River and Stream Water Quality Monitoring Report

Water Year 2009

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Cover photo: Troy Warnick collecting a water sample from the Nisqually River (by Bill Ward).

River and Stream
Water Quality Monitoring Report

Water Year 2009

by
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Waterbody Number: Statewide

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Table of Contents

List of Figures

List of Tables

Abstract

The Washington State Department of Ecology (Ecology) collected monthly water quality data at 100 stream monitoring stations during Water Year 2009 (October 1, 2008 through September 30, 2009). We also collected 30-minute interval temperature data at 37 sites, mostly from July through September 2009. In addition, we began a continuous oxygen monitoring program at one site (Big Quilcene River).

The principal goals of this ongoing monitoring program are to characterize the rivers and streams of Washington State and to track changes in water quality.

This report documents methods and data quality and presents the data for Water Year 2009. This year's annual report includes an analysis of ambient metals data, including trends in the Spokane River. Concentrations of cadmium, lead, and zinc in the river have been declining since Water Year 1994.

A description of Ecology's long-term monitoring program and access to historical data can be found on Ecology's Internet web site at www.ecy.wa.gov by clicking on "Programs" then "Environmental Assessment" and then "River and Stream Water Quality."

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- Bill Ward, Bruce Barbour, Casey Clishe, Chris Coffin, Daniel Sherratt, Jason Myers, Jim Ross, Mike Anderson, and Troy Warnick collected samples. They continue to spend long hours working in all kinds of weather, traffic, and road conditions. Without their dedication, Appendix D would be much longer.
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- Stuart Magoon managed the lab and kept everything working together.

Introduction

The Washington State Department of Ecology (Ecology) and its predecessor agency have operated a long-term ambient water quality monitoring program since 1959. The basic program consists of monthly water quality monitoring for conventional parameters at 62 long-term stations and 20 basin (rotating) stations on rivers and streams throughout Washington State.

In Water Year (WY) 2009, we monitored 18 additional stations associated with special projects (and external funding). Seven of these were in the Eastern Region, one in the Central Region, four in the Northwest Region, and six in the Southwest region. Ten of these stations were associated with the "Intensively Monitored Watersheds" (IMW) project (see www.ecy.wa.gov/programs/eap/imw). Seven stations were added as part of a larger Spokane River study, and one station was added to evaluate the effect of moving a long-term station slightly upstream.

We collected 30-minute interval temperature data from about July through September at many long-term and a few basin stations, as well as conducted bi-monthly metals monitoring at 12 selected stations.

We also established a continuous monitoring station on the Big Quilcene River. This station records 15-minute interval temperature, dissolved oxygen, pH, and conductivity.

The primary goals of the River and Stream Ambient Monitoring Program are to characterize water quality and to evaluate spatial and temporal changes in water quality (trends).

Within Ecology, data generated by ambient monitoring are used to:

- Determine if waters are meeting standards or are in need of cleanup (e.g., www.ecy.wa.gov/programs/wq/303d/index.html).
- Identify trends in water quality characteristics (e.g., Hallock, 2005).
- Refine and verify TMDL models.
- Develop water quality based permit conditions.
- Conduct miscellaneous site-specific evaluations (e.g., Hallock, 2004).

Our data are provided free to the public and are widely used by academics, consultants, local government entities, schools, and others interested in the quality of Washington's flowing waters.

The purpose of this report is to describe the WY 2009 monitoring program, discuss data quality, and present results. More detailed analyses and interpretations of ambient monitoring data are reported elsewhere, though this report includes an analysis of ambient metals data.

A generalized assessment of water quality at particular stations is provided online (www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html) in the form of a water quality index (WQI; Hallock, 2002). The WQI and trends at long-term stations are reported in *Washington State Water Quality Conditions in 2005 based on Data from the Freshwater Monitoring Unit* (Hallock, 2005).

Other Ecology programs conduct some of their own analyses. For example, Ecology's Water Quality Program applies its own data reduction procedures prior to producing Washington State's Water Quality Assessment [303(d) & 305(b) Report] that is the list of waters needing to be cleaned up (www.ecy.wa.gov/programs/wq/303d/index.html).

Methods

Sampling Network

The ambient monitoring network in WY 2009 consisted of monthly water collection at 62 long-term stations, 20 regional ("basin") stations, and 18 special project stations (Table 1 and Appendix A).

We sampled all stations year-round except for two special project stations. The Spokane River at Fort Wright Bridge station was added in April. The long-term station at Methow near Pateros was moved 0.6 miles upstream to a safer metal bridge. We sampled the original station five times during the year to confirm that water quality was effectively the same between stations.

- *Long-term stations* are monitored every year to track water quality changes over time (trends), assess inter-annual variability, and collect current water quality information. These stations are generally located near the mouths of major rivers, below major population centers, where major streams enter the state, or upstream from most anthropogenic (human-caused) sources of water quality problems.

- *Basin stations* are generally monitored for one year only (although they may be re-visited periodically) to collect current water quality information. These stations are selected to support the waste discharge permitting process, Total Maximum Daily Load (TMDL) assessments, site-specific needs, and to allow expanded coverage over a long-term network. Some basin stations are selected to target known problems and may not necessarily reflect conditions representative of the entire basin.

- *Special project stations* are typically sampled to address a particular question, and they are usually supported by funding external to the ambient monitoring program. We may not sample these stations for the entire usual suite of sampled parameters, or we may sample extra parameters. Special project stations will not necessarily represent typical water quality conditions.

The locations of ambient stations monitored during WY 2009 are presented in Table 1. Appendix A lists current and historical monitoring locations and the years they were monitored by Ecology and its predecessor agency. Historical data for these stations are available from the ambient monitoring program on request.

Also, a description of our long-term monitoring program, access to historical data, and previous annual reports can be found on Ecology's Internet web site at www.ecy.wa.gov under the "Environmental Assessment" program and "River and Stream Water Quality."

Table 1. Ecology stream ambient monitoring stations for Water Year 2009. See Appendix A.

Key	Station	Location	Status[a]	Key	Station	Location	Status[a]
1	01A050	Nooksack R at Brennan	C	51	27B070	Kalama R near Kalama	C
2	01A120	Nooksack R at No Cedarville	C	52	27D090	East Fork Lewis R near Dollar Corner	C
3	03A060	Skagit R near Mount Vernon	C	53	28C070	Burnt Br Cr at mouth	B
4	03B050	Samish R near Burlington	C	54	31A070	Columbia R at Umatilla	C
5	04A100	Skagit R at Marblemount	C	55	32A070	Walla Walla R near Touchet	C
6	05A070	Stillaguamish R near Silvana	C	56	32B075	Touchet R at Cummins Rd	B
7	05A090	SF Stillaguamish at Arlington	C	57	33A050	Snake R near Pasco	C
8	05A110	SF Stillaguamish near Granite Falls	C	58	34A070	Palouse R at Hooper	C
9	05B070	NF Stillaguamish at Cicero	C	59	34A170	Palouse R at Palouse	C
10	05B110	NF Stillaguamish near Darrington	C	60	34B110	SF Palouse R at Pullman	C
11	07A090	Snohomish R at Snohomish	C	61	35A150	Snake R at Interstate Br	C
12	07C070	Skykomish R at Monroe	C	62	35B060	Tucannon R at Powers	C
13	07D050	Snoqualmie R near Monroe	C	63	35F050	Pataha Cr near mouth	B
14	07D130	Snoqualmie R at Snoqualmie	C	64	36A070	Columbia R near Vernita	C
15	08C070	Cedar R at Logan St/Renton	C	65	37A090	Yakima R at Kiona	C
16	08C100	Cedar R at RR Grade Rd	B	66	37A190	Yakima R at Parker	B
17	08C110	Cedar R near Landsburg	C	67	37A205	Yakima R at Nob Hill	C
18	08N070	Johns Cr at Gene Coulon Park	B	68	37G050	Ahtanum Cr at Fulbright Park	B
19	09A080	Green R at Tukwila	C	69	38A050	Naches R at Yakima on US HWY 97	B
20	09A190	Green R at Kanaskat	C	70	39A050	Yakima R at Harrison Bridge	B
21	09H090	Black R at Monster Rd SW	B	71	39A090	Yakima R near Cle Elum	C
22	09L060	Walker Cr near mouth	B	72	41A070	Crab Cr near Beverly	C
23	09M050	North Cr at Seahurst Pk	B	73	45A070	Wenatchee R at Wenatchee	C
24	10A070	Puyallup R at Meridian St	C	74	45A110	Wenatchee R near Leavenworth	C
25	11A070	Nisqually R at Nisqually	C	75	46A070	Entiat R near Entiat	C
26	12F090	Spanaway Cr at Old Military Rd	B	76	48A070	Methow R near Pateros	S2
27	13A060	Deschutes R at E St Bridge	C	77	48A075	Methow R near Pateros at Metal Br	C
28	15F050	Big Beef Cr at mouth	S1	78	48A140	Methow R at Twisp	C
29	15L050	Seabeck Cr at mouth	S1	79	48D070	Twisp R near mouth	B
30	15M070	Llt Anderson Cr at Anderson Hill Rd	S1	80	49A070	Okanogan R at Malott	C
31	15N070	Stavis Cr near mouth	S1	81	49A190	Okanogan R at Oroville	C
32	16A070	Skokomish R near Potlatch	C	82	49B070	Similkameen R at Oroville	C
33	16C090	Duckabush R near Brinnon	C	83	53A070	Columbia R at Grand Coulee	C
34	18B070	Elwha R near Port Angeles	C	84	53C070	Hawk Cr at Miles-Creston Rd	B
35	19C060	West Twin R near mouth	S1	85	54A070	Spokane R at Long Lake	S3
36	19D070	East Twin R near mouth	S1	86	54A090	Spokane R at Ninemile Br	S3
37	19E060	Deep Cr near mouth	S1	87	54A120	Spokane R at Riverside State Pk	C
38	20B070	Hoh R at DNR Campground	C	88	54A130	Spokane R at Fort Wright Br	S3
39	22A070	Humptulips R near Humptulips	C	89	55B070	Little Spokane R near mouth	C
40	23A070	Chehalis R at Porter	C	90	56A070	Hangman Cr at mouth	C
41	23A160	Chehalis R at Dryad	C	91	57A123	Spokane R at Sandifer Bridge	S3
42	23A170	Chehalis R near Doty	B	92	57A140	Spokane R at Plante's Ferry Park	S3
43	23G070	SF Chehalis R at Beaver Creek Rd	B	93	57A144	Spokane R at Sullivan Rd.	S3
44	24B090	Willapa R near Willapa	C	94	57A150	Spokane R at Stateline Br	C
45	24F070	Naselle R near Naselle	C	95	57A240	Spokane R at Lake Coeur d'Alene	S3
46	25C070	Elochoman R near Cathlamet	B	96	59A140	Colville R at Newton Rd	B
47	25D050	Germany Cr at mouth	S1	97	60A070	Kettle R near Barstow	C
48	25E060	Abernathy Cr near mouth	S1	98	61A070	Columbia R at Northport	C
49	25F060	Mill Cr near mouth	S1	99	62A090	Pend Oreille R at Metaline Falls	B
50	26B070	Cowlitz R at Kelso	C	100	62A150	Pend Oreille R at Newport	C

[a] C = long-term.
B = basin.
S1 = Intensively Monitored Watersheds (IMW).
S2 = overlap monitoring to support moving a long-term station.
S3 = Spokane River Project.

Moving Long-term stations

Long-term stations are intended to provide data for trend analyses, which requires a consistent data set. Moving a station even a small distance has the potential to affect trends. However, as discussed in our last Annual Report (Hallock, 2009a), for logistical and safety reasons, we considered moving three long-term stations at the end of Water Year 2009. We sampled both old and proposed new sites concurrently:

- The Chehalis River at Dryad (23A160) bridge washed out during the December 2007 flood. Since the flood, we have been collecting bank samples at this station. We considered moving the station 2.6 miles upstream to Chehalis River near Doty (23A170).
- Access to the Cedar River near Landsburg (08C110) has become problematic due to washouts, tree-fall, and changes to access procedures in this controlled watershed. Also, this station is sampled from the bank. We considered moving 2.6 miles downstream to a bridge sample at Cedar River at Railroad Grade Road (08C100).
- The concrete bridge at Methow River near Pateros (48A070) has little room for pedestrian traffic and is deteriorating. We considered moving this station 0.6 miles upstream to Methow River near Pateros at Metal Bridge (48A075).

Sample Collection and Analysis

We collected samples from the majority of stations as single, near-surface grab samples from highway bridges. Some stations were sampled from the bank, off of culverts, and other locations. Sampling locations are identified on our web site.

We monitored for 12 standard water quality parameters monthly at all stations except a few special project stations, in WY 2009 (Table 2).

Besides the 12 water quality parameters, we also recorded barometric pressure (to calculate percent oxygen saturation) and stream stage measurements, where necessary, to enable flow determination for most long-term stations and many basin stations. We collected metals samples bimonthly at 12 stations and additional parameters, such as total organic carbon and chlorophyll, by request at selected stations.

Sample collection and analytical methods are described in an earlier annual report (Hallock et al., 1998), our field monitoring protocols (Ward et al., 2001), standard operating procedures (Ward, 2007a; Ward, 2007b; Ward, 2010, in draft), ambient monitoring quality assurance documents (Hallock and Ehinger, 2003; Hallock, 2007; and Hopkins, 1996), and Manchester Environmental Laboratory's *Lab Users Manual* (MEL, 2008).

Table 2. Water quality parameters monitored in Water Year 2009.
*Standard parameters collected at all stations are in **bold**.*

Parameter	Method	Typical Reporting Limit
Ammonia, total	SM 4500 NH3H	0.01 mg/L
Carbon, dissolved organic	SM 5310 B	1 mg/L
Carbon, total organic	SM 5310 B	1 mg/L
Conductivity	SM 2510 B	NA
Fecal coliform bacteria	SM 9222 D	1 colony/100 mL
Hardness	SM 2340 B	Not specified
Metals: mercury	EPA 245.7	0.002 µg/L
Metals: other	EPA 200.8	various
Nitrate + nitrite, total	SM 4500 NO3I	0.01 mg/L
Nitrogen, total	SM 4500 NB	0.025 mg/L
Oxygen, dissolved	SM 4500 OC	NA
pH	SM 4500 H+	NA
Phosphorus, soluble reactive	SM 4500 PG	0.003 mg/L
Phosphorus, total	SM 4500 PF	0.005 mg/L
Suspended solids, total	SM 2540 D	1 mg/L
Suspended sediment concentration	ASTMD3977B	1 mg/L
Temperature	SM 2550 B	NA
Turbidity	SM 2130	0.5 NTU

SM = APHA 2005.
EPA = U.S. Environmental Protection Agency, 1983.

Program Changes

All long-term monitoring programs experience changes in sampling or analytical procedures that can potentially affect results. Normally, changes will result in improved precision or reduced bias. Most changes will have only a minor effect on a synoptic analysis of the data, but even minor improvements in procedures should be considered when evaluating long-term trends. We made no substantive changes to collection, analytical, or quality control procedures in WY 2009.

However, at one airport (Pasco), the Transportation Security Administration has begun x-raying the coolers in which we ship samples. Given the low level of radiation (< 1 millirad), the viability of fecal coliform bacteria should not be affected, at least within our ability to test for it.

In late WY 2009, we implemented a continuous oxygen monitoring program at one station (Big Quilcene River, 17A060). We expect to continue in the Big Quilcene and at two additional stations in WY 2010.

Also in WY 2009, we changed the procedures that calculate the water quality index scores presented on our web site to incorporate the November 2006 water quality standards criteria (WAC Chapter 173-201A). All previous scores were recalculated so that scores would remain consistent over time. Because oxygen and temperature criteria are more stringent in the newer standards, scores got worse at many stations.

All known and suspected changes to methods and procedures during the history of the stream monitoring program, as well as large-scale environmental changes that may affect a trend analysis, are documented in Appendix B.

Continuous Temperature Monitoring

The program goal is to collect summer, diel (24-hour) temperature data with 30-minute monitoring intervals at most long-term and current basin ambient monitoring stations, as well as at some special request stations. The data are primarily used for trend analyses and to determine the stream's compliance with water quality standards.

We try to deploy the loggers by early July and retrieve them in late September. However, because nearly half of our monitoring stations have supplemental temperature criteria that apply during fall through spring, we are moving towards year-round temperature monitoring, where possible.

We deploy two Onset StowAway TidbiT® temperature loggers at each site, one in water and one in air. All deployed loggers are shaded with a PVC pipe and installed in a location representative of the surrounding environment. We usually install stream temperature loggers about six inches off the stream bottom to minimize potential influence from groundwater inflow. Loggers were placed in a free-flowing location at a depth to avoid exposure to air resulting from low streamflows. Detailed protocols are found in Ward (2010, in draft) and quality control requirements in Ward (2005).

Continuous Oxygen Monitoring

Like temperature, oxygen concentration changes in a sinusoidal pattern over a 24-hour period. Oxygen concentration is typically lowest in the early morning and highest in the late afternoon. Usually, daily lows are of the most interest because they have the most impact on aquatic life. Our grab-sample monitoring program does a poor job of capturing daily lows.

To measure daily low oxygen concentrations, we need diel oxygen data. We are particularly interested in annual lows (usually occurring in mid to late summer), but also in daily low concentrations at the beginning and ending of salmonid spawning seasons, which vary according to location.

In September 2009, we deployed a Hydrolab® Minisonde with an optical oxygen sensor (LDO) connected to a near real-time telemetry station near the mouth of the Big Quilcene River (station 17A060). The instrument returned temperature, oxygen, pH, and conductivity readings every

15 minutes. Our methods are described in Hallock (2009b). We intend to expand this program in the future; however, we are dependent on available resources. We have no dedicated funding.

Metals Monitoring

Metals monitoring continued in WY 2009 at 12 stations, plus an additional station sampled in September only by special request (Table 3). Metals samples were collected every other month beginning in October 2008. Four samples were missed due to site inaccessibility or equipment problems.

Table 3. Bi-monthly sampling stations for metals in Water Year 2009.

Station	Name		Station	Name
07A090	Snohomish R at Snohomish		38A050	Naches R at Yakima on US HWY
07D130	Snoqualmie R at Snoqualmie		39A050	Yakima R at Harrison Bridge
09L060	Walker Creek near mouth		48D070	Twisp R near mouth
09M050	North Creek at Seahurst Park		54A090[a]	Spokane R at Ninemile Bridge
12F090	Spanaway Creek at Old Military		57A150[b]	Spokane R at Stateline Bridge
35A150	Snake R at Interstate Bridge		61A070	Columbia R at Northport
37A190	Yakima R at Parker			

[a] Sampled for a special project in September only.
[b] Sampled for a special project in September in addition to bi-monthly sampling.

Samples were analyzed for hardness, total mercury, as well as total and dissolved arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc. Collection and analytical methods are discussed in more detail in Ward (2007b) and Hopkins (1996).

We selected stations for metals monitoring based on known problem areas (e.g., Spokane River) and sites where we have little current data.

This annual report includes a summary of our metals monitoring results since May 1994, including a description of the statewide distribution of metals concentrations and an analysis of trends in the problem metals in the Spokane River: zinc, lead, and cadmium. Statistical analyses were done using WQHydro (Aroner, 2009).

Quality Assurance

Ecology's Manchester Environmental Laboratory (MEL) quality assurance (QA) program includes the use of quality control (QC) charts, check standards, in-house matrix spikes, and laboratory blanks, along with performance evaluation samples. For a more complete discussion of laboratory QA, see MEL's *Quality Assurance Manual* (MEL, 2006) and their *Lab Users Manual* (MEL, 2008).

The QA program for field sampling consisted of three parts:

1. Adherence to standard operating procedures for sample/data collection and periodic evaluation of sampling personnel.
2. Consistent instrument calibration methods and schedules.
3. The collection of field QC samples during each sampling run.

Our QA program is described in detail in Hallock and Ehinger (2003) and Hallock (2007).

Three types of field QC samples were collected:

1. *Duplicate (Sequential) Field Samples.* These consisted of an additional sample collection made approximately 15-20 minutes after the initial collection at a station. These samples represent the total variability due to short-term, instream dynamics; sample collection and processing; and laboratory analysis.
2. *Duplicate (Split) Field Samples.* These consisted of one sample (usually the duplicate sequential sample) split into two containers that are processed as individual samples. This eliminates the instream variability. Remaining variability is attributable to field processing and laboratory analysis.
3. *Field Blank Samples.* These consisted of the submission and analysis of de-ionized water. These are field process blanks. In other words, the blank water was poured into cleaned sample collection equipment to simulate collecting a water sample. The expected value for each analysis is the reporting limit for that analysis. Significantly higher results would indicate that sample contamination had occurred during field processing or during laboratory analysis.

QC samples were submitted semi-blind to the laboratory. They were identified as QC samples, but sample type (duplicate, split, or blank) and station were not identified.

Altogether, 129 field QC samples for standard parameters were processed: 11 field blanks, 60 field duplicates (sequential), and 58 field split samples. In addition, the laboratory conducted its own splits of some field QC samples. The central tendency of the variance of pairs of split field samples was summarized by calculating the square root of the mean of the sample-pair variances (root-mean-square - RMS). These figures provide an unbiased and higher estimate than other commonly used statistics (for example, mean or median of the standard deviations).

A two-tiered system was used to evaluate data quality of individual results based on field QC. The first tier consisted of four automated checks: holding time, variability in field duplicates, reasonableness of the result, and the balance of nutrient species. Results exceeding pre-set limits were flagged. The second tier QC evaluation was a manual review of the data flagged in the first tier. Data were then coded from 1 through 9 (1 = data meets all QA requirements, 9 = data are unusable). Criteria for assigning codes are discussed in more detail in Hallock and Ehinger (2003). We do not routinely use or distribute data with quality codes greater than 4.

Finally, data management includes verification at several stages:

- Field data entry is verified quarterly by comparing field data forms to printouts from the database.
- At the end of the WY, data in Ecology's Environmental Information Management system (EIM) and in the database used for our web presentation are compared electronically to the primary database.
- Plots of streamflow versus stage height are visually checked for anomalies.

Flows were plotted against stage height for all stations with stage data, and the plots were visually inspected for outliers. For flows determined independent of stage records, this method confirms the flow. (Most flows are derived from continuous recorders and based on date and time, not stage.) For flows based on stage, this method confirms that the flow was correctly determined from the flow curve, but the method cannot ensure that stage was correctly recorded.

Continuous Temperature Monitoring

The quality of the continuous temperature data was assessed by calibration checks using a certified reference thermometer before and after a deployment. If a pre-survey calibration check indicated a logger's accuracy was not within the required limits (0.2 °C for water and 0.4 °C for air) when compared to a certified reference thermometer, then the logger was rejected and not deployed (Ward, 2005). If a logger failed a post-survey calibration check, then the results may be rejected or, if the bias was relatively small and consistent (i.e., the pre-deployment bias was just within the required limits and in the same direction), results may be adjusted. In addition, the data were compared to field temperature measurements taken at deployment and retrieval with a calibrated alcohol thermometer or thermistor. Results were also compared to the monthly measurements collected during grab-sample monitoring surveys.

All data were reviewed graphically, and anomalies were deleted prior to recording results in the database.

Continuous Oxygen Monitoring

The full QC review of data collected by Hydrolab ® sensors will be included in next year's annual report following requirements specified in Hallock (2009b).

Results and Discussion

The primary purpose of this report is to present the results of Ecology's stream monitoring in WY 2009. The main body of the report describes the sampling program and interprets QC results. This report also includes an analysis of ambient metals data collected since WY 1994. Appendix C contains results for each station monitored in WY 2009. Raw data are available in computer formats on request and are posted on Ecology's web pages (www.ecy.wa.gov). Unpublished data are also available online but are considered "preliminary."

Monthly Ambient Monitoring

A station-by-station data analysis is not within the scope of this report. Individual results not meeting the 2006 water quality criteria in Washington's Water Quality Standards (WAC Chapter 173-201A), excluding un-ionized ammonia, are identified in reports on our web site (www.ecy.wa.gov/apps/watersheds/riv/exceed). The un-ionized ammonia criteria are complicated to determine and are rarely exceeded in ambient waters. In WY 2009, no samples exceeded the chronic un-ionized ammonia criteria.

Effective December 20, 2006, Ecology adopted an aquatic life system for classifying the state's waterbodies, dropping the AA, A, B, and C system in the 1997 standards (Ecology, 2006). Some of the numeric criteria from the new 2006 water quality standards are listed in Tables 4 and 5. Our web presentation now uses the 2006 criteria for current data. In any case, the Ecology ambient monitoring program's comparison of results to water quality criteria is not a formal determination of water quality *violations.* Determining violations requires additional considerations such as human impact or multiple results not meeting a criterion, and in some cases requires continuous data. (See www.ecy.wa.gov/programs/wq/303d//policy1-11Rev.html.)

Of the 14,292 possible standard water quality results in WY 2009, 411 results (2.9%) were missed. This is a larger than usual number of missed results for us. The winter was unusually snowy, and most results (252) were missed because the station was inaccessible or frozen. Other reasons for missing results include sampler-related problem (error or illness) (74) and equipment problems (36). Appendix D gives more detailed explanations for each missed result.

Instantaneous flow was recorded at all but one of the 62 long-term stations. Flows were not available from the South Fork Stillaguamish River at Arlington (05A090); currently, only stage height is being reported for that station. In addition, flows were not available on seven other occasions at different long-term stations for various reasons. Flows at six long-term stations were coded as estimates, generally because the rating curve was too old to be reliable or because the nearest gage was too far upstream.

Discharge was recorded at 27 of the 37 basin and special project stations. Discharge was not recorded during some months at several basin stations for various reasons.

Table 4. Water quality criteria in the 2006 water quality standards associated with aquatic life uses.

Results outside the ranges given do not meet the criterion.

Aquatic Life Use	Temperature (7DADM)[b] (°C)	Oxygen (1-day minimum) (mg/L)	pH
Char spawning	<=9		
Char spawning and rearing	<=12	>9.5	6.5<=pH<=8.5
Salmon and trout spawning	<=13		
Core summer salmonid habitat	<=16	>9.5	6.5<=pH<=8.5
Salmonid spawning rearing and migration	<=17.5	>8.0	6.5<=pH<=8.5
Salmonid rearing and migration only	<=17.5	>6.5	6.5<=pH<=8.5
Non-anadromous interior redband trout	<=18	>8.0	6.5<=pH<=8.5
Indigenous warm-water species	<=20	>6.5	6.5<=pH<=8.5

[a] WAC 173-201A-602 (2006) identifies use designations for waterbodies and some exceptions to the standard criteria listed above. Metals criteria, most of which are a function of hardness, are not listed here.

[b] 7DADM = 7-day average of the daily maximum temperature. There are additional temperature criteria during specified seasons for some waterbodies.

Table 5. Water quality criteria in the 2006 water quality standards associated with contact recreation.[a]

Results outside the ranges given do not meet the criterion.

Recreation Use	Fecal Coliform Bacteria (cfu/100 mL)	
	10%	Geometric Mean
Extraordinary primary contact recreation	<=100	<=50
Primary contact recreation	<=200	<=100
Secondary contact recreation	<=400	<=200

[a] WAC 173-201A-602 (2006) identifies use designations for waterbodies.

Moving Long-Term Stations

We considered moving three long-term stations at the end of WY 2009.

Though similar, data from the Chehalis River at Doty (23A170) do not completely match data from Dryad (23A160). Combining results from the two stations for trend analyses could be problematic for some parameters. We recently learned that the Department of Transportation intends to rebuild the bridge at Dryad. Also, there was a reasonably good historical relationship between flows at Doty, which are currently available, and flows at Dryad, which have been unavailable since the bridge washed out. Therefore, until the bridge is rebuilt, we plan to keep monitoring the Dryad station from the bank, using flows based on those at Doty.

Results from the Cedar River near Landsburg (08C110) were different enough from results from the Cedar River at Railroad Grade Road (08C100) to cause potential problems for trend analyses when combining the two data sets. Furthermore, the bridge at Railroad Grade Road has no railing, making safety a concern. We have decided to keep the long-term station at Landsburg.

We collected only four overlapping samples at Methow River near Pateros (48A070) and Methow River near Pateros at Metal Bridge (48A075); however, results from these two stations are nearly identical. Beginning with WY 2010, we will move the long-term station 0.6 miles upstream from "near Pateros" to "near Pateros at Metal Bridge."

Continuous Temperature Monitoring

During WY 2009, we successfully monitored continuous temperature at 26 western Washington and 11 eastern Washington stations (Table 6). There are still two eastern Washington water loggers that we were not able to retrieve. Those data sets may be available later. Unfortunately, several deployed loggers were lost or damaged (four in western Washington and three in eastern Washington). This year, all of the data sets included the seasonal seven-day maximum periods for the first time.

The seasonal maximum at most stations (32 stations; 86%) failed to meet 1997 water quality criteria. Likewise, the seven-day average of the daily maximum temperature (7DADM) failed to meet the basic 2006 criteria at the same 32 stations. These percentages are higher than in WY 2008. Several stations, especially in western Washington, were unusually warm in 2009.

The five stations with the warmest seasonal water temperatures in 2009 based on continuous monitoring data were:

- 23G070 South Fork Chehalis R at Beaver Creek Rd (30.0 ºC).
- 41A070 Crab Cr near Beverly (29.9 ºC).
- 23A170 Chehalis R near Doty (29.5 ºC).
- 12F090 Spanaway Cr at Old Military Rd (29.4 ºC).
- 34A070 Palouse R at Hooper (29.1 ºC).

Table 6. Temperature summary for Water Year 2009 (°C).

Seasonal maxima exceeding 1997 criteria and 7DADM exceeding 2006 criteria (excluding special seasonal criteria) are shown in bold.

Station	Criteria		Deployment Maximum		7DADM [a]		Deploy Date	Retrieve Date
	1997	2006	Max	Date/Time [b]	Max	Date [b, c]		
01A120	18	16	**19.3**	28-Jul 20:00	**18.9**	30-Jul	23-Jun	28-Sep
04A100	16	16	14.0	02-Sep 18:00	13.5	30-Aug	23-Jun	29-Sep
05A070	18	17.5	**26.5**	29-Jul 20:00	**25.2**	30-Jul	23-Jun	29-Sep
07D050	18	17.5	**25.2**	30-Jul 18:30	**24.3**	31-Jul	25-Jun	28-Sep
07D130	18	16	**21.9**	30-Jul 20:30	**21.3**	30-Jul	25-Jun	24-Sep
08C070	18	16	**22.5**	29-Jul 19:00	**21.9**	30-Jul	25-Jun	24-Sep
08C100	16	16	**16.8**	29-Jul 16:00	**16.5**	29-Jul	25-Jun	24-Sep
08C110	16	16	15.9	28-Jul 19:00	15.6	29-Jul	25-Jun	24-Sep
09A190	16	16	**19.8**	20-Aug 17:30	**19.5**	30-Jul	25-Jun	24-Sep
09L060	16	16	**18.8**	29-Jul 20:00	**17.9**	30-Jul	25-Jun	24-Sep
09M050	16	16	14.7	29-Jul 19:30	14.2	30-Jul	25-Jun	24-Sep
12F090	16	17.5	**29.4**	30-Jul 17:30	**28.3**	31-Jul	22-Jun	23-Sep
13A060	18	17.5	**22.0**	29-Jul 21:00	**21.1**	30-Jul	22-Jun	22-Sep
16A070	16	16	14.0	30-Jul 18:00	13.8	29-Jul	18-Jun	18-Sep
16C090	16	16	**16.5**	30-Jul 16:30	**16.1**	29-Jul	18-Jun	18-Sep
18B070	16	16	**19.0**	19-Aug 17:00	**18.1**	19-Aug	18-Jun	18-Sep
20B070	16	16	**19.0**	28-Jul 22:00	**18.3**	29-Jul	18-Jun	18-Sep
22A070	18	16	**24.7**	29-Jul 19:00	**22.7**	29-Jul	18-Jun	18-Sep
23A070	18	17.5	**27.9**	29-Jul 17:30	**26.0**	30-Jul	18-Jun	18-Sep
23A160	18	16	**28.0**	29-Jul 16:30	**26.0**	30-Jul	16-Jun	22-Sep
23A170	18	16	**29.5**	29-Jul 17:30	**27.8**	29-Jul	16-Jun	22-Sep
23G070	18	16	**30.0**	29-Jul 18:30	**28.4**	30-Jul	16-Jun	22-Sep
26B070	18	17.5	**18.9**	27-Jul 17:30	**18.0**	18-Jul	16-Jun	22-Sep
27B070	18	16	**21.9**	29-Jul 19:30	**21.5**	30-Jul	16-Jun	22-Sep
27D090	18	16	**28.8**	29-Jul 18:00	**27.6**	30-Jul	16-Jun	22-Sep
28C070	18	17.5	**25.4**	29-Jul 19:00	**24.0**	30-Jul	16-Jun	22-Sep
34A070	21	17.5	**29.1**	28-Jul 20:30	**28.5**	30-Jul	01-Jul	22-Sep
34A170	20	20	**28.7**	01-Aug 19:00	**28.1**	30-Jul	01-Jul	22-Sep
34B110	18	17.5	**22.7**	01-Aug 19:00	**22.5**	31-Jul	01-Jul	22-Sep
41A070	21	17.5	**29.9**	01-Aug 18:00	**29.4**	30-Jul	30-Jun	04-Nov
48A070	18	17.5	**23.8**	03-Aug 18:30	**23.3**	31-Jul	19-Jun	01-Dec
49A190	18	17.5	**28.2**	02-Aug 18:30	**27.0**	01-Aug	18-Jun	02-Dec
53C070	18	16	**19.9**	01-Aug 19:30	**19.6**	30-Jul	30-Jun	29-Sep
55B070	18	16	**18.1**	01-Aug 19:30	**17.9**	29-Jul	30-Jun	21-Sep
56A070	18	17.5	**25.5**	01-Aug 18:30	**25.0**	31-Jul	30-Jun	23-Sep
57A123	20	20	19.9	16-Jul 17:30	18.9	18-Jul	10-Jul	23-Sep
59A140	18	17.5	**25.7**	31-Jul 19:30	**25.1**	30-Jul	30-Jun	21-Sep

[a] 7-day average of the daily maximum temperature. This is the 7-day period with the highest average of daily maximum temperatures.
[b] There may be other dates or other 7-day periods with the same maximum.
[c] Date shown is middle of 7-day period.

Continuous Oxygen Monitoring

Continuous oxygen, pH, temperature, and conductivity data collected by deployed sensors from the Big Quilcene River (17A060) from 9 September to 25 November 2009 are available on request. These data will be more formally reported in next year's annual report, in conjunction with the full QC review.

Metals Monitoring

During WY 2009, of the 1,258 possible metals results (12 stations x 6 months x 17 analytes plus 2 stations x 1 month x 17 analytes), we failed to collect 68 results. Field staff could not sample the Columbia River at Northport in February due to snow and in April due to vehicle problems. April's sample from the Snake River at Interstate Bridge was missed due to sampler error.

Of the 630 dissolved metals and total mercury results reported, 7 (1.1%) exceeded 2006 Washington State water quality standards chronic criteria (Table 7). Dissolved zinc exceeded the criterion in the Spokane River at Stateline in all months it was sampled except August and September, and dissolved lead exceeded the criterion in February and June. The Spokane River has a TMDL for metals, mostly due to legacy contamination from upstream mining practices.

Table 7. Metals results from Water Year 2009 exceeding the 2006 water quality standards criteria. All results are from the Spokane River at Stateline Bridge (57A150).

Date	Metal	Hardness (mg/L)	Result (µg/L)	Chronic Criterion (µg/L)	Percent Over Chronic Criterion	Acute Criterion (µg/L)	Percent Over Acute Criterion
10/14/2008	dissolved zinc	18.7	35.1	25.2	39	27.6	27
12/9/2008	dissolved zinc	21.8	55	28.7	91	31.5	75
2/10/2009	dissolved lead	23	0.536	0.492	9	12.6	0
	dissolved zinc	23	60.9	30.1	102	33.0	85
4/14/2009	dissolved zinc	22.5	53.3	29.5	80	32.3	65
6/9/2009	dissolved lead	19.6	0.441	0.411	7	10.6	0
	dissolved zinc	19.6	36.6	26.3	39	28.8	27

See the next section for a more detailed analysis of metals in Washington's rivers.

Metals in Washington's Rivers

Between May 1994, when we began our current metals monitoring program, and September 2009, we collected samples every other month at 12 stations each year. During that period we collected 12,559 results from 1096 samples at 95 different stations around the state.

Usually stations were rotated annually. This practice extends the coverage geographically but limits trend analysis. However, because of metals contamination of the Spokane River from historical mining in the Coeur d'Alene River valley, we have sampled the Spokane River at Stateline Bridge (station 57A150) throughout the period, except from July 1999 through September 2001, when most of our metals monitoring funding was temporarily withdrawn. However, there are sufficient data from the Spokane River for statistical trend analyses.

We tended to focus our monitoring on stations lower in the watershed where metals concentrations were more likely to be high. However, the permitting process often requires data from above the regulated discharge so data from stations higher in the watershed are also needed. We have sampled a few stations upstream of obvious anthropogenic sources.

Distribution of Data

The following is an evaluation of concentrations of metals relative to the body of ambient metals data. Metals concentrations at stations singled out as being high relative to other stations are not necessarily high enough to affect beneficial uses, and metals sources, especially for total metals concentrations, may be natural. The "Comparison to Water Quality Standards" section of this report evaluates concentrations relative to beneficial uses.

Total metals concentrations tended to be slightly higher in western Washington than in eastern Washington, though the differences were not pronounced (Figure 1, top and Figure 2, top). The highest total zinc and lead concentrations measured were both from South Fork Thornton Creek (08M070) in October 2003 (120 and 52 µg/L, respectively). Leach Creek near Steilacoom (12B070) and the Spokane River (57A150) also had high total zinc and total lead concentrations, as did the Columbia River at Northport (61A070).

Four stations had both median-normalized mean total metals concentrations above the 75th percentile, and more that 70% of results were greater than reporting limits (Figure 1, top).

- Nooksack River at Brennan (01A050): higher than average nickel, zinc, chromium, and copper.
- North Fork Stillaguamish (05B110): most metals were a little higher than average.
- South Fork Thornton Creek (08M070): zinc and lead were much higher than average; copper, chromium, and nickel were also higher than average.
- Sulphur Creek at Holaday Road (37F080): arsenic and zinc, especially, were higher than average.

Mercury tended to be higher in western Washington, with only one of the highest dozen concentrations being from eastern Washington (Walla Walla River near Touchet, February 1997, 0.038 µg/L). The highest mercury result recorded was 0.098 µg/L from Nisqually River at Nisqually (February 1999). However, high mercury concentrations tended to be very patchy, with no station exhibiting chronically high concentrations.

Dissolved metals were higher in eastern Washington (Figure 1, bottom and Figure 2, bottom). Dissolved lead and, especially, zinc were much higher in the Spokane River than elsewhere (Figure 3). Otherwise the differences between east and west would have been less pronounced.

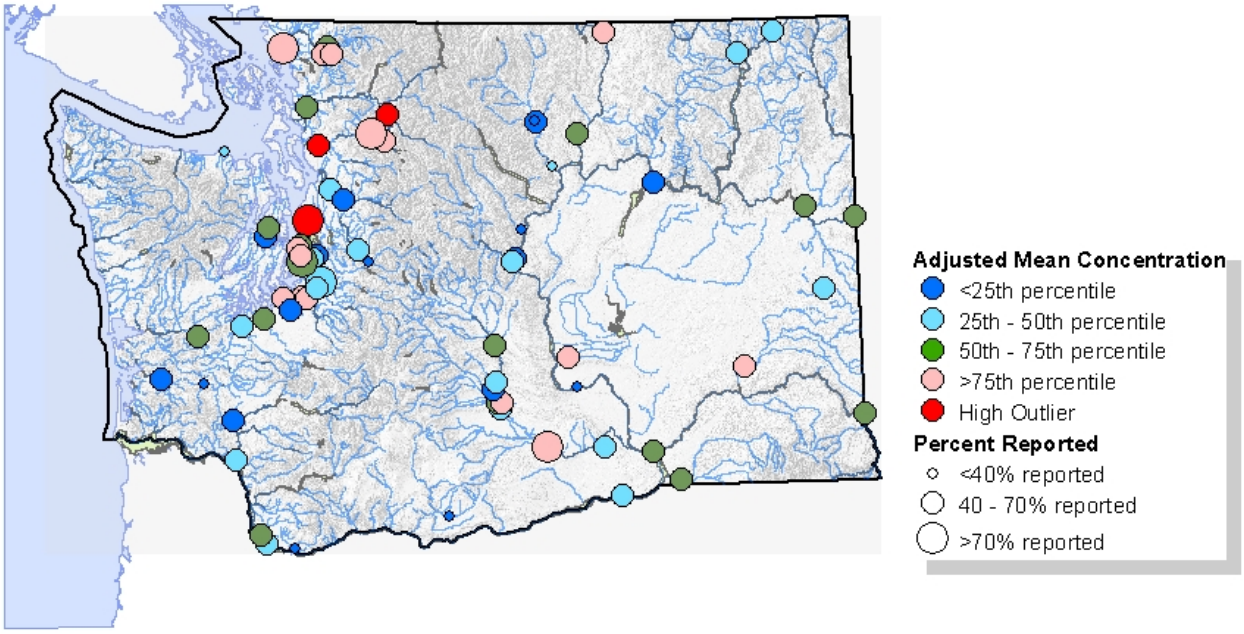
Four stations had median-normalized mean dissolved metals concentrations above the 75th percentile, and more that 75% of results were greater than reporting limits (Figure 1, bottom).

- South Fork Thornton Creek (08M070): dissolved zinc was much higher than typical; other dissolved metals were a little higher than typical.
- Miller Creek near mouth (09D070): all dissolved metals except cadmium were a little higher than typical.
- Clover Creek above Steilacoom Lake (12A110): dissolved zinc and lead were higher than typical.
- Spokane River at Riverside State Park (54A120): dissolved zinc and lead were much higher than typical; dissolved cadmium was higher than typical.
- Spokane River at Stateline Bridge (57A150): dissolved zinc and lead were much higher than typical; dissolved cadmium was higher than typical.

The highest dissolved chromium concentrations were found at several eastern Washington sites. The highest we have measured was at Palouse River at Hooper (34A070), in November 2001 (4.54 µg/L). However, the site with the most consistently high dissolved chromium was Clear Creek near Silverdale (15C070), where concentrations were around 2 µg/L every time we sampled (in WY 2008).

