

DEPARTMENT OF ECOLOGY
ENVIRONMENTAL ASSESSMENT PROGRAM
Quarterly Report

December 8, 2009

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

THROUGH: George Onwumere, Unit Supervisor, Environmental Assessment Program

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SUBJECT: Burnt Bridge Creek Total Maximum Daily Load (TMDL),
Quarterly Progress Report #5

Project Code: 08-029-01-05

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 3 (July - October) 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 occurred. Table 1 lists the sampling sites. Table 2 lists the types of data collected at each site and the site status.

On October 14, 2009 all fixed monitoring sites and 5 accessible storm drains were sampled twice during a rain event. A total of 0.42-inches of rain fell on October 13th and 14th. In the morning all sites were sampled for bacteria, total organic carbon (TOC), dissolved organic carbon (DOC), total suspended solids (TSS), and nutrients (ammonia, nitrite-nitrate, total persulfate nitrogen, orthophosphate, and total phosphorus). In the afternoon, all sites (except two storm drains that were no longer flowing) were sampled for bacteria. Flows were measured at the mouths of each tributary and estimated with bucket flows at each storm drain. Table 3 provides a location description for each storm drain sampled.

The routine monitoring for fecal coliform bacteria that began in June 2008 continued through August 2009. Samples were collected from the Burnt Bridge Creek and its tributaries twice a month during July through August 2009 and analyzed for fecal coliform bacteria (Table 4). During this quarter, samples collected during routine sampling at the following sites had concentrations greater than 200/100 mL on at least one occasion:

- BBC10.4
- BBC9.5
- BBC8.8
- PET1.3
- PET0.0
- BBC8.4
- BUR0.0
- BBC8.0
- BBC7.0
- BBC5.2
- BBC4.3
- BBC3.4
- BBC2.6
- COL0.0
- BBC1.6

Fecal coliform bacteria data collected during the October 14, 2009 storm event is provided in Table 5. At this point, the nutrient data has not been compiled. During this storm event bacteria samples collected at the following sites had concentrations greater than 200/100 mL:

- BBC10.4 AM & PM
- BBC9.5 AM & PM
- BBC8.8 AM
- PET0.0 AM & PM
- BBC8.4 AM & PM
- BUR0.0 AM & PM
- BBC8.0 AM & PM
- BBC7.0 PM
- BBC5.9 PM
- BBC5.2 AM & PM
- BBC4.3 AM & PM
- BBC3.4 AM & PM
- BBC2.6 AM & PM
- COL0.0 AM & PM
- BBC1.6 AM & PM
- BBC0.0 AM
- OF#18031 AM
- OF#18027 AM & PM
- OF#17959 PM
- OF#06235 AM
- OF#06233 AM

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. All equipment; including instream piezometers, air and water thermistors, and staff gauges; were decommissioned and removed from the watershed on September 15 and 16, 2009.

Provisional Results

Table 4 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

- None this quarter.

Project Schedule and Upcoming Tasks

No further field work is scheduled. A TAG meeting will be scheduled to present preliminary results in spring 2010.

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. Outfall identification and location description for storm sampling on October 14, 2009.

Table 4. Burnt Bridge Creek Watershed provisional fecal coliform bacteria results.

Table 5. Provisional fecal coliform bacteria results from October 14, 2009 storm sampling event.

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

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

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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. Outfall identification and location description for storm sampling on October 14, 2009.

Outfall #	Location Description
18031	Storm drain located on right bank (north side) of BBC at NE 121st Ave
18027	Storm drain located on left bank (south side) of BBC at NE 121st Ave
17959	Storm ditch located across from Gifford Pinchot National Forest Headquarters office off of 51st Circle (ditch runs parallel to 110th)
06235	Storm drain located on right back of BBC at NE 18th Street site
06233	Storm drain located on left bank of BBC at NE 18th Street site

Table 4. Burnt Bridge Creek Watershed provisional fecal coliform bacteria results. Data have not been quality assured.

