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SITES WPC6, BC2B, BC2, BC2A, WPC4, JC2, JC1.

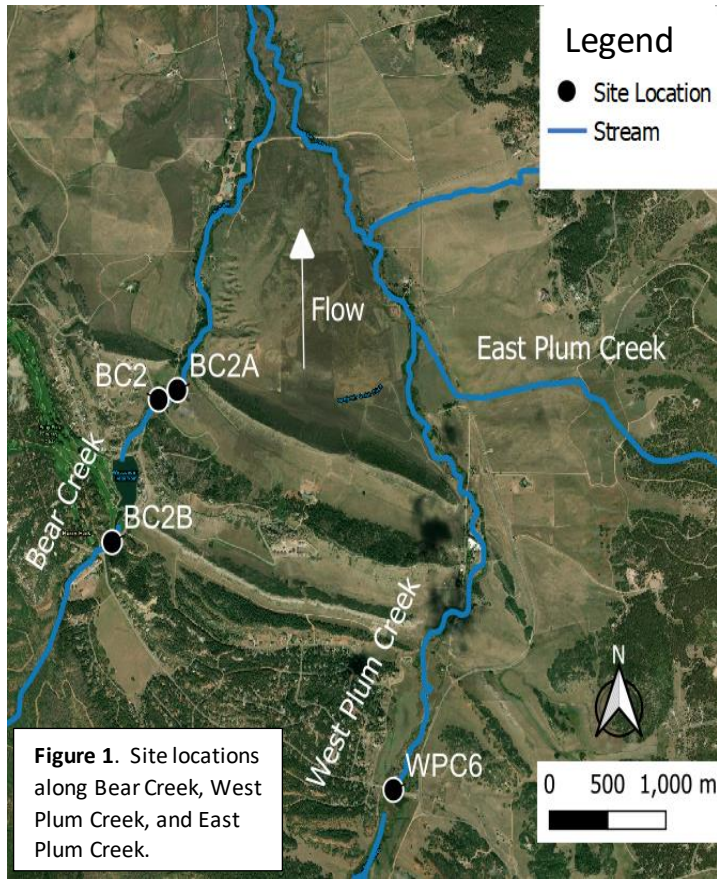


Figure 1. Site locations along Bear Creek, West Plum Creek, and East Plum Creek.



Figure 2. Site locations along Jackson Creek and West Plum Creek.

KEY FINDINGS

- Culvert at WPC6 remained in a stable condition with no washout anticipated, however Iron levels exceeded secondary drinking water standards and alkalinity was higher than previous years.
- Waucondah Wastewater Treatment Plant discharges high amounts of phosphorus and nitrate into Bear Creek.
- Arsenic levels were all below detection limits for each site. Coliform levels varied, with concern at all measured sites (>200 cfu / 100 mL).
- Erosion at JC1 remained minimal.

RECOMMENDATIONS

- Investigation of the source of iron and cause of alkalinity at WPC6
- Discussion with Waucondah Wastewater Treatment Plant about dangerous levels of phosphorus and nitrogen discharging into Bear Creek
 - Additional communication with residents of the area whose drinking water is impacted
- Safe removal of beaver dam at JC2
- USGS flow calculations at JC1: once during peak flow, once during minimum flow, and 2-3 times during average flow.
- Potentially treat for high coliform and *E. coli* loadings from West Plum Creek before WPC-EPC confluence

Table 1. SITE DESCRIPTIONS AND WATER ANALYSIS CHARACTERISTICS.

Site	Description and Coordinates	pH	EC (µS/cm)	Alkalinity (mg CaCO ₃ /L)	TSS (mg/L)	Total Coliform (MPN)
WPC6	Culvert on Red Rocks Rd., some red coloration in runoff into West Plum Creek on east bank - N 39°14'27.5", W 104°57'32.1"	7.15	143	217	3.00	2027
BC2B	Before golf course on Perry Park Blvd. - N 39°15'23.6", W 104°59'12.5"	6.88	200	---	---	---
BC2	After golf course, before WWTP - N 39°15'56.0", W 104°58'55.9"	7.18	455	93.2	3.00	547
BC2A	After WWTP - N 39°15'58.4", W 104°58'49.3"	9.39	788	134	12.3	1036
WPC4	First underpass on Jackson Creek Rd. - N 39°20'51.3", W 104°58'16.1"	7.94	437	91.0	24.0	771
JC2	Second underpass on Jackson Creek Rd., large beaver dam encroaching on culvert, flooding surrounding ranchland - N 39°20'44.4", W 104°58'51.7"	7.44	146	44.8	---	3175
JC1	Confluence of Jackson Creek and West Plum Creek, surrounding ranchland - N 39°19'33.3", W 104°56'16.3"	8.06	367	86.4	12.3	384

