

DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
Quarterly Report

August 28, 2009

TO: Tonnie Cummings, Project Lead, Water Quality Program, SWRO

FROM: Stephanie Brock, Project Manager, Environmental Assessment Program

THROUGH: George Onwumere, Unit Supervisor, Environmental Assessment Program

SUBJECT: Burnt Bridge Creek Total Maximum Daily Load (TMDL),
Quarterly Progress Report #4

Project Code: 08-029-01-04

Introduction

Burnt Bridge Creek and its tributaries lie within Water Resource Inventory Area (WRIA) 28 in southwestern Washington. Burnt Bridge Creek flows from east to west through the City of Vancouver draining approximately 27.6 square miles. From its headwaters near NE 162nd Avenue, Burnt Bridge Creek flows 12.7 river miles to its confluence with Vancouver Lake near Interstate-5 (Figure 1). The study area includes 16 waterbody segments impaired by *fecal coliform* bacteria, dissolved oxygen, and temperature, as listed in the 2004 Clean Water Act Section 303(d) list. The 2008 303(d) list adds 12 segments impaired for *fecal coliform* bacteria, temperature, dissolved oxygen and pH. The impairments were identified based on sampling conducted by the City of Vancouver, Clark County, Ecology, and other entities. Field work for this study began in May 2008 to assess the current condition of the waterbodies and to identify and quantify factors contributing to the impairments.

This memorandum summarizes the progress for Quarter 2 (April - June) 2009 related to data collection and project communications. Data presented are provisional. Data quality has not been checked.

Progress to Date

Dissolved Oxygen, Temperature, Bacteria and Hydrogeology Data Collection

Field data collection began during the week of May 19, 2008 and ended in August 2009. Figure 2 shows fixed-network sites where routine sampling occurs. Table 1 lists the sampling sites. Table 2 lists the types of data collected at each site and the site status.

The routine monitoring for fecal coliform bacteria that began in June 2008 has continued through June 2009. Samples were collected from the Burnt Bridge Creek and its tributaries twice a month during April through June 2009 and analyzed for fecal coliform bacteria (Table 3).

During this quarter, samples collected at the following sites had concentrations greater than 200/100 mL on at least one occasion:

- BBC10.8
- BUR0.0
- BBC5.2
- COL0.0
- BBC10.4
- BBC8.0
- BBC4.3
- BBC1.6
- PET0.0
- BBC7.0
- BBC3.4
- BBC0.0
- BBC8.4
- BBC5.9
- BBC2.6

The instream piezometers and thermistors continued to log through the 2nd quarter of 2009. Dissolved oxygen samples were collected at most sites during each bacteria sampling run. Additionally, instantaneous dissolved oxygen, temperature and pH were measured at each site during site visits.

During the next quarter (3rd quarter 2009) the following activities are expected to commence for the study:

- Bi-monthly samples and flow measurements will be taken at all sites through August 2009
- Weather forecasts will be monitored in order to sample during storm events
- Temperature data will be downloaded from instruments at all sites
- Water levels will be measured and compared between the instream piezometers and stream surface
- All instream piezometers and temperature monitoring equipment will be removed from the watershed in September 2009.

Provisional Results

Table 3 provides provisional data compared to water quality criteria for each site for bacteria. Data collected to this point, indicate that all sites, except PET1.3, violate one or both parts of the water quality criteria for fecal coliform bacteria.

Communication and Coordination

- In April 2009, the City of Vancouver identified an illicit connection from VFO to the storm system. They worked with building owners and tenants to correct the problem.
- In July 2009, the City of Vancouver found a cross-connection into the stormwater system that discharges to Burton Channel and worked with the property owner to resolve the issue.

Project Schedule and Upcoming Tasks

Stormwater sampling remains a goal of the study. Ecology will attempt to capture the following two stormwater sampling events prior to completion of the study: 1) bacteria and streamflow data collected twice during one storm event and 2) a dry season storm sampled once for parameters such as nutrients, bacteria, total organic carbon, dissolved organic carbon, total suspended solids, and streamflow.

Routine bacteria and streamflow sampling ended in August 2009. Prior to August 2009, piezometer/surfacewater gradients were measured on occasion and instream thermistors were redeployed as needed. Monitoring for all parameters will be discontinued and all equipment will be removed from the creek in September 2009.

Attachment(s):

Table 1. Burnt Bridge Creek TMDL fixed network sampling locations.

Table 2. Sampling locations, routine data type collection and, status of continuous, temperature logging.

