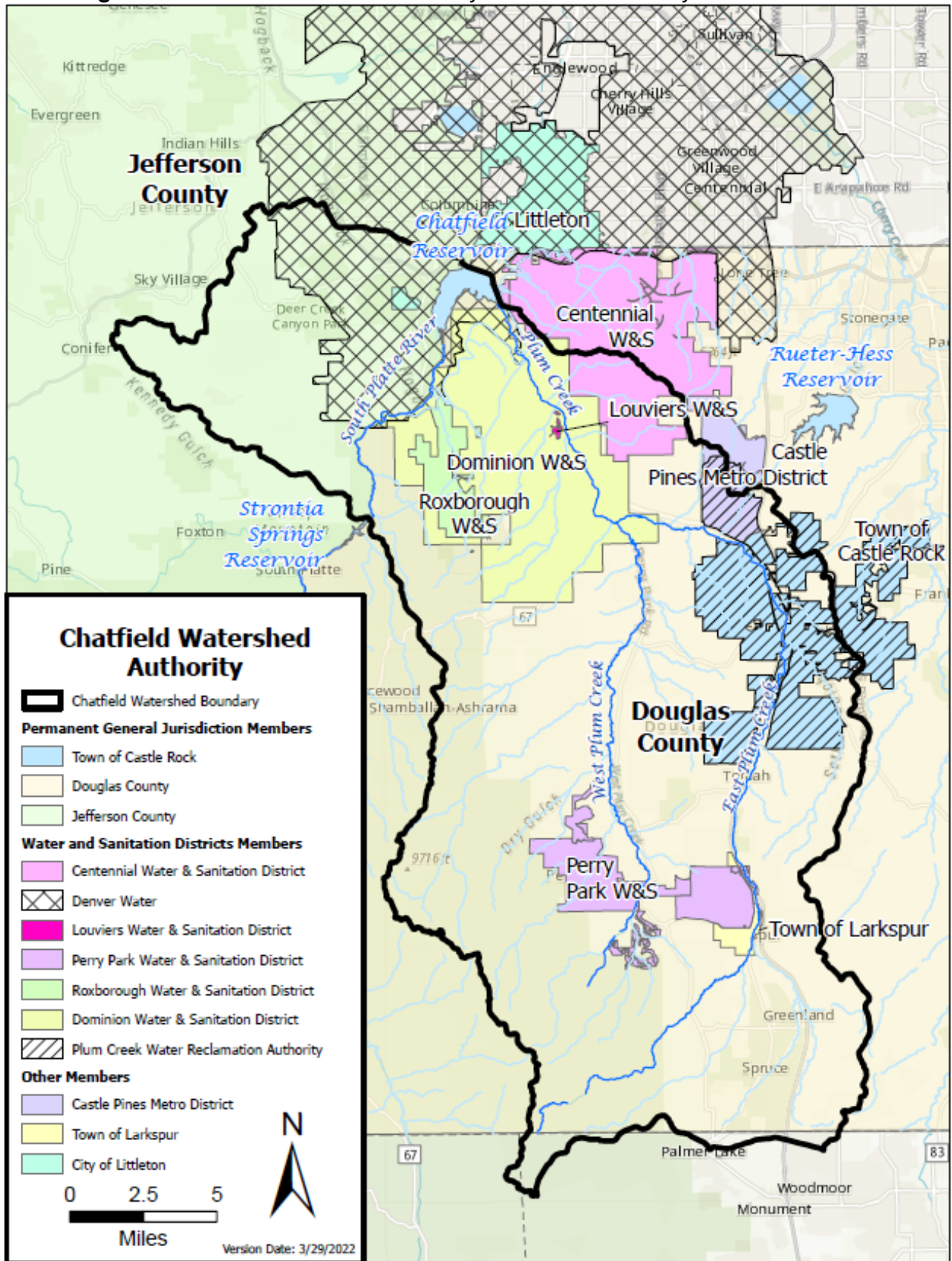
The Technical Advisory Committee (TAC) is a standing committee that meets monthly to address technical and scientific matters, serving at the pleasure of the Board. Other standing committees are formed, as necessary, to address specific issues at the Board's request.

2021 TECHNICAL ADVISORY COMMITTEE REPRESENTATIVES

Town of Castle Rock: Chair, David Van Dellen
Plum Creek Water Reclamation Authority: Vice-Chair Weston Martin
Castle Pines Metropolitan District: Burt Knight
Centennial Water & Sanitation District: Julie Tinetti
City of Littleton: Carolyn Roan
Denver Water: Alison Witheridge
Dominion Water & Sanitation District: Bob Neal
Douglas County: Ryan Adrian
Jefferson County: Patrick O'Connell
Louviers Water & Sanitation District: Matt Collitt
Roxborough Water & Sanitation District: Barbara Biggs
Perry Park Water & Sanitation District: Diana Miller
Town of Larkspur: Paul Grant



Figure 1. Chatfield Watershed Authority Watershed Boundary and Member Entities.



RESERVOIR REGULATORY COMPLIANCE

Chlorophyll- α

In 2021 Chatfield Reservoir was in compliance with Regulation 38 (WQCC 5 CCR 1002-38) chlorophyll-a (chl- α) standard. The chlorophyll- α standard in the reservoir is 10 $\mu\text{g/L}$, with an allowable exceedance frequency of one time in five years. The WQCC adopted an assessment threshold of 11.2 $\mu\text{g/L}$ to be used to determine compliance with the standard. The chl- α standard is the growing season (July through September) average. In 2021, the chl- α average was 7.3 $\mu\text{g/L}$, below both the standard and the assessment threshold. Pursuant to the assessment protocols, because there has been one exceedance of the assessment threshold in the last five years (2020), the reservoir is in compliance with the standard (Figure 2). Observed 2021 chl- α concentrations in Chatfield Reservoir are depicted in Figure 3.

Figure 2. Growing Season Average Chlorophyll α Concentrations, Chatfield Reservoir, 1983-2021.

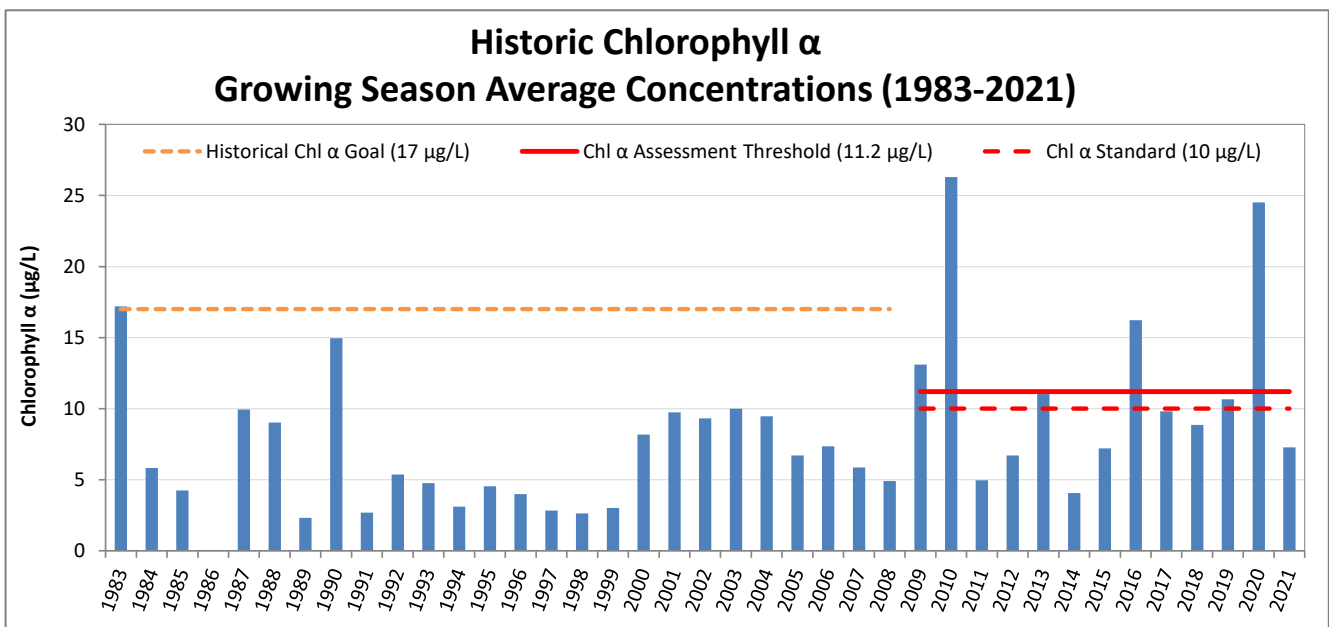
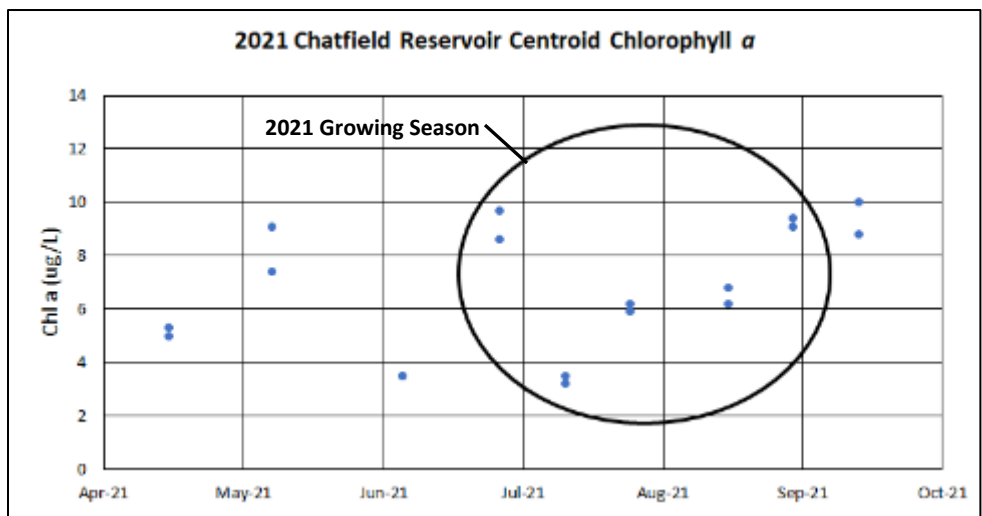


Figure 3. Observed Chlorophyll α Concentrations, Chatfield Reservoir, 2021.

The July-September growing season average in 2021 was 7.3 $\mu\text{g/L}$, below the assessment threshold of 11.2 $\mu\text{g/L}$ (see Figure 3). In 2021, Chatfield Reservoir was in compliance with the chlorophyll- α water quality standard.