With few exceptions, dissolved cadmium exceeded 0.1 µg/L only in the Spokane and Columbia Rivers. Arsenic, however, was highest (>5 µg/L) in several irrigation returns (Moxee Drain (37I070), Sulphur Creek (37F080), and Crab Creek (41A070)), and in the Similkameen and Okanogan Rivers (49B070 and 49A070, respectively). The highest arsenic concentration in western Washington was from Leach Creek near Steilacoom (12B070, 4.99 µg/L in August 2008).

Total



Dissolved

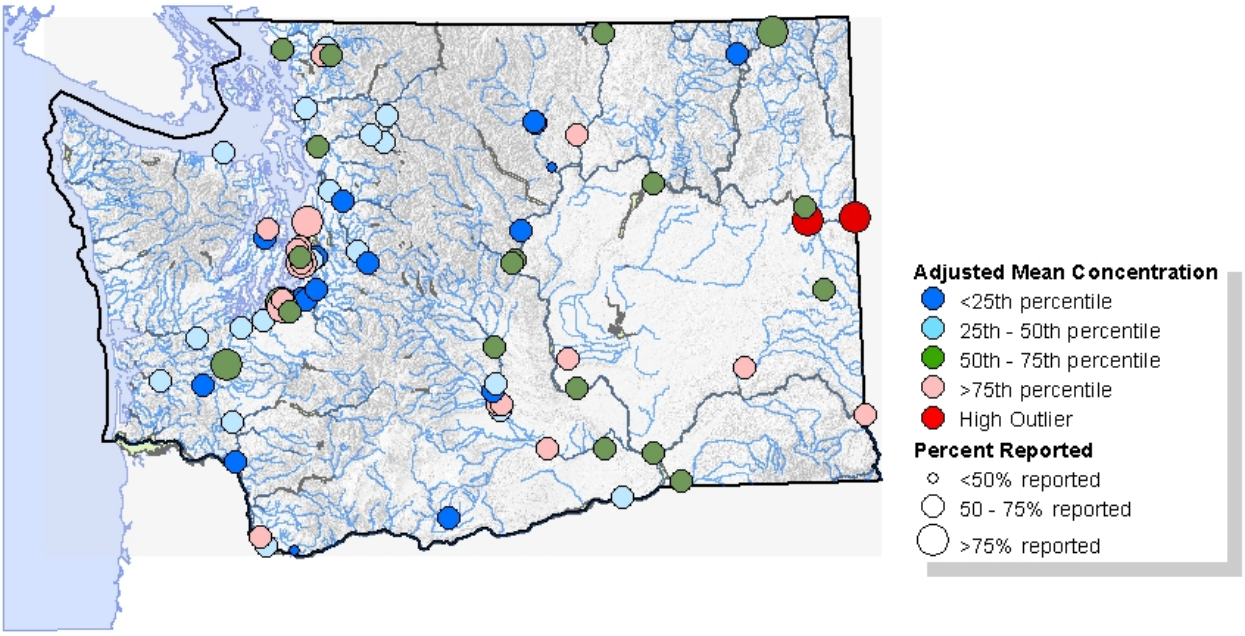
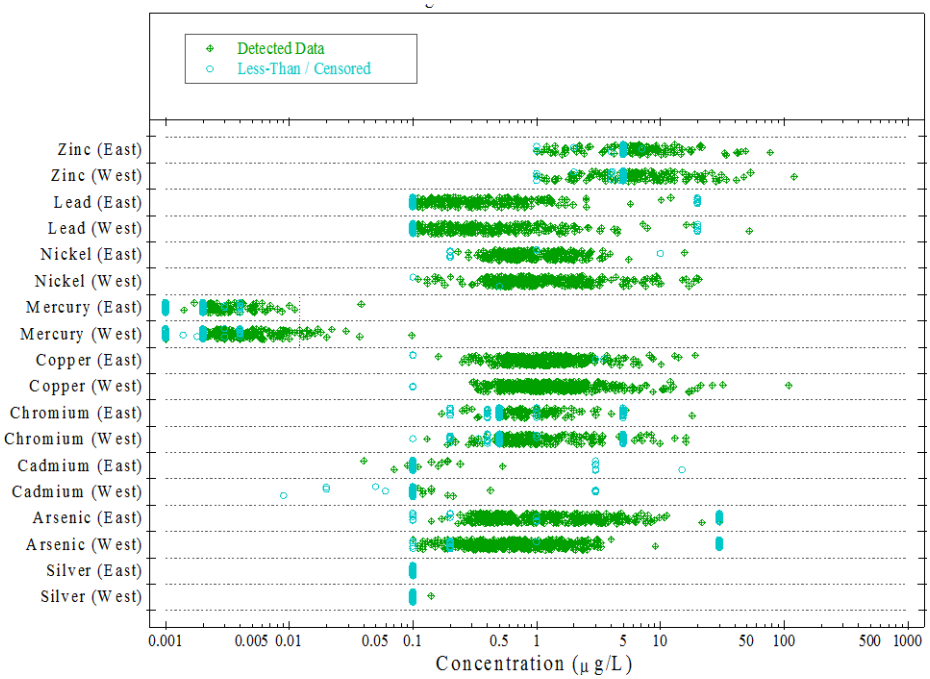


Figure 1. Total (top) and dissolved (bottom) metals results.

Color indicates the percentile of the median-normalized mean concentration.
Circle size indicates the proportion of results above reporting limits.

Regional distribution of total metals



Regional distribution of dissolved metals

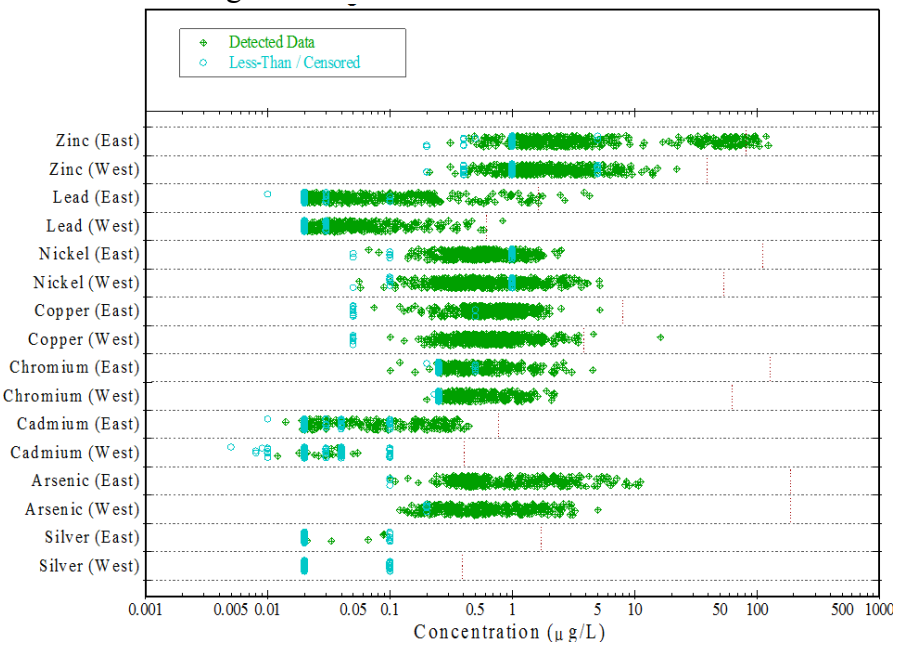


Figure 2. Distribution of total metals (top) and dissolved metals (bottom) concentrations in eastern and western Washington.

Vertical lines for dissolved metals and mercury indicate chronic water quality criteria (except silver is an acute criterion) assuming median hardness (67 mg/L and 28 mg/L in eastern and western Washington, respectively).

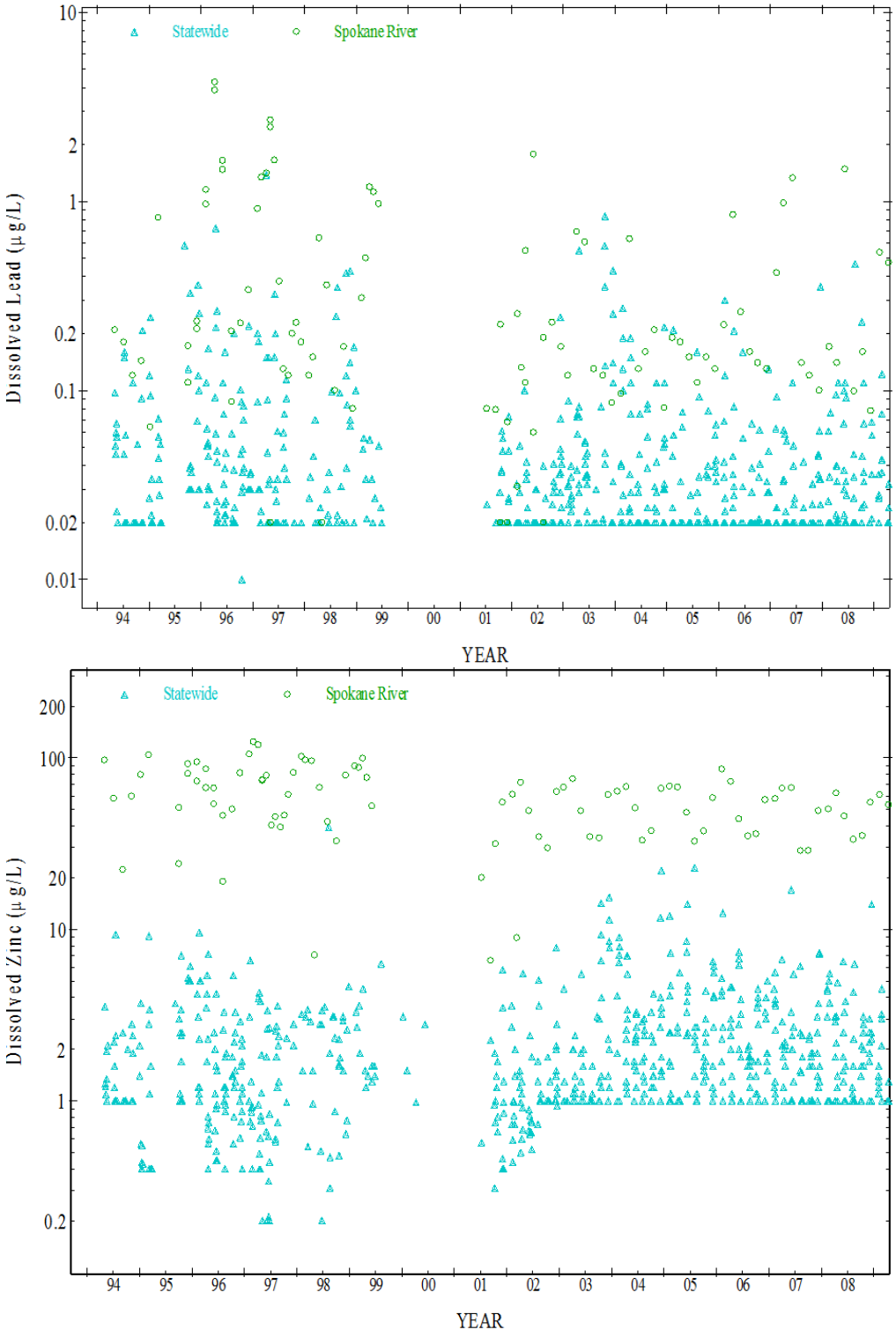


Figure 3. Dissolved lead (top) and dissolved zinc (bottom) results collected statewide since 1994.

Circles are Spokane River results. Triangles are from other stations.

Comparison to Standards

Between May 1994 and September 2009, we collected 6,924 metals results from 92 stations suitable for comparison to water quality criteria in WAC Chapter 173-201A. We calculated hardness-based criteria from hardness samples collected coincident with metals sampling.

Results exceeding criteria may be categorized as lead, zinc, and cadmium from the Spokane River, mercury from various stations, and very little else (Table 8).

Table 8. Metals results exceeding water quality criteria.

Category	Number of samples	Number exceeding criteria	Percent exceeding criteria
Spokane River cadmium	95 [a]	8	8.4
Spokane River lead	98 [a]	28	28.6
Spokane River zinc	98 [a]	84	85.6
Mercury	845	14	1.7
All other metals	5788	4	0.07
Total	6924	138	2.0

[a] Most samples were from Spokane at Stateline (57A150), but a few were from Spokane at Riverside State Park (54A150).

Results from the Spokane River are discussed in more detail in the next section. Only four mercury results were more than double the 0.012 µg/L criterion, and no station had chronically high mercury concentrations (Table 9).

Other than cadmium, lead, and zinc results from the Spokane River and all mercury results, only four other results exceeded water quality criteria (Table 10). High dissolved copper concentrations in Chambers Creek were likely related to copper sulfate treatments of Lake Steilacoom (Cubbage, 1992).

Table 9. Mercury concentrations more than double the 0.012 µg/L water quality criterion.

Station ID	Station Name	Sample Date and Time	Concentration (µg/L)	Percent over Criterion
10A050	Puyallup River at Puyallup	8/18/2003 15:00	0.029	139
11A070	Nisqually River at Nisqually	2/23/1999 14:00	0.098	717
12B070	Leach Creek near Steilacoom	8/20/2008 12:00	0.037	208
32A070	Walla Walla River near Touchet	2/3/1997 7:15	0.038	217

Table 10. Metals results exceeding water quality criteria, excluding mercury results, and cadmium, lead, and zinc results from the Spokane River.

Station ID	Station Name	Sample Date and Time	Dissolved Metal	Criterion (µg/L)	Concen-tration (µg/L)	Percent over Criterion
05A070	Stillaguamish River near Silvana	10/18/1995 8:30	Copper	2.3711	3.26	37
12A100	Chambers Creek below Steilacoom Lk	6/18/1997 12:45	Copper	5.846	16.3	179
08M070	SF Thornton Creek at 107th Ave NE	10/20/2003 8:50	Lead	0.7943	0.834	5
45A070	Wenatchee River at Wenatchee	8/10/1998 15:50	Zinc	37.6802	39.4	5

In general, water column metals concentrations from ambient monitoring stations met water quality criteria and supported beneficial uses. The Spokane River, where zinc, lead, and to a lesser extent, cadmium, are known to be high, is the only clear exception. However, additional metals monitoring might be warranted on the following streams:

- South Fork Thornton Creek, where we found unusually high total lead and zinc concentrations, and dissolved lead exceeded the criterion once.
- Puyallup River, where mercury was particularly high on one occasion. Melting glaciers may release mercury trapped in ice during the latter half of the 20th century (Schuster et al., 2002). The high Nisqually River concentration occurred in February, however, so the source was unlikely to have been glacial melt water.
- Clear Creek near Silverdale, where dissolved chromium, though well below water quality criteria, was consistently higher than we have observed elsewhere.

This analysis is based on metals data from streams selected for ambient monitoring. Few, if any, were selected for monitoring because of suspected metals contamination. There are other streams in Washington with known metals contamination that we have not monitored and that were not included in the analysis above.

Relationships

Correlations

There were few strong correlations between metals concentrations and flow, hardness, or suspended solids (Table 11). These correlations are based on the entire dataset and so are more representative of relationships among statewide conditions than within a particular stream. A positive correlation with flow, for example, indicates that metals concentrations tended to be greater in larger streams; it does not necessarily indicate that, within a particular stream, concentrations were greater when flows were higher.

Table 11. Significant Kendall-tau correlations ($p<0.05$). Data from the Spokane River were excluded.

*Results below detection were set to 0 except for the ratios, where they were excluded. Negative correlations are shaded. *** indicates the correlation was not significant.*

Metal	Fraction	Flow	Hardness	Suspended Solids
Arsenic	Dissolved	-0.072	0.475	0.073
	Total	-0.083	0.357	0.176
Cadmium	Dissolved	0.251	0.144	-0.159
	Total	0.075	***	0.102
Chromium	Dissolved	-0.353	0.472	0.069
	Total	-0.133	***	0.428
Copper	Dissolved	0.067	0.147	0.221
	Total	0.083	***	0.457
Lead	Dissolved	***	0.103	0.119
	Total	0.158	0.125	0.359
Mercury	Total	***	-0.083	0.355
Nickel	Dissolved	-0.071	0.328	0.083
	Total	-0.094	0.185	0.374
Silver	Dissolved	***	***	***
	Total	***	***	***
Zinc	Dissolved	***	0.162	-0.106
	Total	0.096	***	0.154
AsDis:AsTot	Ratio	***	0.285	-0.284
CdDis:CdTot	Ratio	***	***	***
CrDis:CrTot	Ratio	-0.423	0.480	-0.423
CuDis:CuTot	Ratio	-0.068	0.168	-0.461
NiDis:NiTot	Ratio	***	0.226	-0.460
PbDis:PbTot	Ratio	***	***	-0.376
ZnDis:ZnTot	Ratio	-0.201	0.151	-0.327

None of the correlations were particularly strong, and little should be made of them for any particular case, especially since the analysis includes both between-stream and within-stream effects, as well as multiple samples from some streams but not others. However, there were some interesting patterns.

Some metals concentrations were more likely to be greater in smaller streams (arsenic, chromium, nickel) and others in larger streams (cadmium, copper, lead, zinc). The relationship was consistent for both total and dissolved fractions. Most metals were positively correlated with hardness and suspended solids.

Not surprisingly, where significant, the ratios of all dissolved metals to total metals were inversely proportional to both flow and suspended solids. At higher flows, the fraction of total

metals was greater relative to the fraction of dissolved metals, presumably because of greater suspended sediment and associated adsorbed metals.

The dissolved:total metal ratio was directly proportional to hardness. Rivers with higher hardness concentrations were more likely to have higher dissolved metals relative to total metals concentrations. Oddly, the two metals with hardness-based "conversion factors" (see the next section), cadmium and lead, were also the only two metals where the dissolved:total ratio was not correlated with hardness.

Dissolved vs. Total Fractions

Total metals concentrations are generally of less interest than dissolved concentrations because the metal fraction bound to particles (i.e., not dissolved) is less likely to be biologically significant. Water quality criteria are based on the dissolved fraction. However, under certain conditions of pH and temperature, adsorbed metals particles can be released into dissolved form.

Also, water quality criteria were initially developed for total metals and adjusted with a "conversion factor" so that the criteria would apply to the dissolved fraction of the metals. This conversion factor did not derive from ambient data and should not be used to routinely exchange dissolved and total metals fractions for ambient waters. However, if information about the "seasonal partitioning of the dissolved to total metals in the ambient water" is not available, the dissolved metals criteria can be used to determine total recoverable metals effluent limits by back-calculation, using the conversion factors in the criteria (WAC Chapter 173-201A, table 240(3), footnote dd).

Compared to median dissolved:total ratios at our metals monitoring stations, the conversion factors in the standards are higher, sometimes much higher (Figure 4). Therefore, using the conversion factors in the WAC to back-calculate a total recoverable criterion will usually result in a higher, conservative total recoverable criterion. However, this analysis is a summary of all ambient metals data. Ratios can vary greatly with location and season, and analyses at specific sites must use local data whenever possible.

Note that although the dissolved concentration should always be less than the total concentration, the ratios in Figure 4 were frequently greater than 1. This is because there is an inherent amount of variability in any chemical analysis. In the theoretical case where a metal's dissolved concentration always equaled its total concentration, the distribution of the ratio should center on 1.0, with tails less than and greater than 1 representing the variability in the analysis.

The dissolved:total ratio was seasonal for copper, nickel, and lead (Kruskal-Wallis $p<0.05$) but not for other metals. However, the seasonal pattern was not strong; that is, there was not much difference in the ratios between seasons, based on statewide data. The ratios tended to be slightly higher (closer to 1.0) during the low-flow months of August through October, probably because suspended sediment is lower then and therefore sediment-adsorbed (i.e., total) metals would also be lower (Figure 4 and Table 11).

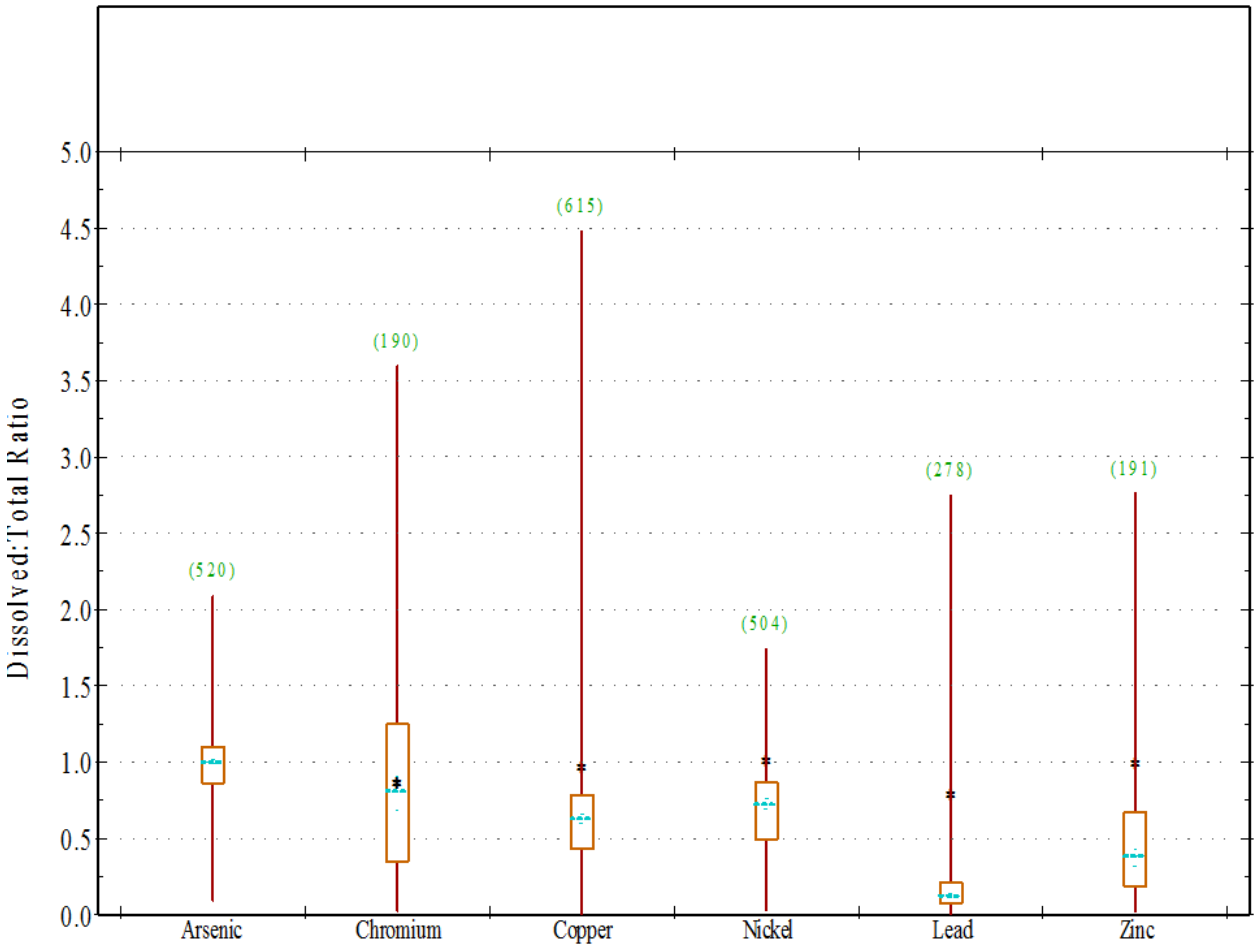


Figure 4. Box plots of the ratio of various dissolved metals to total metals.

The box marks the middle 50% of data, the "tails" mark the range of data, the dashed line marks the median, the tick marks are the 95% confidence intervals on the median, and the number of data is shown above each box. The "" marks the "conversion factor" reported in the criteria. Results with either the dissolved or total fractions less than the reporting limit were excluded. Silver and cadmium are excluded due to too few data points; there is no conversion factor for arsenic.*

Spokane River Cadmium, Lead, and Zinc

Relationships

Correlations

Within the Spokane River, cadmium, lead, and zinc, both total and dissolved, were all strongly correlated with flow ($p<0.001$; Table 12); the higher the flow, the higher the metals concentration. This is likely because at low flow the river contains a higher percentage of groundwater, while at higher flows the river is more dominated by water from the Coeur d'Alene system. For dissolved zinc, there appears to be a baseline concentration around 30 µg/L at the lowest flows (Figure 5).

There was also a positive correlation with suspended solids, most likely because sediment and flow co-vary, though the relationship was not as strong as with flow.

The relationship with hardness was weak, even for the dissolved to total ratios for cadmium and lead, which have hardness-based "conversion factors" in the water quality criteria.

Table 12. Significant Kendall-tau correlations ($p<0.05$) in the Spokane River.
*Results below detection were set to 0 except for the ratios, where they were excluded. Negative correlations are shaded. *** indicates the correlation was not significant.*

Metal	Fraction	Flow	Suspended Solids	Hardness
Cadmium	Dissolved	0.537	***	***
	Total	0.609	0.338	***
Lead	Dissolved	0.440	0.292	***
	Total	0..479	0.506	-0.171
Zinc	Dissolved	0.479	***	0.168
	Total	0.554	***	0.186
CdDis:CdTot	Ratio	***	***	***
PbDis:PbTot	Ratio	0.245	***	***
ZnDis:ZnTot	Ratio	***	-0.213	***

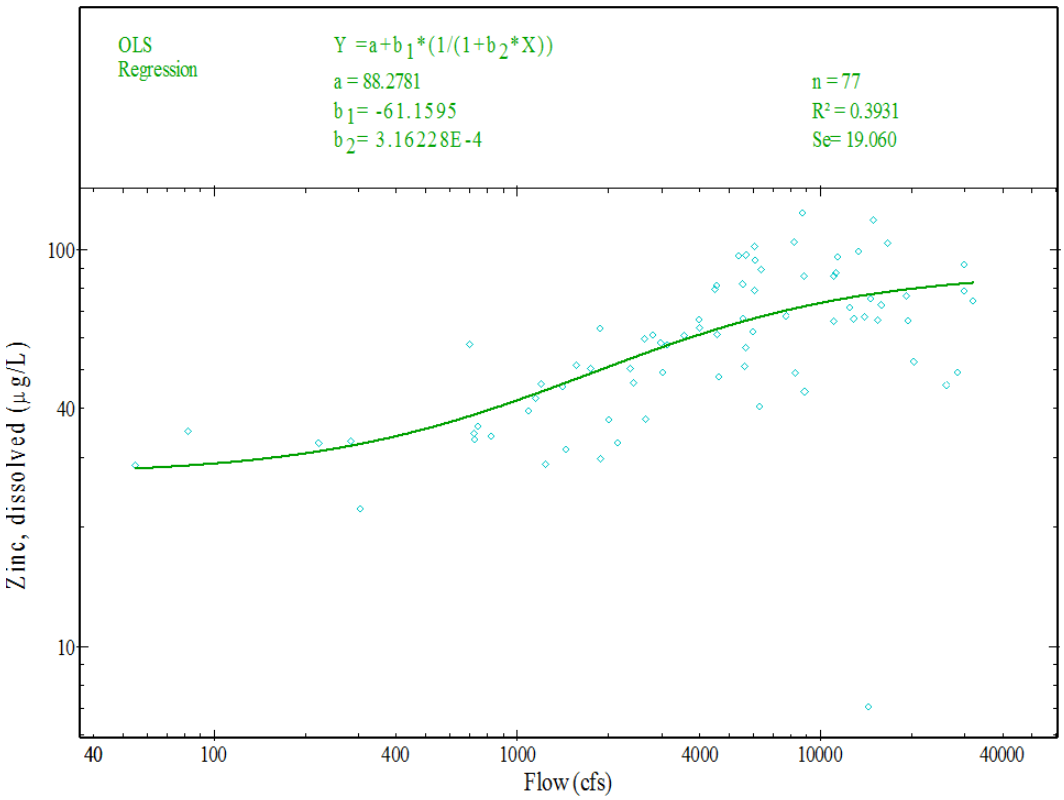


Figure 5. Relationship between flow and dissolved zinc.

OLS = Ordinary least squares. Se = Standard error.

Seasonality

We have seen that dissolved and total cadmium, lead, and zinc in the Spokane River are all strongly correlated with flow and, like flow, all have strong seasonality ($p<0.001$). Concentrations were lowest during the low-flow months of August, September, and October. Seasonality was strongest in total and dissolved zinc (Figure 6).

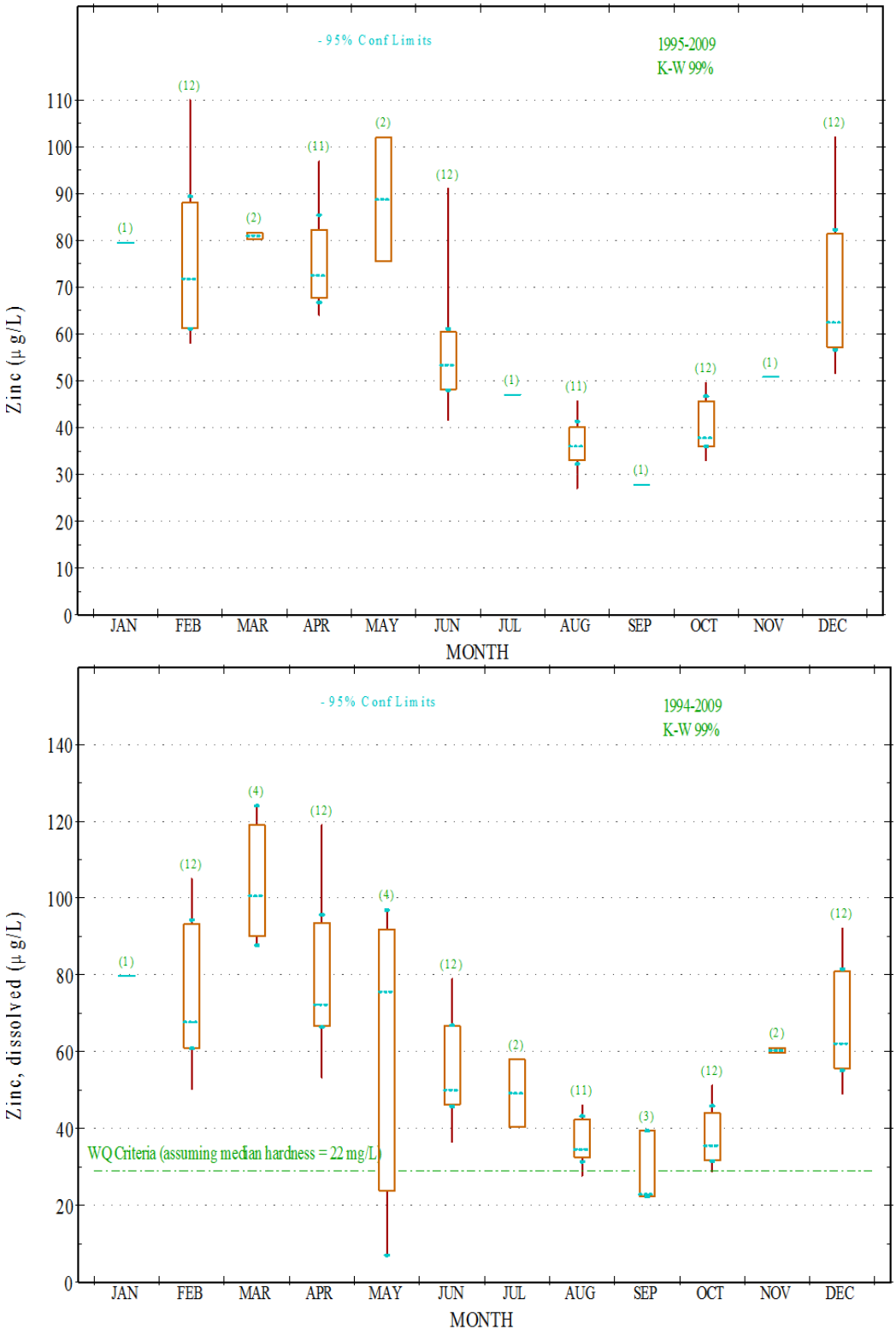


Figure 6. Seasonal distribution of total (top) and dissolved (bottom) zinc in the Spokane River at Stateline.

See Figure 4 for an explanation of the box plot. Kruskal-Wallis test for seasonality (K-W) was highly significant ($p<0.001$) for both plots.

Trends

There are strong indications that concentrations of total and dissolved cadmium, lead, and zinc are decreasing in the Spokane River (Table 13). In most cases, there appears to be a large decrease between mid-1999 and late 2001 (e.g., see Figure 7, top). Unfortunately, we have no data for that interval due to an interruption in funding. Since 2001, the decrease in metals concentrations has been less dramatic but is still statistically significant ($p<0.1$) for cadmium and zinc, though not for lead.

Since metals concentrations are correlated with flow (Table 12), it may be that metals concentrations are declining because of declining trends in flow. Flow may, in fact, have been decreasing, though the trend was not statistically significant (Figure 7, bottom). The lack of statistical significance is partly explained by the inherent variability in flow data, which makes trend detection more difficult. This is reflected in the width of the 95% confidence intervals on the slope (Table 13).

Table 13. Trends in the Spokane River.

*Statistically significant trends (p<0.10) are in **bold**.*

Parameter	Raw Trend (P-value)	Slope (% of median)	Slope (native units)	95% CI on Slope		Test
				Lower	Upper	
Trends on unadjusted data, May 1994 - September 2009						
Cadmium, total (µg/L)	**0.0014**	**-3.9%**	**-0.009**	**-0.013**	**-0.003**	**skc**
Cadmium, dissolved (µg/L)	**<0.001**	**-5.6%**	**-0.010**	**-0.016**	**-0.005**	**sk**
Lead, total (µg/L)	**0.075**	**-1.9%**	**-0.025**	**-0.073**	**0.001**	**skc**
Lead, dissolved (µg/L)	**0.021**	**-5.3%**	**-0.010**	**-0.023**	**-0.001**	**skc**
Zinc, total (µg/L)	**<0.001**	**-2.9%**	**-1.698**	**-2.627**	**-0.988**	**sk**
Zinc, dissolved (µg/L)	**<0.001**	**-3.3%**	**-1.932**	**-3.040**	**-1.147**	**sk**
Cadmium, dissolved:total	**0.05**	**-0.8%**	**-0.007**	**-0.016**	**0.001**	**sk**
Lead, dissolved:total	**0.063**	**-2.0%**	**-0.003**	**-0.010**	**0.002**	**sk**
Zinc, dissolved:total	**0.076**	**-0.4%**	**-0.004**	**-0.012**	**0.003**	**sk**
Hardness (mg/L) [1]	0.754	0%	0.000	-0.189	0.217	sk
Suspended solids (mg/L) [1]	0.104	-1.3%	-0.025	NA	NA	sk
Flow (cfs) [1]	0.187	-1.6%	-108	-281	45	skc
Trends on unadjusted data, October 2001 - September 2009						
Cadmium, total (µg/L)	**0.074**	**-0.42%**	**-0.001**	**-0.010**	**0.000**	**sk** [2]
Cadmium, dissolved (µg/L)	**0.015**	**-2.74%**	**-0.004**	**-0.010**	**-0.0004**	**sk**
Lead, total (µg/L)	0.157	-1.98%	-0.025	-0.060	-0.0012	sk
Lead, dissolved (µg/L)	0.361	-4.14%	-0.007	-0.015	0.010	sk
Zinc, total (µg/L)	**0.003**	**-1.60%**	**-0.837**	**-2.128**	**0.025**	**sk**
Zinc, dissolved (µg/L)	**0.002**	**-1.96%**	**-0.984**	**-1.823**	**0.004**	**sk**
Cadmium, dissolved:total	0.640	-0.51%	-0.004	-0.021	0.017	sk
Lead, dissolved:total	0.960	0.60%	0.001	-0.014	0.015	sk

Parameter	Raw Trend (P-value)	Slope (% of median)	Slope (native units)	95% CI on Slope		Test
				Lower	Upper	
Zinc, dissolved:total	1.000	0.02%	0.000	-0.016	0.023	sk
Hardness (mg/L)	0.446	-0.39%	-0.086	-0.230	0.100	sk
Suspended solids (mg/L)	0.769	0.00%	0.00	NA	NA	sk
Flow (cfs)	0.139	-1.95%	-108	-281	45	sk
Trends on flow-adjusted data [3], May 1994 - September 2009						
Cadmium, total (µg/L)	**0.010**	**NA**	**-0.006**	**-0.013**	**-0.002**	**skc**
Cadmium, dissolved (µg/L)	**0.000**	**NA**	**-0.009**	**-0.015**	**-0.003**	**sk**
Lead, total (µg/L)	0.785	**NA**	-0.008	-0.084	0.049	skc
Lead, dissolved (µg/L)	**0.091**	**NA**	**-0.010**	**-0.027**	**0.001**	**skc**
Zinc, total (µg/L)	**0.000**	**NA**	**-1.532**	**-2.489**	**-0.577**	**sk**
Zinc, dissolved (µg/L)	**0.000**	**NA**	**-1.659**	**-2.713**	**-0.339**	**sk**
Cadmium, dissolved:total	Not correlated with flow					
Lead, dissolved:total	**0.078**	**NA**	**-0.007**	**-0.009**	**0.003**	**sk**
Zinc, dissolved:total	Not correlated with flow					
Hardness (mg/L)	Not correlated with flow					
Suspended solids (mg/L)	0.686	**NA**	-0.0106	-0.0795	0.0153	skc
Trends on flow-adjusted data, October 2001 - September 2009						
Cadmium, total (µg/L)	0.250	NA	-0.004	-0.016	0.004	sk [2]
Cadmium, dissolved (µg/L)	0.250	NA	-0.003	-0.011	0.004	sk
Lead, total (µg/L)	0.542	NA	-0.027	-0.166	0.130	sk
Lead, dissolved (µg/L)	0.310	NA	-0.011	-0.025	0.009	sk
Zinc, total (µg/L)	0.155	NA	-0.662	-2.006	0.491	sk
Zinc, dissolved (µg/L)	0.310	NA	-0.477	-2.082	1.437	sk
Cadmium, dissolved:total	Not correlated with flow					
Lead, dissolved:total	Not correlated with flow					
Zinc, dissolved:total	Not correlated with flow					
Hardness (mg/L)	Not correlated with flow					
Suspended solids (mg/L)	0.946	NA	0.0033	-0.220	0.058	sk

CI = confidence interval.

"Test" refers to the statistical test for trend used, either seasonal Kendall (sk) or seasonal Kendall with correction for autocorrelation (skc).

NA = not applicable.

[1]Only data during months when metals data were available were used in the flow, hardness, and suspended solids trend analyses.

[2] The correction for autocorrelation is not appropriate when there are fewer than 10 years of data. Probabilities between the two tests (sk and skc) are not comparable.

[3] Flow adjustments were done using a hyperbolic relationship, which consistently had the lowest, or nearly the lowest, standard error.

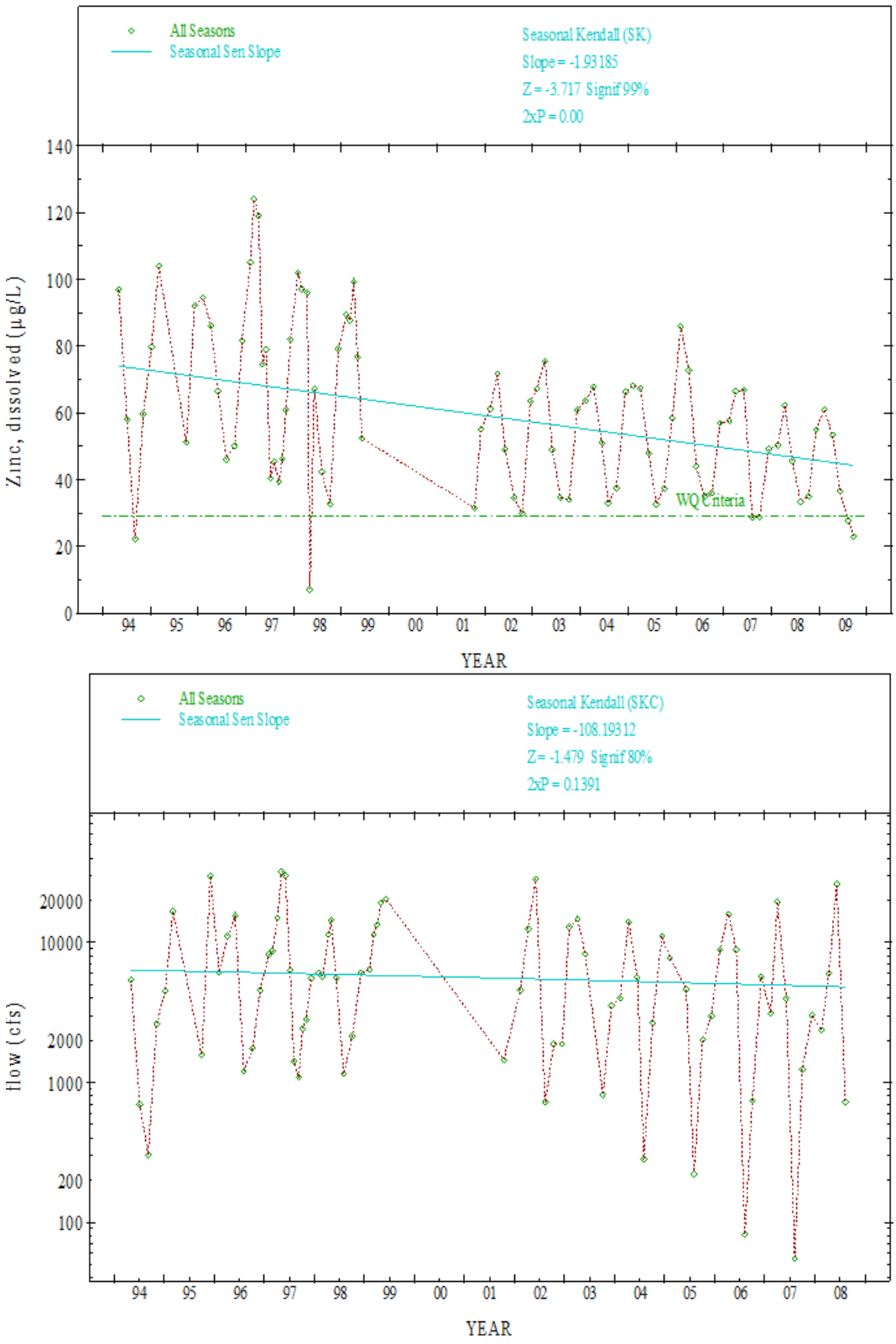


Figure 7. Trends in dissolved zinc (top) and flow (bottom) in the Spokane River at Stateline.