Station ID	7/13 to 7/14/2009	7/27 to 7/28/2009	8/10 to 8/11/2009	8/24 to 8/25/2009	10/14/2009 a.m. samples	10/14/2009 p.m. samples	number of samples (n)	geometric mean	90th percentile	% samples exceed WQ Criterion
BBC11.4	110	33	110	36	60	180	35	38	273	6
BBC10.8	82	31	27	59	54	100	35	39	207	6
BBC10.4	280	330	100	150	340	330	35	81	454	29
BBC9.5	230	80	140	80	230	330	35	55	345	20
BBC8.8	100	96	240	100	240	180	35	53	307	11
PET1.3	220		9	10	130	43	34	8	74	9
PET0.0	2400	270	320	440	700	1800	35	279	1030	69
BBC8.4	830	230	310	250	390	300	35	141	730	34
BUR0.0	1400	180	85	430	2900	1700	35	245	1705	43
BBC8.0	480	300	200	250	250	220	35	134	665	34
BBC7.0	130	280	160	360	200	240	35	92	680	31
BBC5.9	91	84	60	110	130	410	35	92	525	23
BBC5.2	88	120	37	540	560	470	35	141	585	40
BBC4.3	440	160	92	360	1500	480	35	155	765	37
BBC3.4	150	120	120	390	4400	1000	35	154	959	34
BBC2.6	180	290	550	800	1700	1200	35	183	1288	51
COL0.0	720	670	970	1100	3200	1300	35	287	1204	66
BBC1.6	220	300	340	300	1600	1100	35	183	1112	54
BBC0.0	59	11	11	22	360	80	32	37	213	16

Table 5. Provisional fecal coliform bacteria results from October 14, 2009 storm sampling event.
Data have not been quality assured.

Station ID	10/14/2009 morning samples	10/14/2009 afternoon samples
BBC11.4	60	180
BBC10.8	54	100
BBC10.4	340	330
BBC9.5	230	330
BBC8.8	240	180
PET1.3	130	43
PET0.0	700	1800
BBC8.4	390	300
BUR0.0	2900	1700
BBC8.0	250	220
BBC7.0	200	240
BBC5.9	130	410
BBC5.2	560	470
BBC4.3	1500	480
BBC3.4	4400	1000
BBC2.6	1700	1200
COL0.0	3200	1300
BBC1.6	1600	1100
BBC0.0	360	80
OF#18031	230	100
OF#18027	510	1200
OF#17959	85	480
OF#06235	4900	
OF#06233	31000	