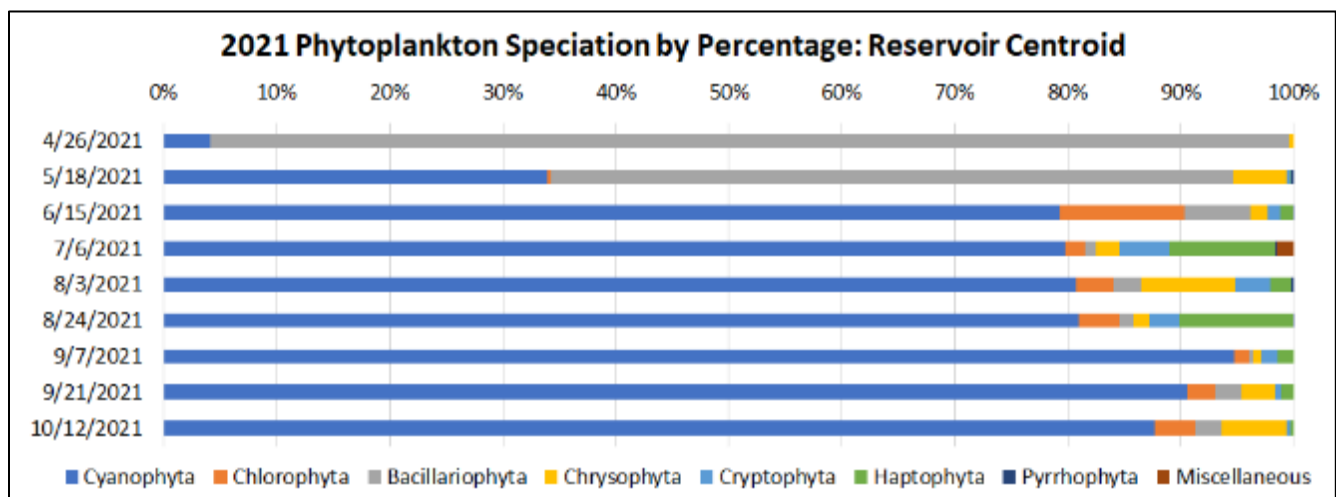
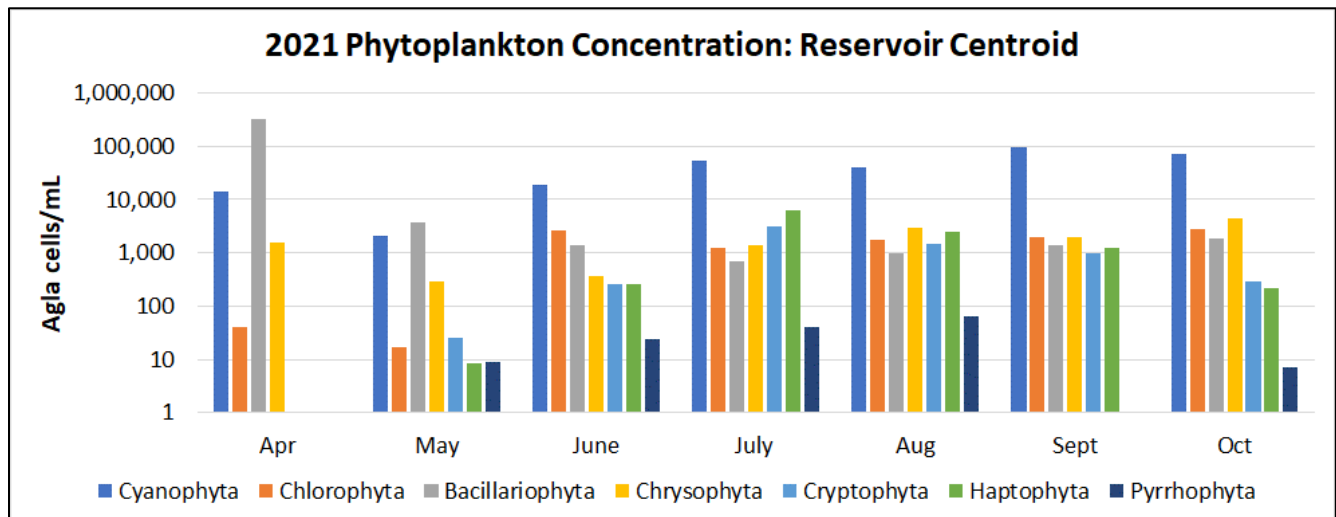


The chl- α concentrations observed result from background, point source and nonpoint sources of nutrients and internal loading. Cyanobacteria, also known as Cyanophyta or blue-green algae, are type of phytoplankton that can product toxins that can harm people, animals, and aquatic ecosystems. Intensified Cyanophyta growth due to certain environmental conditions, including light availability, water temperatures, and nutrient loading, is referred to as a Harmful Algal Bloom (HAB). Although there is currently no standard or assessment threshold for Cyanophyta, a goal of the CWA is to limit conditions that could result in an HAB. Some species of cyanobacteria convert nitrogen gas to biologically available forms of nitrogen, serving as an additional source of nitrogen to reservoir systems. No HABs were reported in 2021.

In 2021, Cyanophyta concentrations ranged from 2,143 to 98,364 algal cells/ml which are slightly lower than the Cyanophyta levels in 2020 which ranged from 229 to 153,079 algal cells/ml. The highest concentrations of Cyanophyta occurred in September, averaging 94,340 algal cells/mL (Figure 4).

A 2021 water quality study by Hydros Consulting showed elevated chl- α concentrations in 2020 were partially driven by higher dinoflagellate (Pyrrhophyta) concentrations. However, in 2021, Cyanophyta were the predominant algae observed in most of the April - October sampling events, with the exception of Bacillariophyta, which were higher than the Cyanophyta in April and May (Figure 5).

Figures 4 and 5. 2021 Phytoplankton Monthly Summary - Phytoplankton samples taken in the reservoir during 9 sampling events from April through October 2021.



Total Phosphorus

In 2021 Chatfield Reservoir was in compliance with Regulation 38 (WQCC 5 CCR 1002-38) total phosphorus (TP) standard. The total phosphorus (TP) July through September growing season average was 20 µg/L, which is below the standard of 30 µg/L and below the assessment threshold of 35 µg/L. Chatfield Reservoir does not exceed the one in five-year assessment allowance, with only 2020 TP concentrations exceeding the standard and assessment threshold. A review of TP compliance with the water quality standard from 1983 to 2021 is illustrated in Figure 6. The TP growing season average remained below the water quality assessment threshold of 35 µg/L, with the exception of the 2020 concentration, since the standard changed in 2009. The monthly TP concentrations observed in 2021 in Chatfield Reservoir are shown in Figure 7.

Figure 6. Growing Season Average Total Phosphorus Concentrations, Chatfield Reservoir, 1983-2021.

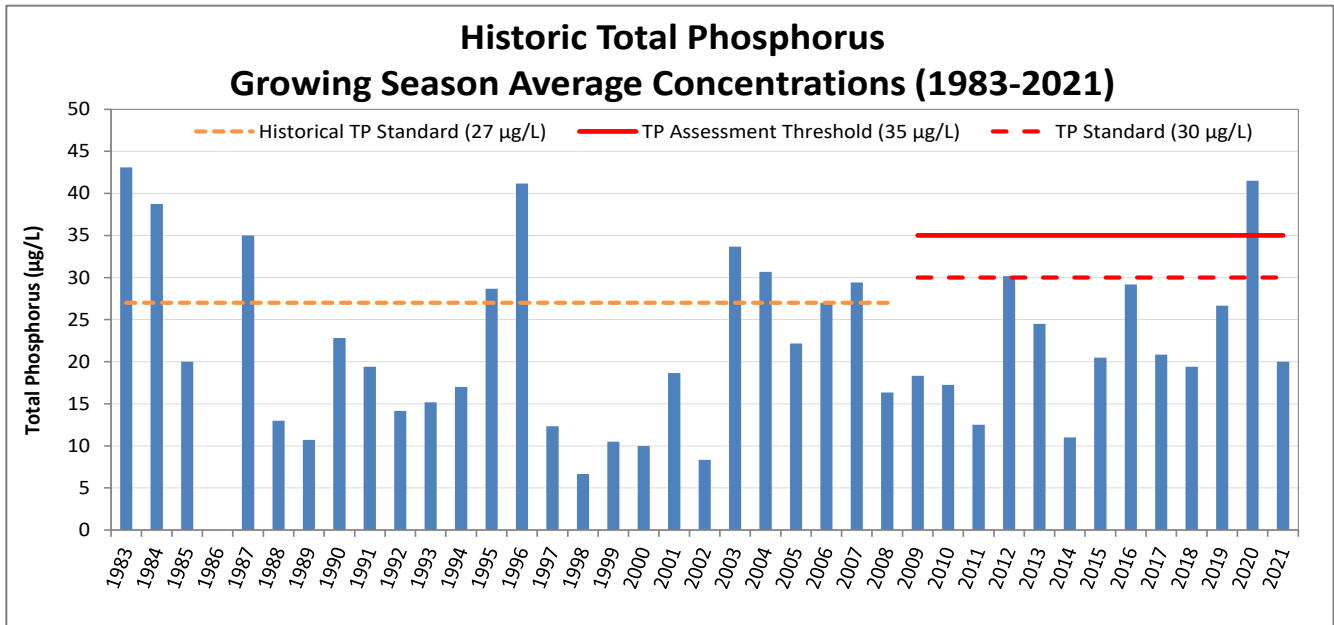
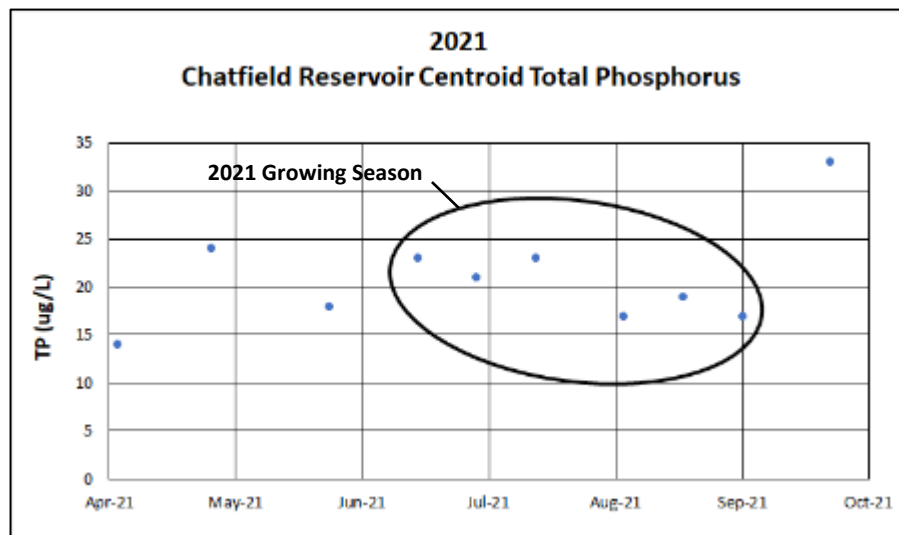


Figure 7. Monthly Total Phosphorus Concentrations, Chatfield Reservoir, 2021.

The July-September growing season average in 2021 was 20 µg/L, below the assessment threshold of 35 µg/L (see Figure 6). In 2021, Chatfield Reservoir was in compliance with the total phosphorus water quality standard.



CHATFIELD RESERVIOR TMAL

The phosphorus Total Maximum Annual Load (TMAL) of 19,600 pounds/year at a median flow of 100,860 acre-feet/year was revised by the WQCC in 2009, based on statewide reservoir data and a probabilistic model describing the linkage between watershed TP loads and in-lake TP concentrations.

The Authority completed the development and calibration of an initial watershed model in 2016. In 2019, plans were developed for additional model runs in 2020 through 2022 to model the effects of possible improvements and other possible events in the watershed. These initial model runs were started in late 2019 and are continuing into 2022.

The Authority continues to collect water quality data (over 20 years of monitoring) and since 2016 has collaborated with the Chatfield Reservoir Mitigation Company (CRMC) on data collection efforts pursuant to the Memorandum of Understanding between the two agencies.

For Chatfield Reservoir the Authority continues to coordinate with the CRMC regarding data collection (required as part of the water quality adaptive management program). The Authority served on the Chatfield Reservoir Model Coordination Committee (RMCC), which was tasked with overseeing the development of a two-dimensional, hydrodynamic water quality model for the reservoir. Development of a model was funded by the CRMC as part of the Chatfield Storage Reallocation Project (CSRP). The independently peer-reviewed model has been calibrated for the period of 2013 through 2016. Sensitivity analysis runs were completed in 2018. The Chatfield Reservoir Water-Quality Model Documentation Report was completed by Hydros in December 2018. Future tasks will include ongoing annual model updates (with more recent data) and predictive runs to support the Chatfield Reallocation project management. Potential impacts from the Chatfield Reallocation Project, if any, will be evaluated on a yearly basis.

2021 TP Concentrations – Instream and Reservoir

Average monthly TP concentrations for 2021 at the Chatfield Reservoir Centroid, Chatfield Reservoir Outflow, Plum Creek Inflow, and South Platte Inflow are depicted in Figure 8. Refer to Figure 12 for these sampling locations. Plum Creek TP concentrations were highest for all months of the year in comparison to South Platte Inflows.

Calculated TP load

The calculated annual TP load is the sum of the average monthly loads. The 2021 annual TP load to the reservoir totaled 8,584 pounds at an inflow of 61,397 acre-feet. This is compared to the TMAL of 19,600 pounds at an inflow of 100,860 acre-feet. Figure 9 shows the calculated annual TP loads to Chatfield Reservoir from 1986 to 2021. Figure 10 shows the Chatfield Reservoir calculated annual inflows from 1986 to 2021. A comparison of the 2021 inflows and TP load contributions per source is presented in Figure 11.

