



We Protect The Water You Enjoy

Chatfield

Watershed Authority

2012 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.





A note from the Chatfield Watershed Authority Chairmen Larry Moore and Kevin Urie

Dear Chatfield Watershed Caretakers,

We are proud to present the 2012 Chatfield Annual Report. Although 2012 was a very dry year, we are pleased to report an excellent water quality report. We measured the lowest inflows to Chatfield Reservoir since the 2002 drought, estimated at 37,550 AF, while still meeting regulatory compliance metrics at the reservoir. The chlorophyll-a and total phosphorus standard was met at the reservoir during the July-September growing season compliance period; moreover, the swim beach water quality was below the e. coli standard and remained open every day during the recreational season.

Some key highlights in 2012 included the following:

- Embarking on development of the Chatfield Watershed Plan –Building partnerships, characterizing the watershed and identifying NPS projects and an implementation plan. Thanks to the Colorado Department of Public Health and Environment for their support on grant funding for the Chatfield Watershed Plan. We are very enthused by the support and outreach from stakeholders as we embark on the Chatfield Watershed Planning process. Based on an initial set of stakeholder meetings we understand the following nonpoint source (NPS) issues are a priority;
 - Improving water quality through conversion of aged septic systems along Plum Creek to wastewater treatment.
 - Implementing stream restoration and trail corridor along Plum Creek, connecting ecology and natural systems from Chatfield State Park to the Town of Castle Rock.
 - Incentivizing phosphorus trading with the agricultural community to manage agricultural land and nutrient loading along environmentally sensitive areas along Plum Creek.
 - Funding to implement NPS projects.
- Implementing agricultural BMPS at Colorado Agricultural Leadership Foundation at Lowell Ranch.
 - With funding assistance from NRCS, developing and implementing land conservation measures.
 - Demonstrating agricultural BMPs and manure management practices.
- Characterizing water quality in Plum Creek
 - With funding support from the CWCB Healthy River Fund Grant, implemented a 1-year monitoring program to characterize water quality and understand potential sources and future projects to control nutrient loading.
- Ongoing coordination with water quality aspects of the Chatfield Reallocation storage project.
 - Continued coordination with the US Army Corps of Engineers on the Chatfield Reallocation Environmental Impact Study, particularly as it relates to water quality issues raised by US EPA, data to support modeling refinements, and the development and implementation of measures for adaptive management responses to water quality changes.

Our water resources are precious, so how we proceed to protect this watershed for drinking water supplies, agricultural uses, fisheries, and recreational purposes is critical to our future! Thanks for your continued support in the Chatfield Watershed as we proceed to secure funding support for projects to improve the water quality and ecological health of Chatfield Reservoir and its watershed.

Sincerely,

Chatfield Watershed Authority

Larry Moore
Co-Chair



Kevin Urie
Co-Chair





The *2012 Chatfield Report* is the annual water quality summary status report presented by the Chatfield Watershed Authority to communicate the health 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

www.chatfieldwatershedauthority.org

Authority Board Co-Chairs:

Kevin Urie, Denver Water
 Larry Moore, Roxborough Water & Sanitation District

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Ronda Sandquist, Brownstein Hyatt Farber Schreck
 Bob Deeds, City of Littleton
 Kevin Urie, Denver Water

Larry Moore, Roxborough Water & Sanitation District

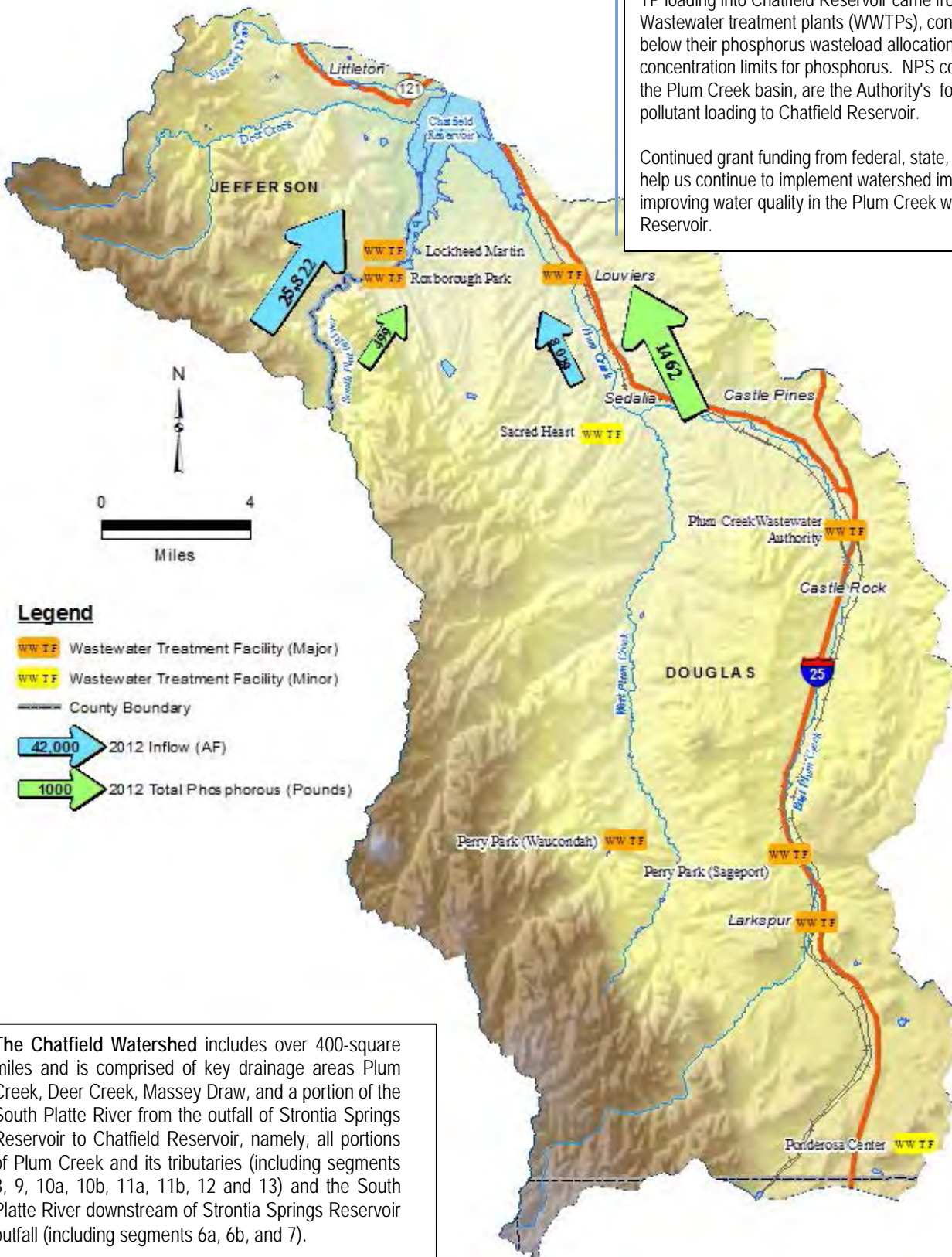
Treasurer:

Lissa Oelkers, Plum Creek Wastewater Authority

Where Do You Focus Limited Resources to Reduce Phosphorus Loading to Chatfield Reservoir?

We need to focus on nonpoint source (NPS) total phosphorus (TP) reductions, primarily in Plum Creek, to maintain the health of the watershed and the Reservoir. In 2012, only 21 % of the flow to Chatfield Reservoir was from Plum Creek, but conversely, 65% of TP loading into Chatfield Reservoir came from the Plum Creek basin. Wastewater treatment plants (WWTPs), continue to operate well below their phosphorus wasteload allocations and meet concentration limits for phosphorus. NPS contributions of TP, from the Plum Creek basin, are the Authority's focus to reduce the pollutant loading to Chatfield Reservoir.

Continued grant funding from federal, state, and local agencies will help us continue to implement watershed improvements aimed at improving water quality in the Plum Creek watershed and Chatfield Reservoir.



The Chatfield Watershed includes over 400-square miles and is comprised of key drainage areas Plum Creek, Deer Creek, Massey Draw, and a portion of the South Platte River from the outfall of Strontia Springs Reservoir to Chatfield Reservoir, namely, all portions of Plum Creek and its tributaries (including segments 8, 9, 10a, 10b, 11a, 11b, 12 and 13) and the South Platte River downstream of Strontia Springs Reservoir outfall (including segments 6a, 6b, and 7).