Figures

Burnt Bridge Creek TMDL Study Area

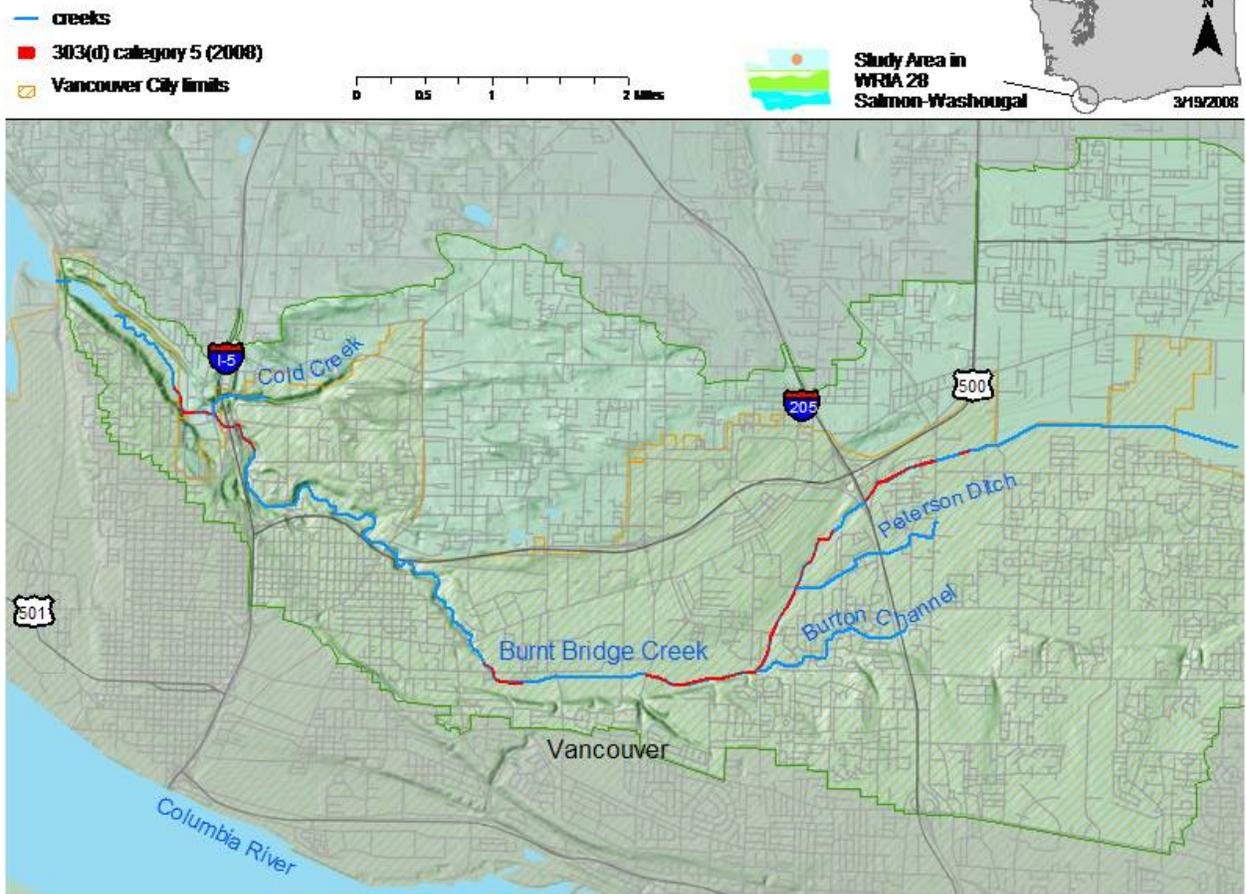


Figure 1. Burnt Bridge Creek study area with 303(d) listed waterbody segments.

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

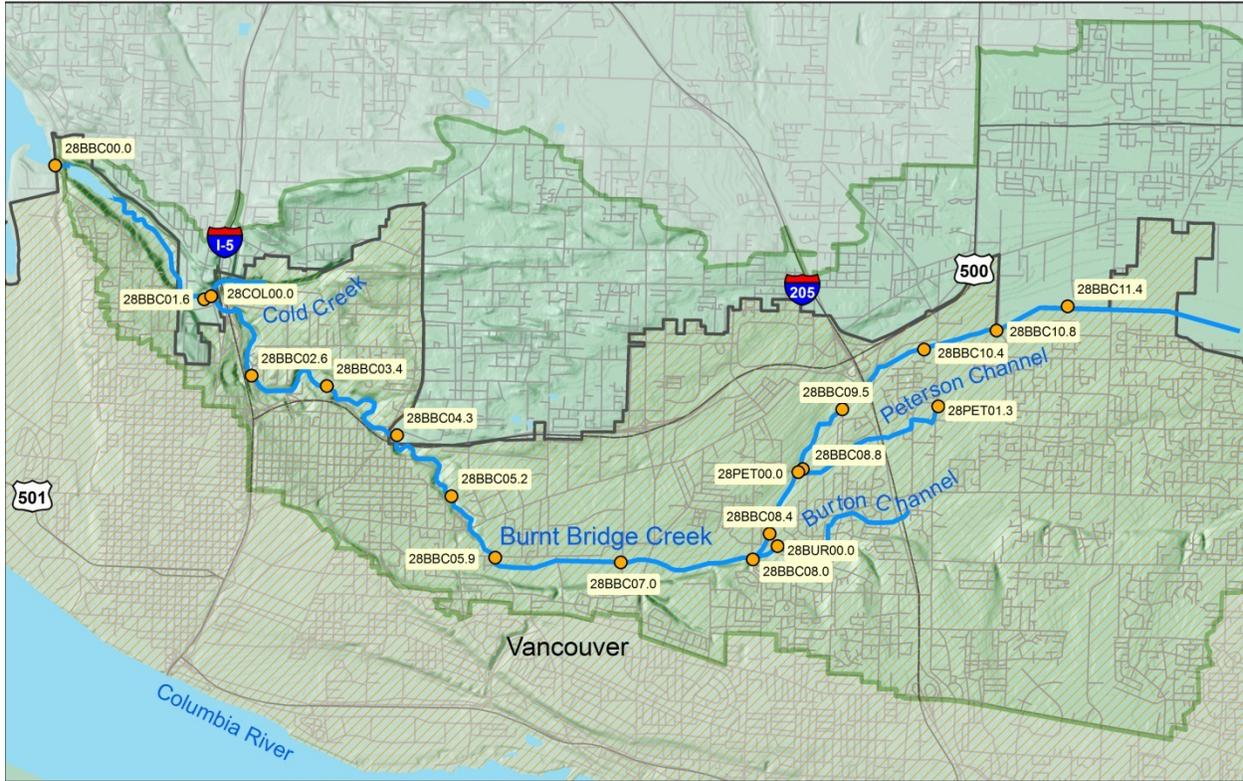


Figure 2. Burnt Bridge Creek TMDL fixed network sampling locations.