The relative TP loading from sources is lower than typical compared to historic TP inputs. This year, TP loading from Plum Creek was 5,498 pounds, or 64% of total input, compared to 2,353 pounds from the South Platte River, or 27% of total input. Direct precipitation on Chatfield Reservoir, alluvial inflows, and other direct flow sources contributed approximately 733 pounds, or 9% of total input.

Figure 8. 2021 Average Monthly Total Phosphorus Concentrations in Chatfield Watershed and Chatfield Reservoir.

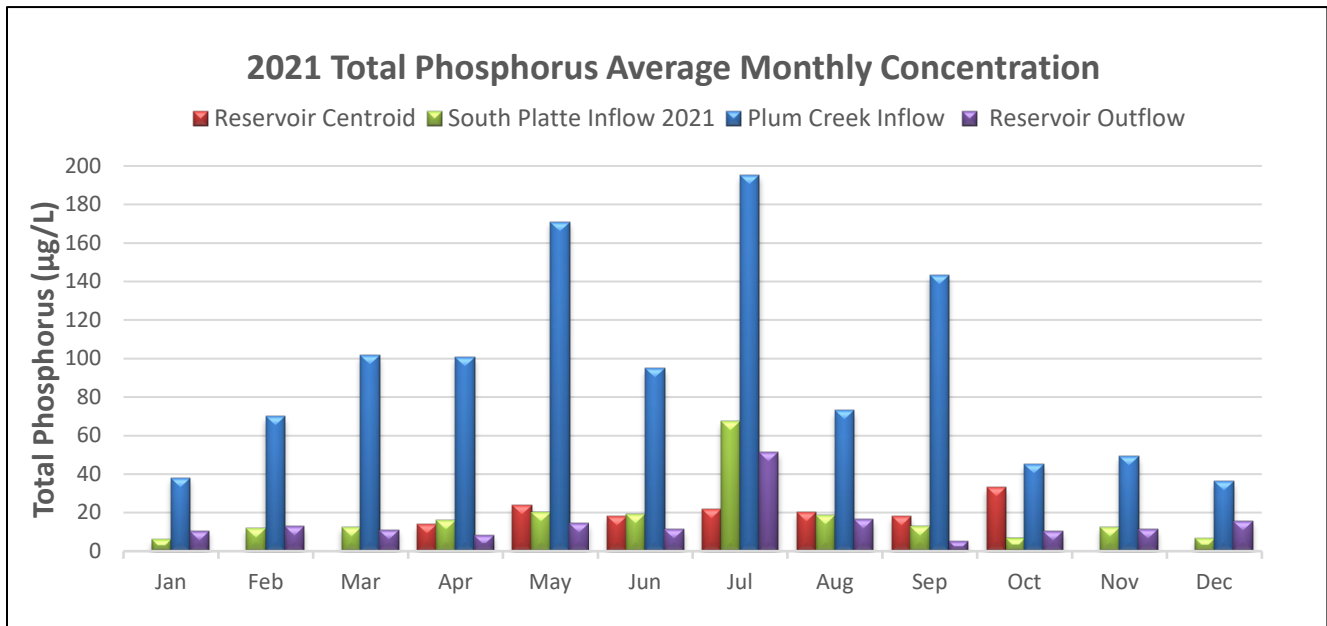


Figure 9. Calculated Annual Total Phosphorus Load to Chatfield Reservoir (1986 – 2021).

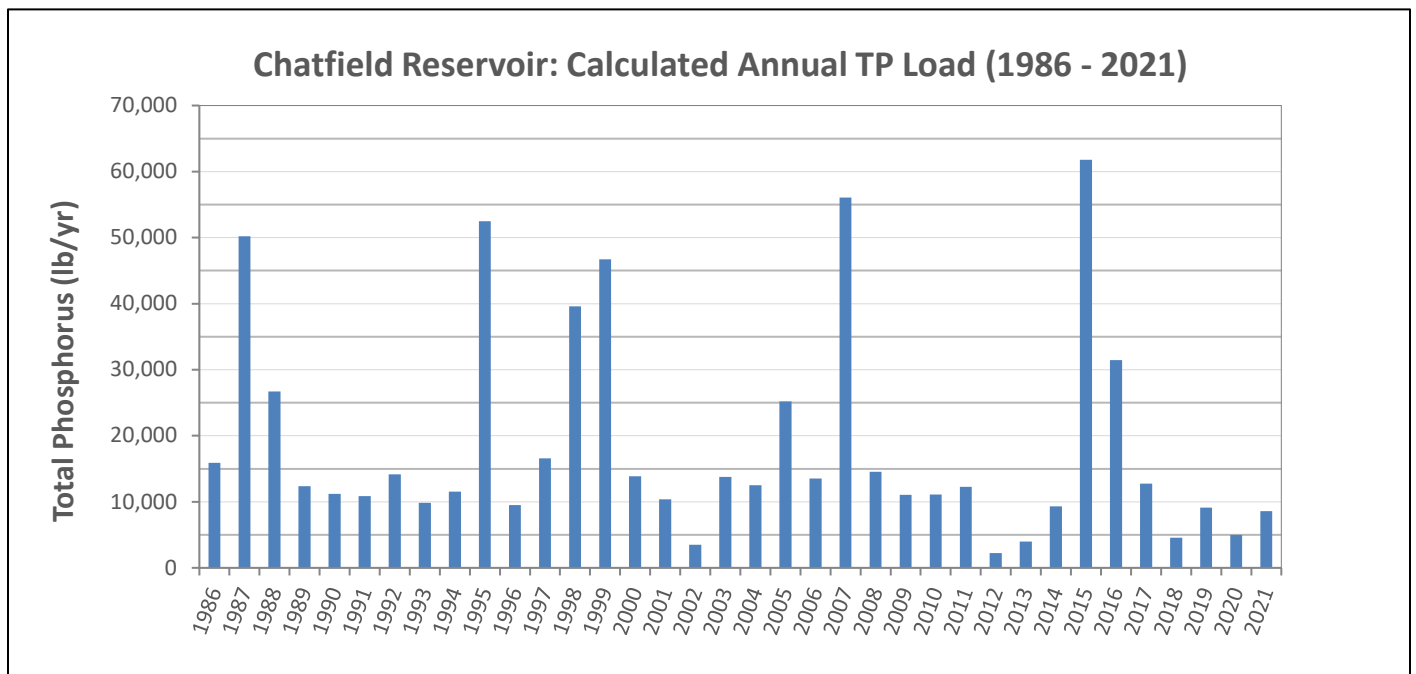


Figure 10. Chatfield Reservoir Calculated Annual Inflow (1986 – 2021).

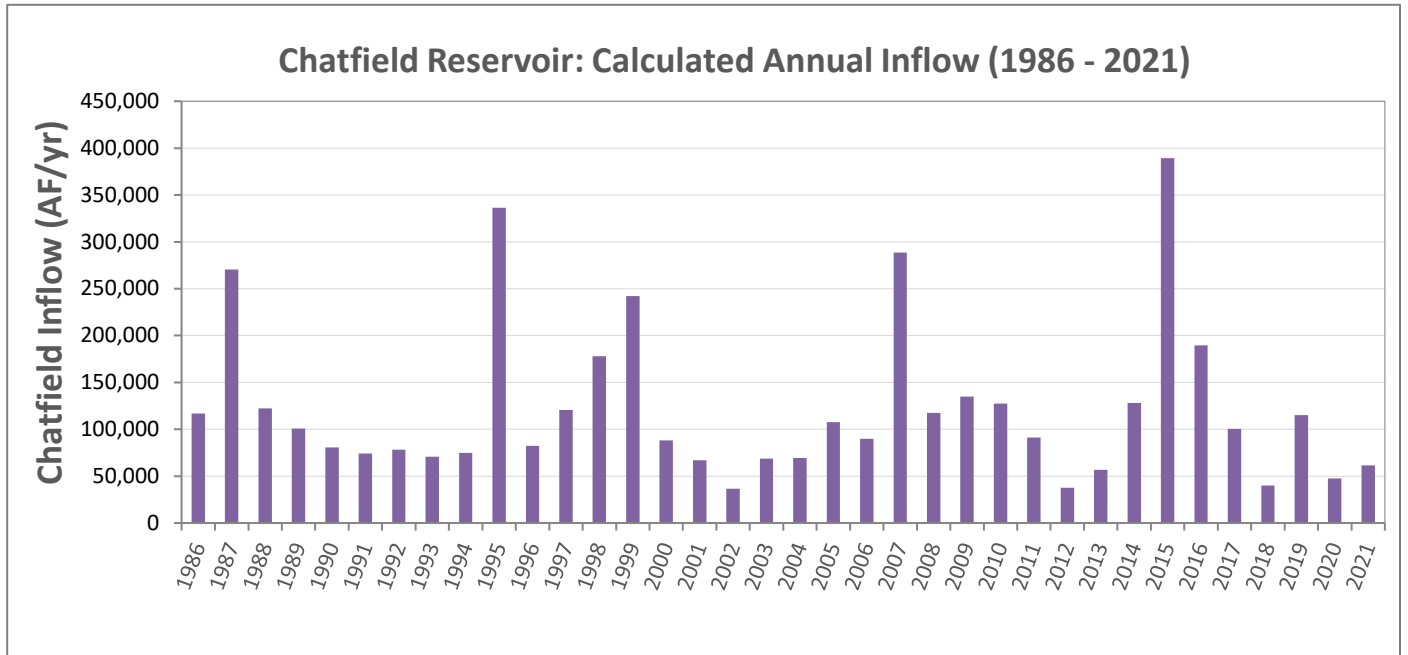
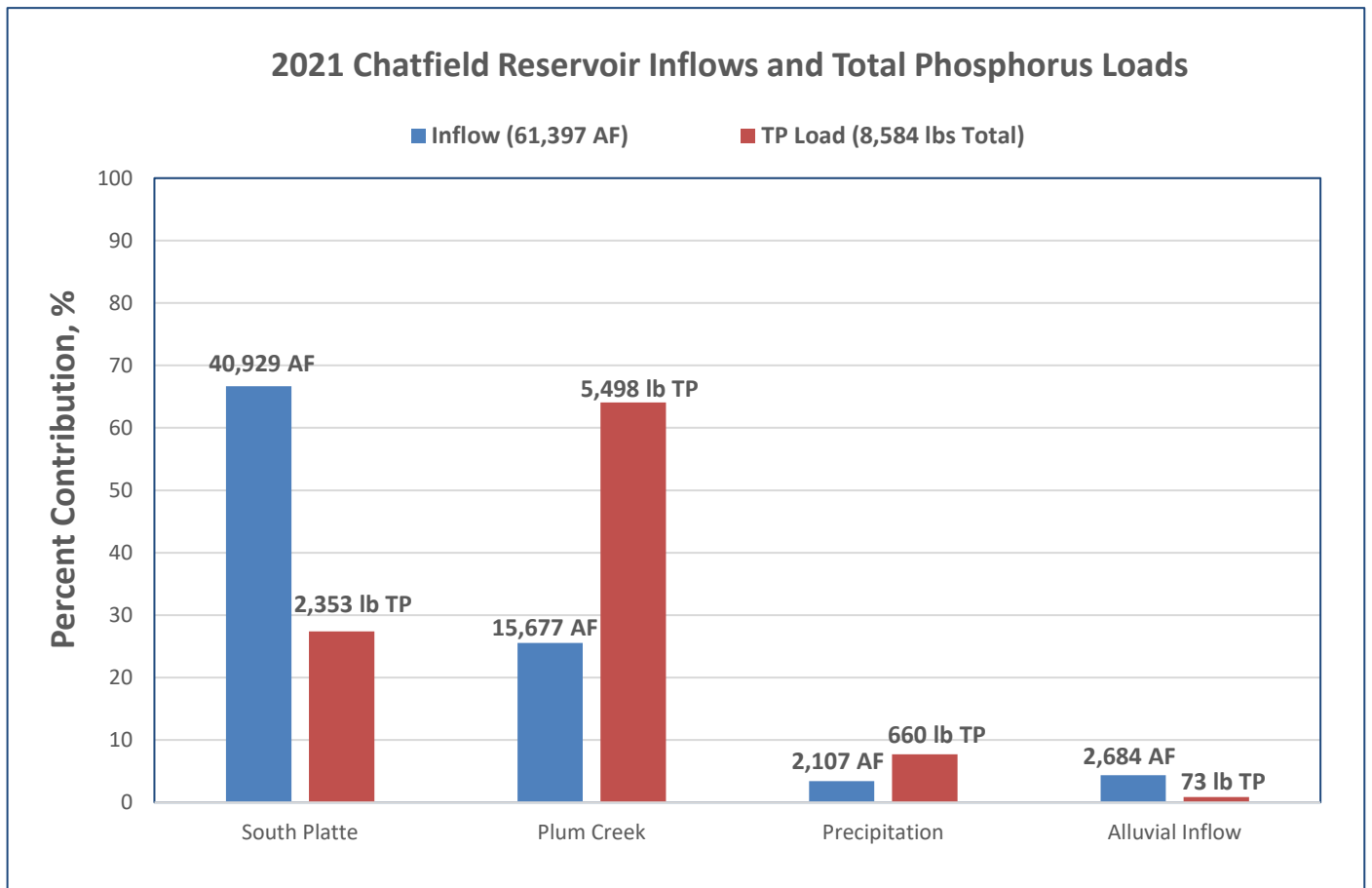


Figure 11. 2021 Chatfield Reservoir Inflows and Total Phosphorus Loads.