Table 3. Burnt Bridge Creek Watershed provisional fecal coliform bacteria results.

Figure 1. Burnt Bridge Creek study area with 303(d) listed waterbody segments.

Figure 2. Burnt Bridge Creek TMDL fixed network sampling locations.

cc: James Kardouni, Field Lead, Environmental Assessment Program
Kim McKee, Unit Supervisor, Water Quality Program, SWRO
Garin Schrieve, Section Manager, Water Quality Program, SWRO
Kirk Sinclair, Hydrogeologist, Environmental Assessment Program
Carol Norsen, Environmental Assessment Program

Tables

Table 1. Burnt Bridge Creek TMDL fixed network sampling locations.

Site ID	Description	NAD 83	
		Latitude	Longitude
BBC0.0	Burnt Bridge Ck downstream of Fruit Valley Rd	45.67520	-122.69253
BBC1.6	Burnt Bridge Ck at 2nd Ave near Alki Rd	45.66137	-122.66934
COL0.0	Cold Creek at Hazel Dell Ave BBC RM 1.6	45.66174	-122.66827
BBC2.6	Burnt Bridge Ck at Leverich Park	45.65339	-122.66180
BBC3.4	Burnt Bridge Ck near SR 500 at 41st Cr	45.65250	-122.65034
BBC4.3	Burnt Bridge Ck upstream of Saint Johns Blvd	45.64745	-122.63946
BBC5.2	Burnt Bridge Ck at Rossiter Ln	45.64112	-122.63094
BBC5.9	Burnt Bridge Ck at NE 18th St	45.63469	-122.62405
BBC7.0	Burnt Bridge Ck at NE 65th Ave	45.63456	-122.60497
BBC8.0	Burnt Bridge Ck NE 86th Ave, dwn/strm of Burton Ch.	45.63523	-122.58489
BUR0.0	Burton Channel at BBC RM 8.3 19th Cr & 92nd Ave	45.63672	-122.58121
BBC8.4	Burnt Bridge Ck at NE Burton Rd, blw Peterson Ditch	45.63802	-122.58246
PET0.0	Peterson Ditch confluence at 93rd Ave, BBC RM 8.8	45.64501	-122.57767
PET1.3	Peterson Ditch at 102nd Ave (SEH outfall 001)	45.65207	-122.55736
BBC8.8	Burnt Bridge Ck above Peterson Ditch at NE 93rd Ave	45.64468	-122.57837
BBC9.5	Burnt Bridge Ck at 98th, up/strm of Royal Oaks Dr	45.65148	-122.57191
BBC10.4	Burnt Bridge Ck at NE 110th Ave	45.65809	-122.55974
BBC10.8	Burnt Bridge Ck at NE 121st Ave	45.66031	-122.54881
BBC11.4	Burnt Bridge Ck at 131st Ave	45.66308	-122.53808

Table 2. Sampling locations, routine data type collection and, status of continuous temperature logging.

Site ID	Bact.	Stream Temp.	Air Temp.	RH	Piezo.	Streamflow Inst.	Cont.	Temp. Data Logging Status
BBC0.0	x	x	x	x		x		ending ¹
BBC1.6	x	x	x		x	x	x	on going
COL0.0	x	x	x			x		ending ¹
BBC2.6	x	x	x		x	x		on going
BBC3.4	x	x	x	x	x	x		on going
BBC4.3	x	x	x		x	x		on going
BBC5.2	x	x	x		x	x		on going
BBC5.9	x	x	x		x	x		on going
BBC7.0	x	x	x		x	x		on going
BBC8.0	x	x	x			x		ending ¹
BUR0.0	x	x	x	x		x		ending ¹
BBC8.4	x	x	x	x	x	x	x	on going
PET0.0	x	x	x			x		on going
PET1.3	x	x				x	x	on going
BBC8.8	x	x	x		x	x		on going
BBC9.5	x	x	x		x	x		on going
BBC10.4	x	x	x		x	x	x	on going
BBC10.8	x	x	x		x	x		on going
BBC11.4	x	x	x	x	x	x		on going

Bact.= *fecal coliform* bacteria, Temp.= temperature, RH= relative humidity, Piezo.= piezometer, Inst.= instantaneous, Cont.=continuous.

¹Continuous temperature data logging will resume May 2009 and end August 2009.

Table 3. Burnt Bridge Creek Watershed provisional fecal coliform bacteria results. Data have not been quality assured.