Reservoir Regulatory Compliance with Water Quality Standards

During 2012, the water quality standards established by the Water Quality Control Commission (Commission) for chlorophyll-a (chl-a) and total phosphorus (TP) were met.

The current water quality standards for Chatfield Reservoir are as follows:

- Chl-a standard of 10- $\mu\text{g/L}$ with an assessment threshold of 11.2- $\mu\text{g/L}$
- TP standard of 30- $\mu\text{g/L}$, with an assessment threshold of 35- $\mu\text{g/L}$

These water quality standards are applicable during the growing season (July through September), and include a one-in-five year exceedance frequency.

“Our water resources are precious, so how we protect this watershed for drinking water supplies, fisheries, recreational and agricultural purposes is critical to our future.”

~Kevin Urie, co-chair of the Chatfield Watershed Authority

As shown in Figure 1, the growing season average concentration for chl-a was 7 $\mu\text{g/L}$, below the 10 $\mu\text{g/L}$ standard. Figure 2 provides a historical perspective of the chl-a growing season average that demonstrates over the 29 year period of record, the reservoir has met the chl-a standard 86 % of the time.

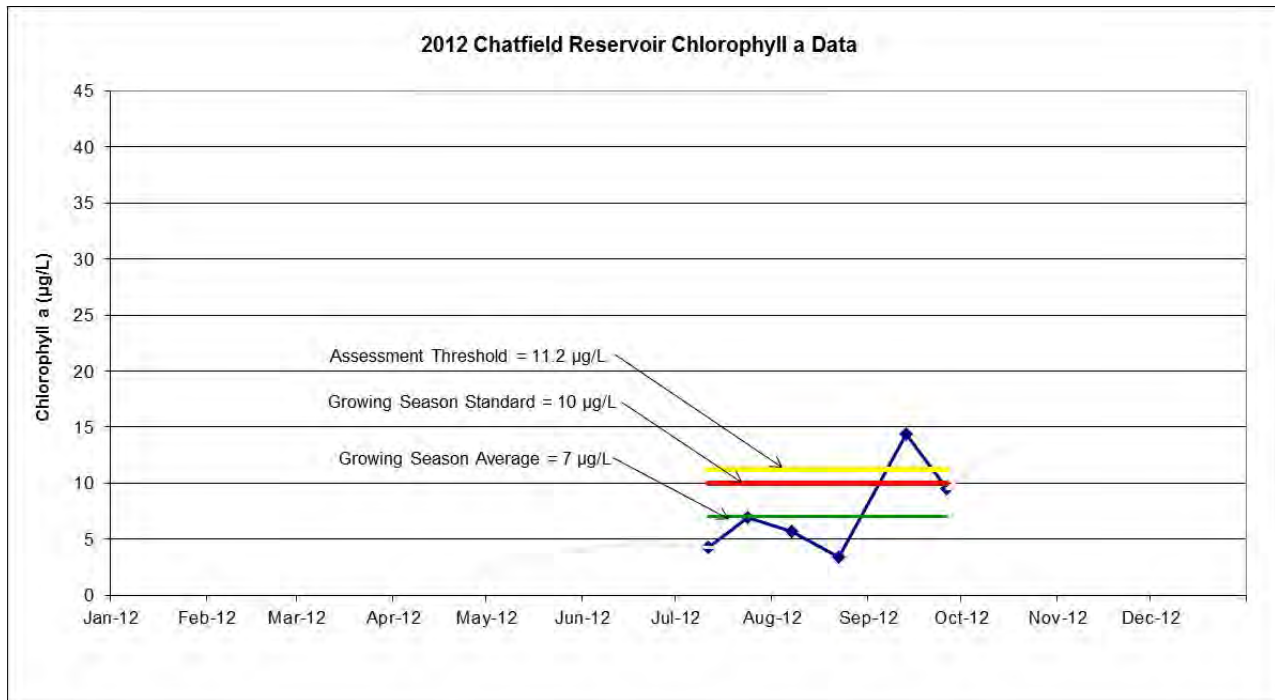


Figure 1: Monthly 2012 Chlorophyll-a Concentration in Chatfield Reservoir

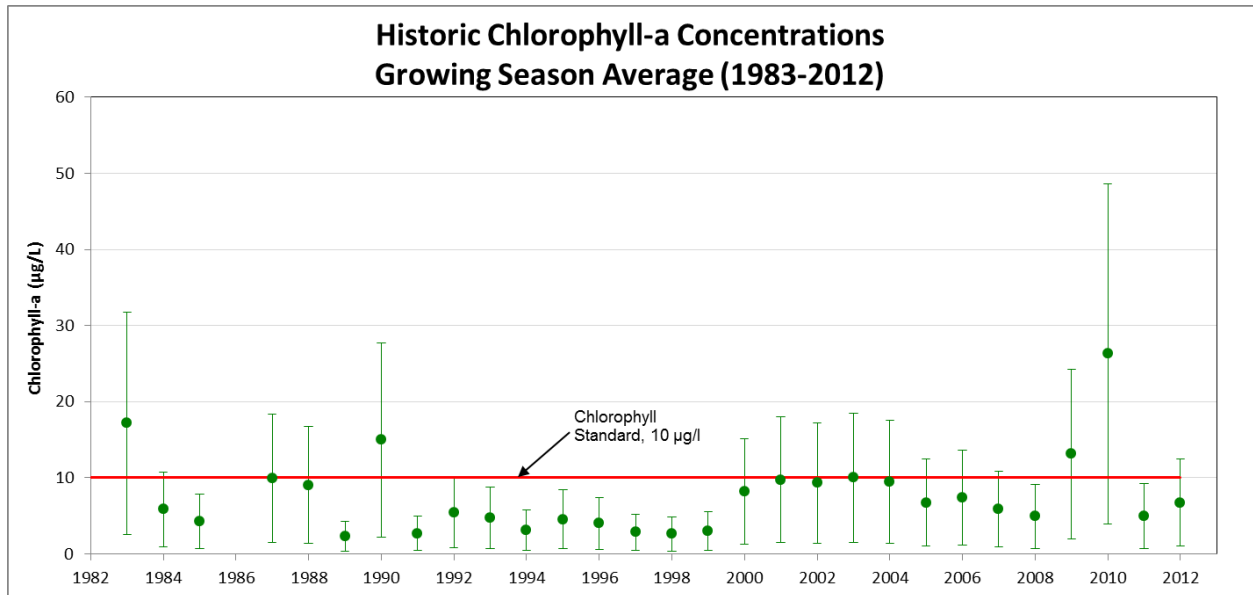


Figure 2: Historical Perspective of Chl-a Growing Season Compliance 1983 to 2012.

The points on Figure 2 depict the chl-a average concentration during the July to September compliance period. The error bars represent 85% confidence intervals around the mean. The solid red line represents the 10-µg/L chl-a standard used for compliance evaluation.

During 2012, the TP standard was met with a growing season average of 30-µg/L (Figure 3). The increase in chl-a and TP measured at the end of the growing season, September 26, 2012 was predicated by an increase number of blue green algae, and anabaena and microcystis cyanobacteria species observed in August and September 2012 (Figure 4). These events, coupled with higher TP internal loading measured in the water column at a depth of 16 meters in August (Figure 5), followed by reservoir mixing during late September, were all indicators, or precursors, to the higher TP and chl-a measurements at the end of September.