However, even after adjusting for flow, except for total lead, metals concentrations since 1994 are still trending down ($p<0.1$; Table 13). In the last decade, flow has been declining even more rapidly, though the trend is still not statistically significant. During this period, after adjusting for flow, no metals trends are significant, though slopes are still negative.

Since 1994, the dissolved:total ratios have also been declining, indicating that dissolved concentrations have been declining faster than total metals. This is confirmed by the slope of dissolved metal concentrations, which in all cases were steeper than the slopes of the total concentrations (measured as a percentage of the median).

Quality Assurance

In 2009 we collected almost 17,000 non-QC water quality results, including metals and various other parameters in addition to the standard 12 parameters listed under *Sample Collection and Analysis*.

- Fifty-five results (0.3%) were coded "4" indicating that the data are usable, but there were questions about the quality. About half of these were due to a thermistor calibration problem. The data were corrected but were coded as estimates.
- Twenty-two results (0.1%) were coded "5" or greater indicating serious data quality questions; these data will not be routinely used. This practice gives us the opportunity to explain quality issues to prospective users. Seventeen of these were conductivity results from one survey where the meter was not holding its calibration.

MEL assigned a qualifier to 14% of usable results. A total of 369 results (2.2%) were qualified as estimates ("J"), 2030 results (12%) as below the reporting limit ("U"), and 20 results (0.1%) were coded for both reasons ("UJ"). Eighty-one percent of all ammonia results were below the reporting limit, as were 16% of orthophosphate results (Table 14).

Data verification identified 26 instances where results in the EIM database were different than results in our primary database. They were all from February and were likely related to the conversion to a new Laboratory Information Management System (LIMS). Two results were not found in EIM for unknown reasons. Results were subsequently corrected or loaded.

There were 183 instances where results in our preliminary web database differed from those in our primary database. All but 11 of these were related to the LIMS conversion and mostly consisted of too many significant digits. The remaining 11 were primarily data entry errors that were corrected in the primary database but not on the web database. Another 201 results had an incorrect date on the web. All results were corrected so that both databases match.

Table 14. Results qualified by Manchester Environmental Laboratory as being below the reporting limit.

Parameter	Reporting Limit (mg/L except where otherwise noted)	Number of results coded U or UJ	Number of results recorded	Percent of results coded U or UJ
Ammonia	0.01	936	1155	81%
Chlorophyll	0.05 µg/L	0	6	0%
Fecal Coliform	1	92	1142	8%
Hardness	Not specified	0	70	0%
Metals	Various	473	1189	40%
Nitrate+Nitrite	0.01	76	1155	7%
Nitrogen, total	0.025	11	1155	1%
Nitrogen, total dissolved	0.025	0	12	0%
Organic carbon, dissolved	1	32	124	26%
Organic carbon, total	1	48	231	21%
Orthophosphate	0.003	180	1154	16%
Phosphorus, total	0.005	46	1154	4%
Suspended sediment concentration	1	12	80	15%
Suspended solids	1	89	1153	8%
Turbidity	0.5 NTU	55	1154	5%

Comparison to Quality Control Requirements

Decision Quality Objectives

Decision quality objectives (DQOs) are based on RMS values by concentration range (Table 15). In practice, estimates of variability are strongly influenced by extreme values, especially when the sample size is small. Also, the variability estimate is skewed downward for the lowest concentration ranges because data below the reporting limit are censored and, therefore, sample pairs below this limit have a variance of zero.

In general, variability of repeated measures followed the expected pattern of field sequential samples > field split samples > lab split samples. However, in a number of cases, lab split samples had greater variability than field QC samples, probably because lab splits are often based on different samples than the field QC samples. Field sequential samples occasionally had less variability than the field splits. Usually, a single field split pair with poor precision was responsible.

Variability between paired samples as measured by RMS was generally low.

No field split constituent/concentration ranges failed our Quality Assurance Monitoring Plan (QAMP) DQO (Hallock and Ehinger, 2003), which specifies that DQOs be evaluated against field splits, where possible.

Table 15. Root mean square (RMS) of the standard deviation of sequential samples, field splits, and laboratory splits.

Results exceeding QAMP DQO criteria (Hallock and Ehinger, 2003) are shown in bold.

Parameter (units)	Range	S_{error} [a] (mp)	Field Sequential RMS	*n*	Field Split RMS	*n*	Lab Split RMS	*n*
Specific Conductance (µS/cm)	≤50 >50-100 >100-150 >150	4.4 8.8 13.2 26.4	0.98 1.71 2.46 8.9	7 28 15 25	No field splits		No lab splits	
Fecal col. bacteria (colonies /100 mL)	1-1000 >1000	88 176	24.9 NA	60 0	No field splits		7.4 NA	178 0
NH_3-N (µg N/L)	≤20 >20-100 >100	1.76 8.8 17.6	0.52 1.52 3.19	50 8 3	0.31 1.87 4.39	46 8 3	1.57 0.54 2.84	62 7 3
Nitrogen, total (µg N/L)	≤100 >100-200 >200-500 >500	8.8 17.6 44 88	4.49 6.38 9.39 **160**	10 14 13 24	1.73 5.74 5.28 28.8	9 13 13 22	8.49 3.64 5.17 18.7	16 16 14 23
NO_3NO_2-N (µg N/L)	≤100 >100-200 >200-500 >500	8.8 17.6 44 88	0.94 2.02 2.46 63.5	16 13 13 19	0.55 1.13 1.60 11.6	15 13 11 18	1.62 1.05 1.74 62.7	27 14 11 21
Oxygen, dissolved (mg O_2 /L)	≤ 8 > 8-10 > 10-12 >12	0.70 0.88 1.06 2.11	0.04 0.20 0.07 0.13	3 12 29 15	No field splits		No lab splits	
pH	All	0.66	0.06	59	No field splits		No lab splits	
Phosphorus, soluble reactive (µg P/L^{-1})	≤50 >50-100 >100	4.4 8.8 17.6	0.90 1.90 5.92	51 7 3	0.76 3.58 3.46	49 5 3	0.34 0.42 1.58	89 8 5
Phosphorus, total (µg P/L)	≤50 >50-100 >100	4.4 8.8 17.6	1.44 6.62 13.3	33 14 14	1.15 7.26 10.2	31 11 14	1.00 2.33 2.78	46 17 17
Solids, suspended (mg /L)	≤10 >10-20 >20-50 >50	0.88 1.76 4.4 8.8	**1.57** 0.88 **12.5** **12.7**	36 9 8 7	No field splits		0.76 **3.90** 1.59 **11.9**	38 25 27 24
Temperature (ºC)	All	2.64	0.05	58	No field splits		No lab splits	
Turbidity (NTU)	≤10 >10-20 >20-50 >50	0.88 1.76 4.4 8.8	0.51 0.67 3.63 **9.0**	40 10 5 4	No field splits		0.24 1.37 1.36 3.54	73 16 7 5

[a] Maximum permissible standard error to meet QAMP DQO (Hallock and Ehinger, 2003).
n = number of sample pairs.
NA = not applicable.

Five field sequential constituent categories failed to meet the DQO criteria, but instream variability is included in these sample pairs so their variability is not a true measure of sampling plus analytical error. The total nitrogen (TN) category with high variance can be attributed to a single poorly matched sample pair (from Crab Creek near Beverly). As in years past, the variability in sequential samples for TSS concentrations tends to be particularly high, even in lab splits. This underscores the inherent variability in measurements of stream sediment.

The criteria in Table 15 are based on desired trend power. (We want to be able to detect a 20% change over a ten-year period with 90% confidence). Parameters that consistently do not meet the DQO criteria are unlikely to meet our goals for trend detection. The variability in most parameters indicates equivalent or greater trend power than the goal specified in our QAMP (Hallock and Ehinger, 2003). Our ability to detect trends in TSS, however, is likely to be worse than our goal.

Measurement Quality Objectives

MQOs for accuracy are based on comparisons (usually against standards) during calibration checks (Hallock, 2007). Checks failing criteria cause an immediate corrective action (usually recalibration). Bias MQOs are evaluated at the laboratory based on spike recovery. Precision MQO evaluations are based on comparisons to average relative standard deviation (RSD) of field split pairs. Results are presented in Table 16.

No parameters exceeded MQO criteria based on field split samples. Only TSS exceeded MQO criteria based on sequential samples, which include instream variability. One split pair (from John's Creek) was unusually poor (RSD = 125%).

Blanks

Almost all results for analyses of blank samples were "below reporting limits," or less than 3 µS (micro Siemens) for specific conductivity (Table 17). Blanks were not measured for temperature, dissolved oxygen, pH, or fecal coliform bacteria.

Few metals blanks are normally collected because many samples are below reporting limits anyway (Table 14). Protocols specify that four dissolved metals blank samples should be submitted annually, one from each run. In WY 2009, we collected seven dissolved metals blanks. Four dissolved zinc results exceeded reporting limits of 1 µg/L, and one dissolved copper exceeded reporting limits of 0.2 µg/L.

Historically, blanks for dissolved zinc frequently (43% of the time) exceeded reporting limits of 1 µg/L (though always < 5 µg/L, the reporting limit for total zinc). As a result, we have decided to set the quality code field = 4 for reported dissolved zinc results < 5 µg/L. The effect of this action is that our low-level zinc data on the internet will be annotated with the following footnote: "Asterisk * indicates possible quality problem for the result. You may wish to discuss the result with the station contact person." Also, we plan to double the number of dissolved metals blanks and modify our procedures as much as we reasonably can to minimize contamination.

We continued to have a problem with dissolved total nitrogen blanks (see Hallock, 2009a), despite using the recommended smaller syringe-type filter. Triple-rinsing the filter and syringe with three full volumes of de-ionized water seemed to resolve the problem.

All conductivity blanks were less than 3 µS.

Laboratory staff assessed the remaining elements of the laboratory QA program through a manual review of laboratory QC results including check standards, in-house matrix spikes, and laboratory blanks. Results were within acceptable ranges as defined by MEL's *Quality Assurance Manual* (MEL, 2006) or were either re-run or coded as determined by laboratory staff (e.g., as an estimate, "J").

Table 16. Average relative standard deviation (RSD) of replicate samples collected in Water Year 2009.

Parameter (units)	Precision MQO (%)	Sequential Sample RSD (%)	*n*	Field Split RSD (%)	*n*
Carbon, total organic	10	3.3	13	2.4	13
Carbon, dissolved organic	10	3.8	9	2.4	9
Specific conductance	10	1.3	73	No field splits	
Fecal coliform bacteria (>20 colonies /100 mL)	50% < 20 90% < 50	27 18	29 9	No field splits	
NH_3-N	10	1.4	61	1.4	57
Nitrogen, total	10	3.4	61	1.8	57
NO_3NO_2-N	10	1.3	61	0.7	57
Oxygen, dissolved	10	0.7	59	No field splits	
pH	10	0.5	59	No field splits	
Phosphorus, soluble reactive	10	4.0	61	3.8	57
Phosphorus, total	10	5.5	61	4.9	56
Solids, suspended	15	16	60	No field splits	
Suspended sediment concentration	15	1.6	2	No field splits	
Temperature	10	0.2	58	No field splits	
Turbidity	15	10.3	59	No field splits	

"n" is the number of sample pairs.

Table 17. Results of field process blank (de-ionized water) samples.

Parameter	Reporting Limit	Number Above Reporting Limit (concentration)	Sample Size *n*
Metals (µg/L)	Various	5 (1 dissolved copper at 0.2 µg/L and 4 dissolved zinc at 1.3, 1.4, 2.0, and 2.4 µg/L)	82
Carbon, dissolved organic (mg/L)	1	0	3
Carbon, total organic (mg/L)	1	0	4
Hardness (mg/L)	0.3	2 (0.32 and 0.53 mg/L)	5
NH_3-N (µg/L)	10	0	11
NO_3/NO_2-N (µg/L)	10	0	11
Soluble reactive phosphorus (µg/L)	3	0	11
Specific conductivity (µS)	NA	NA (mean: 1.1 µS, std dev: 0.33)	9
Suspended solids (µg/L)	1	0	3
Total nitrogen (µg/L)	25	0	11
Total nitrogen, dissolved (µg/L)	25	2 (54 and 68 µg/L)	6
Total phosphorus (µg/L)	5	0	11
Turbidity (NTU)	0.5	0	5

NA = not applicable.

Continuous Temperature Monitoring

Pre- and post-deployment calibration checks using a certified reference thermometer met or exceeded the criteria for the instruments (Ward, 2005).

All but one of the temperature loggers were deployed by 1 July, and the last one was deployed on 10 July. The earlier deployments ensured that all of the logger data sets recorded the seasonal 7-day average maximum temperatures for the first time since we began continuous monitoring of temperature.

Continuous Oxygen Monitoring

The formal QC review of data collected by deployed Hydrolabs® will be included in next year's annual report. In general, the oxygen sensor performed extremely well. We expect most oxygen and temperature data to be usable. Conductivity and pH results, however, began to drift unpredictably after a few weeks.

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Conclusions and Recommendations

Following are conclusions and recommendations resulting from this study.

Conclusions

- Most quality control results were within the limits specified in our Quality Assurance Management Plan and were consistent with findings in previous years.
- Except where noted otherwise, data collected in Water Year 2009 by Ecology's River and Stream monitoring program can be used without qualification.
- Results from a high percentage of dissolved zinc field process blanks were above reporting limits. All dissolved zinc data less than 5 µg/L have been assigned quality code=4, which indicates a potential data quality issue.
- Water column metals concentrations were not chronically high in most of the ambient stations we have monitored. Some notable exceptions include:
  - Spokane River (zinc, lead, and cadmium).
  - South Fork Thornton Creek (zinc and lead).
  - Clear Creek near Silverdale (chromium).
- Concentrations of total and dissolved cadmium, lead, and zinc have been declining in the Spokane River since 1994. The declines are partly, but not entirely, explained by changes in flow.

Recommendations

- When sampling for dissolved nitrogen, small syringe-type filters should be at least triple-rinsed with full volumes of de-ionized water. This is because of nitrogen contamination from cellulose-acetate filters.
- TidBit deployments should be expanded to year-round at stations with supplemental temperature standards. These areas have critical periods in the spring and fall which our summer TidBit deployments miss.
- Field sampling staff need to take extreme care to avoid contaminating dissolved zinc samples.
- Metals monitoring should be continued at the Spokane River at Stateline (lead, zinc, and cadmium), South Fork Thornton Creek (lead and zinc), Puyallup River (mercury), and Clear Creek (chromium). In addition, metals data from stations upstream of regulated discharges are needed for permit writing.

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Appendices

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Appendix A. Station Description and Period of Record

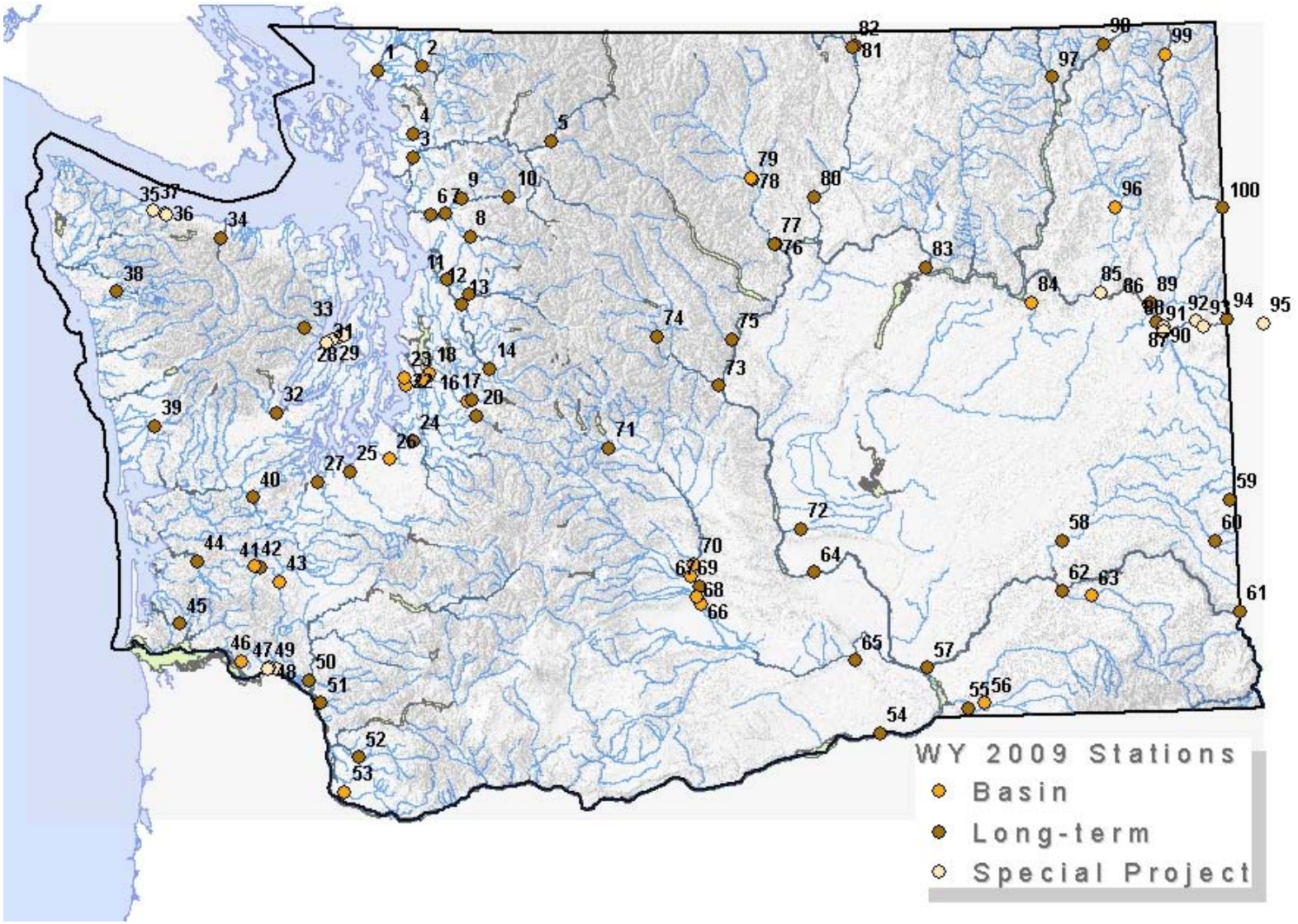

Figure A-1. Map showing stations monitored in Water Year 2009.

See Table 1 for the key.

Monitoring History for Environmental Assessment Program Ambient Monitoring Stations

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
01A050	Nooksack R @ Brennan	L		X XX XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
01A070	Nooksack R @ Ferndale	B	XXXXXXXX	XX X X			
01A090	Nooksack R nr Lynden	B		X X X			
01A120	Nooksack R @ No Cedarville	L	X XXXXXXXX X	XX X XX	XXXXXXXXXX	XX X XXXXX	XXXXXXXXXX
01A140	Nooksack R above the MF	B				X	X X
01B050	Silver Cr nr Brennan	B				XX	
01D070	Sumas R nr Huntingdon BC	B		X X XXX	XXXXXXXXXX	XXX X	
01D080	Sumas R @ Jones Road	B					X
01D090	Sumas R @ Sumas	B		X X			
01D120	Sumas R nr Nooksack	B				X	
01E050	Whatcom Cr @ Bellingham	B		X X		X	
01E070	Whatcom Cr @ Lake Outlet	B		X			
01E090	Whatcom Lake nr Bellingham	B	XXX X	X			
01F070	S.F. Nooksack @ Potter Rd	B				X	X X
01G070	M.F. Nooksack R	B				X	X X
01H070	Terrell Cr nr Jackson Rd.	B					X
01N060	Bertrand Cr. @ Rathbone Rd	B					X
01T050	Anderson Cr @ South Bay Road	B					X
01U070	Fishtrap Cr @ Flynn Rd	B					X
03A050	Skagit R @ Conway	B		X X			
03A060	Skagit R nr Mount Vernon	L	X XXXXXXXX X	X XXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
03A070	Skagit R nr Sedro Woolley	B		X X X			
03A080	Skagit R abv Sedro Woolley	B					X X
03B045	Samish R. nr Mouth	B				X	X
03B050	Samish R nr Burlington	L	X XXXXXXXX X	XX X XXX	XXXXXXXXXX	XX X XXXXX	XXXXXXXXXX
03B070	Samish R nr Hoogdal	B		X			
03B077	Samish R abv Parson Cr	B					
03B080	Samish R. nr Prairie	B				X	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
03C060	Friday Cr Blw Hatchery	B		X		X X	
03C080	Friday Cr at Alger	B		X			
03D050	Nookachamp Ck nr Mouth	B				X	X
03E050	Joe Leary Slough nr Mouth	B					X
03F070	Hill Ditch @ Cedardale Rd	B					X
04A060	Skagit R @ Concrete	B		X X XXX	XXXXXXXXXX	XX X	
04A100	Skagit R @ Marblemount	L	X XXXXXXXX X	X XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
04A140	Skagit R @ Newhalem	B		X X			
04B070	Baker R @ Concrete	B	XXXX	XXX	XXXXXXXXXX	XX X	
04B150	Baker Lake @ Boulder Cr	B		XXXXX	X		
04C070	Sauk R nr Rockport	B		XXX	XXXXXXXXXX	XX X	X
04C110	Sauk R @ Darrington	B	X XX				
04C120	Sauk R @ Backman Park	B					X
04E050	Finney Cr near Birdsview	B				X	
05A050	Stillaguamish R @ Stanwood	B		X			
05A055	Hat Slough nr Stanwood	B		X			
05A070	Stillaguamish R nr Silvana	L	X XXXXXXXXXX	XX X XXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
05A090	SF Stillaguamish R @ Arlington	L		X X XX	XXXXXXXXXX	XX X XXXXX	XXXXXXXXXX
05A110	SF Stillaguamish R nr Granite Falls	L	X XXXXXXX	X		X XXXXX	XXXXXXXXXX
05B070	NF Stillaguamish R @ Cicero	L	XXXXXXXX	XX X XX	XXXXXXXXXX	XX X XXXXX	XXXXXXXXXX
05B090	NF Stillaguamish R @ Oso	B		X			
05B110	NF Stillaguamish R nr Darrington	L		X		X XXXXX	XXXXXXXXXX
05G050	Jim Cr @ Jordan Rd	B					
07A090	Snohomish R @ Snohomish	L	X XXXXXXXX X	XX X XXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
07A109	Snohomish R nr Monroe NE	B		X			
07A110	Snohomish R nr Monroe SW	B		X			
07A111	Snohomish R nr Monroe (USGS)	B		XX X	XX		
07B055	Pilchuck R @ Snohomish	B		X X XX	XXXXXXXXXX	XXX X	
07B075	Pilchuck R @ Russel Rd.	B					

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
07B090	Pilchuck R nr Lake Stevens	B		X			
07B120	Pilchuck R @ Robe-Menzel Rd.	B					X
07B150	Pilchuck R @ Menzel Lake Rd.	B					X
07C070	Skykomish R @ Monroe	L		X X XXX	XXXXXXXXXX	XXXX XXXXX	XXXXXXXXXX
07C090	Skykomish R @ Sultan	B		X X			
07C120	Skykomish R nr Gold Bar	B	X XXXXXXXXXX	X XX	XXXXXXXXXX	XXX	X
07C170	Skykomish R nr Miller R	B		X			
07D050	Snoqualmie R nr Monroe	L		X		XX XXXXX	XXXXXXXXXX
07D070	Snoqualmie R nr Carnation	B		X XX XXX	XXXXXXXXXX	XXX X	
07D100	Snoqualmie R abv Carnation	B					X
07D130	Snoqualmie R @ Snoqualmie	L	X XXXXXXXXXX	X XXX	XXXXXXXXXX	XXX XXXXX	XXXXXXXXXX
07D150	M F Snoqualmie R nr Ellisville	B				X	X
07E055	Sultan R @ Sultan	B	XXXXXXXX X	XX X		X	X
07F055	Woods Cr @ Monroe	B		X X		X X	
07G070	Tolt R nr Carnation	B	XXXXXXXXXX	X		X	
07M070	SF Snoqualmie R at North Bend	B				X	
07M120	SF Snoqualmie R @ 468th Ave. SE	B					X
07N070	NF Snoqualmie R near Ellisville	B				X	
07P070	Patterson Ck nr Fall City	B				X X	
07Q070	Raging R @ Fall City	B				X	X
07R050	French Cr nr Mouth	B				X	
08A070	McAleer Cr nr Mouth	B		X			
08A090	Upper McAleer Cr	B		X			
08B070	Sammamish R @ Bothell	B	X XXXXXXXXXX	XX X X XX	XXXXXXXXXX	XXXXX X	
08B110	Sammamish R @ Redmond	B		X		X	
08B130	Issaquah Cr nr Issaquah	B	XXX X	XX X X		X	
08C070	Cedar R @ Logan St/Renton	L	X XXXXXXX	X X X XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
08C080	Cedar R @ Maplewood	B				X	
08C090	Cedar R @ Maple Valley	B		X		X	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
08C100	Cedar R @ RR Grade Rd	B					X
08C110	Cedar R nr Landsburg	L	X XXX	X XX	XXXXXXXXXX	XX XXXXXX	XXXXXXXXXX
08D070	Mercer Slough nr Bellevue	B		X			
08E090	Kelsey Cr @ Monitor Site	B		X			
08E110	Upper Kelsey Cr	B		X			
08F070	May Cr nr Mouth	B		X			
08G070	Valley Cr nr Mouth	B		X			
08H070	Thornton Cr nr Mouth	B		X			
08H100	North Branch Thornton Cr	B		X			
08J070	West Branch Thornton Cr	B		X			
08J100	Swamp Creek abv Lynnwood	B				X	
08K090	Ship Canal @ Freemont	B				X	
08K100	North Creek nr Everett	B				X	
08L070	Laughing Jacobs Cr nr Mouth	B					X
08M070	SF Thornton Cr @ 107th Ave NE	B					X
08N070	Johns Creek @ Gene Coulon Park	B					X
09A060	Duwamish R @ Allentown Br	B			XXXXXXXXXX	XX	
09A070	Duwamish R @ Foster	B	X XXXXXXXX				
09A080	Green R @ Tukwila	L				XXXXXXXXX	XXXXXXXXXX
09A090	Green R @ 212th St nr Kent	B		X XX	XXXXXXXXXX	XX X	
09A110	Green R @ Auburn	B	XXXXX X	XX			
09A130	Green Abv Big Soos/Auburn	B	X XXXXXXXXX	X		X	
09A150	Green R nr Auburn	B		X			
09A170	Green R nr Black Diamond	B		X			
09A190	Green R @ Kanaskat	L	X XX	X XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
09B070	Big Soos Cr blw Hatchery	B		X X			
09B090	Big Soos Cr nr Auburn	B	XXXX	XX		X X	
09C070	Des Moines Cr nr Mouth	B		X		X	X
09C090	Des Moines Cr @ So 200th	B		X			

Station Number	Name	Long-term or Basin	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
09D070	Miller Cr nr Mouth	B		X			X X
09D090	Miller Cr @ Ambaum Blvd SW	B		X			
09E070	Mill Creek @ Orillia	B			XXXXXX	X X	
09E090	Mill Creek - Kent on W Valley Hwy	B			XXXXXX	X	
09F150	Newaukum Creek nr Enumclaw	B				X	
09H090	Black R @ Monster Rd SW	B				X	X
09J090	Longfellow Cr abv 24-25th St juctn	B					XX
09K070	Fauntleroy Cr. nr Mouth	B					XX
09L060	Walker Creek near mouth	B					X
09M050	North Creek at Seahurst Pk	B					X
10A050	Puyallup R @ Puyallup	B	X XXXXXXXX X	XXX XXXXX	XXX		XXX
10A070	Puyallup R @ Meridian St	L		X X XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
10A075	Puyallup R @ East Main St.	B					X
10A080	Puyallup R. nr Sumner	B					X
10A090	Puyallup R @ McMillin	B		X X			
10A110	Puyallup R @ Orting	B	X XXX XXXXXX	XXX X XX	XXXXXXXXXX	XX X X	
10B070	Carbon R nr Orting	B	XX	XX		X	
10B090	Carbon R @ Fairfax	B		X			
10C070	White R @ Sumner	B		XX XX	XXXXXXXXXX	XX X X	
10C085	White R nr Sumner	B	X	X X		X	
10C090	White R @ Auburn	B	XXXXX	X X			
10C095	White River @ R Street	B				X	XXXXXXX X
10C110	White R blw Buckley	B		X			
10C130	White R @ Buckley	B				X	
10C140	White R nr Buckley	B		X			
10C150	White R nr Greenwater	B		X			
10D070	Boise Cr @ Buckley	B	XXX	X			X
10D090	Boise Cr nr Enumclaw	B	XXX				
10E070	Salmon Cr @ Sumner	B		X			

Station Number	Name	Long-term or Basin	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
10F070	So Prairie Cr nr Crocker	B		X			
10F090	South Prairie Ck nr S. Prairie	B				X	
10H070	Lk Tapps Tailrace @ E. Valley Hwy.	B					X
10I050	Joe's Creek @ SR 509	B					X
11A070	Nisqually R @ Nisqually	L		X X XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
11A080	Nisqually R @ McKenna	B	X XXXXXXXXXX	X		XX X	
11A090	Nisqually R abv Powell Cr	B		X XX	XXXXXXXXXX	X	
11A110	Nisqually R @ LaGrande	B		X			
11A140	Nisqually R @ Elbe	B		X X XX	X		
12A070	Chambers Cr nr Steilacoom	B	XXXXX	XX X	XXXXXX	XX X X	
12A100	Chambers Cr blw Steilacoom Lk	B	XX	X		XXX	
12A110	Clover Cr abv Steilacoom Lk	B	XXX	X		XXXX	
12A130	Clover Cr nr Parkland	B	XX				
12B070	Leach Cr nr Steilacoom	B	XXX	X			X
12C070	Flett Cr @ Custer Rd	B	XXX	X			
12D050	Ponce de Leon Ck nr mouth	B				XXX	
12F090	Spanaway Cr @ Old Military Rd.	B					X
13A050	Deschutes R @ Tumwater	B	XXXXX X	X X			
13A060	Deschutes R @ E St Bridge	L		XX	XXXXXXXXXX	XXXX XXXXX	XXXXXXXXXX
13A080	Deschutes R nr Olympia	B		X X X			
13A150	Deschutes R nr Rainier	B	X XXX	X X XX	XXXXXXXXXX	XX X	
14A060	Goldsborough Cr @ Shelton	B				X X	
14A070	Goldsborough Cr nr Shelton	B	XXX X	X			
15A070	Dewatto R nr Dewatto	B		XXX		X	X
15B050	Chico Cr nr Chico	B				X	X
15B070	Chico Cr nr Bremerton	B	XXXXX	X			
15C070	Clear Cr @ Silverdale	B				X	X
15D070	Tahuya R @ Tahuya River Rd	B					X
15D090	Tahuya R nr Belfair	B				X	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
15E070	Union R nr Belfair	B				X	X
15F050	Big Beef Cr @ Mouth	B					XXXXX
15G050	Little Mission Cr. @ Hwy 300	B					X
15H050	Stimson Creek @ Hwy 300	B					X
15J050	Big Mission Cr. @ Hwy 300	B					X
15K070	Olalla Cr. @ Forsman Rd.	B					X
15L050	Seabeck Cr. @ mouth	B					XXXXX
15M070	Llt Anderson Cr. @ Anderson Hill Rd	B					XXXXX
15N070	Stavis Cr. nr Mouth	B					XXXXX
16A070	Skokomish R nr Potlatch	L	XXXXXXXX X	X XXX XX	X XXXXXX	XXXXXXXXXX	XXXXXXXXXX
16B070	Hamma Hamma R nr Mouth	B	XXXXXX X	X X			
16B110	Hamma Hamma R nr Eldon	B		XX		X	
16C070	Duckabush R @ Mouth	B	XXXXXXXX X	X X			
16C090	Duckabush R nr Brinnon	L		XXX		XXXXXX	XXXXXXXXXX
16D070	Dosewallips R @ Brinnon	B	X XXXXXXXXXX	X XXX		X	
16E070	Finch Cr @ Hoodsport	B				X X	
17A060	Big Quilcene R nr mouth	B					XX
17A070	Big Quilcene R nr Quilcene	B	X XXXXXXX	XXX		X X	
17B070	Chimacum Cr nr Irondale	B				X	
17B090	Chimacum Cr @ Hadlock	B		X			
17B100	Chimacum Cr @ Chimacum	B				X	
17B110	Chimacum Cr nr Chimacum	B		X			
17C070	Jimmycomelately Cr near Mouth	B					XX
17G060	Tarboo Cr. nr mouth	B					X
18A050	Dungeness R nr Mouth	B					XXXXXX
18A070	Dungeness R nr Sequim	B	X XXXXXXX	XXX		X X	XX
18B070	Elwha R nr Port Angeles	L	X XXXXXXX X	XXX		XXXXXX	XXXXXXXXXX
18B080	Elwha R @ McDonald Br (USGS)	B		XXXXX	XX		
19A070	Pysht R nr Pysht	B		XXX			

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
19B070	Hoko R nr Mouth	B		X			
19B090	Hoko R nr Sekiu	B		XX			
19C060	West Twin R. nr mouth	B					XXXXX
19D070	East Twin R. nr Mouth	B					XXXXX
19E060	Deep Cr. nr mouth	B					XXXXX
20A090	Soleduck R nr Forks	B		XXX		X	
20A130	Soleduck R nr Fairholm	B	XXXXXXXX X	X			
20B070	Hoh R @ DNR Campground	L	XXXXXXXXXX	X XXX XX	X	XXXXXX	XXXXXXXXXX
20C070	Ozette R @ Ozette	B	X XX				
20D070	Dickey R nr La Push	B				X	
21A070	Queets R @ Queets	B	XXXXXXXXXX	X X		X	
21A080	Queets R nr Clearwater (USGS)	B		XX	XX		
21A090	Queets R abv Clearwater	B		XX			
21B090	Quinault R @ Lake Quinault	B	X X XXXXXX	X XXX XX	X	X	
21C070	Clearwater R nr Queets	B		XX			
21D070	NF Quinault R @ Amanda	B		XXXXXXXXX	XX		
22A070	Humptulips R nr Humptulips	L	X XXXXXXXXX	X XXX XX	XXXXXXXXX	XXXXXXXXX	XXXXXXXXX
22B070	WF Hoquiam R nr Hoquiam	B	XXXXX	XX		X	
22C050	Chehalis R nr Montesano	B		XX XX	XXXXXXXXX	XXX	
22C070	Chehalis R nr Fuller	B		X X			
22D070	Wishkah R nr Wishkah	B	XXXXX	XX X			
22F090	Wynoochee R nr Montesano	B	X XXXXXXXX X	X XX X			
22G070	Satsop R nr Satsop	B	XXXXXXXXX	XX X XXX	XXXXXXXXX	XX X	
22H070	Cloquallum Cr nr Elma	B	XXXX	X X X			
22J070	Wildcat Cr nr McCleary	B		X			
23A070	Chehalis R @ Porter	L	X XXXXXXXXX	XXXX XXXXX	XXXXXXXXX	XXXXXXXXX	XXXXXXXXX
23A100	Chehalis R @ Prather Rd	B				XXX	XXXX
23A110	Chehalis R @ Galvin	B		X X X			
23A120	Chehalis R @ Centralia	B		XX	XXXXXXXXX	XX X	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
23A130	Chehalis R @ Claquato	B				X	
23A140	Chehalis R @ Adna	B		X X X			
23A160	Chehalis R @ Dryad	L	X XXXXXXX	XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
23A170	Chehalis R. nr Doty	B					X
23B050	Newaukum @ Mouth	B				X	
23B070	Newaukum R nr Chehalis	B	XXXXXXXX	X X X		X	
23B090	SF Newaukum R @ Forest	B		X			
23C070	NF Newaukum R @ Forest	B		X			
23D055	Skookumchuck R @ Centralia	B				X X	
23D070	Skookumchuck R nr Centralia	B	X X				
23E060	Black R. @ Hwy. 12	B					X
23E070	Black River @ Moon Road Bridge	B				XX X XXX	
23F070	Mill Ck nr Bordeaux	B				X	
23G070	SF Chehalis R @ Beaver Creek Rd.	B				X	X
24B090	Willapa R nr Willapa	L	XX X	XXXXX XXXX	XX XXXXXX	XXX XXXXX	XXXXXXXXXX
24B095	Willapa R nr Menlo	B					X
24B130	Willapa R @ Lebam	B	X XX X	XX	XXXXXXXXXX	XXX	
24B150	Willapa R @ Swiss Picnic Rd	B					X
24C070	SF Willapa R @ South Bend	B		X			
24D070	North R nr Raymond	B		X XX		XX	
24D090	North R @ Artic	B				X	
24E070	North Nemah R @ Nemah	B		X X			
24F040	Naselle R @ Mouth	B		X			
24F055	Naselle R @ Naselle	B		X			
24F070	Naselle R nr Naselle	L	XX X	X X XXXX	X	X XXXXX	XXXXXXXXXX
24G070	Bear Branch nr Naselle	B	X	X			
24H070	Middle Nemah R nr Nemah	B		X			
24J070	South Nemah R nr Nemah	B		X			
24K060	Forks Cr abv Hatchery (outfall)	B					

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
25A070	Columbia R @ Cathlamet	B	XX	X X			
25A075	Columbia R @ Bradwood	B		XXXXXX			
25A110	Columbia R @ Fisher Is Lt	B	XXXXX				
25A115	Columbia R nr Longview	B	XX	X X			
25A150	Columbia R blw Longview Br	B	X	X			
25B070	Grays R nr Grays River	B		X XX		X	
25C070	Elochoman R nr Cathlamet	B	X	X XX		X	X
25D050	Germany Cr @ mouth	B					XXXXX
25E060	Abernathy Cr nr mouth	B					XXXXX
25E100	Abernathy Cr. @ DNR	B					XXXX
25F060	Mill Cr. nr mouth	B					XXXXX
25F100	Mill Cr. @ DNR	B					XXXX
26B070	Cowlitz R @ Kelso	L	XXXXXXX	XX X XX	XXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
26B100	Cowlitz R @ Castle Rock	B	XXX	X XXXX			X
26B150	Cowlitz R @ Toledo	B	XXXXX	X X XX	X	X	
26B180	Cowlitz nr Kosmos B Cispus	B	X XXXXXXXX				
26B190	Cowlitz R nr Randle	B	X	X X X			
26B200	Cowlitz R nr Kosmos	B		X			
26C070	Coweeman R @ Kelso	B	XXXXX	XX X	XXXXXX	XXX X	
26C073	Coweeman R @ 3802 Allen Street	B					
26C080	Coweeman R av Goble Cr	B				X	
26C090	Coweeman R nr Rose Valley	B		X X			
26D070	Toutle R nr Castle Rock	B	XXXXXXXX X	X X X XX	XXXXXXXXX	XXX	
26E070	Cispus R nr Kosmos	B		X	XXX		
26F050	Olequa Cr. at 7th Street	B					X
27A070	Columbia R @ Kalama	B	XX	X XX			
27A110	Columbia River nr St. Helens	B	XX	X			
27B050	Kalama R @ Kalama	B	XXXXXXXXX	X			
27B070	Kalama R nr Kalama	L		XX XX	XXXXXXXXX	XXX XXXXX	XXXXXXXXX

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
27B090	Kalama R @ Upper Hatchery	B		X			
27B110	Kalama R @ Pigeon Springs	B		X			
27C070	Lewis R @ Woodland @ I-5	B	XXXXX X	X XX			
27C080	Lewis R @ Co Rd 16	B				X	
27C110	Lewis R @ Ariel	B	X X	XXX	X		
27D090	EF Lewis R nr Dollar Corner	L		XXX	XXXXXXXXXX	XXX XXXXX	XXXXXXXXXX
27E070	Cedar Cr nr Etna	B				X	
27F070	Gee Cr @ Ridgefield	B				X	
28A090	Columbia blw Vancouver WA	B	XX	X			
28A091	Columbia blw Vancouver OR	B	XX	X			
28A100	Columbia R @ Vancouver	B					X X
28A165	Columbia R @ Warrendale	B		XXXXXXX			
28A170	Columbia R blw Bonneville	B	XX	X			
28A175	Columbia R @ Bonneville Dam	B	XX	X X			
28B070	Washougal R @ Washougal	B	X	X XX XX		X	X
28B085	Washougal R abv Ltl Washougal R	B					
28B090	Washougal R nr Washougal	B	XXXXXXXX	X			
28B110	Washougal R blw Canyon Ck	B				X X	X
28C070	Burnt Br Cr @ Mouth	B		X			XX XX
28C110	Burnt Br Cr @ Vancouver	B		X			
28D070	Salmon Cr @ Salmon Creek	B		X			
28D110	Salmon Cr nr Battle Ground	B		X			
28E070	Weaver Cr nr Battle Ground	B		X			
28F070	Lake R nr Ridgefield	B				X	
28G070	Gibbons Ck nr Washougal	B				X	X
28H070	Campen Cr nr Washougal	B					X
28I120	Lacamas Creek @ Goodwin Road	B					X
28J070	Little Washougal Cr. @ Blair Road	B					X
29B070	White Salmon R nr Underwood	B	XXXXXXXXXX	X XX XXXX	XXXX	X	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
29B090	White Salmon R @ Husum St	B					X
29C070	Wind R nr Carson	B		X XXXX	XXXX	X	
29D070	Rattlesnake Cr nr Mouth	B				XXX	X
29E070	Gilmer Cr nr Mouth	B				XXX	
30A070	Columbia R @ The Dalles	B	XX	XXXXXXXX		X	
30A090	Columbia R @ The Dalles Dam	B	X				
30B060	Klickitat R nr Lyle	B				XX	
30B070	Klickitat R nr Pitt	B	XXX	X XXXXXXX	X		
30C070	Little Klickitat nr Wahkiacus	B		X		XX	
30C090	Little Klickitat R. @ Olson Rd.	B					X
30C150	Little Klickitat R. @ Hwy 97	B					X
31A070	Columbia R @ Umatilla	L	X	XXXXX		XXXXXXXXX	XXXXXXXXXX
31A090	Columbia R @ McNary Dam	B	X XXXXXXXXXX				
31A130	Columbia R nr Yakima R Mouth	B	X				
31B110	Rock Creek @ Bickleton Hwy	B					
31C012	Alder Crk @ 6 Prong Rd Bridge	B					
31D010	Pine Creek @ One Mile Bridge	B					
32A070	Walla Walla R nr Touchet	L	X XXXXXXX	XX XXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
32A090	Walla Walla R nr Lowden	B		XX			
32A100	Walla Walla at east Detour Road Br	B				X	X
32A110	Walla Walla R @ College Pl	B		XX XX			
32B070	Touchet R @ Touchet	B		X XX XX	XXXXXXXXXX	XXX X	
32B075	Touchet R. @ Cummins Rd.	B					X X
32B080	Touchet at Sims Road	B				X	X
32B100	Touchet R @ Bolles	B		XX		X	X
32B120	Touchet R nr Dayton	B		XX			
32B130	Touchet R @ Dayton	B	X X			XX	
32B140	Touchet R above Dayton	B				X	
32C070	Mill Cr @ Swegle Rd	B		X XX			X