Table 2. Metals, anions, organics, and pathogens analysis in water

Standards	Metal Concentrations (mg/L)							Anion Concentrations (mg/L)			Organic Concentrations (mg/L)		Pathogen Concentrations (cfu/100 mL)	
	Al	As	Cu	Fe	P	Se	Zn	F ⁻	Cl ⁻	NO ₃ ⁻	COD	DOC	Total Coliform	<i>E. coli</i>
EPA Aquatic Life Chronic [1]	N/A	0.15	N/A	1.0	N/A	N/A	0.12	N/A	230	N/A	N/A	N/A	N/A	N/A
EPA Aquatic Life Acute [1]	N/A	0.34	N/A	N/A	N/A	N/A	0.12	N/A	860	N/A	N/A	N/A	N/A	N/A
EPA Human Recreation and Fishing [2]	N/A	1.80E-05	1.3	N/A	N/A	0.17	7.4	N/A	N/A	10***	N/A	N/A	N/A	N/A
EPA Drinking Water [3]	N/A	0.01	1.3	0.015	N/A	0.05	N/A	4	N/A	11***	N/A	N/A	N/A	N/A
EPA Secondary Drinking Water [4]	0.05	N/A	1	0.3	N/A	N/A	5	2.00	250	N/A	N/A	N/A	N/A	N/A
CDPHE Chronic [5]	N/A	0.00002*	0.0062	WS	0.11	0.0046	0.0082	N/A	250	N/A	N/A	N/A	200	126
CDPHE Acute [5]	N/A	0.34	0.009	N/A	N/A	0.0184	0.110	N/A	N/A	10	N/A	N/A	200	N/A
USDA Livestock [6]	5	0.01	0.5	0.3	N/A	0.05	25	2	1500	100***	N/A	N/A	200	N/A
Detection Limit	0.0042	0.0168	0.0005	0.0003	0.029	0.0110	0.0003	0.1	0.1	0.1	3.0	0.10	1	1
Site ID														
WPC4	0.03	BDL	BDL	0.26	BDL	BDL	0.0084	1.63	21.3	0.04	3.15	2.81	771	<10
WPC6	0.13	BDL	0.0012	3.78	0.07	BDL	0.0135	1.71	7.47	0.03	6.42	4.77	2030	464
BC2	0.09	BDL	BDL	0.33	BDL	BDL	0.0089	2.35	29.3	0.1	7.41	3.81	574	<10
JC1	0.04	BDL	BDL	0.36	BDL	BDL	0.0084	1.6	18.4	0.01	4.93	2.85	384	80.5
JC2	0.06	BDL	0.0012	0.48	BDL	BDL	0.0073	1.45	4.88	0.02	7.36	3.19	3160	97
BC2A	1.06	BDL	0.0139	0.19	1.07	BDL	0.0262	1.35	64.7	69.1	16.6	7.90	1040	20
BC2B	NM	NM	NM	NM	NM	NM	NM	1.82	21.5	0.05	4.13	2.54	NM	NM

N/A – Standards Not Available

BDL – Below Detection Limit

NM – Not Measured

*- Total Recoverable Standards

***- Nitrate + Nitrite

(1) US EPA, O. National Recommended Water Quality Criteria - Aquatic Life Criteria Table. <https://www.epa.gov/wqc/national-recommended-water-quality-criteria-aquatic-life-criteria-table> (accessed 2022-05-23).
 (2) US EPA, O. National Recommended Water Quality Criteria - Human Health Criteria Table. <https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table> (accessed 2022-05-23).
 (3) US EPA, O. National Primary Drinking Water Regulations. <https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations> (accessed 2022-05-23).
 (4) US EPA, O. Secondary Drinking Water Standards: Guidance for Nuisance Chemicals. <https://www.epa.gov/sdwa/secondary-drinking-water-standards-guidance-nuisance-chemicals> (accessed 2022-05-23).
 (5) Water Quality Control Commission regulations | Department of Public Health & Environment. <https://cdphe.colorado.gov/water-quality-control-commission-regulations> (accessed 2022-05-23).