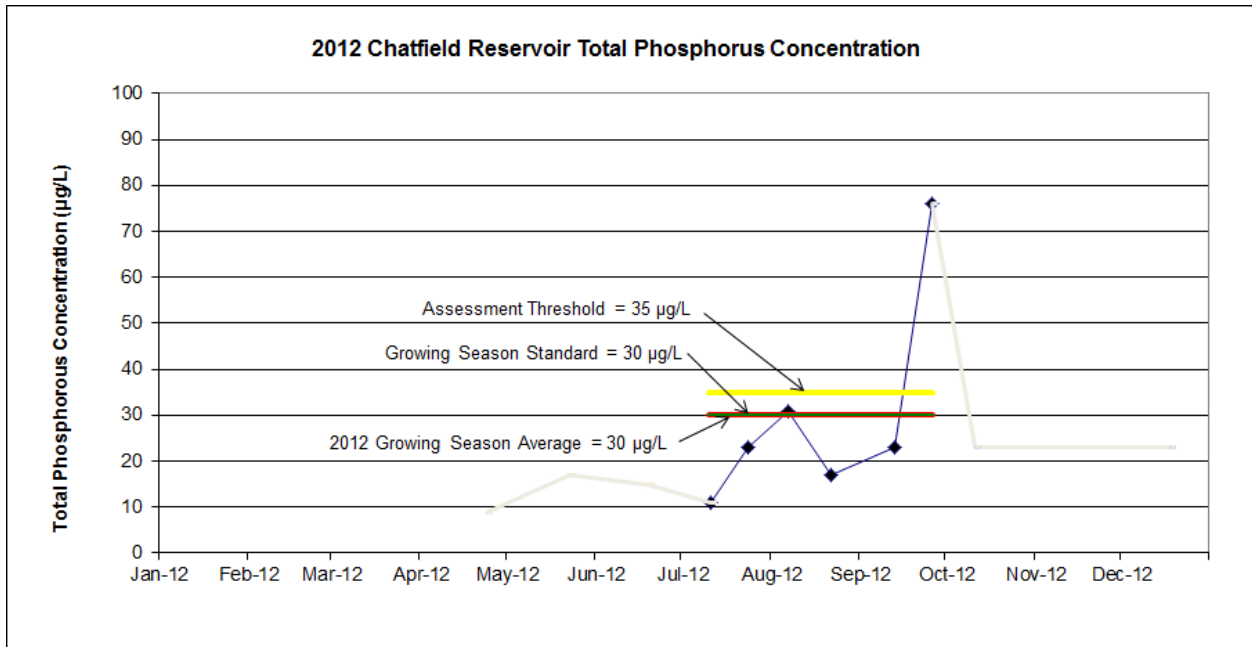


Figure 3: Monthly 2012 TP Concentration in Chatfield Reservoir

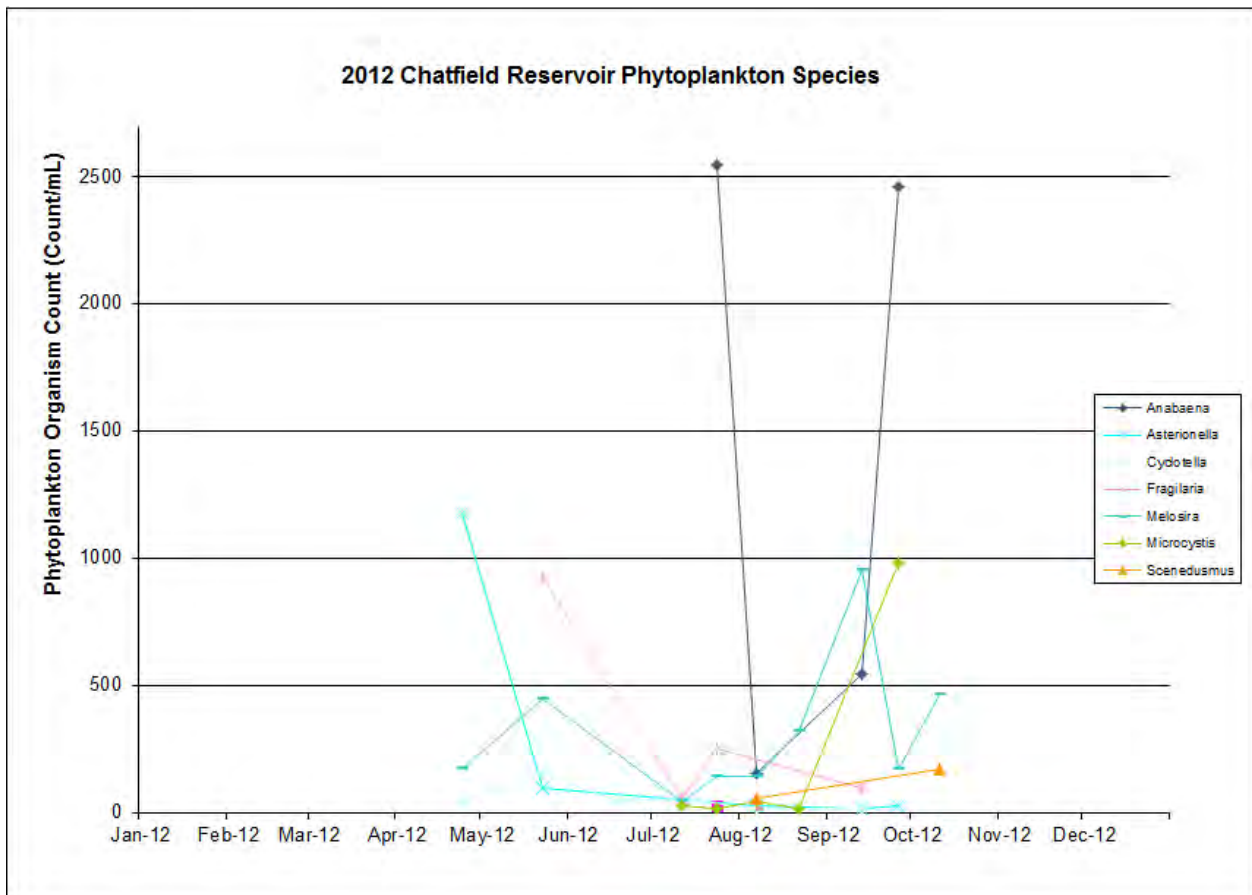


Figure 4: 2012 Phytoplankton Species– Presence of Blue Green Algae (Anabaena and Microcystis) Increased August/September 2012

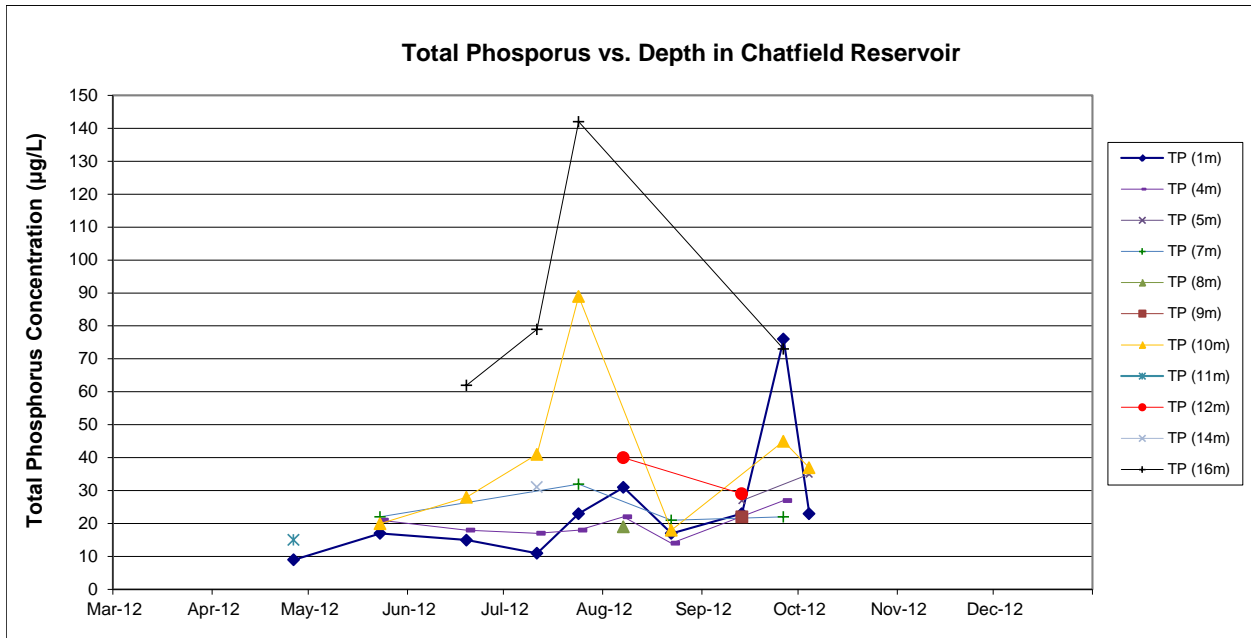


Figure 5: Total Phosphorus Water Column Profile – TP concentrations in

Figure 6 provides a historical perspective of the TP growing season average. Since 1983, when the Authority began monitoring water quality, the reservoir has met the TP standard 76% of the time.