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
32C110	Mill Cr @ Tausick Way	B		X X		X	
33A010	Snake R nr Mouth	B	X				
33A050	Snake R nr Pasco	L	XXXXXXX X	X		XXXXXXXXX	XXXXXXXXXX
33A070	Snake R blw Ice Harbor Dam	B	X	X XXXXXX	XXXXXXXXXX	XX	
34A070	Palouse R @ Hooper	L	X XXXXXXXXXX	X XXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
34A075	Palouse River @ Hwy 26	B					X
34A080	Palouse River above Rebel Flat	B					X
34A085	Palouse R @ Shields Rd Bridge	B				X	X
34A090	Palouse R nr Diamond	B		X X			
34A109	Palouse River blw Colfax	B					X
34A110	Palouse R abv Buck Canyon	B		X XX			
34A120	Palouse R at Colfax	B					X X
34A170	Palouse R @ Palouse	L		X		XXXXXXXX	XXXXXXXXX
34A200	Palouse R nr Stateline	B					X
34B070	SF Palouse R nr Colfax	B		X XX			
34B075	SF Palouse R @ Shawnee Rd	B					X
34B080	SF Palouse R @ Albion	B					X
34B090	SF Palouse R nr Pullman	B		X X			
34B110	SF Palouse R @ Pullman	L		X X XX	XXXXXXXXXX	XXX XXXXX	XXXXXXXXXX
34B130	SF Palouse R blw Sunshine	B		X			XXX
34B140	SF Palouse R @ Busby	B				X	
34C060	Paradise Cr at Mouth	B				X	XXX
34C070	Paradise Cr nr Pullman	B		X			
34C100	Paradise Cr @ Border	B				X	XXX
34D070	SF Palouse Trib Whitman Fm	B		X			
34E070	Rock Creek at Revere	B				X	
34F090	Pine Cr @ Rosalia	B				X	X
34H070	Pleasant Valley Cr blw St John	B					X
34J050	Union Flat Cr nr Mouth	B					X

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
34J070	Union Flat Cr @ Winona Rd	B					X
34J090	Union Flat Cr @ Hwy 26	B					X
34J120	Union Flat Cr @Almota Rd	B					X
34K050	Rebel Flat Cr @ Mouth	B					X
34K080	Rebel Flat Cr @ Repp Rd	B					X
34K120	Rebel Flat Cr @ Fairgrounds	B					X
34L050	Cow Cr @ mouth	B					X
34M070	Dry Creek @ Pullman	B					X
34N070	Missouri Flat Creek @ Pullman	B					X
35A100	Snake R blw Lwr Granite Dam	B		X			
35A150	Snake R @ Interstate Br	L	XXXXX XX			XXXXXXXXX	XXXXXXXXXX
35A200	Snake R nr Anatone	B		XXXXXXXX			
35B060	Tucannon R @ Powers	L		X XX	XXXXXXXXXX	XXX XXXXX	XXXXXXXXXX
35B090	Tucannon R @ Smith Hollow	B					X
35B100	Tucannon R @ Territorial Road	B					X
35B110	Tucannon R nr Delaney	B	X X				
35B120	Tucannon R @ Brines Road	B					X
35B150	Tucannon R nr Marengo	B				X	X
35C070	Grande Ronde R nr Anatone	B		X	XXX	X	
35D070	Asotin Cr @ Asotin	B		X		X X	X
35E070	Clearwater R @ US12/95	B				X	
35F050	Pataha Cr near mouth	B					X X
35F070	Pataha Cr @ Archer Rd	B				X	X
35F095	Pataha Cr @ Tatman Road	B					X
35F110	Pataha Cr @ Rosy Grade	B					X
35L050	Almota Cr. @ mouth	B					X
35L140	Almota Cr @ Klemgard Rd	B					X
35Q050	Little Almota Cr @ Mouth	B					X
35R050	Steptoe Cr @ Mouth	B					X

Station Number	Name	Long-term or Basin	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
35R120	Steptoe Cr blw Stewart	B					X
35R140	Steptoe Cr abv Stewart	B					X
35S060	Wawawai Cr @ mouth	B					X
35U070	Alkali Flat Cr nr Mouth	B					X
35U090	Alkali Flat Cr abv Hay	B					X
35U140	Alkali Flat Cr @ Little Alkali Rd	B					X
35U190	Alkali Flat Cr @ Penewawa Rd	B					X
35W070	Mud Flat Cr @ Mouth	B					X
35Y070	Penewawa Cr nr Mouth	B					X
35Y110	Penewawa Cr @ Looney Br	B					X
35Y170	Penewawa Cr abv Goose cr	B					X
35Z070	Little Penewawa Cr @ Mouth	B					X
36A055	Columbia R @ Port of Pasco	B		X			
36A060	Columbia R @ Pasco	B	XX				
36A065	Columbia R @ Richland	B		X			
36A070	Columbia R nr Vernita	L	XX XX	X X XXX XX	XXXXXXXXXX	XX XXXXXX	XXXXXXXXXX
37A060	Yakima R @ VanGiesen Br	B		X XX			
37A070	Yakima R nr Richland	B		X			
37A090	Yakima R @ Kiona	L	X XXX XXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
37A095	Yakima 2 mi blw Prosser	B				X	
37A100	Yakima below Prosser	B				X	
37A110	Yakima R @ Prosser	B		X XX			
37A130	Yakima R @ Mabton	B		X XX		X	
37A149	Yakima R @ Granger No Side	B		X			
37A150	Yakima R @ Granger So Side	B		X			
37A170	Yakima R nr Toppenish	B		X XX		X	
37A190	Yakima R @ Parker	B		X XXXXXXX	XXXXXXXXXX	XXX	X
37A200	Yakima R abv Ahtanum Cr (USGS)	B		XX X	XX		
37A205	Yakima R @ Nob Hill	L				XXXXX	XXXXXXXXXX

Station Number	Name	Long-term or Basin		Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
37A210	Yakima R nr Terrace Height	B			XX XX		X	
37B060	Satus Cr @ Satus	B			XX			
37C060	Toppenish Cr nr Satus	B			XX			
37D080	Marion Drin nr Granger	B			XX			
37E050	Wide Hollow Cr. @ Main Street	B						XX
37E070	Wide Hollow Cr @ Union Gap	B			X X		X	
37E090	Wide Hollow Cr @ Goodman	B			X X			
37E120	Wide Hollow Creek @ Randall Park	B						XX
37F070	Sulphur Ck Wasteway @ McGee Rd	B					X	
37F080	Sulphur Creek @ Holaday Road	B						X
37G050	Ahtanum Crk @ Fulbright Park	B						X
37G120	Ahtanum Cr @ 62nd Ave	B						XX
37I070	Moxee Drain @ Birchfield Rd.	B						XX
38A050	Naches R @ Yakima on US HWY 97	B		XXXXXXX			X XX	X X X
38A070	Naches R @ Yakima	B			X X			
38A110	Naches R @ Naches	B	X	X	X			
38A130	Naches R nr Naches	B		XXXX				
38B070	Tieton R @ Oak Creek	B		XXXX			X	
38C070	Rattlesnake Cr nr Nile	B		XX				
38D070	Bumping R @ American R	B		XX				
38E070	American R @ American R	B		XX				
38F070	Little Naches nr Cliffdell	B		XXX			X	
38G070	Cowiche Cr. @ Powerhouse Rd.	B						XX
38G120	Cowiche Cr @ Zimmerman rd	B						XX
39A050	Yakima R @ Harrison Bridge	B					XX	XXX X
39A055	Yakima R. @ Umtanum Cr Footbrg	B						
39A060	Yakima R @ Ellensburg	B					XX	XX
39A070	Yakima R nr Thorp	B			X X			
39A080	Yakima R @ Cle Elum	B	X	XXXXXXXXXX	X			

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
39A090	Yakima R nr Cle Elum	L		X X		XXX XXXXX	XXXXXXXXXX
39B070	Cle Elum R nr Cle Elum	B		X X			
39B090	Cle Elum R nr Roslyn	B				X	
39C070	Wilson Cr @ Highway 821	B	XXXX	X X X		X	XX
39D070	Teanaway R nr Cle Elum	B	XXXXX			X	
41A070	Crab Cr nr Beverly	L	X XXXXXXXXXX	XXX XX XX	XXXXXXXXXX	XX XXXXXX	XXXXXXXXXX
41A075	Crab Cr nr Smyrna	B	XXX				
41A090	Crab Cr nr Othello	B		X			
41A110	Crab Cr nr Moses Lake	B	X		XXXX	X X	X
41D070	Rocky Ford Creek @ Hwy 17	B				X	X
41E070	Sand Hollow Creek on Hwy 26	B				X	
41F100	Rocky Ford Coulee Drain	B				X	
41G070	Rocky Coulee Wasteway @ K NE Road	B					X
41H050	Moses Lake at South Outlet	B					X
41J070	Lind Coulee @ Hwy 17	B					X
42A070	Crab Cr below Adrian	B					X
43A070	Crab Cr @ Irby	B	X			X	X
43A080	Crab Creek @ Odessa	B					X
43A095	Crab Creek @ Amnen Road	B					X
43A100	Crab Ck @ Marcelus Road	B				X	X
43A110	Crab Creek at Tokio Road	B					X
43A130	Crab Creek @ US23	B					X
43A150	Crab Ck @ Bluestem Road	B				X	X
43B090	Lake Ck @ Coffeepot Road	B				X	
43C070	Goose Creek nr Wilbur	B					X
44A070	Columbia R blw Rock Is Dam	B		X XX XX	XXXXXXXXXX	XX	
44A190	Columbia River @ Hwy 2 Bridge	B					X
45A070	Wenatchee R @ Wenatchee	L	XXXXXXXX X	X X XX XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
45A075	Wenatchee River @ Sleepy Hollow Br.	B					X

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
45A085	Wenatchee R nr Dryden	B		X			
45A100	Wenatchee R @ Leavenworth	B		X			
45A110	Wenatchee R nr Leavenworth	L	X XXXXXXXX	XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
45B070	Icicle Cr nr Leavenworth	B		X		X	
45C060	Chumstick Cr. nr mouth	B					XX
45C070	Chumstick Cr nr Leavenworth	B				XXX	X X
45D070	Brender Cr nr Cashmere	B				XXX	X XX
45D080	Brender Cr. abv Noname Cr.	B					X
45E070	Mission Cr nr Cashmere	B				XXX	X XX
45J070	Nason Cr. nr mouth	B					X
45K050	White R. @ Road 6500 Bridge	B					X
45L050	Little Wenatchee @ 2 Rvr Grav.Pit	B					X
45Q060	Eagle Cr. nr mouth	B					XX
45R050	Noname Creek nr Cashmere	B					XX
45R070	Noname Cr. on Mill Rd.	B					X
46A070	Entiat R nr Entiat	L	X XXXXXXX	X XX XX	XXXXXXXXXX	XX XXXXXX	XXXXXXXXXX
47A070	Chelan R @ Chelan	B	XXXXXXXX X	X X XX XX	XXXXXXXXXX	XX X	
47B070	Columbia R @ Chelan Station	B				X X	
48A070	Methow R nr Pateros	L	X XXXXXXX	X XX XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXX
48A075	Methow River nr Pateros @ Metal Br.	L					X
48A130	Methow R nr Twisp	B		X XX	XXXXXXXXX		
48A140	Methow R @ Twisp	L			X	XX X XXXXX	XXXXXXXXXX
48A150	Methow R @ Winthrop	B					X
48A170	Methow R @ Weeman Br	B		X			
48A190	Methow R blw Gate Cr	B		X XX	X		
48B070	Chewuch R @ Winthrop	B		X			X
48C070	Andrews Cr nr Mazama	B		XXXXXXXX	XX		
48D070	Twisp River nr Mouth	B					X
49A050	Okanogan R nr Brewster	B	X XXXXXXX X	X			

Station Number	Name	Long-term or Basin	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
49A070	Okanogan R @ Malott	L	XXX	X X XX XX	XX XXXXXX	XXXXXXXXXX	XXXXXXXXXX
49A090	Okanogan R @ Okanogan	B		X XX	XXXXXXXXX	X	X
49A110	Okanogan R @ Omak	B					X
49A130	Okanogan R @ Riverside	B					X
49A170	Okanogan R @ Janis	B		X			
49A180	Okanogan R @ Tonaskat	B				X	
49A190	Okanogan R @ Oroville	L	XXXXXXX	XX XX	XXXXXXXXXX	XX X XXXXX	XXXXXXXXXX
49B070	Similkameen R @ Oroville	L	XXXXXXX	XX XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
49B090	Similkameen R @ Nighthawk	B				X	
49B110	Similkameen R @ Chopaka, BC	B					XX
49F070	Bonaparte Cr. @ Tonasket	B					X
49F105	Bonaparte Cr abv Tonasket	B					X
50A070	Columbia R nr Brewster	B	X				
50A090	Columbia R @ Bridgeport	B	X				
50B070	Foster Cr @ Mouth	B					X
51A070	Nespelem R @ Nespelem	B			XXXXXXXXXX	XX X	
52A070	Sanpoil R @ Keller	B	XXXXXXX	X XX XX	XXXXXXXXXX	XX X	
52A110	Sanpoil R 13 mi S. Republic	B				X	
52A170	Sanpoil R blw Republic	B		X			
52A190	Sanpoil R abv Republic	B		X		X	
52B070	Lake Roosevelt from Keller Ferry	B				X	
53A070	Columbia R @ Grand Coulee	L		X XX XX	XXXXXXXXXX	XX X XXXXX	XXXXXXXXXX
53C070	Hawk Creek @ Miles-Creston Rd.	B					X
54A050	Spokane R @ Mouth	B				XXXX	
54A070	Spokane R @ Long Lake	B	X XXXXXXX X	XXXXXXXXXX	XX		XX
54A089	Spokane R 2 mi blw Ninemile dam	B		XX			
54A090	Spokane R @ Ninemile Br	B		X X			X XX
54A120	Spokane R @ Riverside State Pk	L		XXXXXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
54A130	Spokane R @ Fort Wright Br	B		X X			

Station Number	Name	Long-term or Basin	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
55B070	Little Spokane R nr Mouth	L		X X XXX	XXXXXXXXXX	XX XXXXXX	XXXXXXXXXX
55B075	Little Spokane @ Painted Rocks	B				X	
55B080	Little Spokane R nr Griffith Spring	B				XX	
55B082	Little Spokane R abv Dartford Creek	B				XX X	
55B085	Little Spokane nr Dartford	B	XXXXXXX				
55B090	Little Spokane R abv Wandermere	B		X			
55B100	Little Spokane R abv Deadman Creek	B				XX X	
55B200	Little Spokane @ Chattaroy	B				X X	
55B300	Little Spokane River @ Scotia	B					X
55C065	Deadman Cr nr Mouth	B				X	
55C070	Peone (Deadman) Creek abv L Deep Cr	B				XX	X
55C200	Deadman Cr@Holcomb Rd	B					X
55D070	Deer Cr at Hwy 2	B				X	
55E070	Dragoon Cr at Crescent Road	B				X	
56A070	Hangman Cr @ Mouth	L		X X XXX	XXXXXXXXXX	XX X XXXXX	XXXXXXXXXX
56A200	Hangman Creek @ Bradshaw Road	B				X	
57A120	Spokane R @ Spokane	B		X			
57A123	Spokane River@Sandifer Bridge	B					X
57A125	Spokane R blw Monroe St.	B					X
57A130	Spokane R @ Mission St Br	B		X X			
57A140	Spokane River @ Plante's Ferry Park	B					XX
57A145	Spokane R @ Trent Br	B		X			
57A146	Spokane River @ Sullivan Rd.	B					X
57A148	Spokane R @ Barker Rd	B					X
57A150	Spokane R @ Stateline Br	L	X XXXXXX X	XX X X		XXXXXXXXX	XXXXXXXXXX
57A190	Spokane R nr Post Falls	B		XXXXXXX	XXXXXXXXXX	XX	
57A240	Spokane R @ Lake Coeur d'Alene	B					XX
59A070	Colville R @ Kettle Falls	B	XXXXXXXXXX	X X XX XX	XXXXXXXXXX	XX X	
59A080	Colville R abv Kettle Falls	B				X	X

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
59A110	Colville R @ Blue Creek	B		X			X
59A130	Colville R @ Chewelah	B		X			XXX
59A140	Colville R @ Newton Rd	B					XX
59B070	Little Pend Oreille @ Hwy 395	B					X
60A050	Kettle R @ Hedlund Bridge	B	X				
60A070	Kettle R nr Barstow	L	XXXXXXX X	X X XX XX	XXXXXXXXXX	XX XXXXXX	XXXXXXXXXX
61A070	Columbia R @ Northport	L	X XXXXXXXXXX	XXXXXXXXXX	XX	XXXXXXXXX	XXXXXXXXXX
61B070	Deep Ck nr Mouth	B				X	X
61C070	Onion Cr nr Northport	B				X	
61D070	Sheep Cr nr Northport	B				X	
62A070	Pend Oreille R @ Waneta BC (USGS)	B	XXX				
62A080	Pend Oreille R @ Border	B		XXXXXX	XX		
62A090	Pend Oreille R @ Metaline Falls	B	X XXX			XX XX	XXXXXXXXX
62A150	Pend Oreille R @ Newport	L	X XXXXXXX X	X XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX

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Appendix B. Historical Changes in Sampling and Laboratory Procedures, as well as Large-Scale Environmental Changes Potentially Affecting Water Quality

This appendix provides a record of changes in methods and procedures used by Ecology's Freshwater Monitoring Unit to collect and analyze river and stream water quality data. Other environmental changes that may potentially affect water quality over a large area are also recorded here.

Many of the changes listed below are anecdotal and may or may not have affected data quality. Comments prior to October 1988 are based on interviews with individuals involved with the earlier program. Comments after that date have usually been recorded as the changes occurred.

General

- Jun to Sept 1985: Laboratory moved from Ecology's Southwest Regional Office to Manchester.
- Oct 1988: Implemented QA/QC program (See memo from David Hallock, October 17, 1988.)
- Prior to WY91: Samples were sent to contract labs from time to time. These occurrences are not all recorded here. Records are not detailed and only available from bench sheets archived by Manchester Environmental Laboratory.
- 1994: The use of Polyacrylamide (PAM) to control erosion from rill irrigation is becoming widespread in eastern Washington. Water quality effects are unknown.
- 1996: Began monitoring discharge at some stations ourselves (mostly basin stations), rather than contracting with USGS.
- 2001: Began running Central (Nov 2001) and Eastern (Feb 2002) runs out of regional offices. Barometric pressures calculated from airport readings, either uncorrected, if available, or re-converted to sea level.
- Jan-Jun 2002: Some barometric pressures collected from the western part of the state may be off by 1.0 mmHg due to calibration errors. The effect of this amount of error on the percent oxygen saturation calculation is insignificant.
- Oct 2005 (except the NW run, which made the change several months earlier): Previously, aliquots for pH, conductivity, and turbidity were obtained from the stainless steel bucket used to collect the oxygen. However, this presented a risk of contamination from the oxygen bottles. The sampler was re-designed so that only the oxygen sample is obtained from the bucket; all other samples are collected in passengers.
- Nov, 2007: Implemented a Freshwater Technical Coordination Team-required "ride-along" procedure where a senior staff rides with each sampler once during the year to ensure SOP are followed uniformly.
- Jan 16, 2008: Implemented semi-annual calibration of Operation's Center digital barometer against Hg barometer in Air Lab at HQ. Digital BP read 30.86 before recalibration and 30.54 after. S, N, and W BP data since October 2006 could be up to 0.32 inches Hg high.

Nutrients

- General: Prior to 1980, USGS labs analyzed samples.
- 1966-1969: One gallon of sample was collected in glass jars and held at room temperature for indefinite periods without preservative.
- 1970-1973: Unknown methods; may have been preserved with HgCl. Filtered in field.
- 1973: Laboratory moved from Tacoma to Salt Lake City.
- 1973-1974: Chilled, no preservative. Held as long as one week. Filtered in field; kept in brown poly bottle.
- 1972-1974?: For a short time, TP and NO3 may have been added by filters (probably 72-74). (Personal communications with Joe Rinnella, USGS).
- Sept 30, 1978: USGS Lab moved to Arvada, CO. Joint program samples sent there; samples collected for Ecology project only may have been analyzed in-house.
- ~1978: Chilled. Brown poly bottle? (the brown poly bottle may have been introduced later). 30-day holding time for NO2+NO3 implemented (status of other nutrients is unknown). (Source of methods prior to 1979: pers. comm. Joe Rinnella, USGS, and Skinner, Earl L. "Chronology of Water Resources Division activities that may have affected water quality values of selected parameters in Watstore, 1970-86. Provisional Report Feb 1989.)
- 1979: For a while, the USGS lab reported nutrient results to the nearest 0.01 units. Values below 0.005 were reported as 0.00. USGS decided to change all Watstore data = 0 to 0.01K back to 1973 for NO2+NO3. Decision on other nutrients is unknown, but they may also have been changed. Most of the 0s in our database have been converted to 0.01K (K-below the detection limit) but a few 0s may remain in the older data.
- 1980: USGS requires NO2+NO3 be preserved with HgCl. Status of other nutrients is unknown. Ecology requirements are unknown.
- June 1, 1980 to 1986: Nutrients analyzed by Pat Crawford at Southwest Regional Office.
- Aug 1985: High phosphate values, presumably a result of lab error. (Coded '9-do not use' in our database). (See "Trends in Puget Sound," 1988, Tetra Tech, App. B.)
- 1986 to Apr 1987: Analyzed by various people, mostly Helen Bates, Steve Twiss, and Wayne Kraft at Manchester.
- June 1985: Switched from Technicon to Rapid Flow Analysis (Alpkem) auto-analyzers
- Apr 1987 to present: Analyzed by various people at Manchester.
- Jan 1987 to Jul 1987: NO3, NH3, and TP analyzed by contract lab.
- Mar 1990: Began using MFS cellulose acetate filters for field filtration of nutrients. Previously use Millipore, type HA (cellulose nitrate?).
- Sept 17 - Oct 12, 1990: All nutrient samples were contracted out.
- Oct 1990: Dissolved ammonia (P608) and dissolved nitrate+nitrite (P631) were added to the Marine network. Totals (P610 and P630) were dropped.
- Feb 1991: All nutrients sent to contract lab.
- Mar 1991: All nutrients sent to contract lab.
- ~1993: Began collecting nutrients in acid-washed poly-bottle passenger rather than in the stainless-steel bucket used for oxygen determinations.
- Jul 1994: The phosphorus content in laundry detergents is restricted to 0.5% and dishwashing detergent to 8.7% statewide (SSB 5320; WAC 70.85L.020). Phosphorus use had been limited in Spokane County one (?) year earlier.
- Feb 1999: MEL switched from manual to inline digestion for total phosphorus. In early 2003, during the course of evaluating a different method for phosphorus analysis, MEL discovered that the in-line method contained a high bias (4 to 20 ppb). Trend analyses of total phosphorus data

should be interpreted carefully if results collected between Feb 1999 and Sept 2003 are included. (See email from Dean Momohara to David Hallock, 31 March 2003.) Total phosphorus data analyzed using this method have been coded "4" indicating a potential quality problem, and given a different name ("TP_PInline" rather than the usual "TP_P").

- Oct 2000: Nitrate+nitrite method nomenclature changed from EPA 353.2 to SM 4500NO3I because the latter method is more specific. Actual procedures were not changed.
- Oct 2000: TP method changed from EPA 365.1 to SM4500PI. The former method specifies a manual digestion, while the latter correctly refers to the in-line digestion used by MEL's *Lachat* instrument.
- Oct 2000 to Feb 2001: A low bias may apply to TN data. Except for December data, MEL deemed the bias to be small enough that the data did not need to be qualified. December TN results were coded as estimates (See email from M. Lee to David Hallock, March 8, 2001.)
- Oct 2003: TP method changed from SM4500PI to EPA 200.8M, an ICP/MS method with low detection limits and without the bias associated with in-line digestion. Samples are collected in a 60mL container with HCl preservative instead of the earlier 125mL container with H_2SO_4 preservative.
- Oct 1, 2007 we changed total phosphorus analytical methods from EPA200.8M (ICP-MS) to SM4500PH (colorimetric with manual digestion). We made this change because we discovered that at turbidities greater than 4 NTUs, the ICP method is biased low compared to the colorimetric method. (See email from Dave Hallock to Bob Cusimano, October 25, 2007.)
- Jan 15, 2008: OP method changed from SM4500PG to SM4500PF and TOC method changed from EPA415.1 to SM5310B. Neither procedure actually changed.
- Jul 2008: The phosphorus content in dishwasher detergents is restricted in ~~certain counties~~ Spokane County ~~depending on population~~ as of this date (RCW 70.95L.020). (A new law signed in March, 2008, eliminated Clark County from the July 1 deadline and weakened regulations that will start in Whatcom County. Phosphorus in laundry detergents has been restricted since 1994.)
- Jul 2010: The phosphorus content in dishwasher detergents will be restricted statewide as of this date (RCW 70.95L.020).

Suspended Solids

- General: Filters were usually used, but sometimes Gooch crucibles were used.
- Feb 1978: Began collecting as passenger to oxygen sampler (was previously collected as aliquot of oxygen sampler). (See memo from Bill Yake, 30 Jan 1978 and Ambient Monitoring Procedure-1978(?) notebook.)
- Mid-1985: Amount filtered changed from 250 (?) to 500 ml.
- Sept 17 - Oct 12, 1990: Suspended sediment samples were contracted out.
- Apr 1991: Began collecting 1000 ml of sample.
- Jul 2002: A number of suspended solids results entered into our database as '0' were deleted. We do not know if these results were below reporting limits or "missing data"; 138 results collected between 1972 and 1981 were affected.
- Mar 2003: TSS method reference changed from EPA160.2 to SM 2540D. Methods did not change; the latter reference more accurately reflects analytical procedures. See email from Feddersen, Karin, March 24, 2003.

Conductivity

- Feb 1978: Began calibrating twice monthly using 40, 70, 140, and 200 µmho/cm standards. (See memo from Bill Yake, 30 Jan 1978 and Ambient Monitoring Procedure-1978(?) Notebook)
- Oct 1991: All meters were re-calibrated Oct 11, 1991. One conductivity meter was not calibrated above 500 µmhos/cm (and could not be calibrated). This meter had last been calibrated about 1 year earlier. Most meters read higher than the 100 µmhos/cm standard.
- Oct 1994: Switched from Beckman model Type RB-5 (which could not be field calibrated) to Orion Model 126 meter, calibrated daily.
- 1998: Orion meter calibration began drifting during the day. Sometimes meter could only be calibrated to within 4 µmhos/cm of the standard. At first, some samplers would correct the data, others would not. Now, these data are uncorrected and coded "J" (estimate).

Fecal Coliform Bacteria

- Early 1980s: field personnel may have analyzed some samples.
- Oct 7, 1975 to Nov 1981: fecal data from eastern Washington may be questionable during this period.
- 1980 to Mar 1988: No changes; analyzed by Nancy Jensen and others at Manchester.
- However, there is an apparent drop in monthly geometric means in late 1985. The may be coincident with moving the lab to Manchester (see memo from Dave Hallock to Dick Cunningham, June 18, 1991).
- Mar 1988: Switched to new filter with slightly better recovery.
- Nov 2000: Holding time was changed from 30 hours to 24 hours (Standard Methods changed to 24 hours with the 17th edition, 1989). As a result, more data have been coded "J" since then due to exceeding holding times.
- Sept 2003: FC method reference changed from SM 16-909C to SM 9222D. Methods did not change; the latter reference more accurately reflects analytical procedures. See email from Feddersen, Karin, September 15, 2003.
- ~Aug, 2009: Pasco airport began x-raying water samples. Other airports may follow suit eventually. Exposure is < 1 millirad while doses used to kill bacteria on food are >30,000 rads. An unnamed contact at Washington's Department of Health stated that the dose is not a concern. We considered testing for an effect, but the number of samples required to detect a small effect is prohibitively large given the natural variance in bacteria data.

Turbidity

- 1970s: EPA specified a 2100A turbidimeter. Formerly, turbidity units were FTU (?)
- Jan 1976: Turbidity units changed from Jackson Turbidity Units (JTU) to Nephelometric Turbidity Units (NTU). (Source: review of historical reports.) These are roughly equivalent when greater than 25 JTU/NTU, otherwise not.
- Sept 1993: Lab began using a new turbidimeter, Hach model "Ratio X/R."
- Jan 2003: In our database, the units for turbidity results collected prior to January were changed from NTU back to JTU. Though roughly equivalent at JTUs > 25, these are not equivalent for lower measurements; the original units should have been retained.

Field pH

- Oct 7, 1975 to Nov 1981: pH data from eastern Washington are questionable during this period.
- Feb 1978: Began calibrating meter twice monthly. Previous procedures unknown. (See memo from Bill Yake, 30 Jan 1978 and Ambient Monitoring Procedure-1978(?) notebook)
- 1986: Changed to Beckman digital pH meter with gel probe.
- Dec 1991: Changed to Orion model 250A meter with "spare water" liquid probe (uses 1M KCl, rather than 4M). Calibrate daily and check calibration three times during the sampling day.

Temperature

- Feb 1978: Switched from thermometer in bucket to thermistor in river. (See memo from Bill Yake, 30 Jan 1978 and Ambient Monitoring Procedure-1978(?) notebook)
- Feb 1985: Checked thermistor calibration daily (internal calibration check based on red-lining needle, not a check against a NIST thermometer) (Memorandum from John Bernhardt, Feb 7, 1985).
- Spring 1994: Switched to YSI 300 meter (accuracy +/- 0.4C)
- Jan 1, 2001: Began calibrating thermistors prior to each run rather than annually. Some thermistors were found to be as much as 1-2 °C low.
- About May 2006: Began evaluating thermistor calibration at several temperatures and calculating correction coefficients based on a linear regression correction. Corrections are applied upon data entry by the database rather than by the sampler.

Oxygen

- Oct 1, 1977: Began measuring barometric pressure to calculate percent saturation. Previous saturation calculations were presumably based on elevation.
- Mar 1989: Began applying correction factor to results of Winkler analyses based on titration with sodium biiodate to correct sodium thiosulfate normality to 0.025. Previously, thiosulfate was standardized upon preparation, but not during use.

Barometric Pressure

- Feb 1985: Began calibrating barometer before each run based on National Weather Service report from Olympia airport (Memorandum from John Bernhardt, Feb 7, 1985).
- 1995: Began calibrating barometer prior to each run using an on-site mercury barometer rather than pressure as reported by the Olympia airport.
- 2003: Began calibrating barometer prior to each run using an on-site digital barometer rather than the mercury barometer. Calibrating digital barometer to mercury barometer annually.
- Jan 2008: Began calibrating on-site digital barometer twice yearly against a mercury barometer.

Chlorophyll

- Mar 15, 1990: Switched to fluorometric method (from spectrophotometric). New method has lower detection limit (0.02 µg/L) but less accuracy. (See memo from Despina Strong, April 12, 1990.)

Hardness

- Jul 1, 1991: Began using 125 ml bottle with HNO3 as preservative. (Previously, aliquot from unpreserved general chemistry bottle was used.)

Metals

- May 1994: Implemented low-level dissolved metals monitoring at selected stations. Metals results prior to this date are questionable unless well above detection limits and have been quality-coded "9" in our database so that they will not routinely be retrieved. Quality problems include inconsistent blank correction and indications of simultaneous peaks and troughs in data series from unrelated stations for results above reporting limits.
- Apr 2010: A review of historical blank data showed that dissolved zinc exceed reporting limits of 1 µg/L 43% of the time (though never greater than 5 µg/L). As a result, we have decided to set the quality code field = 4 for reported dissolved zinc results < 5 µg/L, which indicates a potential data quality issue.

Appendix C. Water Year 2009: Raw data

Data listed in this appendix are available in electronic format by contacting the Washington State Department of Ecology regional offices:

- Ecology Central Region: Mike Anderson (509.662.0480; mika461@ecy.wa.gov)
- Ecology Eastern Region: Daniel Sherratt (509-329-3420; dshe461@ecy.wa.gov)
- Ecology Northwest Region: Bill Ward (360.407.6621; bwar461@ecy.wa.gov)
- Ecology Southwest Region: Jason Myers (360.407.6019; jmye461@ecy.wa.gov)

Ambient monitoring data from the most recent complete Water Year are available on Ecology's web pages (www.ecy.wa.gov). Look under "Programs," "Environmental Assessment", and "River and Stream Water Quality."

The first two digits of each station number is the Water Resource Inventory Area (WRIA) number. This number can be used to identify which Water Quality Management Areas (WQMA) or "basin" each station is in, according to the table, below:

Basin	WRIAs		Basin	WRIAs
Cedar/Green	8-9		Nooksack/San Juan	1-2
Columbia Gorge	27-29		Okanogan	48-53
Eastern Olympics	13-14, 16-19		Puyallup/Nisqually	10-12
Esquatzel/Crab Creek	36, 42-43		Skagit/Stillaguamish	3-5
Horseheaven/Klickitat	30-31		Spokane	54-57
Island/Snohomish	6-7		Upper and Lower Snake	32-35
Kitsap	15		Upper Columbia/Pend Oreille	58-62
Lower Columbia	24-26		Upper Yakima	38-39
Lower Yakima	37		Wenatchee	40, 44-47
Mid Columbia	41		Western Olympics	20-23

Remarks codes in historical data are defined below. Only "U" and "J" were used in WY 2009.

B,V	Analyte was found in the blank indicating possible contamination.
E	Result is an estimate due to interference.
G, L	True result is equal to or greater than reported value.
H	Sample was analyzed over holding time.
J	The reported result is an estimate.
K, U	The analyte was not detected at or above the reported result.
N	Spike sample recovery was outside control limits.
P	Result is between the detection limit and the minimum quantitation limit (applied to metals).
S	Spreader: one or more bacteria colonies were smeared, possibly obscuring other colonies.
X	High background count of non-target bacteria, possibly obscuring additional colonies.

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Conventional Data Report

Nooksack R @ Brennan

01A050

Class: A
Rivermile: 3.4
Latitude: 48 49 08.5
Longitude: 122 34 47.9
Waterbody: WA-01-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 15:50	8.3	1780	103	12.2	7.68	17	0.291	0.01 U	0.251	0.021	0.0085	8.2	210 J
11/18/2008 15:35	8.4	3690	114	11.3	7.48	75	0.609	0.022	0.482	0.0699	0.014	22	13
1/27/2009 16:00	2.3	2990	131	13	7.54	23	0.775	0.031	0.684	0.039	0.0083	10	14
2/24/2009 17:00	7.1	2400	132	11.5	7.46	30	0.614	0.024	0.547	0.0521	0.0075	12	17
3/17/2009 16:10	5.7	2340	142	12.3	7.49	26	0.301	0.01 U	0.281	0.0478	0.0041	25	3
4/21/2009 16:30	9.6	4940	87	11.4	7.29	136	0.327	0.01	0.284	0.138	0.0083	70	43
5/19/2009 16:30	8.6	8400	63	12	7.25	348	0.193	0.01	0.16	0.276	0.0067	170	80
6/16/2009 17:20	12.6	4060	72	10.6	7.29	65	0.143	0.01 U	0.135	0.0765	0.005	33	7
7/21/2009 14:15	18.3	1840	90	10	7.78	22	0.108	0.01 U	0.076	0.0255	0.006	9.7	25
8/18/2009 16:05	18.5	1220	112	10	7.6	16	0.208	0.01 U	0.172	0.0332	0.0141	10	69
9/22/2009 15:20	14.9	1190	117	10.3	7.58	21	0.251	0.01 U	0.232	0.0427	0.0163	10	21

Conventional Data Report

Nooksack R @ No Cedarville

01A120

Class: A
Rivermile: 30.8
Latitude: 48 50 29.9
Longitude: 122 17 36.9
Waterbody: WA-01-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008	15:05	8.2	1890	86	12.1	7.71	14	0.16	0.01 U	0.136	0.017	0.0037	9.9	4
11/18/2008	13:58	8.2	2910	90	11.5	7.58	28	0.266	0.01 U	0.231	0.029	0.0045	11	2
12/16/2008	16:15	1.2	1820		14	7.36	7	0.266	0.01 U	0.266	0.013	0.0051	4.8	1
1/27/2009	15:10	3	2310	100	13.2	7.65	14	0.335	0.01 U	0.272	0.0229	0.0047	6.8	1
2/24/2009	16:15	6	2130	94	12.1	7.65	48	0.229	0.01 U	0.197	0.0668	0.0043	26	6
3/17/2009	15:20	5.4	1860	103	13.2	7.75	28	0.893	0.038	0.739	0.0956	0.01	20	120
		After recalibrating the pH meter sample remeasured at 8.8 degrees at 7.68 pH												
4/21/2009	15:45	9.6	5360	72	11.6	7.35	77	0.175	0.01 U	0.161	0.091	0.0049	32	3 U
5/19/2009	15:30	8.6	8130	55	12.2	7.31	165	0.119	0.01 U	0.111	0.145	0.0038	80	22
6/16/2009	16:40	12.9	3510	66	10.6	7.51	36	0.064	0.01 U	0.06	0.0435	0.003 U	20	2
7/21/2009	13:30	15.3	1890	77	10.7	7.9	16	0.072	0.01 U	0.039	0.028	0.0033	16	2
8/18/2009	15:20	16	1440	93	11.2	7.92	16	0.067	0.01 U	0.058	0.032	0.0035	16	6
9/22/2009	14:45	12.6	1390	98	10.9	7.62	18	0.092	0.01 U	0.083	0.0328	0.0039	19	1 U

Conventional Data Report

Skagit R nr Mount Vernon

03A060

Class: A
Rivermile: 15.9
Latitude: 48 26 42.4
Longitude: 122 20 06.6
Waterbody: WA-03-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 13:40	9.8	10300	55	11.5	7.51	15	0.085	0.01 U	0.061	0.011	0.003 U	2.9	9
11/18/2008 11:59	8.3	13900	53	11.4	7.25	134	0.16	0.01 U	0.125	0.031	0.0043	21	6
12/16/2008 14:05	2.2	6930	69	13.8	7.24	21	0.141	0.01 U	0.139	0.0138	0.0039	2.9	1
Mis-printed on field data sheet as Skagit river at Burlington, was Mount Vernon													
1/27/2009 13:20	2.8	10400	71	13	7.03	91	0.177	0.01 U	0.157		0.0075	7.5	3
2/24/2009 13:40	6.5	7800	69	11.8	7.28	75 J	0.163	0.01 U	0.133	0.0397	0.0041 J	6.1	3
3/17/2009 13:10	5.4	6870	76	12.4	7.43	108	0.167	0.01 U	0.142	0.0192	0.0033	2.5	1 U
4/21/2009 13:00	9.9	18800	60	11.5	7.16	11	0.163	0.01 U	0.113	0.0183	0.0049	6.9	12
5/19/2009 13:00	9.4	27100	40	11.3	7.02	37	0.104	0.01 U	0.088	0.0529	0.003 U	16	73
6/16/2009 14:15	11.9	27500	38	10.8	7.04	24	0.113	0.01 U	0.051	0.0809	0.003 U	11	14
7/21/2009 11:40	15.5	11600	47	10.1	7.24	46	0.069	0.01 U	0.037	0.0113	0.003 U	180	1
8/18/2009 12:30	15.3	7020	52	10.5	7.4	18	0.042	0.01 U	0.037	0.0132	0.0035	5.1	14
Swimmers and sunbaithers 3/4 mile upstream of bridge.													
9/22/2009 13:00		5770											
Station skipped due to high-speed fish-boat traffic.													