Station ID	4/6 to 4/7/2009	4/20 to 4/21/2009	5/4 to 5/5/2009	5/18 to 5/19/2009	6/1 to 6/2/2009	6/15 to 6/16/2009	6/28 to 6/29/2009	number of samples (n)	geometric mean	90th percentile	% samples exceed WQ Criterion
BBC11.4	31	7	150	64	170	57	36	29	34	271	7
BBC10.8	34	260	77	65	96	130	84	29	36	223	7
BBC10.4	27	43	31	39	150	440	100	29	66	375	21
BBC9.5	17	10	34	15	87	51	76	29	44	288	14
BBC8.8	4	17	43	41	89	110	160	29	43	261	7
PET1.3	1	1	12	4	6	6	2	29	6	50	7
PET0.0	80	100	570	230	400	370	330	29	231	777	62
BBC8.4	21	37	200	120	4700	660	340	29	117	638	21
BUR0.0	23	34	5800	92	300	190	700	29	204	1383	38
BBC8.0	88	200	1400	150	1800	550	220	29	116	631	24
BBC7.0	81	61	1200	1700	350	130	100	29	78	645	28
BBC5.9	25	22	890	730	37	300	100	29	88	572	24
BBC5.2	26	11	580	430	84	180	120	29	132	548	38
BBC4.3	16	28	660	430	250	180	71	29	131	649	31
BBC3.4	4	37	570	280	210	150	110	29	127	732	31
BBC2.6	4	35	760	390	280	140	88	29	143	1008	45
COL0.0	180	69	380	570	1500	1300	600	29	216	765	59
BBC1.6	10	44	740	450	280	230	140	29	150	940	45
BBC0.0	5	29	360	550		15	1	26	36	216	15

Gray shaded cells exceed 200 cfu/100 mL and yellow shaded cells exceed the WQ criteria