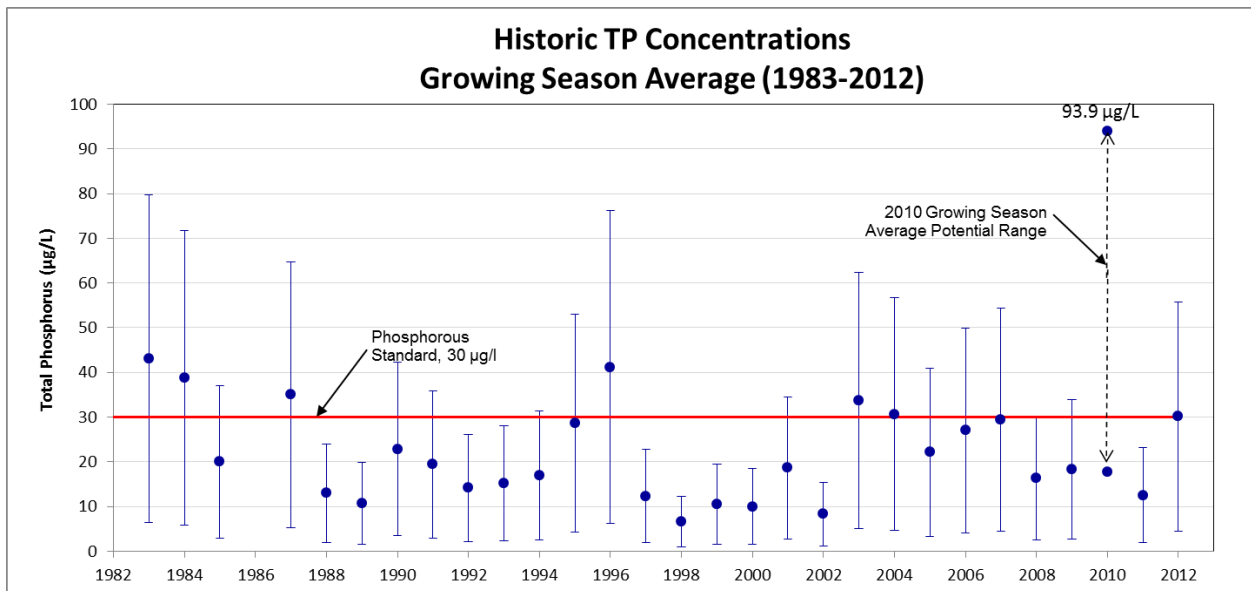


Figure 6: Historical Perspective of TP Growing Season Compliance 1983 to 2012.

The blue points on Figure 6 depict the seasonal average TP concentration during the July to September compliance period. The error bars represent the 85% confidence intervals around the mean. The solid red line represents the TP standard for compliance evaluation.

Compliance with the TMAA

The estimated inflow to Chatfield Reservoir, totaling 37,553 AF, reflected a dry year scenario not observed since the drought in 2002. The median inflow to Chatfield Reservoir is 100,860 AF. In 2012, the South Platte River contributed the majority of the inflow, 25,822 AF (69%). Plum Creek contributed approximately 21% of the inflow, or 8,029 AF, to the reservoir. Inflows are based on USGS satellite monitored flow measurements from Plum Creek at Titan Road and South Platte River at Waterton Road (Colorado Division of Water Resources Gage). Other unmeasured inflows to the reservoir are estimated to be approximately 10% of the total inflow and include direct precipitation (18.55 inches) on the reservoir, alluvial inflow, Deer Creek, Massey Draw, and direct surface runoff (Figure 7).

The estimated TP load to the reservoir from the primary inflow sources, Plum Creek, South Platte River, alluvial flow and precipitation, was calculated at 2,234 pounds (Figure 8).

An estimated 65% (1,462 pounds) of the TP load to the reservoir is from Plum Creek and the South Platte River contributed 22% of the TP load, or 499 pounds. Phosphorus loads were calculated based on monthly TP data collected at each inflow sampling location on the South Platte and Plum Creek. An exception to the loading calculation occurred during a storm event on June 7, 2012, when flow on Plum Creek was gaged at 215 cfs. A higher TP concentration was used during this 24-hour period, based on review of 30-years of TP and flow data on Plum Creek. For Plum Creek, the higher flows (75th percentile flow is 46.5 cfs), result in higher TP concentrations. The median TP concentration during the high flow events is 0.2 mg/L. This is consistent with TP event

mean concentration data collected during storm events in the Denver urban area, and expected during runoff periods.

While Plum Creek contributed less inflow to the reservoir, because the monthly TP concentration is considerably higher in Plum Creek compared to South Platte (Figure 9), the majority of the TP load is from Plum Creek.