Conventional Data Report

Samish R nr Burlington

03B050

Class: A
Rivermile: 10.4
Latitude: 48 32 44.8
Longitude: 122 20 17.6
Waterbody: WA-03-2010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 14:05	8.6	75	97	12	7.66	7	0.574	0.01 U	0.425	0.021	0.0076	2.8	35
11/18/2008 12:50	9.3	260	77	11.2	7.39	29	0.8	0.015	0.639	0.032	0.0054	14	32
12/16/2008 15:00	1.5	186		13.9	7.22	14	0.881	0.022	0.774	0.0277	0.0063	9.6	33
1/27/2009 14:00	3.4	337	81	12.9	7.39	21	0.945	0.01	0.855	0.0386	0.0059	10	18
2/24/2009 14:40	7.4	215	87	11.6	7.45	15	0.763	0.011	0.695	0.0363		9.5	37
3/17/2009 14:00	5.4	383	75	12.7	7.5	12	0.825	0.01 U	0.729	0.0353	0.0053	9.3	43
Co-sampled with Skagit County staff													
4/21/2009 14:00		307				15	0.649	0.01 U	0.553	0.0319	0.0069	8.2	15
5/19/2009 14:10	11.5	363	63	10.7	7.19	28	0.49	0.01 U	0.414	0.0568	0.0054	17	400
6/16/2009 15:10	14	61	105	10.5	7.53	3	0.735	0.01 U	0.665	0.0147	0.0068	1.8	71
7/21/2009 12:15	15.2	32	116	9.9	7.52	24	0.774	0.01 U	0.688	0.02	0.0087	1.9	160
8/18/2009 13:20	14.6	27	123	10.4	7.55	2	0.701	0.01 U	0.645	0.0147	0.0078	1.5	46
9/22/2009 13:30	12.3	25	126	10.1	7.43	6	0.769	0.012	0.696	0.0207	0.0104	2.3	33

Conventional Data Report

Skagit R @ Marblemount

04A100

Class: AA
Rivermile: 78.2
Latitude: 48 31 36.4
Longitude: 121 25 44.5
Waterbody: WA-04-1090

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2008	8:25	8.7	4260	56	11.6	7.49	1 U	0.074	0.01 U	0.06	0.005 U	0.003 U	0.6	1 U
11/19/2008	8:05	7.3	4730	49	11.6	7.44	6	0.099	0.01 U	0.071	0.0063 J	0.003 U	1	1 UJ
12/17/2008	8:45	4.6	4200		12.1	7.65	1 U	0.071	0.01 U	0.068	0.008	0.003 U	0.8	3 J
		recalibrated cond. And pH resampled after QC												
1/28/2009	8:00	3.9	3610	64	12.8	7.38	1	0.092	0.01 U	0.072	0.0153	0.003 UJ	0.5	1 J
2/25/2009	8:30	4.1	3640	66	12.7	7.48	2 U	0.079	0.01 U	0.062	0.0102 J	0.003 U	0.5 U	2 J
3/18/2009	8:10	3.7	3640	68	13.3	7.61	1 U	0.077	0.01 U	0.059	0.0058	0.003 U	0.5 U	1 J
		Rain/Snow												
4/22/2009	8:00	5.4	5680	43	12.4	7.27	7	0.1	0.01 U	0.094	0.008	0.003 U	1.6	1 J
5/20/2009	8:00	6	5350	37	12.3	6.88	3	0.081	0.01 U	0.086	0.0058	0.003 U	0.9	2 J
6/17/2009	9:15	8.9	11300	44	11.4	7.36	11	0.071	0.01 U	0.061	0.0172	0.003 U	4.1	6 J
		Alaska Air changed policy and now requires cargo to arrive two hours before flight. Subsequently yesterday's coolers could not be shipped by air and I delivered them to the storage locker in Tukwila by 6am.												
7/22/2009	8:00	10	4950	49	11.2	7.32	1	0.079	0.01 U	0.052	0.005 U	0.003 U	0.8	9 J
8/19/2009	8:00	10.8	2990	48	9.8	7.43	1 U	0.07	0.01 U	0.052	0.005 U	0.003 U	1	2 J
9/23/2009	8:30	10.1	2490	54	10.7	7.37	2	0.093	0.01 U	0.059	0.005 U	0.003 U	1.9	1 UJ

Conventional Data Report

Stillaguamish R nr Silvana

05A070

Class: A
Rivermile: 11.1
Latitude: 48 11 48.9
Longitude: 122 12 36.5
Waterbody: WA-05-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2008 12:55	7.9	1680 J	51	12.6	7.46	9	0.267	0.01 U	0.216	0.02	0.0044	8.6	19
11/19/2008 12:57	7.1	2040 J	64	11.6	7.33	9	0.344	0.01 U	0.302	0.014 J	0.0059	6.9	3
12/17/2008 13:02	0.7			13.8	7.27	9	0.401	0.01 U	0.396	0.0168	0.0082	4.4	3
Cond. Was 53 before recal. Did not get stage height as it was too dangerous on bridge. Chained up semi's slinging ice.													
1/28/2009 11:40	3.2	2610 J	65	13.2	7.27	12	0.353	0.01 U	0.32	0.0218	0.0099 J	6.1	6
2/25/2009 11:40	4.5	6137 J	40	12.7	7.29	375	0.301	0.013	0.235	0.34	0.0059	350	18
check bar = 58.98													
3/18/2009 12:00	4.7	15168 J	68	12.5	7.34	16	0.319	0.01 U	0.292	0.0298	0.0062	16	6
Did not get stage at this station, high wind, rain and heavy traffic, too dangerous. pH after recal was 12.8 degrees and pH 7.48													
4/22/2009 12:10	6.5	8331 J	33	12	6.99	74	0.167	0.01 U	0.147	0.0909	0.0041	55	9
resampled ph after recal. Recal sample at 12.8C and 6.99pH													
5/20/2009 11:30	6.9	7099 J	33	12.2	6.91	37	0.121	0.01 U	0.113	0.0532	0.0036	23	36
(Check bar)58.98 - 27.07 (stage) = 31.91													
6/17/2009 13:30	14.2	14499 J	50	10.4	7.18	4	0.098	0.01 U	0.066	0.0104	0.0051	3.2	10 J
Stage N/A due to heavy traffic.													
7/22/2009 11:25	20.8	472 J	78	8.5	7.36	3	0.147	0.01 U	0.087	0.018	0.0135	1.6	30
Check bar 58.98 - 23.85 stage height													
8/19/2009 10:50	19.7	372 J	90	8.5	7.53	2	0.108	0.01 U	0.045	0.0191	0.0089	1.4	40
9/23/2009 11:45	15.5		88	8.6	7.22	4	0.256	0.042	0.129	0.0252	0.0124	2.5	28

Conventional Data Report

SF Stillaguamish R @ Arlington

05A090

Class: A
Rivermile: 18.2
Latitude: 48 12 02.6
Longitude: 122 07 08.5
Waterbody: WA-05-1040

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2008 12:00	7.5	939 J	42	12.2	7.37	10	0.23	0.01 U	0.191	0.019	0.003 U	10	22
2 Dogs playing on beach adjacent to sample site.													
11/19/2008 12:07	6.8	612 J	56	12.1	7.39	6	0.37	0.01 U	0.292	0.011 J	0.0047	5.4	6
12/17/2008 11:50	0.7	470 J		14.1	7.4	5	0.413	0.01 U	0.398	0.0163	0.0056	3.4	7 J
1/28/2009 10:45	2.8	618 J	57	13.3	7.36	6	0.349	0.01 U	0.316	0.015	0.0055 J	5.5	7
2/25/2009 11:00	4.2	1720 J	33	12.6	7.29	247	0.267	0.01 U	0.212	0.255	0.0048	210	8
3/18/2009 11:10	4.5	455 J	59	12.9	7.34	27	0.317	0.01 U	0.29	0.0436	0.0042	25	4
4/22/2009 11:15	6	2263 J	30	12.3	7.05 j	65	0.15	0.01 U	0.144	0.0774	0.0033	29	10
5/20/2009 11:00	6.5	2204 J	28	12.4	6.93	36	0.112	0.01 U	0.108	0.0565	0.003 U	23	35
6/17/2009 12:00	16.1	803 J	40	10.7	7.2	4	0.086	0.01 U	0.064	0.0402	0.003 U	3.1	1 U
7/22/2009 10:50	19.7	279 J	64	8.69	7.46	3	0.162	0.01 U	0.097	0.0076	0.0047	1.5	25
8/19/2009 10:20	18.9	201 J	73	8.6	7.67	2	0.114	0.01 U	0.073	0.0068	0.003 U	1.3	37
9/23/2009 11:00	14.7	213 J	71	8.9	7.41	4	0.205	0.018	0.126	0.014	0.003 U	1.3	20

Conventional Data Report

SF Stillaguamish R nr Granite Falls

05A110

Class: AA
Rivermile: 34.6
Latitude: 48 06 09.9
Longitude: 121 57 11.5
Waterbody: WA-05-1050

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2008	14:10		592	38	12.8	7.45	12	0.2	0.01 U	0.149	0.017	0.003 U	9.4	4
		Temperature not recorded.												
11/19/2008	14:15	6.3	476	47	12.5	7.55	15	0.19	0.01 U	0.146	0.013 J	0.0042	10	1 U
12/17/2008	14:35	0.8	356		14.2	7.57	6	0.186	0.01 U	0.183	0.0186	0.0045	4.2	2
		Deep snow and ice on stairs down to station.												
1/28/2009	13:20	2.5	546 J	47	13.8	7.36	18	0.175	0.01 U	0.153	0.0288	0.0049	9.6	1
2/25/2009	12:45	3.6	1539 J	28	13.2	7.26	147	0.228	0.01 U	0.177	0.168	0.0051	140	14
3/18/2009	14:10	3.4	348 J	50	13.3	7.48	48	0.178	0.01 U	0.16	0.0688	0.0048	50	1
4/22/2009	13:30	5.5	2121 J	27	12.6	6.96	39	0.118	0.01 U	0.101	0.0476	0.003 U	21	4
5/20/2009	12:45	5.8	1878 J	26	12.8	7.02	42	0.086	0.01 U	0.085	0.066	0.003 U	30	24
6/17/2009	14:30	11.4	580 J	31	10.9	7.11	4	0.054	0.01 U	0.033	0.0089	0.003 U	2.8	13
7/22/2009	12:25	19.7	162 J	49	9.19	7.71	8	0.082	0.01 U	0.031	0.0095	0.0057	1.7	7
8/19/2009	12:20	18.8	117 J	61	8.6	8.02	1 U	0.061	0.01 U	0.024	0.0076	0.003 U	1.4	16
		Collected sample from downstream end of platform.												
9/23/2009	13:30	14.2	121	59	10.1	7.73	7	0.089	0.01 U	0.039	0.0082	0.003 U	2.4	15

Conventional Data Report

NF Stillaguamish R @ Cicero

05B070

Class: A
Rivermile: 9.5
Latitude: 48 16 02.4
Longitude: 122 00 47.0
Waterbody: WA-05-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2008 10:50	6.9	1510	57	12.8	7.56	3	0.262	0.01 U	0.21	0.011	0.0045	3.4	11
11/19/2008 11:16	6.7	1420	63	11.9	7.45	9	0.298	0.01 U	0.252	0.015 J	0.0063	8.1	7
12/17/2008 11:00	0.6	1090		13.6	7.5	5	0.304	0.01 U	0.285	0.0218	0.0095	3.1	2 J
Put chains after this station. Cond. Was 48 before recal.													
1/28/2009 10:00	2.8	2400	63	13.4	7.38	34	0.299	0.01 U	0.251	0.0538	0.0067 J	24	28
2/25/2009 10:15	4.2	3700	43	12.4	7.31	133	0.277	0.01 U	0.235	0.127	0.0055	110	9 J
3/18/2009 10:40	3.6	1750	69	12.8	7.51	17	0.274	0.01 U	0.239	0.0206	0.0058	8.4	2
4/22/2009 10:50	5.9	3830	36	12.2	7.04	69	0.149	0.01 U	0.129	0.0818	0.0041	34	4
5/20/2009 10:30	6.2	2670	35	12.4	6.98	47	0.13	0.01 U	0.11	0.0473	0.0038	23	17
6/17/2009 11:20	12.6	871	51	10.9	7.17	4	0.086	0.01 U	0.056	0.0118	0.0042	2.7	27
7/22/2009 10:10	17.5	342	78	9.69	7.65	3	0.089	0.01 U	0.02	0.0101	0.008	0.9	17
8/19/2009 9:55	17.2	285	94	8.8	7.75	3	0.081	0.01 U	0.031	0.0135	0.0062	1.4	40
9/23/2009 10:15	13.7	246	99	9.9	7.64	4	0.143	0.01 U	0.063	0.013	0.0064	1.3	63

Conventional Data Report

NF Stillaguamish R nr Darrington

05B110

Class: A
Rivermile: 30
Latitude: 48 16 48.1
Longitude: 121 42 08.7
Waterbody: WA-05-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2008	10:00	6.3	495	44	12.2	7.33	1 U	0.18	0.01 U	0.138	0.0076	0.003 U	0.6	91
11/19/2008	9:48	6.6	800	48	11.7	7.32	3	0.25	0.01 U	0.181	0.0066 J	0.0036	6.4	5 J
12/17/2008	10:00	1.1	1092		13.2	7.46	1 U	0.18	0.01 U	0.176	0.0086	0.0057	0.6	1 J
		Could not find RP scratch in concrete under the snow and ice.												
1/28/2009	9:30	3	903	52	13	7.14	3	0.198	0.01 U	0.167	0.0151	0.0034 J	1.7	2 J
		Stage not available as RP mark was under snow and ice												
2/25/2009	9:40	3.6	1281	39	12.4	7.33	7	0.189	0.01 U	0.161	0.0118	0.0033	3.2	2 J
3/18/2009	9:50	3.4	559	57	13	7.47		0.201	0.01 U	0.182	0.0083	0.0036	0.7	1 U
		pH after recal at 7.1 degrees was7.48												
4/22/2009	10:10	5	2240	30	12.4	7.07	21	0.126	0.01 U	0.107	0.0238	0.003 U	6.5	5
		24.93 - 2.76 = 22.17 RP												
5/20/2009	9:30	5.7	1732	30	12.4	6.99	4	0.081	0.01 U	0.082	0.0088	0.003 U	2.5	6 J
6/17/2009	10:40	10.5	612	35	11	6.94	2	0.076	0.01 U	0.062	0.0061	0.003 U	0.7	26
		26.32 - 2.76 = 23.56												
7/22/2009	9:05	13.2	257	52	10	7.31	2	0.129	0.01 U	0.089	0.0065	0.0056	0.6	20 J
		26.97 - 2.76 = 24.21												
8/19/2009	9:10	13.3	178	70	9.1	7.48	1 U	0.117	0.01 U	0.094	0.0074	0.0048	0.5 U	47
9/23/2009	9:45	11.1	163	77	10.3	7.47	3	0.212	0.032	0.143	0.0134	0.0087	0.8	4
		27.26-2.76=24.50												

Conventional Data Report

Snohomish R @ Snohomish

07A090

Class: A
Rivermile: 12.7
Latitude: 47 54 38.1
Longitude: 122 05 55.7
Waterbody: WA-07-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 12:00	8.6	6390	44	11.7	7.21	8	0.21	0.01 U	0.163	0.014	0.0035	6.4	80
11/18/2008 10:50	8.2	15520	41	10.5	6.89	44	0.376	0.017	0.302	0.044	0.0068	17	28
12/16/2008 12:15	1.9	8934		13.6	7.06	8	0.401	0.015	0.368	0.0219	0.0062	5.9	69
pH is after recal at mid-day													
1/27/2009 12:00	2.8	7724	50	12.9	6.81	18	0.386	0.021	0.327	0.0321	0.0047	9.8	44
2/24/2009 11:45	6.6	4122	59	12.4	7.14	7	0.348	0.017	0.301	0.026	0.0096	11	18 J
3/17/2009 11:30	5.4	5564	59	12.8	7.18	13	0.388	0.01 U	0.334	0.0316	0.0052	9 J	9
4/21/2009 10:50	8.4	15987	39	11.6	6.92	34	0.189	0.01 U	0.174	0.0341	0.0051	13	8
5/19/2009 11:10	8.2	23213	25	12	6.88	91	0.109	0.01 U	0.097	0.0731	0.0036	36	47
6/16/2009 11:45	11.6	11319	28	10.6	6.82	11	0.087	0.01 U	0.073	0.0163	0.0031	6.1	11 J
7/21/2009 10:30	18.2	3142	47	9.19	7.14	5	0.128	0.01 U	0.094	0.0132	0.0035	2.7	21
8/18/2009 10:50	17.5	2104	58	9.5	7.29	8	0.183	0.01 U	0.15	0.0175	0.0057	3.5	30
Fishing boats up and downstream of bridge													
9/22/2009 11:48	14.8	2007	60	8.19	6.97	4	0.239	0.024	0.169	0.0175	0.0042	2.4	15

Metals Data Report

Snohomish R @ Snohomish

07A090

Class: A
Rivermile: 12.7
Latitude: 47 54 38.1
Longitude: 122 05 55.7
Waterbody: WA-07-1020

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/21/2008	12:00		16.8		0.02 U		0.25 U		0.82		0.067	0.0021	0.35			2.8
12/16/2008	12:15		17.6		0.02 U		0.25 U		0.72		0.036	0.0022	0.39			2.3
2/24/2009	11:45		22.9		0.02 U		0.25		0.63		0.122	0.002 U	0.3			3
4/21/2009	10:50		14.8		0.02 U		0.44		1.52		0.26	0.002 U	0.68			1.5
6/16/2009	11:45		11.5		0.02 U		0.25 U		0.83		0.063	0.002 U	0.23			1.7
8/18/2009	10:50		23.8		0.02 U		0.25 U		0.68		0.047	0.002 U	0.32			7.9

Conventional Data Report

Skykomish R @ Monroe

07C070

Class: A
Rivermile: 25.6
Latitude: 47 51 07.4
Longitude: 121 57 33.2
Waterbody: WA-07-1160

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008	11:30	8.1	7170 J	35	12.3	7.19	14	0.18 J	0.01 UJ	0.16 J	0.018	0.003 U	10	49
11/18/2008	9:45	7.6	9597 J	33	9.6	6.94	24	0.21	0.01 U	0.176	0.021	0.003 U	14	3
12/16/2008	11:30	2.1	5810 J		13.6	7.22 J	3	0.216	0.01 U	0.196	0.0108	0.0035	2.6	1
		pH is j'd due to mid-day QC +.14 above true pH.												
1/27/2009	11:05	2.3	5758 J	36	13.5	6.91	10	0.212	0.01 U	0.167	0.019	0.003 U	8.7	4
		Stage Height corrected 83.80-48.51 = 45.75												
2/24/2009	11:10	5.9	3732 J	42	12.3	7.16	7	0.19	0.01 U	0.157	0.0214	0.003 U	5.1	1 J
		Wire weight gage house lock sticky, hard to lock, unlock. Check bar = 83.41												
3/17/2009	10:25	3.7	3721 J	43	13.4	7.27	4	0.214	0.01 U	0.183	0.0113	0.003 U	5.2	1 U
4/21/2009	10:00	6.7	10733 J	32	12.2	6.93	33	0.227	0.01 U	0.116	0.0393	0.0038	16	15
		Check bar = 83.41												
5/19/2009	10:30	6.5	19892 J	22	12.5	6.74	80	0.091	0.01 U	0.07	0.0611	0.0056	50	57
		(Check bar) 83.41 - 51.88 (stage) = 31.53												
6/16/2009	10:55	10.1	8086 J	23	11.3	6.85	7	0.04	0.01 U	0.034	0.0082	0.003 U	3.9	2 J
		83.41 - 49.34 = 34.07												
7/21/2009	9:30	16.1		34	10.1	7.2	4	0.083	0.01 U	0.033	0.0063	0.003 U	2.3	10
8/18/2009	9:40	16.5	1929 J	42	10	7.29	2	0.067	0.01 U	0.052	0.0056	0.003 U	0.6	6
		Gage lock rusted open.												
9/22/2009	10:20	13.5	2053 J	44	9.4	7.04	3	0.159	0.013	0.102	0.0083	0.003 U	1.4	15 J
		83.41-46.56=36.85												

Conventional Data Report

Snoqualmie R nr Monroe

07D050

Class: A
Rivermile: 2.7
Latitude: 47 48 13.7
Longitude: 122 00 10.4
Waterbody: WA-07-1060

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008	10:45	8.8	1756 J	48	11.8	7.27	4	0.267	0.01 U	0.214	0.012	0.0069	2.9	22
11/18/2008	9:00	8.4	5475 J	42	11.7	6.6	36	0.455	0.027	0.345	0.0567	0.011	22	34 J
12/16/2008	10:30	1.5	2870 J		13.4	6.62 J	12	0.459	0.025	0.411	0.027	0.0072	7.4	53
		mid-day pH QC was off by +.14. This and the next stations were j'd												
1/27/2009	9:40	3.3	2873 J	57	12.4	6.96	17	0.44	0.022	0.391	0.024	0.0051	7.9	83
		Stage Height corrected 37.88 - 2.76 = 35.12												
2/24/2009	10:20	7.1	1565 J	68	11.5	7.12	8	0.428	0.03	0.367	0.028	0.0073	4.5	97 J
		Very windy stage is +/- 0.50												
3/17/2009	9:50	4.7	2344 J	67	12.8	7.17	69	0.462	0.01 U	0.405	0.0347	0.0055	14	27
		Very windy Stage is =/-0.50												
4/21/2009	9:15	8.7	2541 J	42	11.6	6.8	33	0.245	0.01 U	0.23	0.034	0.0048	11	13
		35.49 - 2.76 = 32.73 RP												
5/19/2009	9:30	9.4	8000 J	25	12	6.69	52	0.126	0.01 U	0.128	0.0558	0.0037	22	24
		Tape down 33.16 - 2.76 correction = 30.4												
6/16/2009	10:10	12.3	3390 J	31	10.4	6.71	11	0.131	0.01 U	0.114	0.0193	0.0039	5.7	46 J
		37.33 - 2.76 = 34.57												
7/21/2009	8:55	19.6	1251 J	54	9	7.12	4	0.183	0.01 U	0.129	0.0135	0.0054	1.1	22
		Stage Height = 39.93 - tape offset 2.76 = 37.17												
8/18/2009	9:00	17.4	971 J	64	9.5	7.31	4	0.238	0.013	0.202	0.0166	0.0082	2	28
9/22/2009	9:45	15.1	948 J	73	9.3	7.24	4	0.282	0.01 U	0.222	0.0164	0.0067	2.6	41
		40.44-2.76=37.68												

Conventional Data Report

Snoqualmie R @ Snoqualmie

07D130

Class: A
Rivermile: 42.3
Latitude: 47 31 36.9
Longitude: 121 48 43.7
Waterbody: WA-07-1100

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 9:00	7.4	1680	36	11.8	7.11	12	0.18	0.01 U	0.172	0.016	0.0031	11	51
11/18/2008 8:00	7.9	2740	36	11.4	6.81	15	0.296	0.01 U	0.245	0.016	0.003 U	6.3	11 J
Light rain and fog													
12/16/2008 8:00	0.9	1660		13.6	7.18	5	0.258	0.01 U	0.254	0.0127	0.0058	3.4	1
metals blank done here. pH is after recal.													
1/27/2009 8:00	2.7	1740	46	12.9	7.17	7	0.276	0.01 U	0.264	0.0169	0.003	4.3	1
2/24/2009 8:15	5.9	1070	53	11.4	7.11	3	0.277	0.01 U	0.245	0.0146 J	0.0032	1.7	1 J
Metals station													
3/17/2009 8:20	3.4	1480	56	13.5	7.03	14	0.298	0.01 U	0.292	0.0251	0.0031	11	5
Snowing, pH meter recalabrated, new reading at 5.7 degrees was 7.12													
4/21/2009 8:00	5.2	5680	28	12.6	6.8	59	0.339	0.01 U	0.143	0.0511	0.0032	18	20
5/19/2009 8:00	6.2	8530	18	12	6.74	72	0.099	0.01 U	0.091	0.0678	0.003 U	25	24
6/16/2009 8:30	10.2	3100	24	10.8	7.02	6	0.088	0.01 U	0.073	0.0088	0.003 U	4.5 J	17 J
7/21/2009 8:00	15.1	840	45	9.1	6.87	3	0.154	0.01 U	0.121	0.0055	0.0031	1.6	42 J
8/18/2009 7:55	15.3	540	58	9.3	7.15	2	0.184	0.01 U	0.166	0.0068	0.003 U	0.5 U	45
9/22/2009 8:00	12.6	506	59	9.19	7.16	2	0.2	0.01 U	0.172	0.0172	0.0088	0.9	45
changed batteries in Conductivity meter.													

Metals Data Report

Snoqualmie R @ Snoqualmie

07D130

Class: A
Rivermile: 42.3
Latitude: 47 31 36.9
Longitude: 121 48 43.7
Waterbody: WA-07-1100

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/21/2008	9:00		13.8		0.02 U		0.25 U		0.6		0.033	0.0026	0.22			2
12/16/2008	8:00		15.4		0.02 U		0.25 U		0.44		0.021	0.002	0.16			1 U
2/24/2009	8:15		19.7		0.02 U		0.25 U		1.74		0.043	0.002 U	0.31			4.5
4/21/2009	8:00		10.4		0.02 U		0.25 U		1.15		0.042	0.0045	0.23			3.5
6/16/2009	8:30		9.47		0.02 U		0.25 U		0.56		0.02 U	0.002 U	0.15			2.1
8/18/2009	7:55		24.9		0.02 U		0.25 U		0.39		0.02 U	0.002 U	0.21			1 U

Conventional Data Report

Cedar R @ Logan St/Renton

08C070

Class: A
Rivermile: 1
Latitude: 47 29 08.4
Longitude: 122 12 32.4
Waterbody: WA-08-1143

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008	15:30	10.7	406	70	12.2	7.75	3	0.2	0.01 U	0.159	0.011	0.0062	1.1	46
11/17/2008	15:20	9.2	2090	44	11.2	7.38	25	0.21	0.01 U	0.175	0.018	0.0045	8.8	11
		high flows												
12/15/2008	14:00	3	588		12.9	7.56	3	0.34	0.01 U	0.341	0.0176	0.0088	1	5
		Original pH 7.47, pH after recalibration was 7.56												
1/26/2009	12:30	5.2	578	78	12.7	7.49	5	0.409	0.01 U	0.402	0.0159	0.0111	2 J	2
		Tractor removing flood deposited sand from walk next to river near site												
2/23/2009	14:40	8.5	481	74	12.1	7.65	36	0.246	0.01 U	0.232	0.0157 J	0.007	0.7	9
3/16/2009	13:00	5.8	619	71	12.8	7.57	11	0.373	0.01 U	0.316	0.0246	0.0062	3.7	64
4/20/2009	14:50	11.2	780	133	11.4	7.44	6	0.261	0.01 U	0.242	0.0132	0.0086	1.9	3
5/18/2009	14:15	11	1570	45	11.2	7.42 J	109	0.116	0.01 U	0.11	0.0232	0.0057	6.3	2
6/15/2009	14:10	14.9	324	77	11.1	8.02	2	0.152	0.01 U	0.123	0.0078	0.0056	1	11 J
7/20/2009	13:20	17.7	198	82	10.3	7.92	3	0.214	0.01 U	0.175	0.0143	0.0081	0.7	40
8/17/2009	13:45	16.9	185	91	12.4	8.63	2	0.123	0.01 U	0.115	0.0107	0.0061	0.5 U	110
9/21/2009	13:20	13.5	162	96	12.4	8.56	4	0.137	0.01 U	0.113	0.0152 J	0.0051	0.9	35

Conventional Data Report

Cedar R @ RR Grade Rd

08C100

Class: AA
Rivermile: 22.5
Latitude: 47 23 05.8
Longitude: 121 57 23.2
Waterbody: WA-08-1150

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008	11:12	10	470 J	52	11.4	7.56	6	0.14	0.01 U	0.116	0.005 U	0.0031	0.6	5
11/17/2008	9:35	8.3	1840 J	35	11.7	7.39	9	0.15	0.01 U	0.114	0.01	0.0033	3.7	1
12/15/2008	8:50		511 J											
		Gate inoperable unable to sample. Snow was also deep, may not have been able to sample even if gate would open.												
1/26/2009	9:40	5.1	606 J	61	12.3	7.63	4	0.208	0.01 U	0.206	0.0172	0.0096	2 J	2
		Stage Height corrected 26.64 - 2.76 = 24.88 (sic)												
2/23/2009	9:30	7.1	490 J	58	11.7	7.67	1	0.173	0.01 U	0.167	0.0165 J	0.0056	0.9	1
3/16/2009	9:50		573 J											
		Large maple tree down across road at first turn off. Could not reach sample site.												
4/20/2009	9:50	7.4	793 J	50	11.9	7.35	12	0.176	0.01 U	0.173	0.0089	0.0079	1.3	1 U
		RP = 26.35 - 2.76 = 23.59												
5/18/2009	9:40	9.4	1570 J	36	11.3	7.26 J	11	0.082	0.01 U	0.083	0.0083	0.0034	1.4	1 U
		recalculated pH meter with new "7" buffer at next station and remeasured here, temp 15.7 and pH 7.01												
6/15/2009	9:30	11	470 J	57	10.9	7.52	2	0.131	0.01 U	0.121	0.0073	0.0049	0.9	6
		26.90 - 2.76 = 24.14, worng BP entered on sheet.												
7/20/2009	9:35	12.5	408 J	59	10.6	7.61	1	0.156	0.01 U	0.126	0.0069	0.0063	0.5 U	12 J
		~200 flags below water at gravel bar u/s r/b. Sediment study? Did not take RP.												
8/17/2009	9:45	11.1	275 J	71	11.4	7.74	1	0.155	0.01 U	0.158	0.009	0.0067	0.5 U	14
9/21/2009	9:25	9.9	248 J	72	11	7.58	1 U	0.179	0.01 U	0.159	0.0073	0.0073	0.5 U	23
		27.40-2.76 =24.64												

Conventional Data Report

Cedar R nr Landsburg

08C110

Class: AA
Rivermile: 25.1
Latitude: 47 23 28.7
Longitude: 121 55 13.9
Waterbody: WA-08-1150

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008	10:40	10	470	51	11.4	7.56	2	0.13	0.01 U	0.111	0.0063	0.0033	0.7	1
11/17/2008	9:15	8.3	1840	35	11.7	7.39	7	0.16	0.01 U	0.103	0.008	0.0037	3.2	1 U
		High Flows												
12/15/2008	8:45		511											
		Gate inoperable unable to sample. Snow was also deep, may not have been able to sample even if gate would open.												
1/26/2009	9:10	5	606	62	12.5	7.62	5	0.222	0.01 U	0.192	0.0198	0.0101	1.5 J	1 U
		Logs down on road, pulled them off with van.												
2/23/2009	9:14	7	490	58	11.6	7.65	1	0.162	0.01 U	0.161	0.0169 J	0.0057	1.1	4
3/16/2009	9:30		573											
		Large maple tree down on road just beyond first turn off. Could not access sampling site.												
4/20/2009	9:30	7.2	793	50	11.9	7.24	7	0.19	0.01 U	0.163	0.0094	0.0088	1.3	1 U
5/18/2009	9:10	9.2	1570	35	11.2	7.29 J	4	0.088	0.01 U	0.081	0.0101	0.0034	1.5	1
6/15/2009	9:00	10.9	470	56	10.9	7.37	2	0.147	0.01 U	0.12	0.0079	0.0095	0.6	2
7/20/2009	9:00	12.2	408	58	10.6	7.53	1	0.147	0.01 U	0.127	0.0079	0.0056	0.5 U	7 J
8/17/2009	9:20	10.9	275	70	10.9	7.63	2	0.162	0.01 U	0.16	0.0087	0.0068	0.5 U	5
9/21/2009	9:00	9.9	248	72	11.1	7.53	1	0.148	0.01 U	0.158	0.0102	0.0068	0.5 U	1 U

Conventional Data Report

Johns Creek @ Gene Coulon Park

08N070

Class: AA
Rivermile: 0.2
Latitude: 47 30 12.3
Longitude: 122 12 02.4
Waterbody: WA-08

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008 15:00	13.3		152	7.3	7.17	11	0.883	0.23	0.467	0.087	0.021	15	1300 J
11/17/2008 14:10	12.7		264	7.7	7.45	3	1.34	0.182	1.02	0.0682	0.025	4.7	38
	Lots of leaf litter, shallow												
12/15/2008 13:25	7.9			11.3	7.42	209	1.09	0.135	0.987	0.0923	0.0202	5.8	88
	recalibrated pH meter and remeasured pH. Original was 7.62 after recal 7.42												
1/26/2009 12:00	7.4		272	10	7.38	8	1.36	0.154	1.12	0.0649	0.0237	4.2 J	41
	New ground digging and construction near sampling site												
2/23/2009 14:10	9.8		249	8.6	7.32	6	1.36	0.148	1.02	0.0752	0.0181	11	37
3/16/2009 12:20	6.4		124	10.5	7.28	15	0.62	0.109	0.379	0.064	0.0124	14	440
	Raining hard												
4/20/2009 14:30	13.2		54	9.19	7.31	6	1.21	0.136	0.978	0.0775	0.0309	5.1	17
	No flow, may be backed up by higher lake level, skin on surface. If continues may have to move collections site upstream to open flow stretch.												
5/18/2009 13:30	13.6		256	7.7	7.29 J	3	1.38	0.253	1.05	0.109	0.0286	6.2	110 J
	Lake level up, damming flow. Sampled upstream 450' where there appeared to be flow. Any further up and I would pass a point where five pipes merge. Site in front of the Bristol Apts. Near RR tracks.												
6/15/2009 13:30	16.2		255	6.9	7.24	33	1.55	0.186	1.24	0.149	0.0341	6.8	63
	Sampled 150 yds. Upstream of old site, to moving water. Lake still damming the creek.												
7/20/2009 12:50	17.1		180	8.8	7.72	63	0.953	0.068	0.808	0.326	0.101	75	150
	Turbid: tea with cream.												
8/17/2009 13:15	17.7		250	8	7.43	2	1.3	0.14	1.1	0.0981	0.0419	2.7	460
	Sampled at original site just upstream of trail.												
9/21/2009 12:30	16.1		243	8.2	7.47	49	1.35	0.169	1.06	0.16	0.0424	7.9	92

Conventional Data Report

Green R @ Tukwila

09A080

Class: A
Rivermile: 12.4
Latitude: 47 27 55.4
Longitude: 122 14 52.3
Waterbody: WA-09-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008 16:40	11.1	680	91	11.1	7.36	11	0.299	0.012	0.232	0.031	0.0093	4.9	62
11/17/2008 17:00	7.9	4970	51	11.3	7.19	63	0.385	0.01 U	0.32	0.076	0.011	32	15
12/15/2008 15:25	1.9	1550	83		7.3	8	0.527	0.011	0.508	0.0399	0.0207	3.8	23
Cond from MEL. DO bottle froze and broke in van (closest to the door). Original conductivy was 85, 75 after recal. All cond. Samples were redone using the gen chem water sample from each site.													
1/26/2009 14:30	4	1840	86	12.5	7.26	24	0.612	0.014	0.543	0.024	0.0155	9.7 J	10
chk bar 38.35													
2/23/2009 16:00	7.9	731	134	10.8	7.16	17	0.666	0.045	0.561	0.0476	0.0084	7	11
chk bar = 38.34													
3/16/2009 14:00	5.3	1100	105	11.7	7.42	13	0.554	0.077	0.276	0.0962	0.0157	12	430 J
4/20/2009 16:00	8.7	2720	69	11.8	7.24	18	0.317	0.01 U	0.302	0.033	0.0142	6.4	3
5/18/2009 15:30	9.3	3530	52	11.3	7.17 J	20	0.14	0.01 U	0.119	0.0304	0.008	7	21
Check bar = 38.34 - 9.75 (stage) = 28.59													
6/15/2009 15:40	13	1450	62	10.4	7.19	8	0.183	0.01 U	0.143	0.0253	0.0087	4.2	25
38.28 - 5.62 = 32.66 Note: Check bar was .06 shorter than last 4 months.													
7/20/2009 14:20	20.1	299	189	8.9	7.22	5	0.491	0.068	0.329	0.0527	0.0096	2.7	18
8/17/2009 15:10	18.8	264	180	9.4	7.16	9 J	0.389	0.073	0.269	0.0526	0.0099	1.9	32
Brown clumps of suspended algae like stuff on water surface.													
9/21/2009 14:50	15.7	295	154	7.4	7.13	7	0.585	0.109	0.402	0.0581	0.013	3.7	41
38.29 (check bar) - 2.15 = 36.14													

Conventional Data Report

Green R @ Kanaskat

09A190

Class: AA
Rivermile: 57.6
Latitude: 47 19 09.4
Longitude: 121 53 36.7
Waterbody: WA-09-1030

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008	9:40	11.4	487	50	10.9	7.58	2	0.12	0.01 U	0.087	0.007	0.003 U	0.9	2
11/17/2008	8:30	7.2	4340	39		7.34	28	0.255	0.01 U	0.217	0.047	0.0082	26	6
		High flows, turbid, barometric pressure is from Cedar at Landsburg. Error in processing eliminated DO for this station.												
12/15/2008	8:15	0.1	1020		14.4	7.63	10	0.149	0.01 U	0.159	0.0207	0.0093	5.1	2 J
		bitter cold, ice on roads												
1/26/2009	7:50	2.5	1020	45	13.3	7.33	27	0.209	0.01 U	0.173	0.0386	0.0093	18 J	1
2/23/2009	8:15	4.8	348	48	12.6	7.35	3	0.146	0.01 U	0.13	0.0153 J	0.0067	1.1	1 U
		After pH recal remeasured at 6.5 C/ 7.34												
3/16/2009	8:30	3.4	441	45	13.4	7.17	3	0.189	0.01 U	0.176	0.0127	0.0082	1.4	1
4/20/2009	8:15	6	1910	40	12.3	7.31	4	0.141	0.01 U	0.123	0.0141	0.0116	2.8	1 U
5/18/2009	8:30	7.4	2920	38	12	7.38 J	4	0.033	0.01 U	0.025	0.0144	0.0075	2.9	2
		recalibrated pH meter												
6/15/2009	8:00	10.2	1130	35	11	6.91	2	0.044	0.01 U	0.016	0.0134	0.0072	1.8	3
7/20/2009	8:05	12.9	143	48	10.5	7.9	1 U	0.079	0.01 U	0.042	0.0077	0.0059	0.5 U	11 J
		Post-recal pH: 7.49. Three fishermen. Water clear												
8/17/2009	8:30	15	123	53	9.69	7.62	1	0.104	0.01 U	0.069	0.01	0.0042	0.6	23 J
9/21/2009	8:15	14	169	57	10.1	7.43	2	0.108	0.01 U	0.067	0.0121	0.006	1.2	7

Conventional Data Report

Black R @ Monster Rd SW

09H090

Class: A
Rivermile: 0.6
Latitude: 47 28 20.4
Longitude: 122 14 10.4
Waterbody: WA-09-1015

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008	16:00	11.5		234	5.3	7.05	5	0.749	0.152	0.369	0.138	0.027	10	220
11/17/2008	16:10	10.7		209	5.4	7.01	6	0.676	0.126	0.219	0.137	0.0392	6.1	110
12/15/2008	14:30	3.3			8.9	7.03	9	0.725	0.132	0.346	0.154	0.0377	9.7	400
		original conductivty ws 44, after calibration 120												
1/26/2009	13:30	5.3		348	6.2	7.09	12	1.04	0.337	0.454	0.2	0.0285	20 J	46
		River water looks like chocolate milk												
2/23/2009	15:20	9.3		328	5.4	7.05	9	0.959	0.265	0.406	0.19	0.0229	19	240
		QA/QC station. Water very dark with sediment. Good candidate for DO study												
3/16/2009	13:20	5.8		133	10.6	7.15	25	0.76	0.018	0.583	0.0614	0.0168	8.3	120
4/20/2009	15:20	13.2		309	6.1	7.01	7	0.702	0.152	0.298	0.176	0.0315	13	66
		slow flows, very low DO. Cond bad: Coded QC=D and Lab Cond used. (MEL re-ran and got 303)												
5/18/2009	15:00	15.2		338	3.6	7.01 J	7	0.818	0.28	0.303	0.192	0.0194	17	52
		re-measured pH after calibration at next site. Temp 17.0 and pH 7.00												
6/15/2009	14:45	16.2		403	4.2	7.17	6	0.894	0.213	0.445	0.158	0.0221	19	200
7/20/2009	13:45	18.7		379	4.7	7.27	5	0.727	0.116	0.428	0.134	0.0225	13	320
		Turbid but not as bad as Johns Creek. Thick with fine-leaved Potomogeton. Some flow visible but slow.												
8/17/2009	14:35	17.6		293	5.09	7.12	5	0.7	0.087	0.43	0.162	0.0184	12	250
		Ducks upstream of sample site												
9/21/2009	13:50	14.8		286	3.7	7.06	7	0.678	0.131	0.341	0.18	0.023	12	470

Conventional Data Report

Walker Creek near mouth

09L060

Class: AA
Rivermile: 0.4
Latitude: 47 26 40.4
Longitude: 122 21 04.8
Waterbody: WA-09-

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008 13:03	10.7		241	10.9	8.11	17	1.37	0.01 U	1.21	0.0603	0.0321	9	1600 J
11/19/2008 16:45	9.7		285	10.7	8.08	6	1.51	0.01 U	1.3	0.034	0.029	5.4	15
Resampled on 11/19/2008													
12/15/2008 10:30	2.3			14.7	8.22	6	1.45	0.01 U	1.38	0.0389	0.0288	2	14
RP = 5.55 - 2.76													
1/26/2009 11:00	3.4		291	12.9	7.96	6	1.67	0.01 U	1.56	0.033	0.0319	1.9 J	20
Stage Height corrected 5.22 - 2.76 = 2.46													
2/23/2009 10:55	8.4		285	11.5	8.27	4	1.44	0.01 U	1.39	0.0392	0.0258	1.6	13
3/16/2009 10:10	5.6		208	11.8	7.89	9	0.993	0.01 U	0.799	0.0435	0.0189	4.3	68
4/20/2009 11:25	10.7		60	11.3	8.14	7	1.4	0.01 U	1.31	0.0361	0.0305	1.1	32
5.32 - 2.76 = 2.56													
5/18/2009 11:10	12.4		287	10.7	8.06 J	7	1.55	0.01 U	1.47	0.054	0.0423	2.6	28
recalibrated at this station with new buffers													
6/15/2009 10:55	13.6		299	9.9	7.88	7	1.56	0.01 U	1.46	0.0639	0.0455	4.4	300
5.37 - 2.76 = 2.61													
7/20/2009 11:10	14.8		309	9.6	8.14	7	1.59	0.01 U	1.47	0.0677	0.0498	3.7	580
RP location uncertain.													
8/17/2009 11:05	14		289	10.1	8.14	7	1.12	0.01 U	1.05	0.0667	0.0477	2.9	380
9/21/2009 11:00	12.2		293	10.19	8.06	3	1.42	0.01 U	1.34	0.0594	0.0515	1.8	430
5.45-2.76=2.69													

Metals Data Report

Walker Creek near mouth

09L060

Class: AA
Rivermile: 0.4
Latitude: 47 26 40.4
Longitude: 122 21 04.8
Waterbody: WA-09-

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/20/2008	13:03		108		0.02 U		0.69		1.13		0.11	0.0061	1.18			3.1
12/15/2008	10:30		119		0.02 U		1.29		0.83		0.068	0.0028	1.41			2.5
2/23/2009	10:55		127		0.02 U		0.76		0.79		0.075	0.0029	0.99			3.2
4/20/2009	11:25		134		0.02 U		0.83		0.8		0.063	0.0028	1.38			4.7
6/15/2009	10:55		139		0.02 U		1.53		0.62		0.056	0.0026	1.88			2.4
8/17/2009	11:05		136		0.02 U		0.83		0.57		0.046	0.002 U	1.15			1.5