WATERSHED AND RESERVOIR MONITORING PROGRAM

Since 1984, the Authority and its members have monitored water quality in the reservoir and upstream in the watershed and has undertaken measures to protect water quality in the Watershed through voluntary funding contributions and grants. The Authority, in coordination with its membership agencies, implements point source, nonpoint source and stormwater controls pursuant to the Chatfield Reservoir Control Regulation #73 (5 CCR 1002-73) to protect water quality and beneficial uses of the Reservoir.

Chatfield Reservoir

The Authority collects water quality data to determine reservoir chlorophyll levels, temperature, dissolved oxygen concentration, phosphorous concentrations, nitrogen concentrations and inflow quantities. The members develop and implement nonpoint source and stormwater projects which benefit the watershed and reservoir. The Chatfield Watershed Plan identified opportunities within the watershed to address the chemical, physical and biological constituents (pollutants) that impact the watershed. Some examples include phosphorus reductions from stabilizing degraded streambanks, mitigating runoff from agricultural lands, minimizing leachate from septic systems, controlling runoff from wildfire burn areas, and providing public education for reducing contamination from the actions of people.

The monitoring program characterizes water quality and determines regulatory compliance in the reservoir. Surface water samples are collected in the following locations:

- / South Platte Inflow
- / Plum Creek Inflow
- / South Platte Arm (in Chatfield Reservoir)
- / Plum Creek Arm (in Chatfield Reservoir)
- / Reservoir Centroid (Chatfield Reservoir)
- / Reservoir Outfall

The constituents are monitored monthly when ice has melted off the reservoir. During the growing season (July through September), reservoir sampling is conducted twice per month. To better understand reservoir dynamics, the Authority collects water column measurements, including the epilimnion and hypolimnion layers, at various depth intervals. All water quality data are available on the Authority's website: www.chatfieldwatershedauthority.org

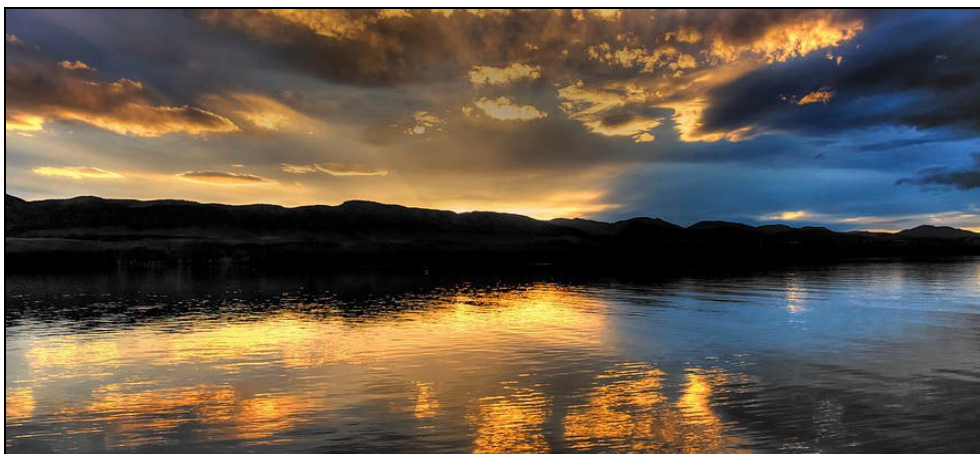


Figure 12. 2020 Chatfield Watershed Authority Sampling Locations and Constituents.

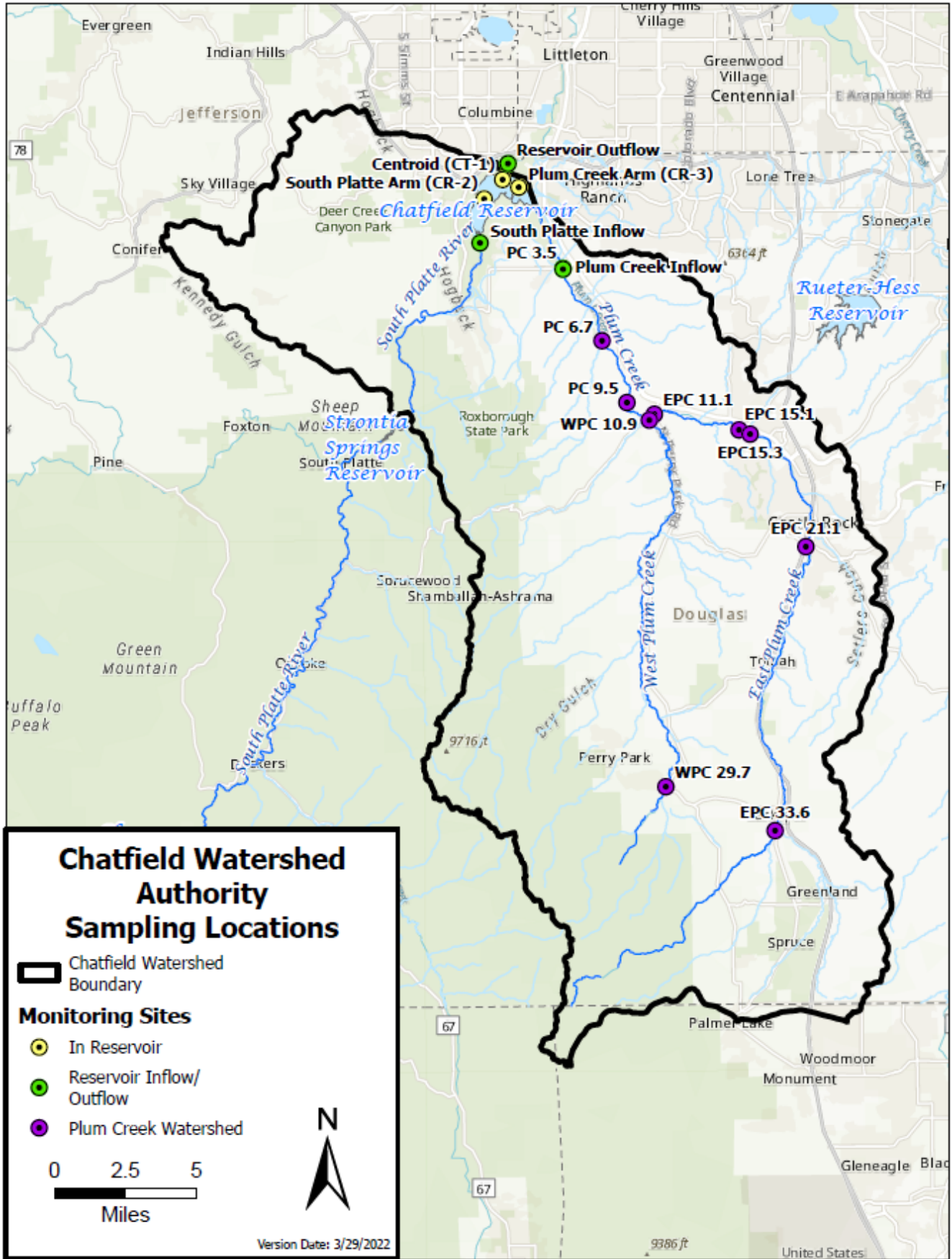


Table 1: Sampling and Analysis Plan

CONSTITUENT	PLUM CREEK WATERSHED ¹	CHATFIELD RESERVOIR ²	RESERVOIR INFLOW/OUTFLOW ²
Field Parameter			
pH	X	X	X
Specific Conductance	X	X	X
Temperature	X	X	X
Streamflow	X		
Dissolved Oxygen	X	X	X
Oxidation-Reduction Potential		X	
Secchi Depth		X	
Nutrients			
Total Phosphorous	X	X	X
Ortho-Phosphorous	X	X	X
Dissolved Phosphorous		X	X
Nitrate-nitrite	X	X	X
Ammonia		X	X
Total Kjeldahl Nitrogen		X	X
Biological			
E. coli	X	X	X
Chlorophyll <i>a</i>		X	
Phytoplankton		X	
Zooplankton		X	
Metals			
Arsenic		X	
Cadmium		X	
Chromium		X	
Copper		X	
Iron		X	
Lead		X	
Manganese		X	
Mercury		X	
Nickel		X	
Selenium		X	
Silver		X	
Zinc		X	
Other			
Total Suspended Solids	X	X	X
Total Dissolved Solids		X	X
Total Organic Carbon		X	X
Dissolved Organic Carbon		X	X
Carbonaceous Biochemical Oxygen Demand		X	X
Alkalinity	X	X	X
Sulfate		X	
Silica		X	X

¹ Plum Creek Watershed Monitoring Network Sampling and Analysis Plan (Tetra Tech, 2013)

² Chatfield Reservoir Reallocation Project and Chatfield Watershed Authority Coordinated Sampling and Analysis Plan (SAP) (Chatfield Reservoir Mitigation Company and Chatfield Watershed Authority, 2019)

Plum Creek Watershed Monitoring System

In the Plum Creek basin, watershed monitoring continued in 2021 through voluntary sampling efforts by the Plum Creek Water Reclamation Authority (PCWRA); monitoring locations are shown in Figure 12. The objective of the Plum Creek monitoring program is to better characterize water quality in Plum Creek and identify potential nonpoint source pollutant sources, a variety of which have already been identified in the watershed, including:

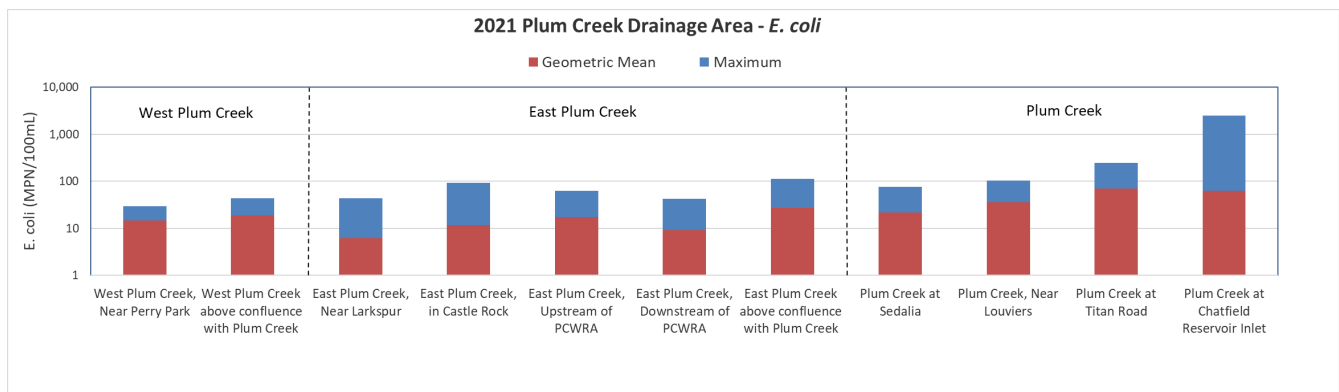
- / Stormwater runoff from historic urbanized and rural areas
- / Leachate from unmaintained septic systems, agricultural activities, including runoff from overgrazed agricultural lands
- / Runoff from wildfire burn areas
- / Runoff from impervious areas
- / Erosion from degraded streambanks (Chatfield Watershed Plan, May 2015)

Further data collection is needed, contingent on available resources, to identify and quantify phosphorus sources in the Plum Creek basin. The 2021 Plum Creek water quality observations included the following:

Stream Bank Erosion. Historically, there was significant streambank erosion on Plum Creek and tributaries. This eroding area contributed significant sediment, and likely TP. As part of the mitigation for the CRMC reallocation project, stabilization of a portion of Plum Creek in the State Park has been completed. Additional stabilization on Plum Creek and tributaries continued to be evaluated and stabilized by watershed stakeholders.