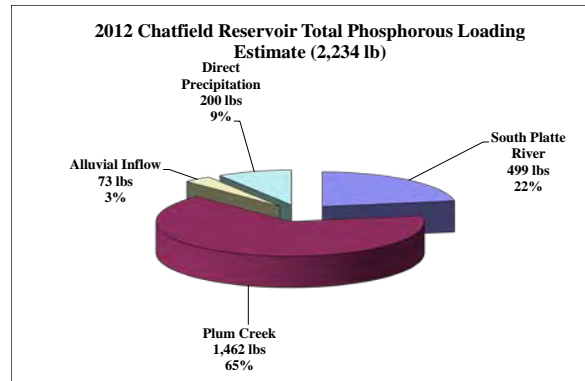


Figure 7: 2012 Inflows of 37,553 AF – Extremely Low Flows Observed

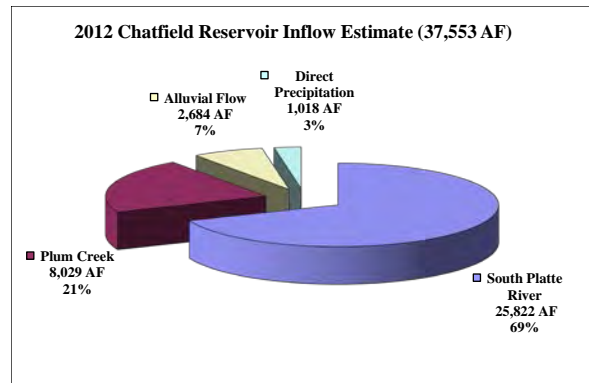


Figure 8: Breakdown of 2012 TP Loading to Chatfield Reservoir

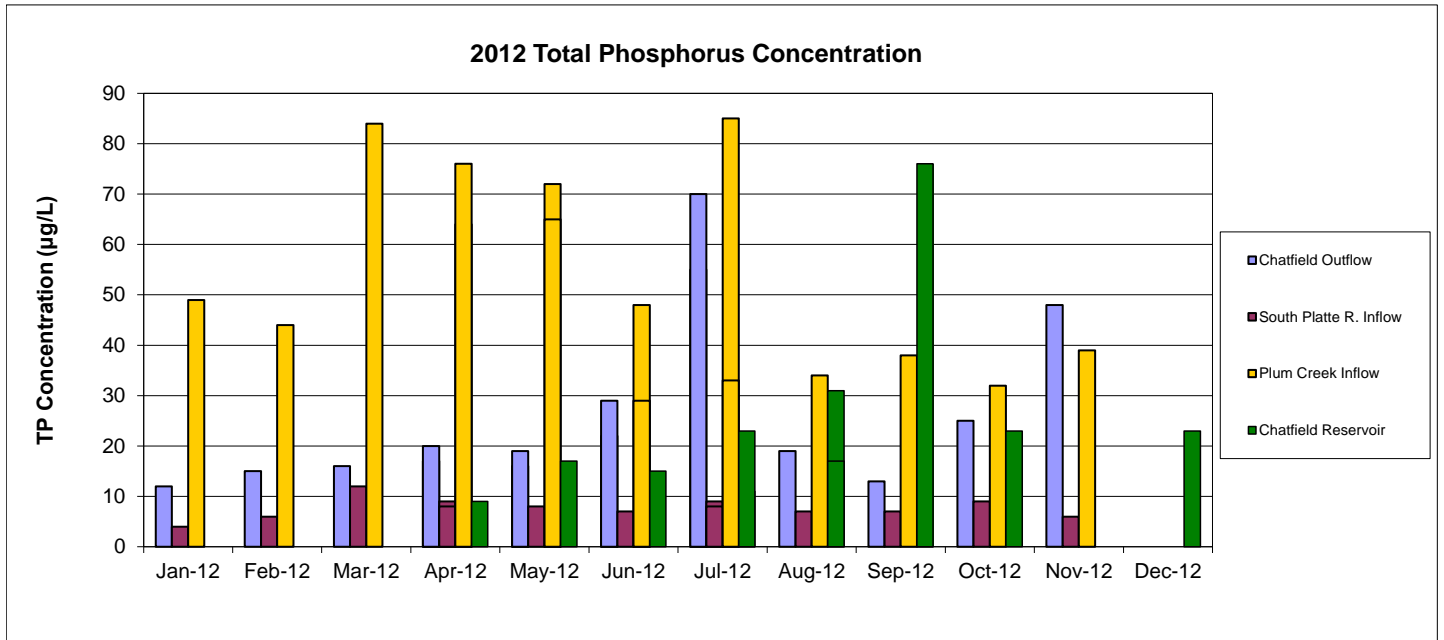


Figure 9: 2012 Comparison of Monthly TP Concentrations

Monitoring Program

The Authority maintains a monitoring program to characterize reservoir water quality and determine regulatory compliance. Surface water samples are collected at four locations as depicted in Figure 10.

- South Platte River at Waterton Road,
- Plum Creek at Titan Road,
- South Platte River below Chatfield, and
- Chatfield Reservoir.

The constituents (Table 1) are monitored monthly, plus twice monthly reservoir sampling during the July through September growing season. To better understand reservoir dynamics, the Authority continues water column measurements, including the epilimnion, depth intervals at every 3 meters, and hypolimnion. All water quality data is available on the Authority's website, located at www.chatfieldwatershedauthority.org.



Figure 10: Chatfield Watershed Authority Conducts Monitoring at Four Sampling Locations to Determine Regulatory Compliance

Table 1: Chatfield Reservoir Water Quality Monitoring Parameters

Field Parameters	Nutrients	Biological	Wet Chemistry
Temperature, degrees C*	Chlorophyll-a, µg/L	e. Coli (number/mL)	Alkalinity, mg/L
pH (s.u.)	Total Phosphorus, mg/L		Total Suspended Solids, mg/L
Specific Conductance, µS/cm	Ortho Phosphorus, mg/L		
Dissolved Oxygen, mg/L*	Nitrite + Nitrate-nitrogen, mg/L		
Secchi Depth, meters	Ammonia Nitrogen, mg/L		
Instantaneous Flow (Rivers and Creeks), cfs	Total Nitrogen, mg/L		
	Phytoplankton (# of organisms/ml)		

* Chatfield Reservoir measurements include depth profile measurements in addition to epilimnion.

In 2012, the Authority also conducted additional monitoring at nine sites in the Plum Creek watershed with financial assistance from the CWCB Healthy Rivers Fund Grant (Figure 11).

The objective of the one-year monitoring program was to better characterize water quality in Plum Creek and identify potential NPS pollutant sources and control strategies. Key findings from the monitoring program included:

- High correlation between stream sediment (measured as total suspended solids (TSS) and TP (Figure 12) were measured, demonstrating that streambank stabilization will improve ecological integrity and improve water quality through nutrient and sediment reductions.

- Elevated e. coli counts measured near Sedalia (Figure 13), where numerous aged septic systems (on-site wastewater systems, OWS) are located in a concentrated area along Plum Creek, indicates conversion of OWS to conventional treatment provided by existing wastewater treatment facilities along the US 85 corridor would improve water quality and public health.



Figure 11: Plum Creek Monitoring Characterizes Water Quality. Funded through a Healthy Rivers Fund Grant from the CWCB.

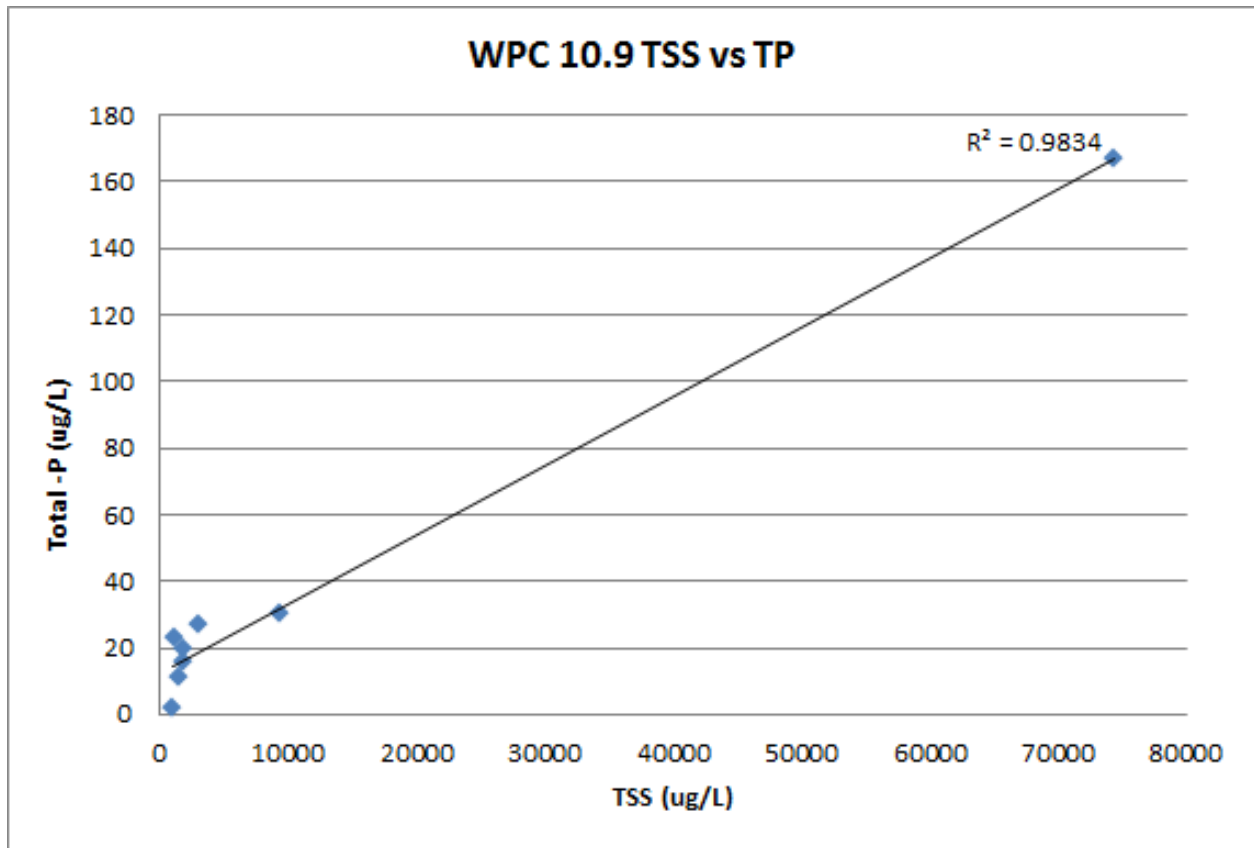


Figure 12: High Correlation Between TSS and TP on West Plum Creek ($R^2 = 0.98$) Suggest Opportunities to Stabilize Eroded Streambank to Reduce Sediment and Phosphorus Loading in Plum Creek Basin.