Conventional Data Report

North Creek at Seahurst Pk

09M050

Class: AA
Rivermile: 0
Latitude: 47 28 54.2
Longitude: 122 21 40.2
Waterbody: WA-09

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008 13:55	10.6		280	11.5	8.29	7	1.26	0.01 U	1.13	0.05	0.0365	3.8	96 J
11/17/2008 13:40	10.2		277	11.2	7.98	3	1.27	0.01 U	1.09	0.035	0.0323	1.4	7
2/23/2009 12:15	8.4		278	12.1	8.35	17	1.32	0.01 U	1.19	0.0842	0.0323	1.7	1
	Normal access road washed out, accessed site from south through park. Sampling site is below a series of small water falls, very low flows.												
3/16/2009 10:50	6.2		242	12.1	8.24	13	1.29	0.01 U	1.12	0.0496	0.0299	2.2	6
	Crew cleaning out settling pond. Sampled above pond and avoided stirred up sediments.												
4/20/2009 13:30	10.3		58	11.1	8.16	9	1.19	0.01 U	1.11	0.0491	0.0444	3.3	1 U
	9.15 - 2.76 = 6.39 RP												
5/18/2009 12:10	10.9		277	11.3	8.24	16	1.18	0.01	1.12	0.0529	0.0455	2.7	22
6/15/2009 11:55	12.2		284	10.5	8.09	8	1.28	0.011	1.17	0.0605	0.0453	4.7	49
	9.20 - 2.76 = 6.44												
7/20/2009 11:50	12.8		288	10.5	8.34	6	1.24	0.01 U	1.17	0.0496	0.0413	3.1	33
	RP location uncertain. Construction upstream (stabilizing banks?) but no visible effect on stream.												
8/17/2009 12:15	12.7		288	10.9	8.23	8	1.17	0.01 U	1.11	0.0559	0.044	1.7	40
9/21/2009 11:45	11.5		290	10.7	8.26	5	1.17	0.01 U	1.09	0.048	0.0463	1.8	160
	9.17-2.76=6.41												

Metals Data Report

North Creek at Seahurst Pk

09M050

Class: AA
Rivermile: 0
Latitude: 47 28 54.2
Longitude: 122 21 40.2
Waterbody: WA-09

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/20/2008	13:55		128		0.02 U		0.89		0.45		0.037	0.0051	0.78			2.5
2/23/2009	12:15		125		0.02 U		0.96		0.68		0.043	0.0096	0.43			2.1
4/20/2009	13:30		130		0.02 U		1.11		0.65		0.049	0.002 U	0.86			1.1
6/15/2009	11:55		132		0.02 U		1.6		0.68		0.031	0.0028	1.42			2.8
8/17/2009	12:15		139		0.02 U		1.08		0.38		0.02 U	0.002 U	0.84			1.2

Conventional Data Report

Puyallup R @ Meridian St

10A070

Class: A
Rivermile: 8.3
Latitude: 47 12 09.4
Longitude: 122 17 37.4
Waterbody: WA-10-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2008 9:15	6.6	1110	94	11.8	7.39	9	0.24	0.01 U	0.189	0.041	0.023	5.5	29 J
11/19/2008 8:45	7.8	3610	65	11.6	7.39	117	0.313	0.012	0.242	0.105	0.011	36	14 J
Not well mixed, patchy dark spots of water with lower sediment content													
12/17/2008 11:40	2	2250	83	13.3	7.41	161	0.301	0.018	0.279	0.144	0.0158	44.1	12 J
1/28/2009 9:40	3.7	2730	80	13	7.35	53	0.381	0.015	0.302	0.0681	0.0146	19	17 J
2/25/2009 9:00	5.9	2180	88	12	7.43	626	0.378	0.041	0.242	0.485	0.0183	180	600 J
3/18/2009 8:40	4.9	2090	95	12.5	7.4	115	0.509	0.016	0.399	0.0863	0.0244	9.8	120 J
4/22/2009 10:45	7.5	5350	53	11.8	7.4	439	0.152	0.01 U	0.115	0.336	0.0081	70	28
5/20/2009 11:20	7.5	7160	49	11.95	7.36	304	0.108	0.01 U	0.095	0.143	0.0096	55	24
High muddy water													
6/17/2009 9:55	11.8	4460	52	11.1	7.33	43	0.087	0.018	0.056	0.0537	0.0132	19	22 J
7/23/2009 8:40	15.5	2540	62	9.69	7.41	307	0.108	0.01 U	0.081	0.31	0.0178	220	48 J
Very hard to process DTN sample through small filter and syringe. Delayed processing of OP_DIS sample.													
8/19/2009 11:45	15.8	2020	66	9.6	7.55	241	0.115	0.013	0.111	0.267	0.0194	140	120
Lots of fishermen in river													
9/23/2009 11:30	13.4	1620	77	10.3	7.38	173	0.289	0.098	0.176	2.27	0.027	110	190
Fishermen were upstream of site													

Conventional Data Report

Nisqually R @ Nisqually

11A070

Class: A
Rivermile: 3.4
Latitude: 47 03 42.3
Longitude: 122 41 46.5
Waterbody: WA-11-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2008 11:40	10.5	1154 J	68	10.9	7.64	6	0.12	0.01 U	0.08	0.016	0.0063	6	12 J
11/19/2008 10:40	9.2	2136 J	51	10.9	7.38	224	0.274	0.01 U	0.188	0.444	0.0089	370	28
12/17/2008 14:30	4.9	1292 J	68	11.9	7.52	8	0.229	0.01 U	0.221	0.0411	0.0099	14.3	3
1/28/2009 11:30	4.7	2627 J	61	12.6	7.62 J	20	0.361	0.01 U	0.31	0.0594	0.0093	24	14
PH probe was potentially contaminated influencing the reading. Meter was recalibrated and sample was remeasured.													
2/25/2009 11:45	5.6	1439 J	65	12.1	7.46	9	0.342	0.01 U	0.303	0.0312	0.011	8.8	5
3/18/2009 11:00	6.2	1582 J	69	12.7	7.56	6	0.415	0.01 U	0.345	0.0271	0.0085	6.6	2
4/22/2009 13:20	9	1714 J	66	12	7.72	8	0.277	0.01 U	0.214	0.0233	0.0074	4.3	1
5/20/2009 13:28	9.3	2947 J	58	11.55	7.54	16	0.176	0.01 U	0.138	0.0231	0.0071	3.4	15
6/17/2009 12:10	12.2	1161 J	66		7.67	4	0.164	0.01 U	0.127	0.0139	0.007	2.2	23
DO sample lost (previous sample not removed from bucket)													
7/23/2009 11:50	14.1	1176 J	61	10.4	7.6	5	0.144	0.01 U	0.093	0.012	0.0103	2.8	13
8/19/2009 15:20	18.6	860 J	68	10	7.85	5	0.162	0.01 U	0.116	0.0177	0.0097	2.7	16
Fisherman in area													
9/23/2009 13:25	16.4	755 J	69	10.5	7.87	6	0.131	0.01 U	0.092	0.0489	0.0083	10	9
Fishermen were upstream of site.													

Conventional Data Report

Spanaway Cr @ Old Military Rd.

12F090

Class: AA
Rivermile: 2.2
Latitude: 47 07 20.9
Longitude: 122 26 47.6
Waterbody: WA-11-111?

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/22/2008 10:50	11.2		140	8.8	7.48	3	0.388	0.073	0.077	0.024	0.0037	2.3	37
11/19/2008 9:36	10.1		136	8.1	7.35	3	0.443	0.017	0.21	0.026	0.0058	2.2	13 J
12/17/2008 13:30	4.5		153	10.1	7.4	4	0.514	0.018	0.445	0.0312	0.0117	2.4	23 J
1/28/2009 10:40	4.7		135	11.3		3	1.52	0.01 U	1.38	0.0329	0.0096	1.2	29
PH probe was potentially contaminated influencing the reading result considered unacceptable.													
2/25/2009 10:45	6.4		134	12.1	7.3	2	1.6	0.01 U	1.61	0.0226	0.0053	0.9	14
3/18/2009 9:50	6.9		132	12.6	7.51	3	1.79	0.01 U	1.7	0.0205	0.0046	1.3	9
4/22/2009 12:05	14.4		131	12	7.69	8	1.77	0.01 U	1.4	0.0198	0.0043	1	21
5/20/2009 12:30	16.1		127	10.65	7.73	9	1.28	0.023	1.17	0.0343	0.0044	3.6	24
6/17/2009 11:05	20.9		128		7.99	4	0.968	0.029	0.802	0.0169	0.0061	1.2	84
Ducks upstream. DO sample lost (left in bucket and not processed)													
7/23/2009 10:30	22		133	8.19	7.94	2 U	0.617	0.037	0.392	0.0183	0.0107	1.7	40
8/19/2009 13:15	22.8		136	8.8	8.51	2	0.344	0.051	0.122	0.0223	0.0072	1	210
9/23/2009 12:30	20.2		136	9	8.16	3	0.236	0.015	0.014	0.056	0.0053	1.9	140
ducks were upstream of site.													

Metals Data Report

Spanaway Cr @ Old Military Rd.

12F090

Class: AA
Rivermile: 2.2
Latitude: 47 07 20.9
Longitude: 122 26 47.6
Waterbody: WA-11-111?

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/22/2008	10:50		52.8		0.02 U		0.38		0.55		0.025	0.002 U	0.39			1.6
12/17/2008	13:30		48.3		0.02		0.73		0.8		0.058	0.0023	0.41			14
2/25/2009	10:45		49.3		0.02 U		0.37		0.67		0.037	0.002 U	0.15			1
4/22/2009	12:05		47.8		0.02 U		0.32		0.69		0.036	0.002 U	0.34			1 U
6/17/2009	11:05		48.4		0.02 U		0.46		0.75		0.02	0.002 U	0.57			1
8/19/2009	13:15		53.9		0.02 U		0.34		0.99		0.029	0.002 U	0.48			1.3

Conventional Data Report

Deschutes R @ E St Bridge

13A060

Class: A
Rivermile: 0.6
Latitude: 47 00 42.3
Longitude: 122 54 11.5
Waterbody: WA-13-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 16:55	10.5	102	145	11.4	7.59	1	0.918	0.01 U	0.847	0.052	0.015	1.4	6
11/18/2008 15:30	9	275	107	10.5	7.29	6	0.8	0.01 U	0.72	0.029	0.015	4.8	42
12/16/2008 16:07	2.7	190	117	12.7	7.35	4	0.845	0.01 U	0.86	0.0344	0.0174	5.6	27
RP should probably be 24.42.													
1/27/2009 16:50	4.7	377	108	11.9	7.24	8	1.01	0.01 U	0.916	0.0327	0.0166	6.1	11
2/24/2009 15:00	8.5	238	124	11.5	7.43	3	0.879	0.01 U	0.907	0.0228	0.0154	2.2	10
3/17/2009 15:00	6.2	745	79	12.1	7.19	22	0.73	0.01 U	0.676	0.0488	0.0121	18	91
4/22/2009 9:00	12	395	100	10.19	7.45	7	0.616	0.01 U	0.55	0.0278	0.0124	4.1	17 J
gage wire strand breaking.													
5/20/2009 9:35	11.2	373	99	10.35	7.32	7	0.562	0.013	0.527	0.0295	0.0124	4	49 J
Cloudy water and surface debris.													
6/17/2009 8:50	14.6	143	135	9.19	7.34	3	0.849	0.01 U	0.775	0.0229	0.0117	2.3	31 J
Geese located upstream.													
7/22/2009 15:50	18.3	93	146	9.4	7.43	3	0.977	0.014	0.873	0.028	0.0281	2.1	51
Rafters floated by approx. 8-10 min. after sample was taken.													
8/19/2009 10:10	15.9	97	149	8.69	7.35	4	0.87	0.013	0.819	0.0286	0.0152	1.8	25
9/23/2009 8:50	13	83	149	8.9	7.3	4	0.96	0.015	0.869	0.0368	0.0202	2.8	41 J

Conventional Data Report

Big Beef Cr @ Mouth

15F050

Class: AA
Rivermile: 0.2
Latitude: 47 39 01.3
Longitude: 122 47 00.6
Waterbody: WA-15-0000

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 13:35	10.7	18.72	85	11.4	7.41	2	0.16	0.01 U	0.058	0.013	0.0076	0.7	9
The road to the field station is repaired. I sampled at the pour-off point for the adult weir. A school of approximately 100 salmon were staged downstream of the weir. The majority were adult coho with approximately 10 chum patrolling the edge of the s													
11/4/2008 13:45	9.7	18.72	91	11	7.25	13	0.341	0.01 U	0.188	0.023	0.0063	4.3	20
Coho salmon moving upstream into the adult trap and being passed upstream by Matt Gillam (WDFW). Returns have been very low to date.													
12/9/2008 13:00	7		72	11.6	7.46	1	0.342	0.01 U	0.243	0.0173	0.0091	0.8	5
Sampled during high tide upstream of weir. A few chum and coho salmon staged in the pool below the weir.													
1/13/2009 14:15	5.8	30.86	47	12.3	7.04	5	0.475	0.01 U	0.396	0.0148	0.0042	4.2	15
410 adult coho returned to the Big Beef creek weir and collection facility during the winter of 2008/2009. This is the lowest return since records have been kept. --Matt Gillam (WDFW) personal communication													
2/10/2009 14:35	2.8		65	12.9	7.56	2	0.346	0.01 U	0.261	0.0123	0.0077	0.8	1 U
Stream low and clear.													
3/10/2009 14:30	5.9	16.41	64	12.3	7.56	7	0.281	0.01 U	0.222	0.0108	0.0068	0.6	1
4/14/2009 13:50	10.3	34.4	61	11	7.44	3	0.261	0.01 U	0.156	0.0151	0.0058	2.1	4 J
sampled near low tide. A pair of geese were swimming upstream during sampling.													
5/12/2009 13:55	12.5	21.37	62	10.19	7.5	2	0.25	0.01 U	0.128	0.018	0.0071	1.3	2
Geese swimming in water upstream during sampling activity.													
6/9/2009 14:25	17.4	3.98	302	9.5	7.71	1	0.155	0.01 U	0.077	0.0139	0.0094	0.7	17
7/14/2009 14:35	16.2	1.11	126	9.9	7.72	2	0.235	0.01 U	0.161	0.0157	0.0147	0.8	20
very low and clear													
8/11/2009 14:25	16.2	1.3	249	9.69	7.71	2	0.205	0.01 U	0.134	0.0195	0.0125	1	29 J
low and clear													
9/9/2009 14:00	15.1	5.8	222	10	7.63	2	0.242	0.01 U	0.185	0.0187	0.0131	1	8
Low and clear. Fish are present.													

Conventional Data Report

Seabeck Cr. @ mouth

15L050

Class: AA
Rivermile: 0.2
Latitude: 47 38 06.1
Longitude: 122 50 06.6
Waterbody: WA-15-7300

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008	14:15	9.8	0.75	96	10.9	7.25	1 U	0.556	0.01 U	0.495	0.013	0.0079	0.5 U	19
		The stage was taken from the WDOE staff gage. Seabeck creek was very low and clear with no adult salmon present at the station.												
11/4/2008	14:45	9.2	0.84	95	10.19	7.1	1 U	0.589	0.01 U	0.522	0.0099	0.005	0.5	24
		The stage was taken from the WDOE staff gage.												
12/9/2008	13:30	7.8	1.95	92	10.9	7.3	1 U	0.689	0.01 U	0.669	0.0187	0.0096	0.5	44
		The stage was taken from the WDOE staff gage. Several spawned out and partially eaten chum salmon carcasses at the station.												
1/13/2009	14:40	6.6	8.88	51	11.65	7.07	14	0.723	0.01 U	0.705	0.0121	0.0054	1	4
		The stage was taken from the WDOE staff gage. Seabeck creek was low and clear.												
2/10/2009	15:15	4.6	1.17	87	11.4	7.29	1	0.684	0.01 U	0.629	0.0146	0.0114	0.5	31
		Stream low and clear.												
3/10/2009	15:10	6	1.52	77	11.9	7.41	1 U	0.663	0.01 U	0.678	0.0111	0.0103	0.5 U	1 U
4/14/2009	14:30	8.2	5.72	50	11.3	7.32	1 U	0.563	0.01 U	0.511	0.0092	0.0067	0.5 U	7 J
5/12/2009	14:30	9.8	1.02	73	10.8	7.38	1 U	0.612	0.01 U	0.581	0.017	0.012	1.3	1 U
6/9/2009	15:10	12.8	0.54	91	10.1	7.53	1 U	0.635	0.01 U	0.608	0.0163	0.0154	0.5 U	24
7/14/2009	15:05	12.4	1.02	95	10.4	7.51	1 U	0.586	0.01 U	0.568	0.0156	0.0184	1.1	53
		low and clear												
8/11/2009	14:55	12.9	0.54	98	9.9	7.58	1 U	0.568	0.01 U	0.532	0.0142	0.0115	0.5 U	45
		low and clear												
9/9/2009	14:35	12.4	0.54	99	10	7.46	1	0.538	0.01 U	0.516	0.0154	0.0121	0.7	240
		Low and clear. Dept. of Fish and Wildlife truck parked at bridge.												

Conventional Data Report

Lt Anderson Cr. @ Anderson Hill Rd

15M070

Class: AA
Rivermile: 0.2
Latitude: 47 39 37.3
Longitude: 122 45 19.6
Waterbody: WA-15-0000

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 12:54	9.5	0.24	111	11.4	7.37	1 U	0.343	0.01 U	0.278	0.041	0.024	0.9	3
The stage was taken from the WDOE staff gage.													
11/4/2008 13:00	8.8	3.07	103	10.8	7.29	4	0.793	0.01 U	0.649	0.032	0.022	1.5	8
The stage was taken from the WDOE staff gage.													
12/9/2008 11:55	7.4	1.19	105	11.5	7.25	3	0.455	0.01 U	0.414	0.043	0.036	1.2	20
The stage was taken from the WDOE staff gage.													
1/13/2009 13:00	7	3.06	93	11.9	7.28	6	1.09	0.01 U	1.03	0.0312	0.02	1.8	1
The stage was taken from the WDOE staff gage. The stream was low and clear.													
2/10/2009 13:35	3.6	2.49	104	12.4	7.58	9	0.624	0.01 U	0.545	0.0441	0.0315	2.4	1
Stream low and clear.													
3/10/2009 13:50	5.2	2.76	107	12.3	7.6	23	0.659	0.01 U	0.653	0.0393	0.0309	1.2	2
4/14/2009 13:10	8.5	4.65	99	11.2	7.61	2	0.762	0.01 U	0.693	0.034	0.0253	1.3	1 J
5/12/2009 13:20	10.6	2.76	103		7.64	2	0.61	0.01 U	0.539	0.0413	0.0347	1.8	4
Error made during titration of DO. No DO data available.													
6/9/2009 13:45	13.3	1.94	112	10.1	7.72	1	0.357	0.01 U	0.333	0.0498	0.0414	0.9	2
7/14/2009 14:00	12.6	1.94	115	10.4	7.68	3	0.35	0.01 U	0.307	0.0491	0.048	1.2	49
low and clear													
8/11/2009 13:50	12.6	1.94	117	10.19	7.75	3	0.294	0.01 U	0.253	0.0543	0.0405	1.1	85
low and clear													
9/9/2009 13:30	12.1	1.94	117	10.6	7.68	2	0.342	0.01 U	0.316	0.0456	0.0451	0.7	14
Low and clear.													

Conventional Data Report

Stavis Cr. nr Mouth

15N070

Class: AA
Rivermile: 0.2
Latitude: 47 37 28.3
Longitude: 122 52 29.6
Waterbody: WA-15-0000

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 15:00	9.9		105	10.8	7.33	2 U	0.14	0.01 U	0.088	0.042	0.0324	1.2	7
I sampled approximately 300 feet upstream from the Stavis road bridge during high tide. Bear scat on the trail leading to the old flow station.													
11/4/2008 15:07	9.4		146	10.5	7.23	7	0.408	0.01 U	0.3	0.039	0.021	1.4	6
The elevated conductivity could be due to tidal influence from sampling at the Stavis creek road bridge despite it being very near low tide.													
12/9/2008 14:20	7.6		94	11.3	7.43	2	0.194	0.01 U	0.136	0.0421	0.0349	1.2	24
Sampled approximately 100 meters upstream of the Stavis Bay road bridge during high tide. Salmon redds and carcasses (2) present at this location.													
1/13/2009 15:20	6.1		51	12.1	7.04	18	0.297	0.011	0.251	0.0332	0.0098	7.8	4
I sampled approximately 150 meters upstream from the Stavis Creek road bridge during mid-tide.													
2/10/2009 15:55	3.2		87	12.4	7.49	3	0.17	0.01 U	0.133	0.0364	0.0299	1.2	3
Stream low and clear.													
3/10/2009 15:50	6		79	12.1	7.51	8	0.173	0.01 U	0.145	0.0363	0.0291	0.7	1 U
4/14/2009 15:10	9.8		60	11	7.38	8	0.21	0.01 U	0.139	0.0316	0.0212	1.8	6 J
5/12/2009 15:05	11.3		78	10.6	7.49	2	0.167	0.01 U	0.111	0.0407	0.0292	0.7	4
6/9/2009 15:40	15.2		103	9.5	7.57	2	0.138	0.01 U	0.07	0.0564	0.039	1.4	17
7/14/2009 15:35	14		114	10.1	7.51	1	0.107	0.01 U	0.063	0.0547	0.0452	1	27
low and clear													
8/11/2009 15:15	13.8		116	9.8	7.56	2	0.099	0.01	0.055	0.0537	0.0392	0.9	31
low and clear													
9/9/2009 15:05	13.1		120	10.1	7.5	1	0.131	0.01 U	0.085	0.0537	0.0378	0.8	11
Low and clear.													

Conventional Data Report

Skokomish R nr Potlatch

16A070

Class: AA
Rivermile: 5.3
Latitude: 47 18 35.3
Longitude: 123 10 37.6
Waterbody: WA-16-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 10:30	9.4	731	71	10.7	7.04	4	0.066	0.01 U	0.046	0.009	0.0041	1.6	8
The stage was taken from the USGS wire weight gage on the bridge.													
11/4/2008 9:25	8.4	1220	64	10.9	7.07	9	0.072	0.01 U	0.05	0.012	0.0039	5.7	14 J
The stage was taken from the USGS wire weight gage.													
12/9/2008 9:20	7.7	1340	70	11.02	6.87	3	0.105	0.012	0.07	0.014	0.0092	2.1	15
The stage was taken from the USGS wire weight gage on the bridge.													
1/13/2009 9:45	6.1	2980	57	12.4	7.45	16	0.087	0.01 U	0.074	0.0266	0.0056	12	7 J
The Skokomish is green/white in color and moderately high. Flood debris is evident through the valley. The stage was taken from the USGS wire weight gage on the bridge.													
2/10/2009 10:00	4.8	1400	69	11.9	7.39	2	0.07	0.01 U	0.055	0.0105	0.0059	1.5	1 J
Stage was measured using USGS wire weight gauge. Stream low and clear.													
3/10/2009 11:15	5.5	1270	69	12.3	7.44	2	0.044	0.01 U	0.054	0.0095	0.0067	1.3	2
4/14/2009 10:30	6	2000	59	12	7.44	16	0.056	0.01 U	0.052	0.0243	0.006	15	7 J
5/12/2009 10:55	8.1	1790	63	11.5	7.52	5	0.051	0.01 U	0.038	0.0168	0.0072	6.1	2
6/9/2009 11:05	10.2	1000	72	10.9	7.42	2	0.036	0.01 U	0.024	0.0102	0.0075	0.6	6
7/14/2009 11:35	10.7	706	74	11.1	7.42	2	0.037	0.01 U	0.024	0.0097	0.0089	0.9	4
low and clear													
8/11/2009 11:20	10.5	556	77	10.5	7.39	1 U	0.053	0.01 U	0.029	0.0103	0.0069	0.7	30
low and clear													
9/9/2009 10:55	10.5	562	79	10.19	7.31	1	0.062	0.01 U	0.04	0.0115	0.0083	0.8	26
Low and clear. Fish carcass in water upstream.													

Conventional Data Report

Duckabush R nr Brinnon

16C090

Class: AA
Rivermile: 4.5
Latitude: 47 41 02.3
Longitude: 123 00 41.6
Waterbody: WA-16-3010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 8:40	7.8	165	80	11.9	7.34	3	0.053	0.01 U	0.03	0.0056	0.003 U	1.6	1 UJ
The stage was taken from the USGS staff gage. The Duckabush river was crystal clear and moderately low.													
11/4/2008 8:15	7	523	61	12.1	7.17	2	0.081	0.01 U	0.055	0.005 U	0.003 U	1.6	1 J
The stage was taken from the USGS staff gage. The river was moderately low and clear.													
12/9/2008 8:15	5.3	148	87	12.6	7	1 U	0.052	0.01 U	0.036	0.0064	0.0034	1.1	1 J
The stage was taken from the USGS staff gage. The river is very low for this time of year.													
1/13/2009 8:30	4.9	466	70	13	6.61	3	0.054	0.01 U	0.042	0.0079	0.0033	1.7	3 J
The stage was taken from the USGS staff gage. It doesn't appear as if anyone has checked the station or staff gage since my last visit (no new tracks in the snow at the gage house).													
2/10/2009 8:40	3.1	126	102	13.1	7.69	1 U	0.039	0.01 U	0.028	0.005 U	0.0031	0.5 U	1 J
Stream low and clear.													
3/10/2009 9:45	3.3	201	86	13.2	7.62	2	0.054	0.01 U	0.037	0.0066	0.0036	0.6	1
Low and clear													
4/14/2009 9:05	3.9	294	73	12.9	7.54	1 U	0.07	0.01 U	0.048	0.006	0.003 U	0.7	1 UJ
5/12/2009 9:35	5.6	368	85	12.5	7.67	1	0.06	0.01 U	0.042	0.0094	0.0039	2.3	2
6/9/2009 9:45	8.3	361	66	11.6	7.56	2	0.025 U	0.01 U	0.011	0.007	0.0032	1.3	6
7/14/2009 10:15	10.6	125	85	11.3	7.74	1 U	0.025 U	0.01 U	0.01 U	0.005 U	0.0049	0.5 U	1 U
8/11/2009 10:10	11.3	80	94	10.8	7.75	1 U	0.03	0.01 U	0.013	0.005 U	0.003 U	0.5 U	30
low and clear													
9/9/2009 9:50	10	100	86	11.7	7.65	1 U	0.071	0.01 U	0.054	0.0051	0.003 U	0.5 U	7 J
Low and clear.													

Conventional Data Report

Elwha R nr Port Angeles

18B070

Class: AA
Rivermile: 8.1
Latitude: 48 03 55.3
Longitude: 123 34 39.7
Waterbody: WA-18-2010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/13/2008 15:50	10.6	597	97	11.3	7.49	2	0.03	0.01 U	0.01 U	0.0072	0.003 U	2.2	3
The Elwha river was green and clear. Steady light rain all day.													
11/3/2008 14:45	8.4	1110	101	11.8	7.48	2	0.025 U	0.01 U	0.01 U	0.005 U	0.003 U	1	1
The Elwha river was moderately low and clear (green).													
12/8/2008 16:20	5.8	816	94	12.6	7.07	5	0.035	0.01 U	0.026	0.0193	0.0041	9.1	1 U
Contacted Steve at Clallam County Streamkeepers. He said they sampled this location approximately 90 minutes earlier.													
1/12/2009 16:10	4.5	2220	81	13.3	7.26	45	0.062	0.01 U	0.046	0.0785	0.0053	45	2
The Clallam county streamkeepers sampled just downstream from the bridge on the right bank prior to my arrival. They were at the station when I arrived and observed sampling and processing.													
2/9/2009 16:05	3.9	772	105	12.9	7.75	2	0.026	0.01 U	0.022	0.0096	0.003 U	4.1	1 U
Stream low and clear. Clallam County Streamkeepers sampled just before us.													
3/9/2009 17:40	3.7	787	104	13.1	7.82	1	0.025 U	0.01 U	0.01 U	0.0113	0.003 U	2.6	1 U
4/13/2009 16:20	6	1310	110	12.2	7.72	2	0.025 U	0.01 U	0.01 U	0.0075	0.003 U	1.3	1 U
5/11/2009 16:30	7.8	1340	94	11.9	7.89	3	0.033	0.01 U	0.02	0.0124	0.003 U	3.2	1
6/8/2009 17:10	10.7	1860	71	11.2	7.81	10	0.025 U	0.01 U	0.011	0.0138	0.003 U	9.7	1 U
7/13/2009 18:00	12.6	809	91	10.7	7.79	1	0.025 U	0.01 U	0.01 U	0.0051	0.0033	1	1 U
low and green													
8/10/2009 17:00	16	517	100	9.9	7.85	3	0.025 U	0.01 U	0.01 U	0.0058	0.003 U	0.7	20
clear													
9/8/2009 17:10	15.7	564	104	10.19	7.97	1	0.027	0.01 U	0.01 U	0.0069	0.003 U	1.8	4
Green.													

Conventional Data Report

West Twin R. nr mouth

19C060

Class: AA
Rivermile: 0.2
Latitude: 48 09 51.6
Longitude: 123 57 04.9
Waterbody: N/A

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/13/2008 14:00	9.6	10.3	98	11.6	7.17	1 U	0.326	0.01 U	0.275	0.0098	0.0043	0.5	3
The stage was taken from the WDOE staff gage.													
11/3/2008 12:35	8.6	27.9	94	11.3	7.16	2	1.23	0.01 U	1.13	0.0085	0.003 U	1.2	1
The stage was taken from the WDOE staff gage.													
12/8/2008 13:50	6.3	29.6	88	12.05	7.09	2	0.502	0.01 U	0.465	0.0144	0.0079	1.3	1
The stage was taken from the WDOE staff gage.													
1/12/2009 13:30	6.3	205	64	12.4	7.44	130	0.556	0.01 U	0.556	0.0864	0.0059	70	2
The stage was taken from the WDOE staff gage.													
2/9/2009 13:50	3.9	27.9	83	12.6	7.48	2	0.348	0.01 U	0.324	0.0106	0.006	1.9	1 U
low and clear													
3/9/2009 15:30	2.5	36.7	79	13.4	7.41	5	0.524	0.01 U	0.517	0.011	0.0054	2.8	1 U
low and clear													
4/13/2009 14:30	6.4	83.7	70	12	7.38	16	0.493	0.01 U	0.469	0.0243	0.0053	8.7	2
5/11/2009 14:10	8.9	37.5	78	11.3	7.48	6	0.355	0.01 U	0.33	0.0146	0.0057	2.7	1
6/8/2009 14:25	14.1	11	95	9.9	7.45	1 U	0.152	0.01 U	0.117	0.0125	0.0063	0.5	1
Fish trap located just upstream of sampling location.													
7/13/2009 16:05	14	4.84	107	9.9	7.39	1	0.106	0.01 U	0.058	0.0113	0.01	0.5	8
low and clear													
8/10/2009 15:05	13.9	5.55	113	9.6	7.38	2	0.07	0.01 U	0.034	0.0114	0.0075	1.6	87
low and clear													
9/8/2009 15:10	13.3	5.8	124	10.4	7.47	1 U	0.568	0.01 U	0.514	0.01	0.0066	0.7	16
Clear and low.													

Conventional Data Report

East Twin R. nr Mouth

19D070

Class: AA
Rivermile: 1.5
Latitude: 48 09 17.7
Longitude: 123 56 17.9
Waterbody: N/A

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/13/2008	14:40	9.2	7.08	112	11.8	7.37	1	0.278	0.01 U	0.23	0.012	0.0062	0.6	5
		The stage was taken from the WDOE staff gage.												
11/3/2008	13:31	8.5	16	100	11.35	7.26	2	1.47	0.01 U	1.35	0.0099	0.0049	1.1	4
		The stage was taken from the WDOE staff gage.												
12/8/2008	14:55	6.5	21.4	89	12.2	7.06	3	0.52	0.01 U	0.507	0.0125	0.0067	1.4	3
		The stage was taken from the WDOE staff gage.												
1/12/2009	14:45	6	125	62	13	7.34	262	0.505	0.01 U	0.501	0.207	0.0056	210	1 U
		The stage was taken from the WDOE staff gage.												
2/9/2009	14:45	3.8	134	81	12.9	7.56	3	0.404	0.01 U	0.355	0.0111	0.0074	3.3	3
		Staff guage dewatered. No stage data taken. Stream low and clear												
3/9/2009	16:25	2.5	46.3	78	13.4	7.5	4	0.525	0.01 U	0.524	0.0141	0.0064	1.6	1 U
		low and clear												
4/13/2009	15:15	6.1	146	66	12.2	7.41	49	0.471	0.01 U	0.456	0.0644	0.0065	35	1
5/11/2009	14:55	9.2	55.2	75	11.3	7.63	5	0.39	0.01 U	0.361	0.0162	0.006	3.2	1
		Staff gauge dewatered												
6/8/2009	15:05	14.4	9.21	97	10.4	7.76	2	0.187	0.01 U	0.154	0.0122	0.0072	2	4
		Staff gauge is de-watered.												
7/13/2009	16:45	12.9	1.37	111	10.5	7.76	1 U	0.141	0.01 U	0.109	0.0116	0.0109	0.6	2
		low and clear												
8/10/2009	15:45	13.4	2.84	116	10.4	7.76	2	0.105	0.01 U	0.069	0.0113	0.0103	0.6	120
		low and clear												
9/8/2009	16:05	12.8	7.2	124	10.9	7.71	1	0.597	0.01 U	0.533	0.0122	0.0092	0.8	28
		Clear and low.												

Conventional Data Report

Deep Cr. nr mouth

19E060

Class: AA
Rivermile: 0.2
Latitude: 48 10 21.3
Longitude: 124 01 30.3
Waterbody: WA-19-4500

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/13/2008 13:15	9.4	9.84	109	11.25	7.1	1	0.458	0.01 U	0.337	0.0098	0.004	0.8	8
The stage is taken from the WDOE staff gage. Deep creek was low and clear.													
11/3/2008 11:55	8.5	52.6	99	11	7.03	3	1.28	0.01 U	1.15	0.0096	0.003 U	1.7	8
The stage was taken from the WDOE staff gage.													
12/8/2008 12:40	6.2	27.3	91	11.9	6.85	1	0.517	0.01 U	0.472	0.0149	0.0054	0.9	1
The stage was taken from the WDOE staff gage.													
1/12/2009 12:00		153											
I was unable to sample the Deep Creek station due to time constraints caused by the closure of Highway 112 due to a landslide.													
2/9/2009 11:15	3.5	30.4	86	12.7	7.42	1	0.411	0.01 U	0.364	0.0097	0.0047	1.7	1 J
low and clear													
3/9/2009 12:40	2.7	48.4	83	13	7.26	2	0.59	0.01 U	0.584	0.0111	0.0049	1.2	1 J
low and clear. Stage using tape down measurement from bridge=20.32.													
4/13/2009 13:45	6.5	123	72	11.9	7.31	21	0.569	0.01 U	0.536	0.0156	0.005	5.3	3
5/11/2009 13:35	9.1	53.3	81	11.4	7.53	1	0.376	0.01 U	0.342	0.0148	0.0049	1.2	2
6/8/2009 13:50	13.2	10.5	105	10.4	7.48	1	0.15	0.01 U	0.112	0.0122	0.0063	0.5 U	4
7/13/2009 14:30	13.6	5.06	130	9.8	7.41	1 U	0.091	0.01 U	0.042	0.011	0.0091	0.9	7
8/10/2009 14:25	14	5.45	129	9.19	7.36	1 U	0.064	0.01 U	0.021	0.0126	0.0077	0.7	64
low and clear													
9/8/2009 14:20	12.7	10.5	136	10.4	7.41	1 U	0.677	0.01 U	0.628	0.0131	0.0073	0.7	15
Clear and low.													

Conventional Data Report

Hoh R @ DNR Campground

20B070

Class: AA
Rivermile: 16.5
Latitude: 47 48 35.3
Longitude: 124 14 51.7
Waterbody: WA-20-2010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/13/2008	11:40	9.2	1320	84	11.7	7.06	5	0.11	0.01 U	0.093	0.011	0.003 U	5.3	35 J
		The Hoh river was low and green with very light color.												
11/3/2008	10:00	7.7	2860	75	11.6	7	23	0.1	0.01 U	0.088	0.034	0.003 U	20	37 J
		The Hoh river was at low to moderate flow volumes with some color which appears due more to organics than snowmelt.												
12/8/2008	10:55	7	1620	83	11.9	6.91	4	0.127	0.01 U	0.103	0.0151	0.0035	4.6	8
		The Hoh is very low and clear.												
1/12/2009	10:55	5.7	4600	68	12.4	7.25	56	0.133	0.01 U	0.129	0.0524	0.004	28	6 J
		The Hoh river was greenish gray and moderately high. Severe erosion has occurred at the campground, the boat launch is no longer useable.												
2/9/2009	9:20	4.1	1100	83	12.7	7.47	3	0.075	0.01 U	0.067	0.0089	0.003	3.6	4 J
		low and clear.												
3/9/2009	10:40	4.4	1220	83	12.9	7.51	3	0.064	0.01 U	0.071	0.0116	0.003 U	2.7	1 J
		low and green												
4/13/2009	12:10	5.6	3610	69	12.1	7.22	33	0.111	0.01 U	0.085	0.0365	0.0032	16	13 J
5/11/2009	11:40	8.2	3560	85	11.6	7.54	6	0.067	0.01 U	0.057	0.0161	0.003 U	4.2	4 J
		QC												
6/8/2009	12:20	11.1	1890	83	11.4	7.68	7	0.025 U	0.01 U	0.02	0.0111	0.003 U	5.8	1 UJ
7/13/2009	12:45	11.7	1090	83	11.2	7.75	5	0.025 U	0.01 U	0.01 U	0.0079	0.003 U	4.5	12 J
		Green low and silty.												
8/10/2009	12:15	11.9	890	79	10.6	7.45	10	0.025 U	0.01 U	0.017	0.0153	0.003 U	11	120 J
		low green and silty												
9/8/2009	12:10	11	1590	82	11.54	7.39	36	0.104	0.01 U	0.089	0.0234	0.003 U	13	56 J
		Moderately increased flow due to rain over the weekend. Green and silty.												

Conventional Data Report

Humptulips R nr Humptulips

22A070

Class: A
Rivermile: 23.6
Latitude: 47 13 47.3
Longitude: 123 57 42.6
Waterbody: WA-22-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/13/2008	9:40	9.5	598	60	11.35	7.01	1	0.16	0.01 U	0.136	0.0075	0.0042	1.2	36 J
		The stage is from the USGS wire weight gage on the bridge. The Humptulips was low, clear, and green.												
11/3/2008	8:40	9.2	939	56	10.8	6.9	4	0.14	0.012	0.096	0.0077	0.003 U	2.3	120 J
		The stage was taken from the USGS wire weight gage on the highway 101 bridge.												
12/8/2008	9:12	6.4	834	56	11.9	6.78	3	0.188	0.01 U	0.166	0.0116	0.0055	2.4	3 U
		The stage was taken from the USGS wire weight gage. The river was very low and clear.												
1/12/2009	9:10	6.2	4080	45	12.4	6.8	40	0.178	0.01 U	0.17	0.0522	0.0049	20	5 J
		The stage was taken from the USGS wire weight gage on the bridge. The river was greenish brown and moderately high following last weeks very large flood event throughout Western Washington.												
2/9/2009	7:40	4	604	57	12.5	7.43	1 U	0.116	0.016	0.107	0.007	0.0048	0.8	3 J
		Stage taken using USGS wire weight gauge. Stream was low and clear.												
3/9/2009	8:40	3.5	728	56	12.7	7.29	1 U	0.098	0.01 U	0.097	0.0071	0.0036	2.4	1 J
		low and clear												
4/13/2009	10:25	5.8	4280	42	12.2	7.38	81	0.141	0.01 U	0.126	0.111	0.0057	80	5 J
5/11/2009	9:40	8.8	1380	54	11.2	7.41	3	0.111	0.01 U	0.1	0.0132	0.0041	2.3	7 J
6/8/2009	10:15	12.5	332	63	10.6	7.46	1	0.058	0.01 U	0.03	0.0068	0.0032	0.7	4 J
		Fishermen wading in river upstream of station while sampling.												
7/13/2009	10:40	14.4	229	68	10.19	7.5	1 U	0.061	0.01 U	0.027	0.0054	0.0067	0.5 U	30 J
		Green and low. Cows were present in river upstream during sampling.												
8/10/2009	10:25	15.3	148	73	9.19	7.73	1 U	0.055	0.01 U	0.02	0.0059	0.0052	0.5 U	150 J
		low greeen/clear												
9/8/2009	10:15	12.5	550	64	10.8	7.69	2	0.214	0.01 U	0.171	0.007	0.0036	1.5	85 J
		Green and low. Fish are present during sampling.												