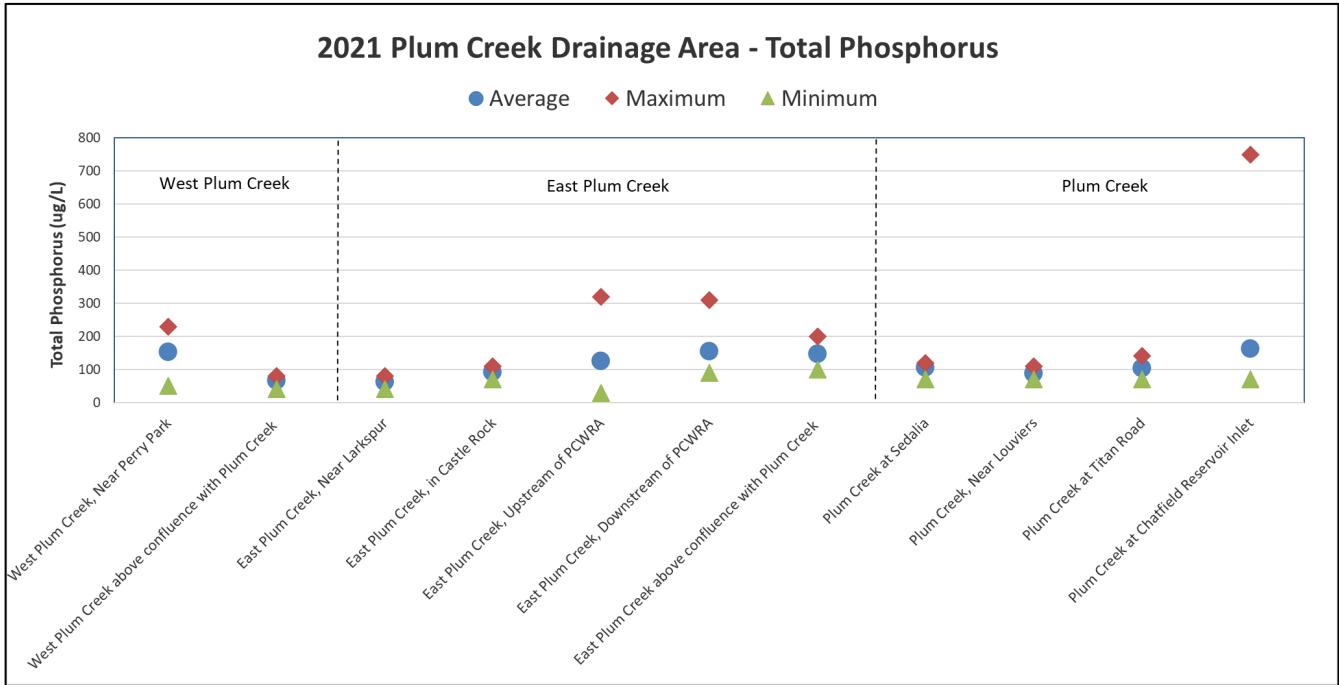
E. coli. Although variability is evident at all monitoring sites, the central tendency of the 2-month geometric mean (or the geometric mean where monthly sampling is not available) of observed *E. coli* remains below the water quality standard of 126 organisms/100 mL (Figure 13) except at the Plum Creek at Chatfield Reservoir Inlet sampling site.

Figure 13. *E. coli* in Plum Creek Drainage Area, 2021



Total Phosphorus. TP concentration generally increases from upstream to downstream for both East Plum Creek and Plum Creek (Figure 14). Average Total Phosphorus in West Plum Creek decreased between Perry Park and the confluence with East Plum Creek. Total Phosphorus concentrations have historically been observed to be relatively high at East Plum Creek, downstream of PCWRA as well as East Plum Creek above the confluence with Plum Creek (Site EPC-11.1), compared to other sites in Plum Creek watershed. In 2021 the average TP at East Plum Creek, downstream of PCWRA was 154 $\mu\text{g/L}$, compared to the 2020 average of 183 $\mu\text{g/L}$. In 2021 the average TP at Site EPC-11.1 (East Plum Creek above the confluence with Plum Creek) was 147.5 $\mu\text{g/L}$, compared to the 2020 average of 130 mg/L , the 2019 average of 193 $\mu\text{g/L}$ and the 2018 average of 185 $\mu\text{g/L}$.

Figure 14. Total Phosphorus in Plum Creek Drainage Area, 2021



Considerable monitoring has been performed in the Plum Creek watershed. This effort provides the ability to evaluate conditions on both a temporal and spatial scale.

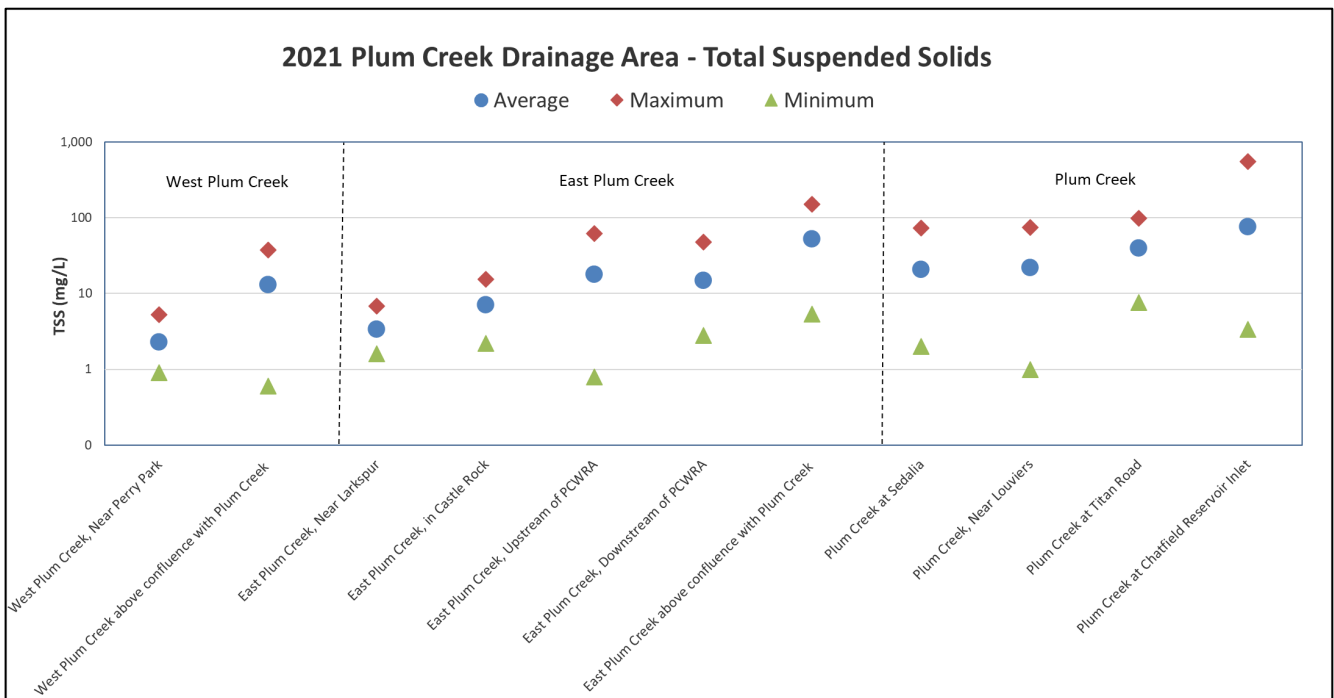
Chatfield Watershed Plan



Total Suspended Solids. The average TSS concentration is an indicator of sediment and high precipitation events. The highest average TSS concentration observed in 2021 was at Plum Creek at Chatfield Reservoir Inlet at 76.1 mg/L TSS. In 2020, the highest TSS concentration was at Site PC-3.5 (Plum Creek at Titan Road) at 24.5 mg/L. In 2019, the highest TSS concentration was at Site EPC-11.1 (East Plum Creek above the confluence with Plum Creek) at 64.7 mg/L. This was also the highest average TSS site in 2018 (73.6mg/L) and 2017 (201.4 mg/L) (Figure 16). In 2021, the average TSS concentration at Site EPC-11.1 was 52.53 mg/L. This concentration corresponds with similar precipitation events in 2019 and 2018.

The average TSS at West Plum Creek above the confluence with Plum Creek (WPS-10.9) was 13.03 mg/L in 2021 in 2020 compared to 5.3 mg/L in 2020 and 4.3 mg/L in 2019. All the other sites increased in average TSS concentrations in 2021 compared to 2020, potentially indicating more erosion and sediment loading to Plum Creek for 2021 as a result of precipitation events.

Figure 15. Total Suspended Solids in Plum Creek Drainage Area, 2021



Total Phosphorus vs. Total Suspended Solids. The relationship between TP and TSS is complex. The highest TSS and TP data collected in the watershed generally occurred during the spring runoff months during high flow, (April-June). Additionally, TP and TSS typically had an increasing trend through the watershed. 2021 showed some slight increases (TSS) below the confluence of East and West Plum Creek. The TP vs TSS relationship, along with identification of potential nonpoint sources of TP, will be further evaluated as monitoring in Plum Creek basin continues.

WASTEWATER TREATMENT PLANTS

Table 1 summarizes the wastewater treatment plants (WWTPs) in the Chatfield watershed and their respective TP wasteload allocations. In 2021, the total reported TP discharges from WWTPs were approximately 2,800 pounds out of the allowable wasteload allocation of 7,533 pounds. Refer to Figure 17 for WWTP locations. As growth in the watershed continues, wasteloads from the wastewater treatments plants will continue to rise towards the total allowed wasteload allocations.

Table 2. 2021 Phosphorus Wasteload from WWTPs in the Chatfield Watershed*

Permittee	CDPHE Permit Number	TP Wasteload Allocation (Pounds)	2021 TP Loading (Pounds)
Plum Creek Water Reclamation Authority	CO0038547	4,256	2,044
Perry Park Water and Sanitation District	CO0022551	365	173.8
Perry Park Water and Sanitation District	CO0043044	73	59.4
Lockheed Martin Space Systems Company	CO0001511	1,005	22.1
Town of Larkspur	COX632092	231	10.6
Highlands Ranch Law Enforcement Academy	20060427 ¹	30 ²	No Data Available ³
Centennial Water and Sanitation District	CO0037966	20	No Discharge ⁴
Ponderosa Retreat and Conference Center	COX047511	75	No Discharge ^{5,6}
Louviers Water and Sanitation District	COX632098	122	No Data Available ⁷
Dominion Water and Sanitation District	CO0041645	1,218	No Discharge
Sacred Heart Retreat	COX041874	15	No Discharge ⁸
Jackson Creek Ranch	N/A	50	No Data Available
Reserve Emergency Pool	N/A	73	Not used
Sun Jelly RV Park	COX631080	72.6	105.2**
TOTAL PHOSPHORUS WASTELOADS		7,605.6	2,415.1

*TP loading from WWTPs is from the WWTP point of discharge; the TP load discharged from WWTPs does not equate to the TP load delivered to Reservoir due to assimilation of TP and geochemical fate and transport processes in the watershed.