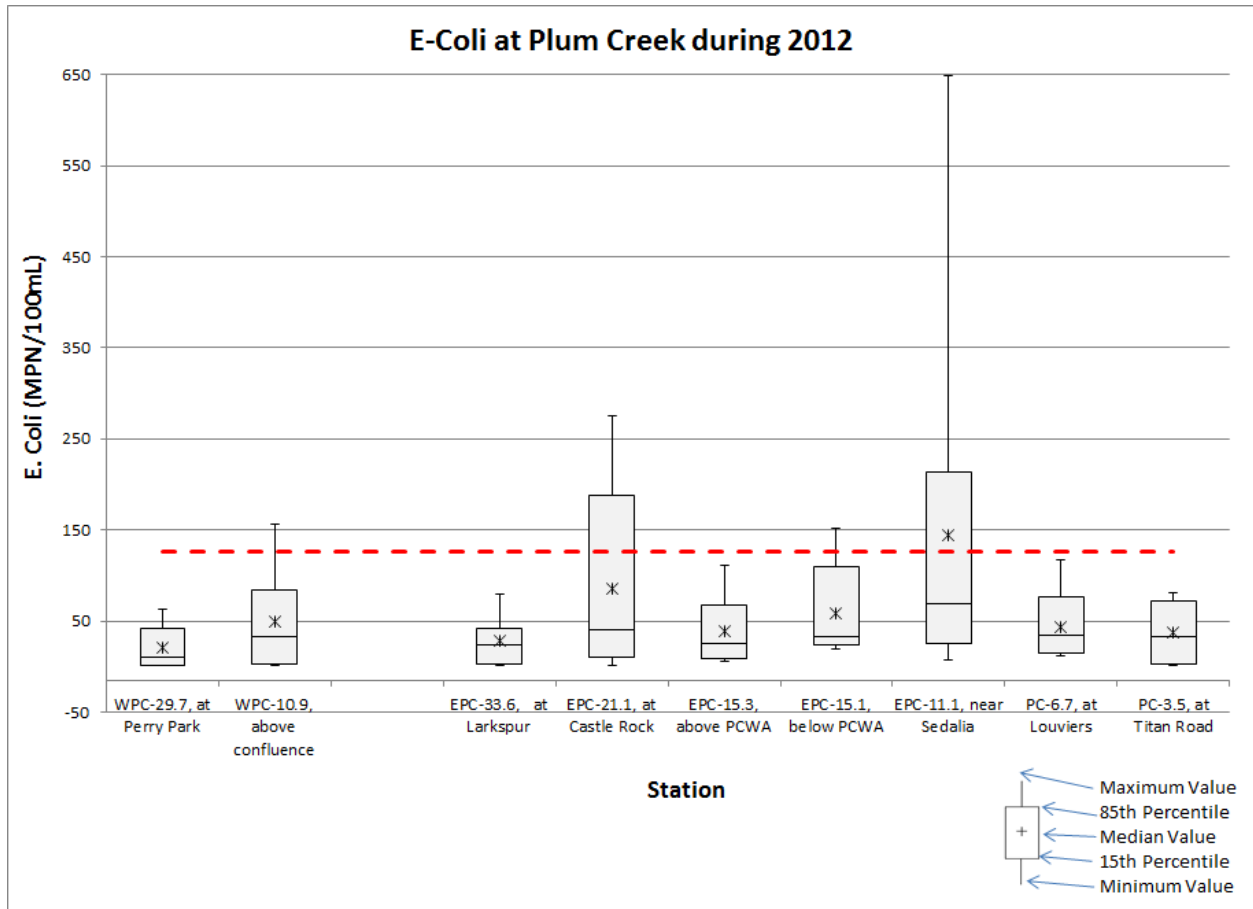


Figure 13: Increased number of E. Coli Bacteria Suggest Potential NPS from OWS's Adjacent to Plum Creek near Sedalia, CO (E. Coli Standard = 126 colony forming units/ml)

Wastewater Treatment Plants

Table 2 summarizes the twelve wastewater treatment plants (WWTPs) in the Chatfield watershed, nine which are located and discharge to the Plum Creek sub-watershed.

In 2012, reported TP discharges from WWTPs were 2,166 pounds or about 29% of the allowable total discharge allocation.



Compliance with Permits

WWTPs monitor their effluent discharges for compliance with their individual permits and compliance with Regulation #73. Every discharger in the Chatfield Watershed with a TP allocation fully complied with their TP concentration limits and TP wasteload allocation in 2012.

The Authority remains concerned with Bell Mountain Ranch Metropolitan District, located south of Castle Rock, which treats Denver basin aquifer groundwater from the Arapahoe formation for drinking water supply purposes and discharges backwash from the water treatment plant into a tributary to East Plum Creek. The discharge amount permitted is 28,000 gallons per day but there is presently no phosphorus allocation for the discharge which is elevated in phosphorus. Bell Mountain does not have a wasteload allocation or phosphorus credits, however it has been advised by the Water Quality Control Division and the Authority to secure a wasteload allocation through the Trading Program or modify water treatment processes to eliminate TP in the discharge. To date, no phosphorus allocation has been secured.

Table 2: Phosphorus Loading from Wastewater Treatment Plants in the Chatfield Watershed

Allocation Sources	TP Wasteload Allocation (pounds)	2012 TP Loading from WWTPs (pounds)
Plum Creek Wastewater Authority	4,256	2,049.1
Perry Park Water and Sanitation District: Waucondah	365	68.6
Perry Park Water and Sanitation District: Sageport	73	25.3
Lockheed Martin Space Systems Company	1,005	10.3
Town of Larkspur	231	5.6
Centennial Law Enforcement Foundation	30 ⁵	6.1
Centennial Water and Sanitation District	20	0
Ponderosa Center	75 ³	0.1
Louviers Water and Sanitation District	122	0
Roxborough Water and Sanitation District	1,218	No discharge ¹
Jackson Creek Metropolitan District	50 ⁴	No discharge ¹
Sacred Heart Retreat	15 ²	0.6
South Santa Fe Metro District	21 ⁶	No discharge ¹
Reserve Emergency Pool	52	Not used
Total Phosphorus Wasteload	7,533	2,165.7

Notes:

1. No discharge of wastewater effluent in the Chatfield watershed.
2. Temporary five-year phosphorus allocation of 15 pounds for inclusion in discharge permit; allocation obtained from Roxborough Water and Sanitation District.
3. Ponderosa Center water quality credits are subject to completing a trade project pursuant to the Authority Trading Program.
4. Jackson Creek Metropolitan District received point source allocations through trades pursuant to the Authority Trading Program. Jackson Creek has a transfer agreement of 50 pounds with Roxborough Water and Sanitation District.
5. Centennial Law Enforcement Foundation water quality credits awarded pursuant to Authority's Trading Program.
6. South Santa Fe Metropolitan District received a point source allocation of 21 pounds through trade pursuant to the Authority Trading Program.



Photograph by Thad Roan

Chatfield Reservoir at Sunrise

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. Figure 13 on page 18 shows the MS4 permit coverage areas in the Chatfield Watershed. Phase I and II MS4s in the Chatfield Basin includes:

- Town of Castle Rock
- City of Littleton
- Castle Pines Metropolitan District
- Colorado Department of Transportation

- Douglas County
- Jefferson County

Table 3 on the following page summarizes information about the 2012 Phase II MS4 activities in the Chatfield watershed.

MS4 permits are based on requirements to develop programs that meet six minimum control measures, and many of these programs involve the implementation of best management practices in order to reduce pollutants discharged to the maximum extent practicable. The six minimum control measures Phase II MS4s are required to meet include:

- 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

“Our challenge and focus for the next decade will be on reducing NPS pollutants in the Plum Creek Basin and generating additional funds to implement important nonpoint source projects in the Watershed.

Through collaboration and partnerships, the Authority will continue to protect the water resource that we all enjoy.”

~ Larry Moore, co-chair of the Chatfield Watershed Authority



Table 3: 2012 MS4 Education and Outreach Programs in the Watershed

Land Use Agency	Permit Inspection Actions			Permit Enforcement Actions		
	Illicit Discharges	Construction	Post Construction	Illicit Discharges	Construction	Post Construction
Douglas County	26	1001	41	2	287 violation 6 Stop Work	0
Jefferson County	2	73	0	2	0	0
Town of Castle Rock	219	2884	227	6	585	2
Castle Pines Metropolitan District	*	*	*	*	*	*
City of Littleton	0	0	3	0	0	0

* Castle Pines Metro District inspection and enforcement action data incorporated in Douglas County reporting.