Conventional Data Report

Chehalis R @ Porter

23A070

Class: A
Rivermile: 33.3
Latitude: 46 56 16.3
Longitude: 123 18 49.5
Waterbody: WA-23-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008	9:40	10.8	589	130	10.3	7.67	2	0.574	0.01 U	0.455	0.025	0.012	1.5	37 J
11/17/2008	8:50	8.7	5240	76 J	9.4	6.91	37	0.782	0.016	0.604	0.0794	0.011	32	43 J
		River high and muddy												
12/15/2008	9:15	3.8	4500	111	11.9	7.23	27	0.757	0.013	0.642	0.0729	0.0163	19	120 J
1/26/2009	8:59	3.7	3790	84	12.1	7.51	16	0.786	0.013	0.728	0.0484	0.012	14	10 J
2/23/2009	9:25	6.9	1820	121	13.7	7.32	10	0.79	0.049	0.688	0.0424	0.011	9.2	4 J
3/16/2009	9:00	5.4	6720	86	11.9	7.29	124	0.577	0.022	0.484	0.138	0.0091	37	55 J
4/20/2009	8:50	11.3	4540	91	10.5	7.19	14	0.533	0.017	0.464	0.0406	0.0147	9.8	12 J
5/18/2009	8:55	14.2	3860	81	9.54	7.69	13	0.43	0.01 U	0.39	0.042	0.0133	13	10 J
6/15/2009	8:45	16.9	967	100	9	7.44	3	0.525	0.01	0.448	0.0233	0.0077	2.6	8
7/21/2009	8:49	21	467	112	8.3	7.54	5	0.634	0.043	0.482	0.0185	0.0088	2	10
8/17/2009	9:15	18	394	121	9.19	7.8	2	0.576	0.015	0.445	0.0214	0.0084	1.2	21
9/21/2009	8:50	16.2	435	109	9.1	7.7	5	0.588	0.01 U	0.478	0.0253	0.0142	1.6	4 J

Conventional Data Report

Chehalis R @ Dryad

23A160

Class: A
Rivermile: 97.8
Latitude: 46 37 51.4
Longitude: 123 15 00.5
Waterbody: WA-23-1100

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 15:00	9	198	75	12.1	7.76	2	0.1	0.01 U	0.046	0.011	0.0046	1.9	130
11/18/2008 13:40	9.5	616	69	11.2	7.34	22	0.536	0.01 U	0.471	0.047	0.0074	29	31
12/16/2008 14:20	1.4	585	69	13.8	7.24	5	0.559	0.01 U	0.587	0.0224	0.0084	6.1	31
1/27/2009 15:00	2.6	486	64	13.7	7.18	6	0.456	0.01 U	0.428	0.021	0.0087	5.7	11
2/24/2009 13:05	6.7	746	63	12.4	7.43	20	0.283	0.01 U	0.244	0.0389	0.0075	17	84
3/17/2009 13:25	5	2377 J	60	13.4	7.11	87	0.564	0.01 U	0.526	0.111	0.0081	55	21
4/21/2009 13:15	11.3	585	65	11.6	7.4	7	0.346	0.01 U	0.33	0.0235	0.012	7.2	8
5/19/2009 13:35	10.9	623	63	11.15	7.45	6	0.27	0.01 U	0.261	0.0245	0.0088	7.6	47
6/16/2009 14:20	16.8	266	75	11.7	8.5	1	0.119	0.01 U	0.025	0.0161	0.0051	1.8	31
7/22/2009 13:22	21.2	107	84	9.6	7.8	1	0.077	0.01 U	0.01 U	0.0119	0.0117	1.4	13
8/18/2009 14:45	22	98	86	9.8	7.94	2	0.101	0.01 U	0.014	0.018	0.0074	1.1	53
9/22/2009 13:15	16.2	102	88	10.7	7.78	2	0.091	0.01 U	0.01 U	0.0157	0.0056	1.6	33

Conventional Data Report

Chehalis R. nr Doty

23A170

Class: A
Rivermile: 100.4
Latitude: 46 38 05.3
Longitude: 123 16 58.3
Waterbody: WA-23-1100

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 14:35	9.5	103	73	12.6	8.17	2	0.095	0.01 U	0.041	0.0092	0.0045	2.3	40
Fish in area													
11/18/2008 12:40	9.5	408	70	11.2	7.39	34	0.474	0.01 U	0.427	0.0621	0.0077	34	17
Switched DO result with QA sample because of overrun result													
12/16/2008 13:40	1.4	386	72	13.7	7.37	6	0.517	0.01 U	0.533	0.0216	0.0087	6.7	9
1/27/2009 14:25	2.8	314	67	13.5	7.34	7	0.458	0.01 U	0.43	0.0227	0.0104	6.8	11
2/24/2009 12:40	6.7	486	62	12.2	7.44	44	0.275	0.01 U	0.245	0.0646	0.008	5.1	110
Windy RP +/- 0.2 ft.													
3/17/2009 13:00	5	1620	61	12.8	7.25	93	0.501	0.01 U	0.472	0.14	0.0092	65	19
4/21/2009 12:45	10.8	386	66	11.6	7.45	9	0.337	0.01 U	0.329	0.0262	0.012	8.5	5
5/19/2009 13:05	10.5	408	64	11.25	7.46	9	0.26	0.01 U	0.265	0.0243	0.0096	8.4	20
Rain - bridge construction work.													
6/16/2009 13:30	16.9	148	78	11.8	8.77	2 U	0.081	0.01 U	0.01 U	0.0093	0.0039	1.4	9
7/22/2009 12:55	20.9	34	88	9.69	7.92	2	0.167	0.013	0.057	0.0141	0.0141	1.2	52
8/18/2009 14:05	22.4	44	90	9.6	8.1	2	0.08	0.01 U	0.01 U	0.0135	0.0065	0.6	13
9/22/2009 12:47	16.1	30	90	10.3	7.28	1	0.07	0.01 U	0.01 U	0.0097	0.0061	0.8	15
A few fish carcasses and clam shells.													

Conventional Data Report

Black R. @ Hwy. 12

23E060

Class: A
Rivermile: 2
Latitude: 46 49 48.4
Longitude: 123 11 08.7
Waterbody: WA-23-1015

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/9/2008	14:50	11.9 J	89.1	118	9.5									
		Check samples for hydrolab deployment; temperature from conductivity meter												
10/21/2008	7:50		77.8	119	8.65									
		Check samples for hydrolab deployment												

Conventional Data Report

SF Chehalis R @ Beaver Creek Rd.

23G070

Class: A
Rivermile: 3
Latitude: 46 34 26.4
Longitude: 123 07 13.5
Waterbody:

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 15:45	10.2	57.91	98	11.6	7.64	2	0.081	0.01 U	0.016	0.013	0.0057	3.2	31
11/18/2008 14:15	10.1	242.57	78	10.6	7.2	18	0.506	0.01 U	0.453	0.031	0.0053	15	37
12/16/2008 14:55	1.7	220.25	80	13.4	7.17	20	0.508	0.01 U	0.5	0.0294	0.0064	11	18
1/27/2009 15:30	2.7	176.42	75	13.2	7.09	15	0.413	0.01 U	0.376	0.0308	0.008	11	3
2/24/2009 13:40	7	213.25	74	11.8	7.23	46	0.277	0.01 U	0.211	0.0682	0.0079	24	57
3/17/2009 13:55	5.6	1374	61	12.1	6.97	116	0.56	0.01 U	0.523	0.0949	0.0076	45	28
4/21/2009 13:50	14.1	231	73	10.6	7.21	13	0.287	0.01 U	0.264	0.0263	0.0111	9.5	5
5/19/2009 14:30	12.6	242	71	10.45	7.25	20	0.209	0.01 U	0.202	0.0289	0.0081	10	74
6/16/2009 15:15	18.1	46.52	94	10.7	7.6	1 U	0.082	0.01 U	0.01 U	0.0129	0.0048	2.1	25
7/22/2009 14:05	22.3	19.27	117	10.1	7.65	2	0.15	0.01 U	0.045	0.0155	0.0129	1.4	57
8/18/2009 15:30	23.2	16.21	122	9.3	7.56	1	0.074	0.01 U	0.01 U	0.0162	0.0076	1.1	16
9/22/2009 13:50	16.6	16.95	122	9.9	7.56	2	0.064	0.01 U	0.01 U	0.013	0.0061	1.2	32

Conventional Data Report

Willapa R nr Willapa

24B090

Class: A
Rivermile: 17.7
Latitude: 46 39 00.4
Longitude: 123 39 12.6
Waterbody: WA-24-2020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008	11:25	10.2	74	70	10.8	7.45	2	0.352	0.014	0.258	0.025	0.013	1.6	37
11/17/2008	10:45	8.9	772	59 J	10.8	6.88	12	1.05	0.011	0.959	0.02	0.007	4.1	33
12/15/2008	11:30	4	813	67	12.5	7.1	7	1.07	0.01 U	1.06	0.0203	0.0072	4.1	20
1/26/2009	10:40	3.6	398	64	13	7.14	5	0.822	0.01 U	0.781	0.0175	0.0078	1.6	2 J
2/23/2009	10:50	7.6	334	65	11.7	7.22	3	0.565	0.01 U	0.524	0.0138	0.0036	1.6	15
3/16/2009	10:40	5.2	1480	58	12.2	6.99	45	0.888	0.01 U	0.857	0.0443	0.0061	11	74
4/20/2009	10:15	10.2	556	63	11.2	7.13	5	0.675	0.01 U	0.652	0.014	0.0088	1.7	2
5/18/2009	10:30	12.7	425	62	10.35	7.31 J	3	0.552	0.01 U	0.536	0.0149	0.0065	1.6	26
		No pH. Calibration went bad.												
6/15/2009	10:15	16.3	104	71	9.4	7.37 J	2	0.401	0.018	0.302	0.0169	0.0046	1.5	130
7/21/2009	10:43	20.2	39	79	7.1 J	7.28	2	0.278	0.034	0.139	0.0153	0.006	1.2	54
		When performing winkler, knob was turned wrong direction twice filling the burrette instead of draining by approx. .2-.3 mL, original result was 6.9 and estimated actually DO at 7.1												
8/17/2009	11:10	17.8	33	78	9.1	7.38	3	0.23	0.027	0.105	0.0199	0.0051	1.7	51
9/21/2009	10:30	15.1	41	78	9	7.46	4	0.246	0.016	0.155	0.021	0.0067	2.7	120

Conventional Data Report

Naselle R nr Naselle

24F070

Class: A
Rivermile: 17.4
Latitude: 46 22 22.4
Longitude: 123 44 48.5
Waterbody: WA-24-3010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008 12:40	8.9	96	59	11.6	7.54	1	0.444	0.01 U	0.386	0.012	0.007	0.8	37
11/17/2008 12:03	8.8	508	54.6	11.5	7.23	5	0.673	0.01 U	0.648	0.015	0.0085	2.8	29
12/15/2008 12:55	3.8	446	55	13.1	7.26	2	0.619	0.01 U	0.626	0.0136	0.008	1.2	21
1/26/2009 12:10	3.6	172	52	13.7	7.22	2	0.556	0.01 U	0.527	0.0114	0.0098	1.2	3
2/23/2009 12:00	7.3	135	52	12.5	7.38	1	0.389	0.01 U	0.372	0.0106	0.005	0.8	8
3/16/2009 12:20	5.3	666	50	13	7.21	12	0.558	0.01 U	0.545	0.0214	0.0058	4.7	16
4/20/2009 11:45	9.4	261	54	12.2	7.31	4	0.473	0.01 U	0.476	0.0142	0.0101	1.2	3
5/18/2009 11:45	11.4	270	53	11.35	7.54 J	2	0.422	0.01 U	0.431	0.0114	0.0083	1.1	4
	No pH. Calibration went bad.												
6/15/2009 11:40	14.2	75	58	11.5	7.72 J	1 U	0.242	0.01 U	0.21	0.0078	0.0047	0.7	9
7/21/2009 12:15	18.4	37	62		7.48	1 U	0.245	0.01 U	0.172	0.0095	0.0064	0.5	50
	Fish carcasses dumped in sample area. DO result not written and confused with following station, neither will be included												
8/17/2009 12:30	17.8	29	62	10	7.59	1 U	0.159	0.01 U	0.089	0.0091	0.0046	0.5	31
9/21/2009 12:45	14.2	29	64		7.53 J	1	0.225	0.01 U	0.164	0.0126	0.0054	0.8	66
	DO result not recorded.												

Conventional Data Report

Elochoman R nr Cathlamet

25C070

Class: A
Rivermile: 5
Latitude: 46 13 15.4
Longitude: 123 20 35.5
Waterbody: WA-25-3010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008 13:50	9.4		74	11.6	7.54	2	0.35	0.01 U	0.288	0.011	0.0064	1.2	110
11/17/2008 13:00	9.2		51 J	11.3	7.35	48	0.68	0.01 U	0.642	0.032	0.0065	12	31
12/15/2008 14:00	2.8		57	13.4	7.35	4	0.604	0.01 U	0.635	0.0124	0.0068	2	5
1/26/2009 13:50	3.9		56	13.4	7.28	10	0.542	0.01 U	0.489	0.018	0.0079	3.9	3
2/23/2009 13:15	7.2		61	12	7.33	4	0.346	0.01 U	0.323	0.0119	0.0051	3.4	14
3/16/2009 13:40	5.2		52	12.8	7.24	40	0.551	0.01 U	0.548	0.0442	0.0052	15	17
4/20/2009 13:10	10.3		54	11.9	7.37	9	0.43	0.01 U	0.419	0.0138	0.0096	2.4	2
5/18/2009 12:50	12		53	11.15	7.32	8	0.381	0.01 U	0.394	0.015	0.0066	3	8
6/15/2009 12:55	15.6		65	10.3	7.39	2	0.228	0.01 U	0.189	0.0107	0.0057	1.3	27
7/21/2009 13:25	18.6		78		7.29	2	0.182	0.01 U	0.121	0.0098	0.0066	0.9	44
DO result confused with previous station, neither will be included													
8/17/2009 13:45	17.7		82	9.69	7.34	1	0.126	0.011	0.064	0.0106	0.0046	0.7	49
9/21/2009 14:00	14.6		87	10.4	7.33	1 U	0.194	0.01 U	0.142	0.0139	0.0061	0.7	51

Conventional Data Report

Germany Cr @ mouth

25D050

Class: A
Rivermile: 0.6
Latitude: 46 11 29.3
Longitude: 123 07 31.2
Waterbody: WA-25-3500

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008 16:58	9.8	77	67	10.8	7.44	1 U	0.364	0.01 U	0.297	0.011	0.0053	0.9	20
Staff hard to get to after habitat rehab project, staff accuracy questionable from placement of in-stream logs.													
11/17/2008 15:50	9.7	147	45 J	11.1	7.27	12	0.795	0.01 U	0.759	0.02	0.0066	5.3	12
12/15/2008 16:00	2.7	103	56	13.2	7.25	3	0.832	0.01 U	0.862	0.0116	0.0067	1.8	11
no staff, too dark													
1/26/2009 16:00	3.5	202	49	13.2	7.22	13	0.622	0.01 U	0.605	0.0196	0.0084	3.1	9
2/23/2009 15:00	6.8	43.6	55	12.1	7.32	4	0.468 J	0.01 J	0.456 J	0.0148	0.0064 J	2.7	2
3/16/2009 15:45	5.7	160	48	12.8	7.19	46	0.702	0.01 U	0.679	0.0601	0.0059	22	17
4/20/2009 15:10	13.2	103	49	11.2	7.51	5	0.47	0.01 U	0.45	0.0142	0.0082	2	1
5/18/2009 15:00	13.6	121	49	10.45	7.42	8	0.433	0.01 U	0.459	0.0179	0.0076	3.5	4
6/15/2009 15:05	17.3	24	65	9.69	7.39	2	0.311	0.01 U	0.264	0.0123	0.0062	1.4	8
7/21/2009 16:50	20.6	8.15	79	8.69	7.42	1 U	0.207	0.01 U	0.155	0.0078	0.0071	0.8	40
8/17/2009 16:45	18.7	6.45	85	9.3	7.37	1	0.139	0.01 U	0.093	0.0097	0.0045	0.7	46
9/21/2009 16:30	14.8	7.7	92	9.8	7.23	2	0.167	0.01 U	0.132	0.0108	0.0065	1	120
sampled at gage. Dogs were playing in stream above our site.													

Conventional Data Report

Abernathy Cr nr mouth

25E060

Class: A
Rivermile: 0.4
Latitude: 46 11 41.4
Longitude: 123 09 58.3
Waterbody: WA-25-3300

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008	16:00	9.7	27.9	54	11.2	7.51	2	0.21	0.01 U	0.144	0.01	0.0039	0.9	31
11/17/2008	15:10	9	120	33 J	11.2	7.23	2	0.458	0.01 U	0.417	0.0086	0.005	2.1	19
		Recalibrated pH, original pH 7.36												
12/15/2008	15:20	3.4	105	35	13	7.11	1	0.467	0.01 U	0.486	0.0068	0.0039	1.2	11
1/26/2009	15:15	3.9	76.6	36	13.2	7.04	2	0.368	0.01 U	0.35	0.0096	0.0059	1.5	9
2/23/2009	14:30	6.6	48.5	39	12.1	7.23	1 U	0.247	0.01 U	0.229	0.0087	0.0041	0.9	4
3/16/2009	15:05	6.1	135	32	12.5	6.99	6	0.427	0.01 U	0.415	0.01	0.0033	2.7	9
4/20/2009	14:40	12.9	92.5	36	11.2	7.47	2	0.298	0.01 U	0.266	0.0107	0.0062	1	4
5/18/2009	14:35	13.4	97.7	35	10.65	7.23	2	0.304	0.01 U	0.288	0.0096	0.005	1.7	3
6/15/2009	14:15	16.7	25.2	46	9.69	7.31	1 U	0.222	0.02	0.173	0.0111	0.0065	1	54
7/21/2009	16:15	20.3	11.4	56	8.8	7.46	3	0.199	0.01 U	0.145	0.0103	0.0082	1.4	55
		Sampled below recreational rock wier, Swimmers in area.												
8/17/2009	15:50	19.1	9.15	58	9.6	7.45	1	0.149	0.01 U	0.103	0.0107	0.0059	0.6	16
9/21/2009	15:50	14.9	10.3	62	10.6	7.47	1 U	0.173	0.01 U	0.146	0.0117	0.0079	0.8	27

Conventional Data Report

Mill Cr. nr mouth

25F060

Class: A
Rivermile: 0.5
Latitude: 46 11 26.2
Longitude: 123 10 42.9
Waterbody: WA-25-3200

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/20/2008 15:00	8.9	20.3	42	11.3	7.47	1	0.18	0.01 U	0.127	0.0065	0.003 U	1.1	80
	staff= 1.56												
11/17/2008 14:10	9.1	138	26 J	11.5	7.02	2	0.309	0.01 U	0.269	0.005 U	0.003 U	1.3	3
	Staff: 2.53; stage based on staff conversion. Original pH 7.09, rechecked after recalibration @ Abernathy Cr.												
12/15/2008 14:50	3.3	152	32	13.2	7.12	1	0.33	0.01 U	0.357	0.0054	0.003 U	1	10 J
	staff=2.61												
1/26/2009 14:45	3.6	77.7	31	13.6	7.16	2	0.368	0.01 U	0.338	0.005 U	0.004	1	3
	Staff gauge= 2.04												
2/23/2009 14:00	6.4	55.9	33	12.4	7.07	1	0.259	0.01 U	0.237	0.008	0.003 U	1.1	4
3/16/2009 14:30	5.6	163	30	12.8	6.96	22	0.316	0.01 U	0.311	0.0098	0.003 U	3.3	9
4/20/2009 13:55	11.1	107	31	11.4	7.08	2	0.297	0.01 U	0.27	0.0075	0.0055	1.1	2
5/18/2009 14:00	11.9	119	30	10.75	7.2	2	0.246	0.01 U	0.25	0.0069	0.003	1.4	9
6/15/2009 13:45	14	40.2	37	10.3	7.18	1	0.308	0.077	0.203	0.021	0.013	1.3	12
7/21/2009 14:45	16.9	21.5	41	9.4	7.18	1	0.261	0.01 U	0.193	0.0061	0.0065	1.6	34
	RP too low and blocked by branch, staff used. RP calculated from staff.												
8/17/2009 15:00	15.6	18.3	43	9.9	7.26	1 U	0.208	0.01 U	0.16	0.0066	0.0039	0.7	36
	Staff = 1.37												
9/21/2009 15:15	12.4	15.6	46	10.7	7.25	1	0.206	0.01 U	0.172	0.0099	0.0061	0.6	25
	staff = 1.34												

Conventional Data Report

Cowlitz R @ Kelso

26B070

Class: A
Rivermile: 4.9
Latitude: 46 08 43.4
Longitude: 122 54 51.4
Waterbody: WA-26-1040

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 12:32	11	7270	75	10.8	7.53	64	0.063	0.01 U	0.047	0.035	0.0048	16	17
11/17/2008 16:40	10.1	10300	60 J	10.8	7.35	287	0.324	0.01 U	0.272	0.21	0.0069	90	18
12/16/2008 11:50	4.8	8020	74	12.3	7.43	68	0.226	0.01 U	0.227	0.0413	0.0076	16	4
moved to day 2													
1/27/2009 12:55	3.2	10400	69	13	7.23	62	0.272	0.01 U	0.25	0.0927	0.0135	37	7
2/23/2009 15:45	6.1	6440	82	11.8	7.32	21	0.205	0.01 U	0.178	0.0396	0.0073	15	12
Lots of seals, seagulls, and ? Smelt.													
3/16/2009 16:30	5.5	10100	67	12.4	7.28	99	0.457	0.01 U	0.412	0.104	0.0084	31	51
4/20/2009 16:05	11.1	8210	73	11.4	7.4	83	0.256	0.01 U	0.229	0.071	0.0093	23	6
5/18/2009 15:45	11.8	10100	69	10.95	7.45	101	0.161	0.01 U	0.159	0.0882	0.0075	18	11
6/15/2009 16:05	11.9	9130	77	11.1	7.5	20	0.101	0.01 U	0.084	0.0231	0.005	9.8	5
7/21/2009 17:50	18.9	4040	98	9.69	7.66	7	0.078	0.01 U	0.032	0.0105	0.0059	2.7	5
8/18/2009 12:30	16.8	3020	105	9.9	7.5	8	0.07	0.01 U	0.028	0.0133	0.0056	1.6	11
9/22/2009 11:20	13.9	4690	78	10.6	7.56	9	0.071	0.01 U	0.032	0.0178	0.0048	1.7	14

Conventional Data Report

Kalama R nr Kalama

27B070

Class: A
Rivermile: 2.8
Latitude: 46 02 50.4
Longitude: 122 50 14.4
Waterbody: WA-27-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008	11:55	8.4	161 J	60	12	7.77	2	0.24	0.012	0.175	0.02	0.015	1.1	13
		Fisherman cleaning fish upstream on bank. RP +- 0.5, windy												
11/18/2008	10:55	8.1	544 J	46	11.8	7.37	6	0.525	0.01 U	0.505	0.017	0.0095	3.4	9
12/16/2008	11:10	0.4	315 J	53	14.3	7.37	1	0.563	0.01 U	0.61	0.0166	0.0128	1.4	2 J
1/27/2009	12:15	2.8	482 J	44	13.6	7.28	4	0.501	0.01 U	0.483	0.0155	0.0106	2.7	2
		Measured stage with drop rope as it was too widy to use tape down, accuracy within 0.3'.												
2/24/2009	11:00	6.5	663 J	45	12.5	7.5	11	0.349	0.01 U	0.341	0.0209	0.0108	4.7	13
3/17/2009	11:15	5.6	832 J	48	13.2	7.4	7	0.735	0.01 U	0.702	0.0197	0.0091	4.1	6
4/21/2009	10:55	8.3	1300 J	38	12.3	7.31	9	0.282	0.01 U	0.27	0.0212	0.0113	4.3	5
		windy, gage + or - 0.3 ft.												
5/19/2009	11:15	9.8	1022 J	37	11.55	7.49	7	0.252	0.01 U	0.251	0.0202	0.0096	4.1	7
6/16/2009	10:55	13.9	226 J	53	11.2	7.95	2	0.178	0.01 U	0.127	0.0159	0.009	1.3	11
7/22/2009	11:15	16.9	170 J	61	9.5	7.54	4	0.177	0.017	0.106	0.0165	0.0198	1.4	13
8/18/2009	11:55	16.4	153 J	64	10.1	7.66	2	0.153	0.013	0.086	0.0173	0.0123	0.7	11
		Fish carcasses in area												
9/22/2009	10:17	12	148 J	67	10.4	7.49	3	0.164	0.012	0.102	0.0204	0.014	0.9	11

Conventional Data Report

EF Lewis R nr Dollar Corner

27D090

Class: A
Rivermile: 10.2
Latitude: 45 48 52.4
Longitude: 122 35 30.4
Waterbody: WA-27-2020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008	10:50	8.5	156	54	12	7.71	1	0.21	0.01 U	0.188	0.005 U	0.003 U	0.7	24
		Fish in area												
11/18/2008	10:00	7.9	464	36	11.5	7.35	1	0.476	0.01 U	0.447	0.0064	0.004	1.4	12
12/16/2008	10:05	0.1	366	43	14.5	7.41	1 U	0.546	0.01 U	0.555	0.0076	0.0048	1.6	2 J
		Ice chunks in stream and at edges												
1/27/2009	11:20	1.3	230	39	14.2	7.5	1 U	0.424	0.01 U	0.403	0.0074	0.005	1	1 U
		Too icy to sample from bridge, streamside sample collected.												
2/24/2009	10:05	6.2	332	39	12.5	7.49	2	0.296	0.01 U	0.277	0.0088	0.0045	1.4	21
3/17/2009	10:05	5.6	792	35	12.7	7.32	5	0.514	0.01 U	0.485	0.0113	0.0035	2.7	13
4/21/2009	10:00	9.2	741	30	11.9	7.35	2	0.215	0.01 U	0.2	0.0089	0.005	1.2	6
5/19/2009	10:15	11.3	877	30	11.45	7.62	3	0.174	0.01 U	0.169	0.0086	0.0034	1.6	45
6/16/2009	9:45	15.5	156	48	10.3	7.62	2	0.211	0.01 U	0.165	0.0076	0.0036	1.7	29 J
7/22/2009	10:15	20.4	57	60	9	7.56	2	0.241	0.01 U	0.168	0.0066	0.0079	0.6	41
8/18/2009	10:35	19	42.3	64	9.5	7.54	2	0.196	0.01 U	0.123	0.0076	0.004	0.5	8
		Swimmers in the area												
9/22/2009	9:25	14.5	33.3	67	9.8	7.5	2	0.178	0.01 U	0.121	0.0216	0.0041	0.8	8

Conventional Data Report

Burnt Br Cr @ Mouth

28C070

Class: A
Rivermile: 1.6
Latitude: 45 39 41.4
Longitude: 122 40 20.4
Waterbody: WA-28-1040

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/21/2008 9:55	9.5	6.7	209	10.9	7.99	4	1.7	0.01 U	1.68	0.0659	0.0519	1.6	170
11/18/2008 9:05	8.3	11.5	177	11.2	7.79	4	1.76	0.01 U	1.46	0.155	0.129	3.5	33 J
12/16/2008 9:10	0.1	8.4	194	14.1	7.83	2	1.86	0.01 U	2.19	0.0881	0.0702	4	36 J
1/27/2009 10:00	3.4	13.2	194	13	7.79	6	2.47	0.01 U	2.44	0.0906	0.0622	4	81
Nutrient grab sample bottle was not mixed before getting total samples.													
2/24/2009 9:00	7.8	20.3	142	11.5	7.78	18	1.41	0.026	1.42	0.0877	0.0427	13	300 J
3/17/2009 9:00	8.4	21.5	148	11.7	7.73	14	1.77	0.01 U	1.86	0.0936	0.0477	9.7	51 J
4/21/2009 9:00	13.7	10.5	193	10	7.83	11	1.59	0.01 U	1.46	0.0789	0.0556	5.3	76 J
5/19/2009 9:35	14.9	17	118	9.24	7.63	21	0.939	0.019	0.799	0.0965	0.0492	8.7	430 J
6/16/2009 8:55	16.2	6.5	207	9.3	7.97	10	1.54	0.01 U	1.43	0.101	0.0684	5.9	240 J
7/22/2009 9:12	18.4	4.7	220	8.6	7.93	7	1.02	0.01 U	0.877	0.113	0.0999	3.6	240 J
8/18/2009 9:45	17.5	4.6	223	8.8	7.94	4	0.911	0.01	0.799	0.0963	0.0798	2.5	320
9/22/2009 8:30	13.2	4.1	208	9.9	7.94	4	1.01	0.01 U	0.92	0.0785	0.061	2.4	400 J

Conventional Data Report

Columbia R @ Umatilla

31A070

Class: A
Rivermile: 290.5
Latitude: 45 56 01.5
Longitude: 119 19 35.1
Waterbody: WA-CR-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 10:50	17.9	138	153	8.9	7.94	2	0.26	0.01 U	0.161	0.017	0.011	1.4	3
pH measured @ 17.6°C. Barometric pressure recorded approximately 60' above water level.													
12/2/2008 11:41	9.1	248	163	10.7	8.06	2	0.281	0.01 U	0.23	0.0168 J	0.014	1.3	2 J
pH measured @ 10.5°C. Pressured measured @ ≈ 60' above water surface.													
1/7/2009 12:04	3.4	317	165	12.4	8.1	2	0.3	0.01 U	0.268	0.0189	0.0107	4.2	2
pH measured @ 6.6°C. Barometric pressure measured @ ≈ 60' above water level.													
2/4/2009 12:00	2.4	277	164	13.8	8.01	2	0.409	0.01 U	0.37	0.0245	0.0141	2.8	1 U
pH measured @ 3.8°C. Pressure measured @ ≈ 60'. Conductivity meter found to be set to 20°C reference and Linear Function at the end-of-day calibration check. Meter was reset and calibrated to 25°C ref. and NLF and the SUSSOL sample was rechecked for con													
3/2/2009 12:50	3.7	208	115	13.1	8.09	3	0.403	0.01 U	0.344	0.018	0.0037	1.6	2
pH measured @ 5.3°C. Pressure measured @ ≈ 40' > water level. Raining.													
4/6/2009 13:32	6.5	278	202	12.6	7.73	5	0.666	0.01 U	0.608	0.0342	0.0123	4.2	1
pH measured @ 9.6°C. Pressure measured @ ≈ +60'< the water surface.													
5/13/2009 12:25	15.6	544	156	12.55	8.38	7	0.316	0.01 U	0.237	0.0252	0.0047	3.9	1
pH measured @ 12.8°C. Barometric pressure measured @ ≈ 40' > water surface.													
6/1/2009 12:28	14.4	673	112	11.4	8.11	7	0.175	0.01 U	0.107	0.0234	0.01	4.3	1
Pressure measured @ ≈ + 40' > water surface. pH measured @ 18.9°C.													
7/7/2009 11:54	19.1	374	131	10.4	8.22	4	0.14	0.01 U	0.072	0.0166	0.0047	2.3	2
pH measured @ 20.1°C. Barometric pressure measured @ approximately 40 ft. above water surface.													
9/15/2009 13:40	20.4	162	153	9.19	8.2	2	0.18	0.01 U	0.089	0.0157	0.0046	1.5	4
pH was measured @ 21.5°C. Water lower than usual.													

Conventional Data Report

Walla Walla R nr Touchet

32A070

Class: B
Rivermile: 15.3
Latitude: 46 02 15.5
Longitude: 118 45 59.0
Waterbody: WA-32-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 9:20	14.3	66	330	8.6	7.92	3	0.811	0.01 U	0.542	0.0624	0.049	1.9	78 J
pH measured @ 14.1°C. Barometric pressure recorded approximately 15' above water level.													
11/18/2008 10:15	5.9	239	174	11.4	7.72	3	0.735	0.01	0.607	0.0858	0.0774	3 J	
pH measured @ 6.3°C. No stage recorded.													
12/2/2008 10:04	6.8	207	203	11.4	7.98	3	0.899	0.01 U	0.794	0.116	0.106	1.6	17 J
pH measured @ 7.7°C. Pressured measured @ ≈ 18' above water surface.													
1/7/2009 10:25	6.7	3280	108	11.4	7.78	499	1.14	0.03	0.956	0.677	0.0932	180	560
pH measured @ 7.2°C. Barometric pressure measured @ ≈ 20' above water level. High water, turbid with a lot of debris in the water.													
2/4/2009 10:10	3.2	611	115	12.1	7.78	22	1.43	0.01 U	1.31	0.128	0.0931	9.5	54
pH measured @ 3.5°C. Pressure measured @ ≈ 21'. Some wind causing belly in tape - stage + or - 0.05. Conductivity meter found to be set to 20°C reference and Linear Function at the end-of-day calibration check. Meter was reset and calibrated to 25°C re													
3/2/2009 10:50	5.1	1390	125	11.8	7.82	164	0.851	0.013	0.726	0.247	0.0659	65	34
pH measured @ 6.0°C. Pressure measured @ ≈ 20' > water level. Raining hard.													
4/6/2009 10:46	8.2	3290	105	11	7.81	438	1.34	0.01 U	1.19	0.5	0.0612	120	63
pH measured @ 8.7°C. Pressure measured @ ≈ +18'< the water surface.													
5/13/2009 9:45	9.2	2050	90.8	11.02	7.68	153	0.567	0.01 U	0.49	0.208	0.0517	31	73
pH measured @ 10.0°C. Barometric pressure measured @ ≈ 20' > water surface.													
6/1/2009 10:45	17.5	942	100	8.9	8.02	32	0.463	0.01 U	0.357	0.0669	0.0271	6.7	73
Pressure measured @ ≈ + 21' > water surface. pH measured @ 18.1°C.													
7/7/2009 9:54	20.3	67	306	7.97	7.37	23	0.923	0.047	0.674	0.0991	0.0668	8.1	150
pH measured @ 20.4°C. Barometric pressure measured @ approximately 20 ft. above water surface. A lot of sediment on nutrients filter.													
8/18/2009 9:40	21	30	301	8.88	8.56	2	0.526	0.01	0.342	0.0611	0.0434	1.3	43
pH measured @ 21.1°C. Pressure measured @ ≈ 15' > water surface.													
9/15/2009 9:15	18.2	28	304	9.8	8.78	2	0.585	0.01 U	0.391	0.0603	0.0408	1.3	29
pH was measured @ 18.7°C.													

Conventional Data Report

Touchet R. @ Cummins Rd.

32B075

Class: A
Rivermile: 3
Latitude: 46 03 24.5
Longitude: 118 40 07.6
Waterbody: WA-32-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 8:48	13.6	14.9	118	9.19	7.73	3	0.15	0.01 U	0.03	0.046	0.0339	1.5	980 J
pH measured @ 13.5°C. Barometric pressure recorded approximately 15' above water level.													
11/18/2008 9:25	4.8	51.1	98	12.8 J	7.94	5	0.296	0.01 U	0.234	0.039	0.0339	2 J	
pH measured @ 5.1 °C. No stage recorded.													
12/2/2008 9:25	6	34.3	103	11.6	7.94	2	0.183	0.01 U	0.097	0.0417	0.0305	1.8	120
Stage is from staff. pH measured @ 7.2°C. Pressured measured @ ≈ 15' above water surface.													
1/7/2009 9:30	6.1	877	85	11.6	7.85	602	0.97	0.036	0.839	0.662	0.06	210	530
Stage is from staff. pH measured @ 7.0°C. BP measured @ ≈ 15' above water level. Water turbid with a lot of debris in the water. Flow higher than normal. Tags from MEL had lab ID as -16, but should be -19.													
2/4/2009 9:33	1.6	156	111	12.8	7.81	21	1.1	0.013	1.02	0.0913	0.0549	8.5	27
pH measured @ 2.1°C. Pressure measured @ ≈ 15'. Conductivity meter found to be set to 20°C reference and Linear Function at the end-of-day calibration check. Meter was reset and calibrated to 25°C ref. and NLF and the SUSSOL sample was rechecked for con													
3/2/2009 10:10	4.9	316	91	12.2	8.16	68	0.681	0.012	0.579	0.122	0.0463	17	81
pH measured @ 6.0°C. Pressure measured @ ≈ 15' > water level. Raining													
4/6/2009 10:05	8.5	1477	101	11	8.11	916	1.55	0.012	1.38	0.913	0.0587	220	57
pH measured @ 9.3°C. Pressure measured @ ≈ +12'< the water surface.													
5/13/2009 8:54	9.3	588	79	11.22	7.72	129	0.604	0.01 U	0.533	0.159	0.0442	28	55
pH measured @ 9.7°C. Barometric pressure measured @ ≈ 15' > water surface.													
6/1/2009 10:13	18	297	73	9.4	8.87	60	0.323	0.01 U	0.206	0.0652	0.0146	8.7	21
Pressure measured @ ≈ + 22' > water surface. pH measured @ 18.2°C.													
7/7/2009 8:58	20.1	25	131	8.68	8.05	8	0.291	0.017	0.092	0.0646	0.0466	2	130
pH measured @19.8°C. Barometric pressure measured @ approximately 20 ft. above water surface.													
8/18/2009 8:40	19.7	9.77	141	8.18	7.92	2	0.176	0.01 U	0.015	0.0575	0.0411	0.6	140
pH measured @ 19.5°C. Pressure measured @ ≈ 15' > water surface.													
9/15/2009 8:35	18.4	9.77	135	7.8	7.8	2	0.179	0.01 U	0.018	0.098	0.0394	1.2	66
pH was measured @ 18.2°C.													

Conventional Data Report

Snake R nr Pasco

33A050

Class: A
Rivermile: 2.2
Latitude: 46 12 59.5
Longitude: 119 01 27.0
Waterbody: WA-33-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 7:50	17	28	187	8.19	7.85	4	0.395	0.01 U	0.245	0.041	0.0305	1.8	4 J
pH measured @ 16.0°C. Barometric pressure recorded approximately 80' above water level.													
11/18/2008 8:10	11.2	19.5	316	9.9	8.06	4	0.73	0.01 U	0.599	0.0567	0.0483	1.7 J	
pH measured @ 8.9 °C.													
12/2/2008 8:33	8.9	39	297	10.19	8.08	2	0.672	0.013	0.539	0.0518	0.0458	1.2	1 J
pH measured @ 8.6°C. Pressured measured @ ≈ 80' above water surface.													
1/7/2009 8:35	3.5	51	261	12.5	8.12	2	0.728	0.01 U	0.634	0.0479	0.0367	1.4	3
pH measured @ 5.8°C. Barometric pressure measured @ ≈ 80' above water level. Quite windy, overcast, no precip.													
2/4/2009 8:36	2.8	44	224	11.9	7.9	3	1.15	0.01 U	1.03	0.0708	0.0552	7	2
pH measured @ 3.3°C. Pressure measured @ ≈ 80'. Conductivity meter found to be set to 20°C reference and Linear Function at the end-of-day calibration check. Meter was reset and calibrated to 25°C ref. and NLF and the SUSSOL sample was rechecked for con													
3/2/2009 8:50	3.7	80	288	12.8	8.05	3	1.03	0.01 U	0.91	0.0456	0.0322	2.4	2
pH measured @ 6.4°C. Pressure measured @ ≈ 80' > water level. Raining.													
4/6/2009 8:55	6.9	94	233	13.2	7.65	7	1.3	0.011	1.18	0.0694	0.0426	11	1
pH measured @ 7.4°C. Pressure measured @ ≈ +80'< the water surface. "J" FC bacteria data as sample may have been contaminated by wind blown debris.													
5/13/2009 10:50	11.5	179	166	12.34	8.12	7	0.415	0.01 U	0.304	0.0399	0.0227	5	2
pH measured @ 12.1°C. Barometric pressure measured @ ≈ 80' > water surface.													
6/1/2009 8:45	13.3	320	85	11.6	7.74	18	0.21	0.01 U	0.135	0.0471	0.0174	13	3
Pressure measured @ ≈ + 80' > water surface. pH measured @ 15.0°C.													
7/7/2009 8:01	18.5	102	132	10.2	8	7	0.211	0.01 U	0.124	0.0357	0.0202	3.9	1 U
pH measured @18.2°C. Barometric pressure measured @ approximately 80 ft. above water surface. Thermister probe close to surface.													
8/18/2009 11:47	21.3	72	184	9.69	8.11	3	0.228	0.015	0.148	0.0349	0.0234	1.8	28
pH measured @ 22.0°C. Pressure measured @ ≈ 80' > water surface.													
9/15/2009 10:25	20.3	59	189	7.6	7.87	3	0.256	0.021	0.127	0.0337	0.0184	2	2
pH was measured @ 20.3°C.													

Conventional Data Report

Palouse R @ Hooper

34A070

Class: B
Rivermile: 19.5
Latitude: 46 45 31.5
Longitude: 118 08 52.9
Waterbody: WA-34-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2008 15:15	13.3 J	44	361	11.1	8.64	8	0.7	0.01 U	0.435	0.011	0.012	5.1	14
11/5/2008 13:15	7.6	64	374	10.9	8.59	7	1.26	0.01 U	0.979	0.026	0.0061	3.1	6
12/3/2008 14:25	5.9	124	310	12.2	7.32	8	2.14	0.012	1.95	0.134	0.123	5.5	12
1/7/2009 13:45		478											
Site frozen, no samples collected.													
2/4/2009 13:45	7.3	427	351	12.86	8.2	15	4.24	0.022	4.06	0.148	0.107	10	3
3/4/2009 12:40	5.7	4040	168	11.95	7.79	484	4.12	0.065	3.86	0.682	0.105	350	96
4/8/2009 14:25	10.5	3530	180	10.3	8.16	173	3.56	0.01 U	3.48	0.266	0.0953	100	140
5/6/2009 13:30	12.7	1700	194	10.6	8.52	39	2.77	0.01 U	2.01	0.0981	0.0264	16	300
Raining.													
6/3/2009 14:50	21.6	373	270	9.19	8.56	12	1.92	0.038	1.48	0.0927	0.0591	4.1	69
7/8/2009 15:20	22.9	99	324	9.9	8.77	10	1.13	0.015	0.841	0.108	0.0835	5.2	43
Low velocity, water appears to be stagant.													
8/5/2009 14:05	25.1	45	324	8.6	9.31	26	0.413	0.01 U	0.013	0.146	0.0271	12	28
The water appeared stagnant at this site.													
9/16/2009 14:20	20.9	42	352	9.69	8.7	10	0.659	0.015	0.326	0.0479	0.0181	5.7	38

Conventional Data Report

Palouse R @ Palouse

34A170

Class: A
Rivermile: 121.2
Latitude: 46 54 32.6
Longitude: 117 04 36.6
Waterbody: WA-34-1030

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2008 9:15	9.2 J	43	88	9.05	7.9	3	0.14	0.01 U	0.01 U	0.019	0.0048	2.1	43
11/5/2008 8:15	4	65	96	10.7	7.87	2	0.11	0.01 U	0.01 U	0.022	0.0055	1.8	31
Found water tidbit.													
12/3/2008 8:15	3.4	113	80	11.4	7.63	14	0.215	0.01 U	0.091	0.057	0.0205	14	56 J
1/7/2009 8:45	0.4	457	122	11.6	7.25	41	1.79	0.049	1.7	0.209	0.108	31	210
Forgot RP.													
2/4/2009 8:20	4.6	437	112	12.86	7.62	3	1.03	0.044	0.954	0.0704	0.0282	9.1	4
Due to ice, RP and samples taken from bridge near the right bank.													
3/4/2009 7:45	3.1	4370	60	11.65	7.32	60	0.967	0.022	0.748	0.163	0.0536	55	44 J
4/8/2009 8:45	5	3800	50	10.8	7.42	109	0.673	0.01 U	0.5	0.172	0.0534	60	83
5/6/2009 8:30	7.3	1590	44	10.4	7.41	47	0.226	0.01 U	0.119	0.101	0.0264	26 J	200
Raining.													
6/3/2009 8:50	16.7	379	60	8.8	7.68	5	0.143	0.01 U	0.01 U	0.0408	0.012	4.1	57
7/8/2009 9:30	19	99	80	8.1	7.79	4	0.185	0.01 U	0.01 U	0.0423	0.0173	2.1	67
8/5/2009 8:57	22.4	45	90	6.1	8.36	2	0.316	0.017	0.01 U	0.0269	0.0061	1.3	150 J
Crazy driver on highway.													
9/16/2009 9:15	16	43	96	7.5	8.11	3	0.221	0.01 U	0.01 U	0.0225	0.0046	1.9	54

Conventional Data Report

SF Palouse R @ Pullman

34B110

Class: A
Rivermile: 22.2
Latitude: 46 43 56.6
Longitude: 117 10 51.6
Waterbody: WA-34-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2008	10:05	10.4 J	5.1	689	8.69	7.99	4	4.35	0.01 U	3.87	0.166	0.146	3.1	77
11/5/2008	9:05	6.5	13	646	9.3	7.91	5	3.52	0.01 U	2.99	0.235	0.195	6.3	80
		Sampled on dowstream side of bridge.												
12/3/2008	8:55	5.9	12	400	10.19	7.86	4	2.37	0.018	2.1	0.15	0.117	11	280
1/7/2009	9:30	1.4	452	260	11.5	7.45	508	4	0.247	3.54	1.1	0.254	270	1400 J
2/4/2009	9:30	6.3	35	458	12.26	7.91	9	5.64	0.027	5.72	0.182	0.111	13	62
3/4/2009	8:30	4	170	206	11.35	7.5	75	5.13	0.027	4.53	0.328	0.131	85	84
4/8/2009	9:25	8.2	284	201	10.19 J	7.86	59	4.98	0.01 U	4.76	0.298	0.145	65	23
		Due to high turbity, the end point of the dissolved oxygen titration was hard to determine. This reading is accurate and is most likey the correct value, however, the result should be qualified as an estimate.												
5/6/2009	9:22	9.2	84	272	9.8	7.83	40	4	0.054	3.55	0.272	0.123	60	750
		Raining.												
6/3/2009	9:30	15.3	19	368	8.6	8.17	8	3.49	0.027	3.16	0.158	0.115	6.1	350
7/8/2009	10:15	15.8	5.5	501	8.1	8.07	2	2.94	0.02	2.25	0.194	0.157	1.9	100
8/5/2009	9:30	18.5	10	602	6.1	8	2	2.94	0.03	2.05	0.759	0.655	2.1	210 J
		Gentlmen from USGS working on the WWG.												
9/16/2009	9:40	14.2	3.6	628	7.8	7.98	3	2.91	0.016	2.51	0.218	0.18	1.9	200
		There was a note left inside the WWG housing that said the check bar had been set to 16.665 in late August.												