**Values indicate exceedance of the TP wasteload allocation

1. Permit for the ISDS issued by Tri-County Health Department.
2. CWSD serves as a co-management agency for the water system and has provided the HRLETF with an adequate wasteload allocation from its 50-pound wasteload allocation.
3. Sampling is not required by the current Tri-County Health permit.
4. No discharge of wastewater effluent reported in the Chatfield watershed.
5. Ponderosa Retreat Center water quality credits are based on a trade project completed pursuant to the Authority Trading Program. Ponderosa Retreat Center is currently in Significant Non-Compliance with permitted effluent Total Suspended Solids limitations. Effluent phosphorus concentration was not sampled in 2021.
6. Source: Environmental Protection Agency Integrated Compliance Information System database.
7. No phosphorus samples were collected in 2021 as the compliance point lysimeters were dry during each monthly sampling event.
8. Facility is storing and transporting all wastewater to McDonald Farms for treatment, resulting in no discharge in 2021.

Wastewater providers treat effluent to meet TP load allocations and a TP concentration pursuant to Control Regulation No. 73. The monitoring and reporting of effluent discharges is used to demonstrate compliance with their individual permits and the state regulations. During 2021, all but one of the dischargers maintained their record of compliance with their TP concentration limits and TP wasteload allocation.

Table 3. 2021 Daily Average Phosphorus Concentrations by Month from WWTPs (mg/l)

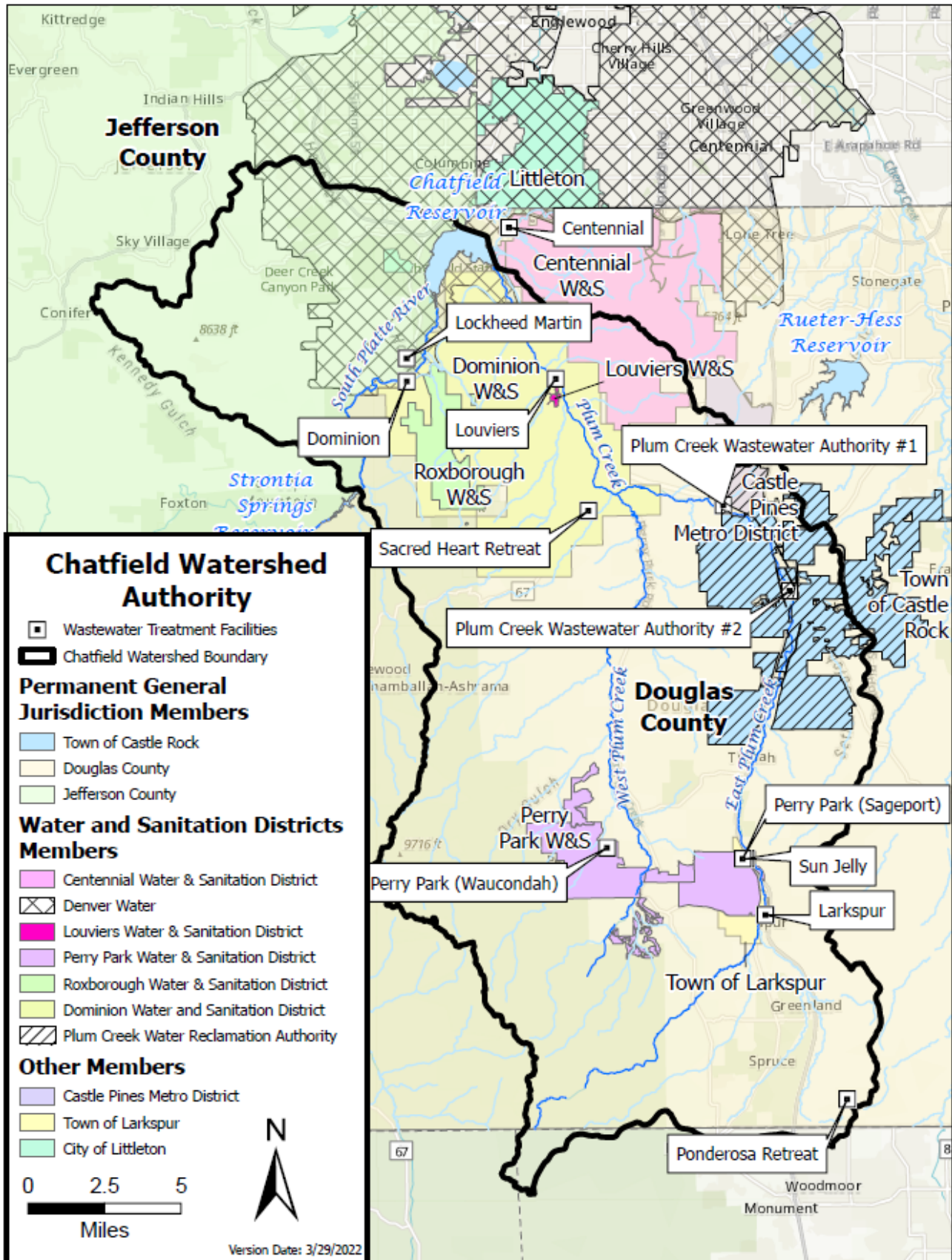
Permittee	CDPHE Permit No.	J	F	M	A	M	J	J	A	S	O	N	D
PCWRA	CO0038547	.12	.10	.16	.17	.17	.26	.10	.11	.11	.07	.10	.11
PPWSD	CO0022551	.25	.33	.27	.21	.43	.34	.34	.18	.34	.96	.44	.32
PPWSD	CO0043044	.21	.52	.52	.25	.34	.17	.25	.26	.12	.16	.20	.54
LMSSC	CO0001511	.06	.09	.09	.04	.05	.08	.11	.09	.04	.04	.03	.03
Larkspur	COX632092	.24	ND	ND	.65	.74	ND	.04	.53	.41	ND	.33	.30
HRLEA	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
CWSD	CO0037966	.80	.81	.81	.82	.79	.76	.75	.78	.78	.78	.79	.76
PRCC	COX047511	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LWSD	COX632098	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
DWSD	CO0041645	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
SHR	COX041874	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
JCR	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SJRP	COX631080	ND	ND	ND	.002	.03	.04	.03	.06	3.2	8.7	4.9	4.4

N/A – Not Applicable

ND – Not Detected

NR – No Record

Figure 17. Wastewater Treatment Plants located within the Chatfield watershed.



SITE LOCATION APPLICATIONS

As the 208 Management Agency, the Authority reviews site location applications and associated engineering reports for new or proposed facilities to effectively manage waste treatment works and related facilities serving Chatfield Basin.

The Authority reviews, comments, and makes recommendations to the Water Quality Control Division for site location applications for domestic wastewater treatment works, including wastewater treatment plants, individual sewage disposal systems, lift (pumping) stations, and certain interceptor sewers with a capacity of 2,000 gallons per day or greater, as well as certain facilities that produce reclaimed domestic wastewater. As required by Colorado's Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works (Regulation 22), most site location applications are submitted to the Authority by the Applicant prior to submittal to the Water Quality Control Division.

Under Control Regulation No. 73, the Authority is to implement the TMAL for total phosphorus loading to the Reservoir. The Authority reviews site location applications for compliance with the Control Regulation No. 73 and the Emergency Response Plan. The review primarily assesses the following criteria:

- / Colorado Department of Public Health and Environment (CDPHE) WQCC Control Regulation No. 73: 73.3.2(b): "No municipal, domestic, or industrial wastewater discharge in the Chatfield Watershed shall exceed 1.0 mg/L total phosphorus as a 30-day average concentration, except as provided under section 73.3(2)(f)."
- / CDPHE WQCC Control Regulation No. 73, 73.3.2(c): "The allowed annual wasteload of point source phosphorus in the Chatfield watershed is limited to 7,533 lb/year, allocated among the dischargers."
- / The likelihood of sanitary sewer overflows and contaminants reaching Chatfield Reservoir, Plum Creek, or the South Platte River and, in the event of an emergency, the ability of emergency response plans to contain the sanitary sewer overflows and contaminants, per the Cherry Creek Reservoir Watershed Site Application Review Process Emergency Response Plan Criteria (Emergency Response Plan Criteria) which have also been adopted by the Chatfield Watershed Authority.

Pine Canyon Site Application and Phosphorus Trade Application

In 2020, the Authority reviewed the following project for compliance with the Chatfield Reservoir Control Regulation No. 73:

- / Pine Canyon (JRW)
 - / Project Summary: Site application for a wastewater treatment facility (0.405 mgd design capacity), and a phosphorus non-point source to point source trade application (1528 lbs/yr cattle operations elimination to 763 lbs/yr WWTF discharging to East Plum Creek). Pine Canyon proposed to remove on-site cattle operations on the JRW property as the source of the nonpoint source trade.
 - / The Authority's technical consultant reviewed the submitted applications and found that Pine Canyon's initial analyses which calculated the phosphorus removal effect of cattle removal did not account for the diminished effect of the change on the amount of phosphorus actually reaching the waters of East Plum Creek. On December 29, 2020, Pine Canyon revised their request to address this issue, and proposed a revised nonpoint source phosphorus credit of 380.5 lbs./yr. based upon a calculated 761 lbs./yr. of phosphorus reaching East Plum Creek from

the JRW property.

- / On October 27, 2020, the Division issued a Request for Information (RFI) on the submitted Site Application for the WWTF. The RFI included, among other requests, a request of the Applicant to 1) submit an application to the Division for the phosphorus allocation approval following the final recommendation of the phosphorus allocation by the Authority, and 2) to address the phosphorus allocation with respect to the MS4 requirements in the phosphorus allocation application. The Applicant provided responses to the Division’s RFI on December 10, 2020.
- / On January 26, 2021, the Division issued a letter to the Applicant stating that “because the Applicant’s property is subject to Douglas County MS4 permit, the discharge is a point source, not a nonpoint source. Furthermore, discussions with our MS4 workgroup have clarified that trading under an MS4 permit also is not a feasible option at this time”.
- / On January 28, 2021, a separate letter from the engineering division within the Water Quality Control Division to the applicant determined: “Further consideration of the site application by the Division staff is “premature” because applicant has not resolved the issue of a phosphorus allocation for the proposed facility”.
- / On February 18, 2021, the CWA sent a letter to the Water Quality Control Division notifying the Division that it had denied the applicants phosphorus trade at its February 2, 2021, meeting; the letter went on to say that the CWA review of the applicants site application had been put “on hold”.
- / On May 4, 2021, the CWA denied Pine Canyon’s Site Application.
- / On December 2, 2021, the Division sent a letter to the applicant “to provide more detailed information on the underlying rationale behind our initial determination that the trade is not feasible”.

WATERSHED MODELING

The Authority contracted with Lynker to use the watershed model to further explore model assumptions and inputs on the model results. In addition, Denver Water funded updating the watershed model by adding additional years of analysis to the original period of analysis. The purposes of the modeling efforts started in 2021 were to:

- / Prepare a more robust model by expanding the model simulation period
- / Simulate the watershed response to removal of modeled point source discharges
- / Simulate the watershed response to wastewater facilities operating in the future at their full wasteload allocations

These model efforts are expected to be completed in 2022 and their results will be reported in the CWA’s 2022 Annual Report.

In addition, the CWA and the CRMC agreed to meet in 2022 to discuss the potential for linking the CWA watershed model to the CRMC reservoir model.

COLORADO SCHOOL OF MINES WATER QUALITY PROJECT

The Authority tasked environmental engineering students at the Colorado School of Mines (Mines) with gathering water quality data from tributaries within the Chatfield watershed, including East Plum Creek, Cook Creek, Carpenter Creek, and Willow Creek (Figures 18 and 19).

The goals of the Mines field session course were as follows:

- / Obtain and document a snapshot-in-time of water quality in the Chatfield watershed tributary creeks through sampling and testing of water quality parameters of concern and streamflow rates.
- / Interpret the potential linkages between the watershed soils/geology/land uses on the sampled water quality constituents.
- / Provide advice on possible measures to improve the quality of water in the Chatfield watershed.
- / Report and present their findings to representatives of the Authority.