The following highlights 2012 MS4 Education & Outreach Programs in the Watershed:

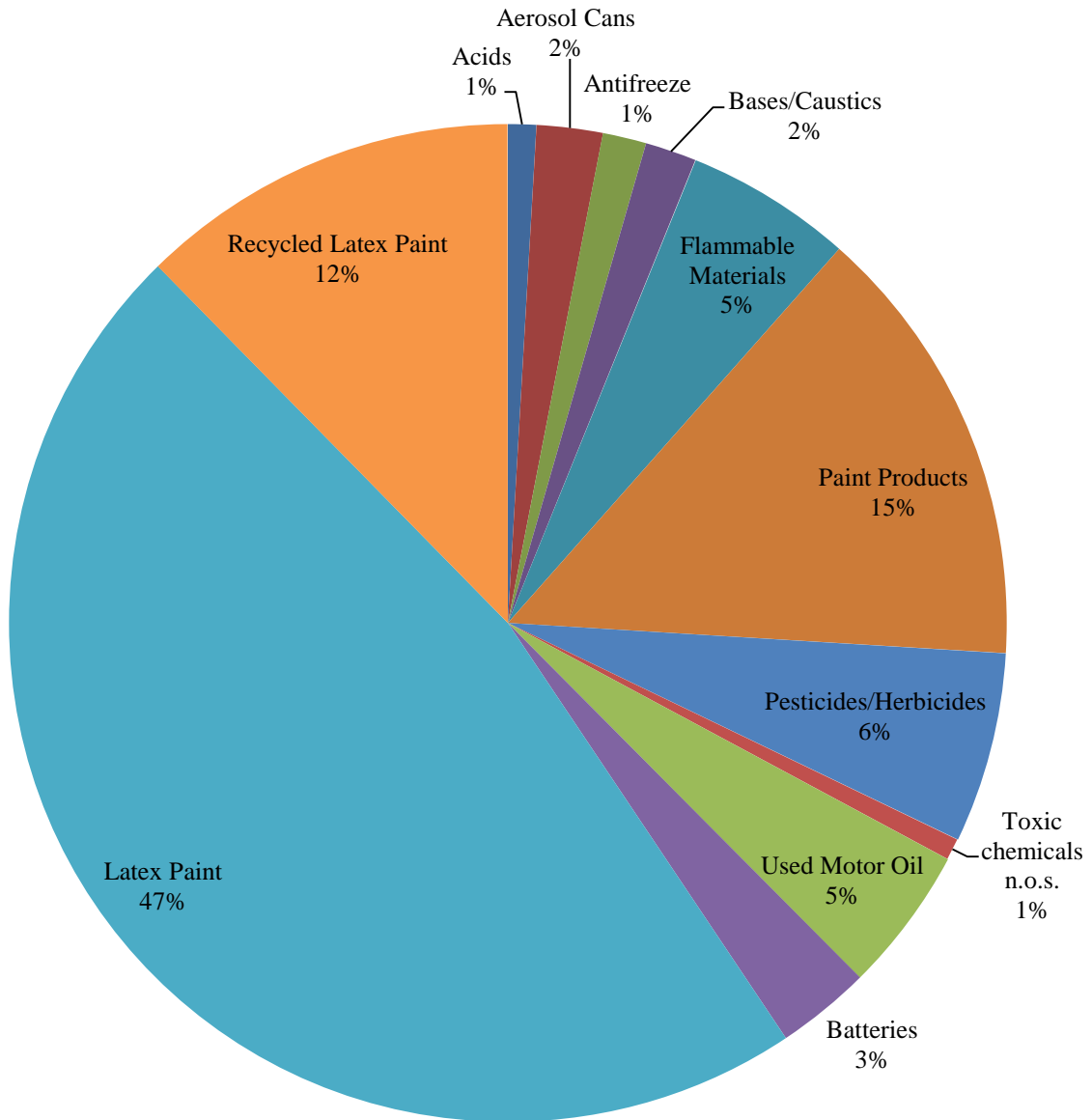
Douglas County

- Douglas County Household Chemical Roundup
- Spring Up the Creek in conjunction with Castle Rock



2012 Douglas County Household Chemical Roundup a SUCCESS

283,000 lbs of Chemicals Safely Disposed



Jefferson County

- Interactive booths at public events
- Stormwater article in County's e-newsletter
- Household chemical waste drop off

Town of Castle Rock

- 108 residential awareness advertisements (12 ads in 9 publications) were distributed in local newspapers in 2012 through CLEAR (Cooperative for Local Environmental Awareness and Responsibility).
- Spring Up the Creek – “It Takes a Team to Clean a Stream”.
 - 142 volunteers participated
 - In only two hours, **53 bags** of trash, **26 bags** of recyclable materials and various pieces of debris were removed from East Plum Creek and Sellars Gulch.
- Hosted the annual Douglas County Household Chemical Roundup at the Town's Utilities Department.





Castle Pines Metropolitan District

- Partner at Spring Up the Creek Clean Up
- Chemical Round up with Castle Rock and Douglas County

City of Littleton

- Information booth with giveaway items at Western Welcome Week Festival Day in downtown Littleton,
- World Water Monitoring Day at Littleton Englewood Wastewater Treatment Plant
- 4 Littleton Report (city published) newspaper articles
- 12 (monthly) Littleton Independent and Douglas County News newspaper adds on water pollution prevention
- Household Hazardous Waste, Lawn and Garden brochures
- CWCB Flood brochure
- City of Littleton and SPLASH web pages

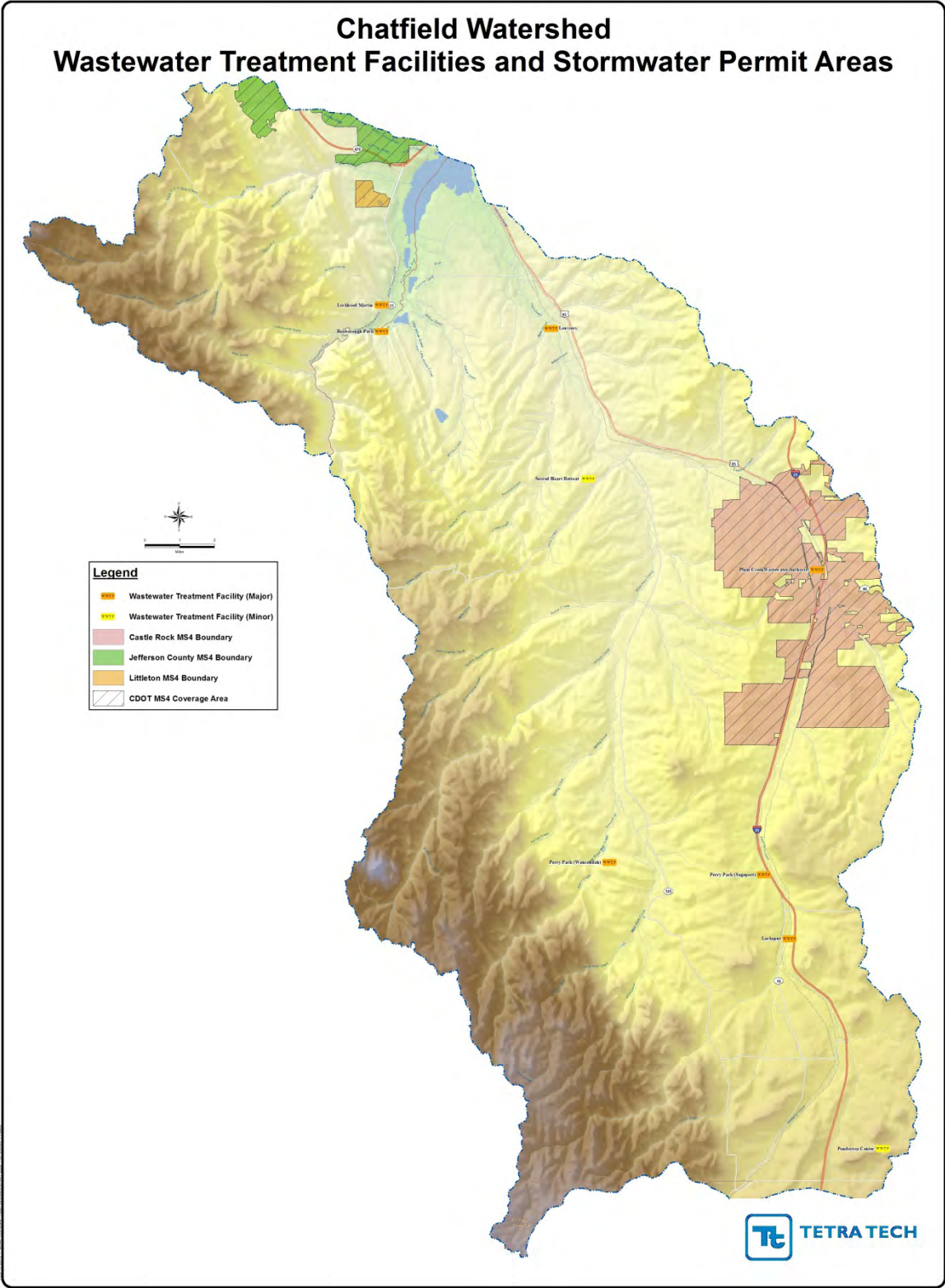


Figure 13: Chatfield Watershed MS4 Stormwater Permit Areas

Improving Water Quality

Chatfield values its members, many of whom have supported the Chatfield Watershed Assembly for 25+ years. In 2012, the Authority reached out to new grant partners and received grants in 2012 to leverage our funding from annual membership dues totaling \$170,000. Here are some of our grant and coordination efforts we are proceeding with to promote water quality in the Chatfield Reservoir and Watershed.