Figures

Burnt Bridge Creek TMDL Study Area

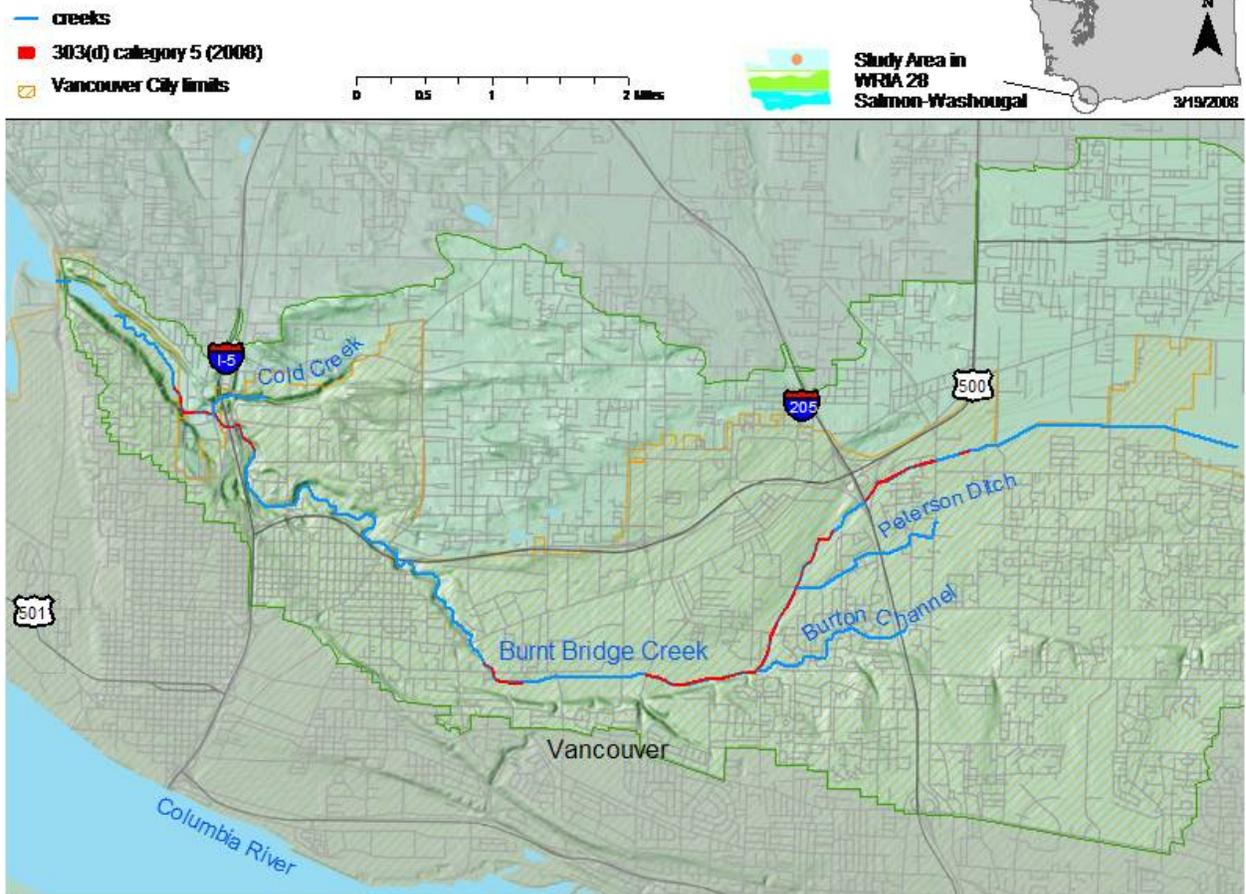


Figure 1. Burnt Bridge Creek study area with 303(d) listed waterbody segments.

Burnt Bridge Creek TMDL Proposed Fixed-Network Monitoring Sites

- Monitoring Sites
- Creeks
- ▭ Vancouver City limits

0 0.5 1 2 Miles

Study Area in
WRIA 28
Salmon-Washougal

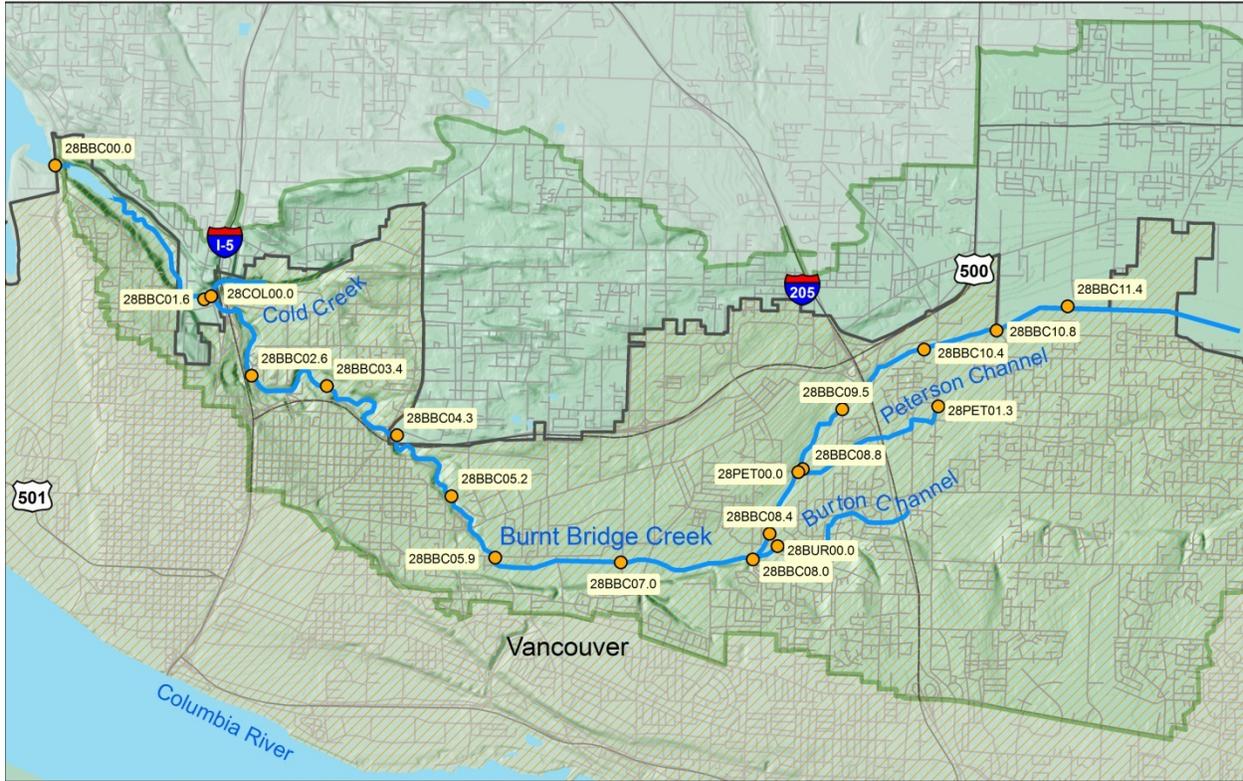


Figure 2. Burnt Bridge Creek TMDL fixed network sampling locations.