Figure 18. Mines Field Session Sampling Locations

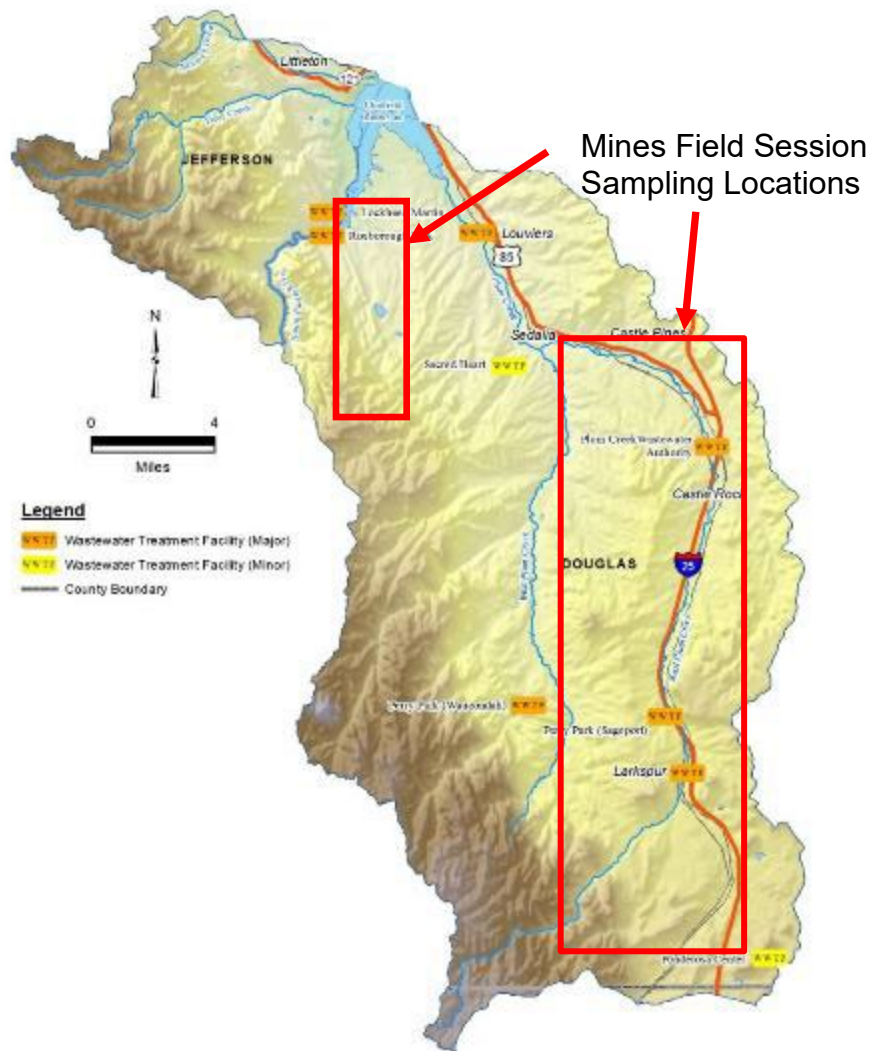
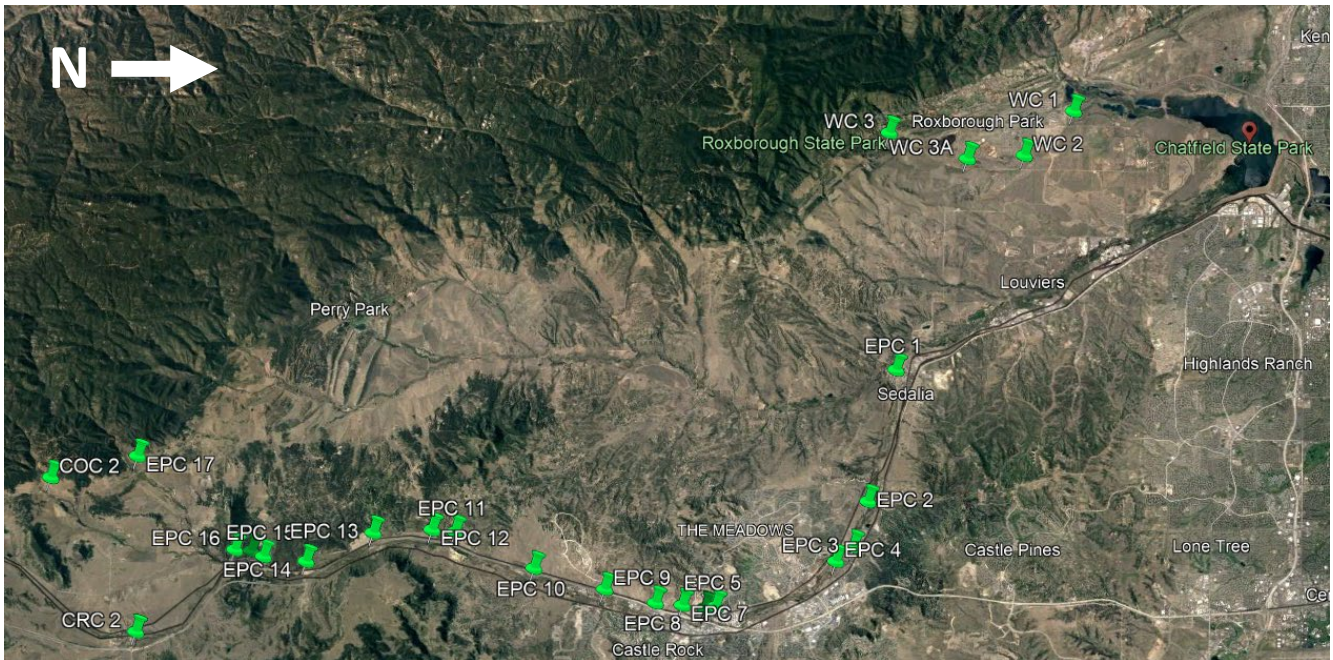


Figure 19. Mines Field Session Sampling Sites



Notes:

- / The orientation of the map in Figure 24 has north to the right.
- / The creeks generally flow south to north towards Chatfield Reservoir.
- / All sampling sites are located on East Plum Creek, Cook Creek, Carpenter Creek, and Willow Creek.

Locations CRC2, EPC17, and CRC1:

- / Phosphorous concentrations exceeded EPA aquatic life acute thresholds at all locations. Arsenic and thallium were measured above drinking water standards, and selenium reported below detection limits.

Locations EPC13, EPC14, EPC15, and EPC16:

- / Phosphorous was measured below the TMDL. E. coli and selenium were detected in low concentrations in all samples.

Locations EPC9, EPC10, EPC11, and EPC12:

- / Phosphorous concentrations exceeding the Chatfield Watershed Authority standards and high levels of E. coli were measured in EPC9, EPC10, and EPC11.

Locations EPC5, SG1, EPC6, EPC7, and EPC8:

- / Phosphorous exceeded EPA drinking water standards at all sites except for EPC7. Arsenic was measured above drinking water standards and E. coli was detected at EPC5, SG1, and EPC6.

Locations EPC1, EPC2, EPC3, and EPC4:

- / Phosphorous exceeded EPA aquatic life chronic standards at all sites. Selenium also exceeded the EPA aquatic life standard at EPC3. E. coli did not exceed any standards at any site.

Locations WC1, WC2, WC3A, and WC3:

- / Phosphorous exceeded either EPA aquatic life chronic standards or CDPHE chronic exposure levels at all sites. Selenium exceeded CDPHE chronic and acute exposure levels at WC2.

REGULATED STORMWATER SOURCES

Colorado's stormwater permit program requires control of stormwater runoff in all Phase I and Phase II Municipal Separate Storm Sewer Systems (MS4) entities. These requirements are separate and distinct from the Chatfield Control Regulations and complement the TMAL's purpose. Through the efforts of the MS4s, rate payers have spent significant funds to address water quality through implementing projects to mitigate impacts from urban stormwater runoff. Authority members with Phase I and II MS4 permits in the Chatfield Basin include:

- / Statewide General Permit (COR090000)
 - / Jefferson County
 - / City of Littleton
- / Cherry Creek Reservoir General Permit (COR080000)
 - / Douglas County
 - / City of Castle Pines
 - / Town of Castle Rock
- / Individual / Other Permit
 - / Castle Pines Metropolitan District
 - / Colorado Department of Transportation
- / Non-Standard General Permit (COR070000)
 - / Douglas County School District
 - / E-470 Toll Road
 - / Regional Transportation District
 - / Castle Pines Metro District
 - / Castle Pines North Metro District
 - / Highlands Ranch Metro District
 - / Highlands Heritage Metro District
 - / Meridian Metro District
 - / Southeast Metro Stormwater Authority
 - / Stonegate Village Metro District
 - / Stonegate Village North Metro District

General MS4 permits require the permittee to develop programs that meet six minimum control measures:

- / Public education and outreach on stormwater impacts
- / Public participation and involvement
- / Detection and elimination of illicit connections and discharges
- / Construction site stormwater runoff control
- / Post-construction stormwater management in development and redevelopment
- / Pollution prevention/good housekeeping for municipal operations



MS4 permits require implementation of best management practices (BMPs) to reduce pollutants discharged to the “maximum extent practicable.” A summary of 2021 MS4 permit inspection and enforcement metrics are provided in Table 4.

Table 4: Summary of 2021 MS4 Permit Activities

Land Use Agency	Permit Number	Permit Inspection Actions			Permit Enforcement Actions		
		Illicit Discharges	Construction	Post-Construction	Illicit Discharges	Construction	Post-Construction
Douglas County	COR080003	15	4,675	1	0	144	0
Jefferson County	COR090024	21	531	10	21	26	0
Town of Castle Rock	COR080012	17	3082	99	11	1193	0
City of Littleton	COR090055	6	110	3	0	0	0

Notes:

- / Castle Pines Metropolitan District inspection and enforcement action data are incorporated in Douglas County reporting; City of Castle Pines MS4 boundary is predominately in the Cherry Creek Basin; only a very small portion is located in the Chatfield Watershed.
- / Town of Castle Rock inspection and enforcement action data includes data from the Cherry Creek Basin and the Chatfield Watershed. Town of Castle Rock MS4 boundary is predominately in the Chatfield Basin; about two-thirds of the Town is located in the Chatfield Watershed.
- / The data for the City of Littleton includes all MS4 activities within the city limits. However, the city limits of Littleton only overlap with the Chatfield watershed boundary for a small portion (i.e. the Trailmark development)
- / Data for Jefferson County includes all MS4 activities within the County limits.

EDUCATION AND OUTREACH

Covid-19 continued to impact the ability of the Authority members to connect with the public to educate and



inform on the benefits of their stormwater programs. Most of these programs include face-to-face opportunities to interact with citizens and students in active hands-on activities. Although the Authority members continued with outreach efforts via on-line programs, billing inserts, and advertisements, some in-person events were able to resume in 2021. Programs used by Authority members are as follows:

Douglas County

Douglas County's Stormwater Management Program provides public education, tracking of stormwater system impact activities, stormwater system project reviews, and coordination between federal, state, and local government for compliance with federally mandated programs.



Through a county Co-op program, the county has created the "One Thing is Clear... our creeks, rivers and lakes depend on you" public awareness program. The interactive website provides information for Douglas County residents on how they can work to keep pollution out of their water ways. CLEAR Members collaborated with Members of Stormwater Permittees for Local Awareness of Stream Health (SPLASH) on Nutrient Outreach and training seminars.

Douglas County's 2021 program activities included:

- / Maintaining a portable "Road Show" for members to use as an education and outreach tool with the public. "In-person" events were limited due to the COVID-19 pandemic.
- / Updating and maintaining the CLEAR website at <http://onethingisclear.org/>
- / Running a total of 12 two-third page residential and commercial awareness advertisements in Colorado Community Media newspapers covering certain portions of Douglas, Arapahoe, Jefferson, and Elbert Counties. Ads ran in the Castle Rock News Press, Castle Pines News Press, Douglas County News Press, Lone Tree Voice, Highlands Ranch Herald, Centennial Citizen, Englewood Herald, Littleton Independent, South Platte Independent, Parker Chronicle and Elbert County News.
- / Holding six membership meetings to discuss stormwater topics and interpret the application of federal

and state stormwater regulations. All meetings were held virtually due to COVID-19 and were open to the public with opportunity to comment.

- / Supporting four Tri-County Health Department/Douglas County Household Chemical Roundups.
- / Supporting and attending both general and committee meetings of the Colorado Stormwater Council (CSC).
- / Supporting the Cherry Creek Stewardship Partners.
- / Actively participating in and commenting on the Non-Standard MS4 "Draft" Permit during CDPHE stakeholder meetings. Members prepared information and participated in December's Non-Standard MS4 Permit Workshop sponsored by SPLASH.
- / Collaborating with members of SPLASH on the new Non-Standard MS4 Permit, nutrient outreach, training seminars, and newspaper ads.