Chatfield Watershed Plan - Section 319 Grant

The Authority is proud to kick-off our watershed planning efforts. The Watershed Plan will be completed in early 2014. Two key components of the watershed planning effort are:

- Stakeholder involvement, fostered through public meetings that will be conducted to educate the public on watershed information, partnerships, and watershed priorities, and
- Addressing water quality issues in the watershed to meet water quality standards and targets.

The watershed plan will be developed in accordance with US EPA's "Nine Elements of a Watershed Plan" that incorporates the following:

- Building partnerships
- Characterizing the watershed
- Identifying projects
- Developing an implementation program

“Looking ahead, our primary focus is to protect the water quality in the Chatfield Reservoir through on-going planning and implementation of water quality projects.”

~Larry Moore, co-chair of the Chatfield Watershed Authority

Agricultural BMPs and Land Conservation Practices at Colorado Agricultural Leadership Foundation (CALF) at Lowell Ranch

In collaboration with one of our new associate members, CALF, NRCS has awarded this agricultural organization funding and technical support to implement a variety of agricultural BMPs at Lowell Ranch. The project objectives are:

- Improve water quality and land conservation by implementing rotational grazing.
- Implementing manure management practices.
- Stabilizing streambed and bank conditions along East Plum Creek.



The Authority is working with CALF, Ducks Unlimited and Douglas County to build on this project to incentivize water quality trading credit markets and nutrient reductions on agricultural lands in the Chatfield Watershed.

Plum Creek Water Quality Monitoring and Source Identification – Healthy Rivers Grant

The Authority was awarded this grant from the CWCB. Grant funds were utilized to characterize and identify pollutant sources in the Plum Creek Basin in Chatfield Watershed. Objectives of this water quality monitoring project include understanding pollutant sources, developing control strategies to reduce pollutant loading to Chatfield Reservoir, and promoting decision-making on where to focus limited resources on future priority NPS project in the Plum Creek basin.

This monitoring program has been enthusiastically received by Authority members and watershed volunteers. Based on interest, we anticipate this monitoring program in the Plum Creek basin will continue.

Chatfield Reallocation

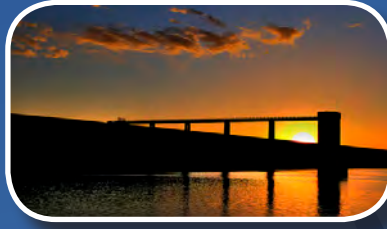
The Chatfield Watershed Authority has continued coordination with the US Army Corps of Engineers on the Chatfield Reallocation Environmental Impact Study, particularly as it relates to water quality issues raised by US EPA, data to support modeling refinements, and the

development and implementation of measures for adaptive management responses to water quality changes. The Authority's water quality data was used for modeling potential water quality impacts associated with the Chatfield Reallocation. Modeling suggests that the potential impacts from the Chatfield Reallocation are generally short term, especially nutrient impacts which could be mitigated by the Chatfield Reallocation's proposal to clear vegetation along the shoreline prior to inundation. Should water quality impacts occur, they will be addressed by the Chatfield Reallocation through its adaptive management plan.

The Chatfield Watershed Authority is well suited to work with the Chatfield Reallocation on water quality mitigation and continues to coordinate on such matters. Our ongoing monitoring program provides not only a short term, but also a long term perspective on water quality changes in Chatfield Reservoir, if any occur.

As many of our members are water providers, we recognize the need for water storage, especially for junior water right holders, so they will have water reserves during the lean years. And given hydrologic variability and drought conditions, all municipal and agricultural water suppliers need storage so they are not just relying on limited annual rainfalls in our region.

List of Chatfield Watershed Priority Projects



Develop Chatfield Watershed Plan

- CDPHE Watershed Plan Grant Awarded!
- Build partnerships
- Characterize watershed
- Identify NPS projects and estimate costs
- Develop an implementation program

Implement Agricultural BMPs at Lowell Ranch

- NRCS Assistance and Grant Award
- Implement land conservation measures
- Demonstrate agricultural BMPs and manure management practices
- Stabilize East Plum Creek to increase riparian area and reduce sediment and nutrient loads
- Education and outreach of watershed improvements at Lowell Ranch

Incentivize Phosphorus Trading Program in Conjunction with Ducks Unlimited and Agriculture Community

- In coordination with CALF and other agricultural landowners, implement through demonstration a variety of nutrient reduction practices
- Quantify nutrient reductions
- Market phosphorus credits to others in the watershed

North Massey Draw Stream Restoration at the Equestrian Center

- CWCB Watershed Restoration Grant Awarded!
- Design and constructed stream stabilization measures to reduce sediment and nutrient loading from horse stables
- Conduct monitoring to quantify NPS improvement

Plum Creek Monitoring and Source Characterization

- CWCB Healthy Rivers Fund Grant Awarded!
- Implementing monitoring and analyzing data
- Identify sources and projects to control NPS loading

West Plum Creek Ecosystem Improvements

- National Fish and Wildlife Foundation Grant Pursuit in partnership with CO Parks and Wildlife, Douglas County, CDPHE, CWCB and Chatfield Watershed Authority
- Restore fish habitat and stream to promote watershed health

Implement Shoreline Erosion Control Management Strategies at Chatfield Reservoir

- Identify funding source(s)
- Stabilize disturbed access areas along shoreline; demonstrate innovative erosion control products



We Protect The Water You Enjoy

Authority Members:

Patrick O'Connell, Jefferson County
Jim Dederick, Douglas County
Bob Deeds, City of Littleton
David Van Dellen, Town of Castle Rock
Kevin Urie, Denver Water
Matt Krimmer, Town of Larkspur
Larry Moore, Roxborough Water & Sanitation District
Diana Miller, Louviers Water & Sanitation District
Martha Hahn, Plum Creek Wastewater Authority
Father Ed Kinerk, Sacred Heart Retreat
Paul Dannels, Castle Pines Metro District
Tim Grotheer, Centennial Water & Sanitation District
Diana Miller, Perry Park Water & Sanitation District
Ronda Sandquist, Jackson Creek Metropolitan District
Doug Lohrey, Ponderosa Retreat & Conference Center
RC Hanisch, South Santa Fe Metro District
Harold Smethills, Dominion Water & Sanitation District
Steve Miller, Centennial Law Enforcement Facility
Chris Pacetti, Ken Caryl Ranch Master Association
Sean Lieske, Aurora Water
Rick McCloud, Chatfield Reallocation Water Users

Technical Review Committee Members:

David Van Dellen, Town of Castle Rock
Fred Bromberger, City of Littleton
Andy Hough, Douglas County
Authority Board Members

Associate Members:

Warren Brown and Hope Dalton,
Tri-County Health Department
Tammy Allen and Joni Nuttle, Colorado Water Quality
Control Division
Jay Skinner, Paul Winkle, and Jamie Anthony, Ken Brink,
Colorado Parks and Wildlife
Chris Sturm, Colorado Water Conservation Board
Timothy Rose, United States Army Corps of Engineers
Carol Ekarius, Coalition for the Upper South Platte
Jeff Shoemaker, Greenway Foundation
Greg Kernohan, Ducks Unlimited
Brooke Fox, Colorado Agricultural Leadership Foundation
Derick Clemons, NRCS

Management:

Tetra Tech, Inc.
Julie Vlier, Manager

Website:

Hughes and Stuart Sustainable Marketing