Additional information on various topics related to Stormwater and Pollution Control can be found on Douglas County's website.

Town of Castle Rock



Spring Up the Creek has become a tradition for Castle Rock and draws residents every year to preserve our waterways by removing trash that collects along the stream banks. After canceling the event in 2020, the event returned on Saturday, May 1, 2021.

178 community volunteers participated, like the 2019 participation rate. Approximately 89 bags of trash were collected, as well as several large items, consisting mainly of building materials. 18 staff trail leaders from across several departments participated, as well as several family members.

To maintain social distancing, the event was not headquartered at Festival Park, but instead volunteers assembled at specific trailheads. The number of routes was increased from the previous event's 7 to 10 trails throughout Town.

The Town of Castle Rock hosted this event in partnership with Douglas County, Castle Pines Metro District, Chatfield Watershed Authority, and Plum Creek Water Reclamation Authority. Event sponsors included Burns & McDonnell, Dana Kepner, Enginuity, Jacobs, JRS Engineering, Muller, Starwood, and W. W. Wheeler & Associates, Inc. Contributions totaled \$3,550, which covered the total cost of the event.

Jefferson County

Jefferson County provides opportunities for residents and visitors in the watershed to learn and be involved in environmental stewardship and programs that promote water quality. The county has a comprehensive storm sewer outfall map to trace sources of potential illicit discharges and illegal dumping in the watershed. Jefferson County continues to participate with Rooney Road Recycling Facility and in 2021 the facility collected over 400,000 pounds of household hazardous waste. Household hazardous waste (includes electronic waste, household chemicals, paints, propane cylinders and automotive products) materials collected at the Rooney Road Recycling facility since 1994 total more than 8,000,000 pounds of potential surface water and ground water pollutants. This process keeps materials out of septic systems and helps reduce illegal dumping in the watershed.

Jefferson County also holds a Drug Take-Back Day twice per year that provides the public an opportunity to surrender expired or unwanted medications, which helps to keep them out of onsite wastewater systems and wastewater treatment facilities.

Jefferson County participated in several public events to reach diverse audiences for their MS4 and floodplain management programs. The County maintains a small-site erosion control manual that explains the basic principles of erosion and sediment control and illustrates techniques to control sediment from small development sites, and has an inspection program for illicit discharges, construction activities, and post-construction inspections.

Jefferson County regularly reports to the Authority on stormwater management practices and programs. More information about Jefferson County's municipal stormwater program is contained in their CDPS Stormwater Permit Annual Report. More information about Jefferson County's municipal stormwater program is contained in their CDPS Stormwater Permit Annual Report.

City of Littleton



The City of Littleton (City) staff conducted stream cleanups and water quality educational outreach via the City newspaper, at community events, and through social media sites. The City holds an annual Hazardous Household Waste collection event with the City of Englewood.

The City joined in efforts of regional groups with radio advertisements and waterway cleanups. In addition, the City publishes articles on water quality awareness in the Littleton Report and social media.

PROGRESS TO PROMOTE WATER QUALITY PROTECTION

While funding sources remain very limited, the Authority's collaborative role seeks out partnerships to support our water quality goals now and in the future. Donations and in-kind services from Authority members to support progress to promote water quality protection included:

- / Continued implementation of the amended Intergovernmental Agreement (IGA) and bylaws.
- / Continued water quality monitoring program in both the reservoir and the watershed.
- / Continued implementation of the Chatfield Watershed Plan.
- / Continued collaboration with Chatfield Reservoir Mitigation Company (CRMC) regarding data collection to support CRMC reservoir modeling efforts.
- / Continued Watershed modeling efforts.
- / Collaboration with local and state agencies in grant funding effort.
- / Continued Public Outreach Committee activities.

In addition, our members have been expending significant funds for drainageway and storm sewer projects to reduce erosion and flooding and improve water quality. Following are example projects completed by Authority Members.

Douglas County

Willow Creek Stream Improvements at Sterling Ranch

Construction of the Willow Creek Stream Improvements at Sterling Ranch project started in October 2021 and concluded in February 2022. The large-scale project has restored a section of Willow Creek upstream of Chatfield Reservoir. Sponsored by the Sterling Ranch Community Authority Board, the Mile High Flood District, and Douglas County; the stream-restoration project rehabilitated nearly 1-mile of stream channel, riparian habitat and floodplain between Rampart Range Road and Waterton Road.

Prior to the project, the Willow Creek corridor was highly degraded. Eroding streambanks contributed large quantities of sediment to downstream receiving waterbodies. Wetland habitat and floodplain connectivity was deficient due to the incised nature of the channel. Residential development projects planned for the watershed would be contributing additional stormwater volume to Willow Creek, increasing stress on the natural system. Restoration and stabilization of the creek was necessary.

Project sponsors selected a multi-disciplinary team that included ICON Engineering, Valerian LLC, Great Ecology, and ERO Resources to design and permit the stream restoration project. Naranjo Civil was selected as the primary contractor to construct the improvements. The project was designed to increase natural stream and floodplain function by slowing water down and dissipating energy that previously caused erosion.

An emphasis was placed on restoring aquatic, riparian, and upland habitat zones. Project site revegetation will continue through May 2022 and a monitoring program is in place to ensure successful plant establishment. The project site has been identified by Douglas County and Colorado Parks and Wildlife as a critical habitat link between mountain foothills, Chatfield State Park, Highlands Ranch Backcountry and Daniel's Park areas.

Outcomes of the project when finished will include:

- Realigning and stabilizing **8,600** linear feet of streambank
- Constructing **33** riffle-pool stream features
- Planting **55** acres of native plant seed
- Planting **50** trees and nearly **2,000** shrubs
- Establishing **2** new acres of wetland habitat
- Creating **18** acres of high-quality riparian habitat
- Establishing a high functioning and more resilient stream corridor



Town of Castle Rock

Metzler Ranch Pond Retrofit (\$830,614)

Castle Rock Water completed improvements to the Metzler Ranch Regional Detention Pond, located in the northwest corner of Metzler Ranch Community Park east of Front Street and south of Sam Walton Lane. Retrofit improvements and analysis of the regional detention pond were completed in 2005. The analysis concluded that approximately 3.5 acre-feet of additional water quality capture volume was needed to restore the design capacity of the facility. Twenty-three volunteer trees and other vegetation had taken over the pond bottom, causing maintenance and operational difficulties.

This project removed the volunteer trees and shrubs from the pond bottom, removed approximately 7,400 cubic yards of sediment that had entered the stormwater system, and added structure improvements at each inlet pipe and at the outlet structure to bring the pond up to current design standards. Maintenance access was also added to provide equipment access for ongoing operation and maintenance. Twenty-three trees were planted in strategic locations to replace those removed during construction. Completion of the retrofit construction added 4.8 acre-feet of water quality capture volume necessary to restore the design capacity of the facility.

53 Corporation was awarded the construction contract. Construction started in December 2020 and is complete. A construction change order extended the original contract time due to wet/muddy site conditions experienced last spring. Construction was completed within that extended time frame.



Village North Drainage and Infrastructure Improvements (\$1,699,500)

Castle Rock Water's Stormwater and Engineering Divisions teamed up to construct drainage and sanitary sewer improvements in the Village North commercial district, north of Wolfensberger Road. New storm sewers were needed to address localized flooding along Park Street, Malibu Street and Caprice Drive, and upgrades to the existing Parks Department Central Service Center detention pond will provide additional volume for area-wide flood control and water quality. The storm sewer system consists of 1,600 LF of reinforced concrete pipe, ten inlets and nine manholes. Street section improvements support the new storm drainage system. The modified detention pond has capacity to treat 24 acres of the commercial and light industrial area at a volume of



approximately four acre-feet. Future infill development will have the option to purchase volume in the regional pond to help offset the cost of the detention pond expansion.

A secondary goal of the project was to take advantage of the street construction to replace an existing 15” clay sanitary sewer main that was old, undersized, and partially located within easements on private property. This pipe was relocated into Town right-of-way and replaced with 1,172 LF of 21” PVC pipe to account for full-buildout upstream conditions.

Notice to Proceed was issued to the contractor on February 1, 2021. The contractor had to pull off the project for approximately two months in early fall to allow for CORE Electric (formerly IREA) to relocate three undetected conduits in conflict with the storm sewer. Completion of all subsurface improvements is anticipated in 2021, with pavement restoration expected in the spring of 2022, due to cold weather.

The contractor of this project is T. Lowell Construction, Inc. The project is expected to be completed in the spring of 2022. There were delays due to the utility conflicts and weather.



FUNDING OF NON-PROFIT SOURCE PROJECTS

Hilldale Pines Fire Mitigation (Total Cost \$70,000, of which \$5,000 contributed by CWA)

This is a fire mitigation project in Hilldale Pines, a 300-home community on less than 1 square mile near Conifer, partially in the drainage for Deer Creek Canyon into Chatfield. The goal of the Hilldale Pines Project is to construct and complete a 2,700-foot shaded fuel break along the ridge from South Crystal Way to the planned Denver Mountain Parks fuel mitigation project on the north. The fuel break will consist of tree density thinning according to a prescription by the Technical Advisory Committee.

The project benefits include the reduction of risk to lives, property, infrastructure, and watershed values from catastrophic wildfire. Specifically, within the project watershed, thousands of homes, millions of dollars of infrastructure (roads, utilities, and communication towers), and water sources used by thousands of residents are located. The project aims to protect these resources by reducing continuous tree cover, reducing ground vegetation, improving options for wildfire suppression by reduction the potential for crown fire, and reducing wildfire intensity and rate of spread near evacuation routes.

West Plum Creek Stream Management Plan (Total Cost \$265,786 with \$31,000 in-kind match funding, of which \$5,000 cash and \$5,000 in-kind services contributed by CWA).

This project aims to fully document existing conditions and identify risks to fish populations along West Plum Creek, the last relatively unaltered transition zone stream in the South Platte Basin and perhaps the best example of a nearly intact fish assemblage along Colorado's Front Range. Colorado Parks and Wildlife, alongside partners including River Network, US Fish and Wildlife Services, Douglas County's Division of Open Space and Natural Resources, Chatfield Watershed Authority, and others will participate in the creation of a Stream Management Plan to assess native fish habitat, improve water quality, and better understand hydrology and opportunities in water management with the water users. Of primary importance is documenting fish passage barriers and understanding the hydrologic regime of the watershed, and how to maintain its integrity into the future.

Phase I will focus on stream condition assessment and characterization, development of objectives to reduce risk to native fish populations, identification of priority projects for fish passage, and landowner engagement. A subsequent phase will identify and prioritize opportunities in water management, water quality, and river/riparian restoration alongside water users.

CHATFIELD WATERSHED AUTHORITY MEMBERS

www.chatfieldwatershedauthority.org

Members consist of water and sanitation districts, water providers, municipalities, metropolitan districts and other area stakeholders within the Chatfield Watershed. The membership representation consists of organization staff and elected officials. Membership dues assist with collaborative projects and water quality testing.

Chatfield Watershed Authority Members

City of Littleton
Denver Water
Douglas County
Jefferson County
Roxborough Water & Sanitation District
Town of Castle Rock
Perry Park Water & Sanitation District
Centennial Water & Sanitation District
Town of Larkspur
Castle Pines Metropolitan District
Dominion Water & Sanitation District
Louviers Water & Sanitation District
Plum Creek Water Reclamation Authority

Ex-Officio Participants

Colorado Agricultural Leadership Foundation (CALF)
Colorado Parks and Wildlife Commission (Chatfield State Park)
Colorado Department of Transportation
Colorado Water Conservation Board
Ken Caryl Ranch Master Association
The Law Enforcement Foundation
Ponderosa Retreat
Sacred Heart Retreat
Tri-County Health Department
U.S. Army Corps of Engineers
Chatfield Reservoir Mitigation Company
Water Quality Control Division of the Colorado Department of Public Health and Environment

Watershed Manager

Colorado Watershed Assembly

Website

Colorado Watershed Assembly

Financials

TWS Financial, Inc.

Technical Consultant

RESPEC Company, LLC