Conventional Data Report

Snake R @ Interstate Br

35A150

Class: A
Rivermile: 139.6
Latitude: 46 25 14.6
Longitude: 117 02 08.6
Waterbody: WA-35-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2008	11:20	17 J	16500	356	9.1	8.42	6	0.808	0.01 U	0.607	0.0614	0.0509	2.5	4
11/5/2008	10:20	11.6	16100	354	10.4	8.36	1 U	3.37	0.01 U	3.35	0.005 U	0.003 U	0.5 U	1 U
		Field measurements were taken from the normal location.												
12/3/2008	10:25	8	15600	353	11.5	8.38	3	0.947	0.01 U	0.815	0.048	0.048	1.5	4
1/7/2009	10:40	3.7	18600	390	12.9	8.31	6	1.21	0.01 U	1.11	0.0785	0.0607	3.5	25
2/4/2009	10:30	6.9	17700	496	13.36	8.5	4	1.38	0.012	1.23	0.0599	0.0406	2.1	6
		Metals												
3/4/2009	9:55	5	25300	312	12.26	8.29	22	1.03	0.027	0.867	0.0947	0.0369	16	15
4/8/2009	11:05	8.5	36200	253	11.2	8.57	25	0.766	0.01 U	0.63	0.0762	0.0376	11	9
		Sampler forgot metals gear, no metals samples collected this month.												
5/6/2009	10:30	10.9	70900	224	10.5	8.42	37	0.537	0.026	0.362	0.0893	0.0253	17	33
6/3/2009	10:45	13.4	96000	130	10.4	8.18	60	0.241	0.01 U	0.146	0.0795	0.0191	22	32
7/8/2009	11:30	19.8	43200	204	8.19	8.19	7	0.4	0.01 U	0.283	0.0487	0.0378	2.2	10
		Fishermen on left bank downstream of bridge while sampling.												
8/5/2009	10:45	23.3	17000	288	7.6	8.32	6	0.516	0.013	0.347	0.0526	0.0367	1.8	15 J
		Boats driving under the bridge while sampling.												
9/16/2009	10:45	21.2	19500	346	7.9	8.34	5	0.741	0.01 U	0.54	0.0769	0.0576	1.7	2
		Lots of fishing boats around the bridge while sampling.												

Metals Data Report

Snake R @ Interstate Br

35A150

Class: A
Rivermile: 139.6
Latitude: 46 25 14.6
Longitude: 117 02 08.6
Waterbody: WA-35-1020

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/8/2008	11:20		117		0.02 U		0.52		0.74		0.045	0.002 U	0.78			2.1
12/3/2008	10:25		125		0.02 U		0.84		0.65		0.02 U	0.002 U	0.72			1.9
2/4/2009	10:30		143		0.02 U		1.54		0.7		0.028	0.002 U	0.75			1.3
6/3/2009	10:45		47		0.02 U		0.3		0.67		0.051	0.0064	0.22			1.6
8/5/2009	10:45		106		0.02 U		0.68		0.89		0.043	0.002 U	0.75			2.7

Conventional Data Report

Tucannon R @ Powers

35B060

Class: A
Rivermile: 2.3
Latitude: 46 32 15.5
Longitude: 118 09 19.9
Waterbody: WA-35-2010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2008 14:10	13.6 J	82	146	10.19	8.12	8	0.22	0.01 U	0.145	0.048	0.0383	2.7	32
11/5/2008 12:20	8.9	98	142	11.6	8.21	4	0.2	0.01 U	0.127	0.048	0.0366	1.4	28
12/3/2008 13:20	8.8	98	140	11.7	8.21	5	0.353	0.01 U	0.292	0.0528	0.0521	2.3	47
1/7/2009 12:50	9.8	432	128	11.6	7.9	72	1.09	0.01 U	0.945	0.16	0.0629	28	72
Windy. Cow in river downstream of bridge before sampling.													
2/4/2009 12:45	9.1	137	164	12.16	7.92	6	0.737	0.01 U	0.672	0.0674	0.0561	3.1	6
Cattle bones dumped in river along the right bank.													
3/4/2009 11:47	7.3	314	114	14.97	7.92	43	0.592	0.01 U	0.493	0.118	0.0478	17	35
Cattle in river dowstream of bridge while sampling.													
4/8/2009 13:20	9.7	1080	120	10	7.96	600	1.07	0.01 U	0.915	0.794	0.0788	260	220
5/6/2009 12:40	10.1	927	88	10.8	7.84	390	0.528	0.01 U	0.429	0.523	0.0528	190	350
Cattle downstream													
6/3/2009 14:00	16.1	480	82	9.5	7.89	54	0.257	0.01 U	0.18	0.122	0.0488	18	29
7/8/2009 14:30	20.1	128	130	7.5 J	8.2	21	0.225	0.015	0.099	0.0815	0.0644	2.3	110
DO reading qualified due to titration equipment problems. Overshot by 0.15 mg/L.													
8/5/2009 13:00	22	77	148	8.6 J	8.25	12	0.251	0.011	0.115	0.0823	0.061	3.1	60 J
DO J'd due to poor match with QC													
9/16/2009 13:20	18.8	82	153	9.6	8.62	14	0.159	0.01 U	0.06	0.0633	0.0462	3.3	83

Conventional Data Report

Pataha Cr near mouth

35F050

Class: FIN
Rivermile: 1.1
Latitude: 46 30 43.9
Longitude: 117 58 22.9
Waterbody:

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/8/2008 13:05	11.3 J	3.13	255	10.8	8.37	2	0.701	0.01 U	0.518	0.131	0.12	1.7	84
	Stage reading taken from staff gage.												
11/5/2008 11:45	5.9	4.2	270	12	8.28	8	1.05	0.01 U	0.812	0.158	0.132	3.2	88
	stage reading taken from staff gage.												
12/3/2008 12:30	6.4	1.5	247	11.9	8.27	3	1.29	0.01 U	1.14	0.154	0.153	2.8	9
	Walnuts in stream.												
1/7/2009 12:15	6.8	45	196	11	7.99	325	1.4	0.039	1.21	0.568	0.13	170	330
	Heavy wind.												
2/4/2009 12:15	6.8	10.3	258	13.26	8.23	28	1.46	0.018	1.35	0.184	0.106	16	29
	Staff= 5.34												
3/4/2009 11:10	6.3	24.8	166	12.26	8.08	171	1.21	0.018	1.01	0.43	0.109	140	270
	Walnuts in stream.												
4/8/2009 12:40	10	163	170	9.9	7.94	1960	3.05	0.093	2.4	2.38	0.111	1500	1100
5/6/2009 12:00	11.6	98.6	140	10.1	7.97	598	1.22	0.023	1.05	0.738	0.0977	250	1300
	Staff reading was 7.86. However, Mich Wallace in the SHU unit informed me that the staff had moved. He recommended a +0.14 correction be added to the observed reading. The water here was really merky, sediment was settling in the bottom of all the samp												
6/3/2009 13:25	20.1	27.9	148	9	8.13	89	0.853	0.01 U	0.717	0.189	0.086	31	160
	Mitch Wallace in the SHU unit advised me that a correction of +0.14 should be applied to the staff gage reading to account for the staff having moved.												
7/8/2009 14:00	21.4	4.36	252	9.19	8.7	6	0.878	0.012	0.645	0.143	0.124	2.7	53
	Staff out of water.												
8/5/2009 12:20	22.7	3.1	280	8.4	8.4	8	0.572	0.017	0.276	0.186	0.141	4.1	610 J
	Staff still out of water.												
9/16/2009 12:45	16.6	3.75	273	9.9	8.47	4	0.972	0.01 U	0.722	0.146	0.122	2.7	200
	Staff out of water.												

Conventional Data Report

Columbia R nr Vernita

36A070

Class: A
Rivermile: 405
Latitude: 46 38 29.5
Longitude: 119 43 54.1
Waterbody: WA-CR-1030

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 13:25	17.9	91100	139	9.6	8.15	1	0.14	0.01 U	0.067	0.0062	0.0031	0.7	1
pH measured @ 17.7°C. Barometric pressure recorded approximately 55' above water level.													
11/18/2008 13:45	10.9	57400	138	10.7	8.29	1 U	0.21	0.01 U	0.151	0.008 J	0.0055	0.6	
pH measured @ 12.1°C.													
12/2/2008 14:55	9.7	73900	138	10.5	8.15	1 U	0.165	0.01 U	0.114	0.0072 J	0.0058	0.7	1
pH measured @ 9.9°C. Pressured measured @ ≈ 60' above water surface.													
1/13/2009 10:50	4.3	96300	140	12.2	8.16	8	0.168	0.01 U	0.14	0.0174	0.0042	8.7	1
pH measured @ 4.9°C. Barometric pressure measured @ ≈ 60' above water level. Cool, no precip., overcast.													
2/4/2009 14:25	2.2	81900	143	13.3	8.22	1	0.182	0.01 U	0.152	0.0088	0.003 U	0.7	1 U
pH measured @ 4.3°C. Pressure measured @ ≈70'. Conductivity meter found to be set to 20°C reference and Linear Function at the end-of-day calibration check. Meter was reset and calibrated to 25°C ref. and NLF and the SUSSOL sample was rechecked for cond													
3/4/2009 15:15	8.8	60500	150	13.5	8.61	1	0.228	0.01 U	0.19	0.0081	0.003 U	1.1	1 U
pH measured @ 9.4°C. Pressure measured @ ≈ 60' > water level.													
4/14/2009 14:25	6.8	123000	144	13	8.56	2	0.169	0.01 U	0.127	0.0087	0.003 U	1.2	1 J
pH measured @ 8.8°C. Pressure measured @ ≈ +60'< the water surface.													
5/12/2009 15:19	9.9	131000	145	13.06	8.56	5	0.238	0.01 U	0.174	0.0137	0.003 U	2.7	3
pH measured @ 11.1°C. Barometric pressure measured @ ≈ 60' > water surface. Very windy with blowing dust. Water level high on bank above grasses.													
6/3/2009 15:20	13.7	204000	122	11.6	8.19	4	0.133	0.01 U	0.071	0.0113	0.0041	1.9	15 J
Pressure measured @ ≈ + 60' > water surface. pH measured @ 16.1°C.													
7/7/2009 14:36	18.7	143000	126	10.7	8.25	2	0.096	0.01 U	0.028	0.0076	0.003 U	1	25
pH measured @18.7°C. Barometric pressure measured @ approximately 60 ft. above water surface.													
9/14/2009 15:35	21	39700	138	10.4	8.52	2	0.153	0.01 U	0.073	0.0103	0.003 U	0.7	10
pH was measured @ 21.5°C.													

Conventional Data Report

Yakima R @ Kiona

37A090

Class: A
Rivermile: 29.8
Latitude: 46 15 10.5
Longitude: 119 28 31.1
Waterbody: WA-37-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 12:00	14.7	2480	260	10.1	8.2	11	1.29	0.01 U	1.14	0.0888	0.0707	5.5	37
pH measured @ 14.8°C. Barometric pressure recorded approximately 15' above water level.													
11/18/2008 12:00	6.6	5000	164	11.7	7.94	24	0.758	0.022	0.692	0.087	0.0481	14 J	
pH measured @ 7.3 °C. Stage not recorded.													
12/2/2008 13:11	6.6	2970	219	12.2	8.25	8	1.25	0.02	1.1	0.0958	0.0775	4.2	15
pH measured @ 7.8°C. Pressured measured @ ≈ 12' above water surface.													
1/7/2009 13:25	5.6	2570	244		8.36	7	1.43	0.01 U	1.32	0.0941	0.0768	4.6	5
pH measured @ 8.9°C. Barometric pressure measured @ ≈ 10' above water level. No DO, bottle spilled.													
2/4/2009 13:27	3.5	3330	202	12.6	8.07	8	0.966	0.017	0.886	0.0818	0.0609	5.3	1
pH measured @ 4.7°C. Pressure measured @ ≈ 15'. Unsure whether stage was 4.95 or 4.96 because of memory lapse. Conductivity meter found to be set to 20°C reference and Linear Function at the end-of-day calibration check. Meter was reset and calibrated													
3/2/2009 14:20	5.8	2810	214	14	8.77	5	0.733	0.01 U	0.633	0.0771	0.0503	3.7	2
pH measured @ 7.6°C. Pressure measured @ ≈ 10' > water level.													
4/6/2009 14:50	12.3	2710	200	13.6	8.76	9	0.483	0.01 U	0.336	0.0606	0.0308	4.2	1
pH measured @ 13.9°C. Pressure measured @ ≈ +15'< the water surface.													
5/13/2009 13:50	13.1	5890	144	10.71	8.08	45	0.448	0.01 U	0.337	0.107	0.0458	14	19
pH measured @ 13.9°C. Barometric pressure measured @ ≈ 12' > water surface.													
6/1/2009 13:45	16.8	12100	93	8.8	7.73	156	0.284	0.013	0.191	0.19	0.035	55	300
Pressure measured @ ≈ + 12' > water surface. pH measured @ 18.2°C.													
7/7/2009 12:49	20.3	1000	253	10.6	8.64	21	0.894	0.015	0.66	0.0863	0.0436	7.1	29
pH measured @ 23.0°C. Barometric pressure measured @ approximately 15 ft. above water surface. Stage was measured at Gauge House @ 13:30.													
8/18/2009 12:47	21.6	1770	240	11.51	8.74	6	0.966	0.01 U	0.85	0.0939	0.0725	1.6	10
pH measured @ 22.3°C. Pressure measured @ ≈ 15' > water surface.													
9/15/2009 12:15	21	2010	276	10.8	8.54	5	1.27	0.01 U	1.1	0.0899	0.0691	1.9	12
pH was measured @ 21.2°C.													

Conventional Data Report

Yakima R @ Parker

37A190

Class: A
Rivermile: 104.6
Latitude: 46 30 21.5
Longitude: 120 27 11.2
Waterbody: WA-37-1040

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/5/2008 14:00	13.8	835	135	11	8.3	6	0.403	0.01 U	0.267	0.0716	0.0562	2.9	89
pH measured @ 13.8°C. Barometric pressure recorded approximately 25' above water level.													
11/17/2008 15:45	6.7	3644	110	12	7.43	13	0.374	0.013	0.292	0.0635	0.0487	8.1	17
pH measured @ 7.2 °C.													
12/1/2008 14:15	6.1	1981	129	11.8	7.89	3	0.493	0.01 U	0.426	0.0579	0.0518	2.7	6
pH measured @ 6.6°C. Pressured measured @ ≈ 25' above water surface.													
1/6/2009 11:05	0.3	1629	135	14.2	7.87	5	0.416	0.01 U	0.349	0.0492	0.0372	3	6
pH measured @ 1.5°C. Barometric pressure measured @ ≈ 30' above water level.													
2/3/2009 14:05	2.7	2383	130	13.3	7.81	5	0.405	0.01	0.335	0.056	0.0384	3.5	1 J
pH measured @ 3.6°C. Pressure measured @ ≈ 20'.													
3/3/2009 13:50	6.6	2005	141	13.2	8.95	5	0.264	0.01 U	0.177	0.0576	0.0395	2.1	1 U
pH measured @ 7.5°C. Pressure measured @ ≈ 30' > water level.													
4/13/2009 14:55	7.9	3385	116	12.3	8.08	18	0.142	0.01 U	0.074	0.063	0.0258 J	9.4	5
pH measured @ 8.4°C. Pressure measured @ ≈ +30'< the water surface.													
5/11/2009 15:01	11.9	4428	100	11.73	8.28	15	0.162	0.01 U	0.088	0.0563	0.0308	6.6	9
pH measured @ 13.7°C. Barometric pressure measured @ ≈ 20' > water surface.													
6/2/2009 15:10	12.3	12243	68	10.4	7.67	60	0.109	0.01 U	0.069	0.0889	0.0368	28	34
Pressure measured @ ≈ + 25' > water surface. pH measured @ 15.1°C.													
7/6/2009 16:10	18.2	553	86	10.5 J	8.52	7	0.264	0.01 U	0.174	0.0499	0.0395	2.6	14
pH measured @ 18.7°C. Barometric pressure measured @ approximately 80 ft. above water surface. DO "J"ed because approximately 1mL extra acid was added during analysis.													
8/19/2009 12:10	20.3	440	98	9.89	8.3	7	0.238	0.011	0.174	0.0506	0.0355	2.6	28
pH measured @ 20.6°C. Pressure measured @ ≈ 30' > water surface.													
9/16/2009 14:10	18.1	444	108	10.6	8.48	10	0.171	0.01 U	0.093	0.0459	0.0312	4.6	28
pH was measured @ 18.7°C.													

Metals Data Report

Yakima R @ Parker

37A190

Class: A
Rivermile: 104.6
Latitude: 46 30 21.5
Longitude: 120 27 11.2
Waterbody: WA-37-1040

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/5/2008	14:00		52.9		0.02 U		0.25		0.73		0.02	0.002	0.71			1.4
12/1/2008	14:15		53.3		0.02 U		0.44		0.43		0.02 U	0.0046	0.66			2.5
2/3/2009	14:05		51.6		0.02 U		0.56		0.49		0.027	0.002 U	0.75			1.6
4/13/2009	14:55		50.9		0.02 U		0.38		0.69		0.024	0.0032	0.7			1.3
6/2/2009	15:10		29.4		0.02 U		0.25 U		0.62		0.022	0.005	0.6			1.4
8/19/2009	12:10		40.7		0.02 U		0.47		0.53		0.02 U	0.002 U	0.99			7.1

Conventional Data Report

Yakima R @ Nob Hill

37A205

Class: A
Rivermile: 111.3
Latitude: 46 34 53.5
Longitude: 120 27 42.2
Waterbody: WA-37-1040

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/5/2008 12:00	13.1	2350	124	10.5	8.05	5	0.304	0.01 U	0.171	0.049	0.0362	2.6	69
pH measured @ 13.0°C. Barometric pressure recorded approximately 10' above water level.													
11/17/2008 13:20	6.5	3680	101	11.6	7.7	10	0.23	0.01	0.151	0.038	0.026	7.9	28
pH measured @ 7.0 °C.													
12/1/2008 13:01	6	2010	116	11.6	7.85	3	0.259	0.01 U	0.208	0.0279	0.0245	2.6	10
pH measured @ 6.3°C. Pressured measured @ ≈ 12' above water surface.													
1/6/2009 10:35	0.3		120	14.2	7.75	3	0.253	0.01 U	0.202	0.0319	0.0215	2.2	4
pH measured @ 1.0°C. Barometric pressure measured @ ≈ 12' above water level. Wading sample. Ice on banks and in river.													
2/3/2009 12:50	2.4	2300	118	13.2	7.75	2	0.279	0.01 U	0.236	0.0331	0.0245	2.9	4
pH measured @ 3.7°C. Pressure measured @ ≈ 12'.													
3/3/2009 12:25	6.1	2100	127	13.4	8.99	3	0.103	0.01	0.028	0.0286	0.0133	1.9	1
pH measured @ 7.3°C. Pressure measured @ ≈ 12' > water level.													
4/13/2009 13:05	7.2	4410	110	11.6	7.82	13	0.084	0.01 U	0.022	0.0428	0.0147 J	7.6	9
pH measured @ 7.7°C. Pressure measured @ ≈ +12'< the water surface.													
5/11/2009 13:10	10.9	6330	96.7	11.12	7.92	8	0.133	0.01 U	0.065	0.0359	0.0226	5.5	8
pH measured @ 13.0°C. Barometric pressure measured @ ≈ 10' > water surface.													
6/2/2009 13:38	11.7	14600	67	10.1	7.6	45	0.08	0.01 U	0.043	0.0732	0.014	24	45
Pressure measured @ ≈ + 6' > water surface. pH measured @ 13.8°C.													
7/6/2009 14:23	17.5	3450	80	10.2	8.27	4	0.161	0.01 U	0.091	0.0265	0.0183	2.8	29
pH measured @18.4°C. Barometric pressure measured @ approximately 20 ft. above water surface.													
8/19/2009 11:10	19.5	3050	91	9.59	8.18	6	0.175	0.01 U	0.113	0.036	0.0226	2.2	36
pH measured @ 20.3°C. Pressure measured @ ≈ 10' > water surface.													
9/16/2009 12:02	17.2	2420	94	10.5	8.38	10	0.112	0.01 U	0.054	0.0359	0.0171	5.2	33
pH was measured @ 17.9°C. River course has changed, moving east, making sampling difficult and a longer walk.													

Conventional Data Report

Ahtanum Crk @ Fulbright Park

37G050

Class: FIN
Rivermile: 1.1
Latitude: 46 32 18.2
Longitude: 120 28 48.3
Waterbody: WA-37-1040

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/5/2008 12:50	12.5	44	182	10	7.88	9	0.404	0.01 U	0.305	0.0858	0.0699	5.1	500
pH measured @ 12.4°C. Barometric pressure recorded approximately 10' above water level.													
11/17/2008 14:35	8.1	20	279	10.8	7.88	13	0.776	0.01	0.652	0.105	0.0962	4.6	88
pH measured @ 8.4 °C.													
12/1/2008 13:45	6.2	34	210	11.1	7.86	5	0.49	0.01 U	0.402	0.0773	0.0701	3.3	34
pH measured @ 6.6°C. Pressured measured @ ≈ 12' above water surface.													
1/6/2009 11:37	2.2	34	213	12.6	7.88	7	0.506	0.01 U	0.43	0.0844	0.0686	2.1	31
pH measured @ 2.5°C. Barometric pressure measured @ ≈ 10' above water level.													
2/3/2009 13:35	2.9	45	187	12.8	7.83	14	0.446	0.01 U	0.362	0.0938	0.0651	7.7	11
pH measured @ 3.6°C. Pressure measured @ ≈ 10'.													
3/3/2009 13:18	7.8	60	198	11.7	8.34	15	0.377	0.01 U	0.276	0.0901	0.0604	7.2	22
pH measured @ 8.5°C. Pressure measured @ ≈ 10' > water level.													
4/13/2009 13:59	8.2	111	139	11.1	7.76	71	0.199	0.01 U	0.095	0.14	0.0502 J	26	240
pH measured @ 8.5°C. Pressure measured @ ≈ +8'< the water surface.													
5/11/2009 14:20	13.1	136	137	10.51	8.04	41	0.211	0.01 U	0.109	0.0943	0.0463	15	83
pH measured @ 14.0°C. Barometric pressure measured @ ≈ 8' > water surface.													
6/2/2009 14:20	12.8	369	85	9.5	7.75	106	0.163	0.01 U	0.077	0.156	0.052	45	290
Pressure measured @ ≈ + 5' > water surface. pH measured @ 14.4°C. Creek flooding, sampled from bridge but water running across park lawns and roadway above bridge and into creek channel.													
7/6/2009 15:19	20.5	26	246	9.59	8.27	7	0.627	0.01 U	0.465	0.101	0.0949	3.2	150
pH measured @ 20.5°C. Barometric pressure measured @ approximately 10 ft. above water surface.													
8/19/2009 13:00	19.9	24	252	9.49	8.03	4	0.677	0.01 U	0.601	0.0966	0.083	2.1	250
pH measured @ 20.7°C. Pressure measured @ ≈ 10' > water surface.													
9/16/2009 13:40	17.8	31	236	9.9	8.03	5	0.542	0.01 U	0.448	0.102	0.0855	3.2	610
pH was measured @ 18.7°C.													

Conventional Data Report

Naches R @ Yakima on US HWY 97

38A050

Class: A
Rivermile: 0.1
Latitude: 46 37 46.3
Longitude: 120 30 55.5
Waterbody: WA-38-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/5/2008	11:15	12.8	1413	80	10.3	7.98	5	0.1	0.01 U	0.051	0.014	0.0078	3.5	21
		pH measured @ 12.5°C. Barometric pressure recorded approximately 25' above water level.												
11/17/2008	12:30	5.9	1935	70	11.9	7.52	8	0.13	0.01 U	0.072	0.025	0.015	6.4	12 J
		pH measured @ 6.3 °C.												
12/1/2008	11:50	5.5	1045	78	11.9	7.8	3	0.122	0.01 U	0.088	0.0187 J	0.0116	3.6	3
		pH measured @ 5.9°C. Pressured measured @ ≈ 20' above water surface.												
1/6/2009	9:40	0	784	91	13.9	7.47	7	0.162	0.01 U	0.125	0.0249	0.0115	3.9	4
		pH measured @ 2.3°C. Barometric pressure measured @ ≈ 20' above water level. Slush and ice in the river floating and submerged. Sample contains what appeared to be "dirty" slush. Weather -- snow, freezing rain, overcast with occasional sun break.												
2/3/2009	11:30	1.7	890	85	13.5	7.81	3	0.117	0.01 U	0.081	0.0243	0.0162	3.7	1
		pH measured @ 2.7°C. Pressure measured @ ≈ 25'.												
3/3/2009	11:45	5.8	845	92	13.4	9.07	3	0.067	0.01 U	0.012	0.0186	0.01	3.1	2
		pH measured @ 7.3°C. Pressure measured @ ≈ 40' > water level.												
4/13/2009	12:10	6.2	2520	86	12.3	8.18	19	0.055	0.01 U	0.01 U	0.0533	0.0197	12	8
		pH measured @ 6.9°C. Pressure measured @ ≈ +20'< the water surface.												
5/11/2009	13:38	9.8	4346	70	11.53	8	19	0.039	0.01 U	0.01 U	0.0406	0.0146	7.8	6
		pH measured @ 11.3°C. Barometric pressure measured @ ≈ 20' > water surface.												
6/2/2009	12:50	10.4	8830	55	10.6	7.62	63	0.037	0.01 U	0.011	0.0811	0.0129	27	19
		Pressure measured @ ≈ + 40' > water surface. pH measured @ 12.7°C.												
7/6/2009	13:27	17.3	1462	70	10.9	8.15	4	0.05	0.01 U	0.019	0.0168	0.0119	2.9	8
		pH measured @18.0°C. Barometric pressure measured @ approximately 50 ft. above water surface.												
8/19/2009	9:50	18.3	286	91	10.1	8.35	4	0.096	0.01 U	0.056	0.0154	0.0082	1.5	42
		pH measured @ 19.3°C. Pressure measured @ ≈ 20' > water surface. Construction on the bridge. Hand sampled from right bank under bridge.												
9/16/2009	11:20	16.6	2040	75	10	8.05	19	0.067	0.01 U	0.035	0.0337	0.008	8.5	55
		pH was measured @ 17.4°C. High water due to irrigation releases												

Metals Data Report

Naches R @ Yakima on US HWY 97

38A050

Class: A
Rivermile: 0.1
Latitude: 46 37 46.3
Longitude: 120 30 55.5
Waterbody: WA-38-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/5/2008	11:15		32.2		0.02 U		0.25 U		0.46		0.02 U	0.0037	0.23			1 U
12/1/2008	11:50		32.3		0.02 U		0.25 U		0.4		0.02 U	0.002 U	0.2			1
2/3/2009	11:30		34.3		0.02 U		0.26		0.48		0.02 U	0.002 U	0.26			1.2
4/13/2009	12:10		37.1		0.02 U		0.25 U		0.77		0.032	0.0052	0.28			1.3
6/2/2009	12:50		23.3		0.02 U		0.25 U		0.54		0.02 U	0.006	0.14			1.3
8/19/2009	9:50		36.2		0.02 U		0.25 U		0.51		0.02 U	0.002 U	0.3			1.3

Conventional Data Report

Yakima R @ Harrison Bridge

39A050

Class: A
Rivermile: 122
Latitude: 46 40 46.5
Longitude: 120 29 28.2
Waterbody: WA-39-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/5/2008 10:10	13	1536	170	10.19	8.1	4	0.458	0.01 U	0.281	0.0858	0.0667	2	150
pH measured @ 12.6°C. Barometric pressure recorded approximately 40' above water level.													
11/17/2008 11:30	6.4	2018	128	11.8	7.59	11	0.272	0.012	0.193	0.035	0.024	5.9	51
pH measured @ 6.6 °C.													
12/1/2008 10:47	6	1141	137	11.4	7.96	3	0.339	0.011	0.264	0.0265	0.0227	1.6	5
pH measured @ 6.5°C. Pressured measured @ ≈ 35' above water surface.													
1/12/2009 15:25	4.1	5352	114	12.9	7.7	39	0.416	0.014	0.294	0.106	0.0344	27	15
pH measured @ 6.0°C. Barometric pressure measured @ ≈ 35' above water level.													
2/3/2009 9:55	1.7	1438	137	12.8	7.87	2	0.344	0.01 U	0.287	0.0277	0.0219	1.8	2
pH measured @ 2.7°C. Pressure measured @ ≈ 35'.													
3/3/2009 10:56	6.2	1285	141	14	9.15	3	0.102	0.01 U	0.01 U	0.0168	0.0036	1.4	1 U
pH measured @ 7.7°C. Pressure measured @ ≈ 30' > water level.													
4/13/2009 11:02	6.9	3275	122	12.5	7.94	15	0.122	0.01 U	0.024	0.0399	0.0102	10	9
pH measured @ 8.2°C. Pressure measured @ ≈ +30'< the water surface. Slow response on pH meter.													
5/11/2009 12:15	11.5	3881	116	12.24	8.51	14	0.203	0.01 U	0.106	0.0519	0.024	6.7	3
pH measured @ 13.4°C. Barometric pressure measured @ ≈ 35' > water surface.													
6/2/2009 11:42	12	7658	74	10.5	7.72	41	0.129	0.01 U	0.074	0.0705	0.0138	20	53
Pressure measured @ ≈ + 30' > water surface. pH measured @ 14.0°C.													
7/6/2009 12:48	16.8	3491	80	10.9	8.45	10	0.246	0.017	0.131	0.033	0.0207	3	27
pH measured @17.6°C. Barometric pressure measured @ approximately 30 ft. above water surface.													
8/19/2009 8:15	18.8	3797	87	8.88	7.98	8	0.17	0.01 U	0.109	0.0367	0.0178	2.6	37
pH measured @ 18.8°C. Pressure measured @ ≈ 35' > water surface.													
9/16/2009 10:40	17.1	1297	141	10.3	8.75	3	0.248	0.01 U	0.107	0.0449	0.0303	1.6	11
pH was measured @ 18.2°C. pH rechecked in second sample cup.													

Metals Data Report

Yakima R @ Harrison Bridge

39A050

Class: A
Rivermile: 122
Latitude: 46 40 46.5
Longitude: 120 29 28.2
Waterbody: WA-39-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/5/2008	10:10		69.4		0.02 U		0.33		1.05		0.024	0.0027	1.27			1 U
12/1/2008	10:47		59.3		0.02 U		0.59		0.39		0.02 U	0.002 U	0.94			2.2
2/3/2009	9:55		56.3		0.02 U		0.66		0.46		0.036	0.002 U	1.01			1.4
4/13/2009	11:02		54		0.02 U		0.4		0.52		0.02 U	0.0026	0.9			1 U
6/2/2009	11:42		33.3		0.02 U		0.36		0.44		0.02 U	0.0032	1.06			1.3
8/19/2009	8:15		38.1		0.02 U		0.47		0.48		0.026	0.002 U	1.13			1.2

Conventional Data Report

Yakima R nr Cle Elum

39A090

Class: AA
Rivermile: 191
Latitude: 47 11 08.4
Longitude: 121 02 40.3
Waterbody: WA-39-1060

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/7/2008 12:30	12.4	524	59	10.4	7.57	1	0.041	0.01 U	0.01 U	0.0053	0.0031	0.5 U	2
pH measured @ 12.4°C. Barometric pressure recorded approximately 10' above water level.													
11/19/2008 14:30	5.8	1210	71	11.2	7.18	3	0.091	0.01 U	0.042	0.011 J	0.0062	3.1	2 J
pH measured @ 6.6 °C.													
12/1/2008 8:55	6.4	631	70	10.6	7.1	2	0.065	0.01 U	0.035	0.0085 J	0.0058	1.3	4
pH measured @ 6.9°C. Pressured measured @ ≈ 12' above water surface.													
1/12/2009 7:55	3.5	3192	70	11.9	6.96	22	0.08	0.01 U	0.045	0.0545	0.0071	21	8
pH measured @ 4.6°C. Barometric pressure measured @ ≈ 10' above water level. Overcast, no precip., air temp < 0°C.													
2/3/2009 8:10	1.8	822	76	11.8	7.77	2	0.073	0.01 U	0.052	0.0111	0.006	1.7	2 J
pH measured @ 4.0°C. Pressure measured @ ≈ 10'.													
3/3/2009 9:18	3.8	683	78	11.9	7.68	1	0.035	0.01 U	0.013	0.0066	0.003 U	0.7	1
pH measured @ 7.4°C. Pressure measured @ ≈ 8' > water level. Runoff from highway upstream of sampling.													
4/13/2009 9:25	4.3	2040	84	11.8	7.57	12	0.028	0.01 U	0.01 U	0.0089	0.003 U	1.7	1
pH measured @ 4.8°C. Pressure measured @ ≈ +10'< the water surface.													
5/11/2009 10:47	7.1	2732	60.6	11.42	7.38	9	0.035	0.01 U	0.01 U	0.0161	0.0035	4	2
pH measured @ 8.7°C. Barometric pressure measured @ ≈ 12' > water surface.													
6/2/2009 9:45	8.2	6390	99	10.5	7.42	9	0.028	0.01 U	0.01 U	0.0145	0.003	5.2	4
Pressure measured @ ≈ + 8' > water surface. pH measured @ 10.6°C. New fence installed at site -- impossible to access old RP. New RP is 4.00 feet > than old (For June run old RP = 19.6, new RP = 23.6)													
7/6/2009 10:54	11.8	3480	61	10.4	7.41	2	0.047	0.01 U	0.011	0.0087	0.0056	1.1	11
pH measured @12.4°C. Barometric pressure measured @ approximately 10 ft. above water surface. Windy; belly in down-tape,+/- 0.05 ft.													
9/16/2009 8:32	14.1	417	62	9	7.46	2	0.034	0.01 U	0.01 U	0.0075	0.0036	0.6	19
pH was measured @ 13.7°C. Stage is measured from RP #2 which is +4' greater than RP #1.													

Conventional Data Report

Crab Cr nr Beverly

41A070

Class: B
Rivermile: 6
Latitude: 46 49 52.5
Longitude: 119 48 58.2
Waterbody: WA-41-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 14:17	14.6	287	552	9.69	8.31	6	1.75	0.01 U	1.57	0.044	0.03	3.3	48
pH measured @ 14.8°C. Barometric pressure recorded approximately 12' above water level.													
11/18/2008 14:50	6.9	174	135	12.1	8.52	16	3.88	0.012	2.95	0.0887	0.0498	11	
pH measured @ 7.9°C. No stage recorded.													
12/3/2008 13:53	5.9	176	755	12	8.41	10	2.98	0.01 U	2.78	0.0602	0.0463	8.1	5
pH measured @ 6.9°C. Pressured measured @ ≈ 14' above water surface.													
1/13/2009 9:45	2	256	838	12.1	8.37	20	3.28	0.026	2.91	0.152	0.105	13	22
pH measured @ 4.2°C. Barometric pressure measured @ ≈ 12' above water level.													
2/2/2009 13:50	2.3	182	783	12.6	8.46	15	3.24	0.01 U	3.01	0.0994	0.0592 J	8 J	
pH measured @ 4.1°C. Pressure measured @ ≈ 14'.													
3/4/2009 13:55	8.7	196	816	11.6	8.54	28	3.76	0.01 U	2.27	0.138	0.0307	19	9
pH measured @ 9.6°C. Pressure measured @ ≈ 12' > water level.													
4/14/2009 13:36	9.9	222	534	10.6	8.24	28	2.37	0.01 U	1.64	0.0889	0.0319	11	29 J
pH measured @ 11.2°C. Pressure measured @ ≈ +8'< the water surface.													
5/12/2009 14:15	14.8	212	537	9.79	8.45	71	1.53	0.01 U	1.3	0.133	0.0316	29	16
pH measured @ 14.7°C. Barometric pressure measured @ ≈ 6' > water surface. Very windy (30+ knots) with blowing dust.													
6/3/2009 13:30	22	129	479	9.1	8.57	38	1.75	0.018	1.48	0.101	0.0366	20	53
Pressure measured @ ≈ + 13' > water surface. pH measured @ 21.9°C.													
7/8/2009 14:05	20.8	128	451	10.5	8.52	38	1.67	0.01 U	1.47	0.0632	0.0202	18	150
pH measured @ 21.0°C. Barometric pressure measured @ approximately 10 ft. above water surface. Turbid. Roadway graded this day.													
8/12/2009 13:45	23	189	501	8.18	8.41	86	1.6	0.013	1.4	0.118	0.0158	38	160
pH measured @ 23.3°C. Pressure measured @ ≈ 10' > water surface. Turbid.													
9/14/2009 13:48	20.4	246	527	9.3	8.45	55 J	2.96	0.01 U	1.66	0.0737	0.0228	13	92
pH was measured @ 20.3°C. Side by side sampling comparison with WDFW													

Conventional Data Report

Wenatchee R @ Wenatchee

45A070

Class: A
Rivermile: 1.1
Latitude: 47 27 31.5
Longitude: 120 20 11.3
Waterbody: WA-45-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/7/2008 9:05	11	669	77	10.5	7.75	3	0.264	0.01 U	0.163	0.005 U	0.003 U	1.5	60
pH measured @ 11.1°C. Barometric pressure recorded approximately 80' above water level.													
11/19/2008 11:45	5.8	4180	44	12.2	7.34	4	0.1	0.01 U	0.083	0.005 UJ	0.0037	1.5	14 J
pH measured @ 6.8°C.													
12/3/2008 10:32	5.1	2550	48	12.4	7.42	1	0.126	0.01 U	0.089	0.005 J	0.0035	0.8	5
pH measured @ 5.9°C. Pressured measured @ ≈ 80' above water surface.													
1/12/2009 12:50	3.5	5000	59	13	7.71	18	0.138	0.01 U	0.088	0.0274	0.0047	4.9	4
pH measured @ 4.1°C. Barometric pressure measured @ ≈ 80' above water level. Cold, foggy.													
2/2/2009 10:01	1.6	1640	75	13.4	7.66	1	0.178	0.01 U	0.138	0.0095	0.0052	0.8 J	
pH measured @ 2.5°C. Pressure measured @ ≈ 80'.													
3/4/2009 11:35	5.4	1420	98	13	8.11	5	0.201	0.01 U	0.131	0.0151	0.0044	2.7	5
pH measured @ 7.1°C. Pressure measured @ ≈ 80' > water level.													
4/14/2009 9:50	5.6	2510	83	12.5	7.36	7	0.066	0.01 U	0.01 U	0.0128	0.0032	2.1	7 J
pH measured @ 6.8°C. Pressure measured @ ≈ +80'< the water surface.													
5/12/2009 10:40	8	5710	53.1	12.04	7.85	14	0.079	0.01 U	0.035	0.0112	0.0037	3.8	11
pH measured @ 9.3°C. Barometric pressure measured @ ≈ 40' > water surface.													
6/3/2009 9:32	9.1	13500	32	11	7.38	23	0.085	0.01 U	0.05	0.0174	0.0037	5.6	5
Pressure measured @ ≈ + 40' > water surface. pH measured @ 11.6°C.													
7/8/2009 10:30	14.8	3210	42	10.2	7.71	4	0.076	0.01 U	0.046	0.0093	0.0041	1	11
pH measured @15.9°C. Barometric pressure measured @ approximately 80 ft. above water surface.													
8/12/2009 11:47	18.6	843	73	9.79	8.35	3	0.196	0.01 U	0.168	0.0078	0.003 U	0.6	14
pH measured @ 19.7°C. Pressure measured @ ≈ 100' > water surface.													
9/14/2009 9:49	17.8	686	81	9.9	8.11	3	0.23	0.01 U	0.156	0.0082	0.003 U	0.8	140
pH was measured @ 18.4°C. Windy, blowing debris on bridge.													

Conventional Data Report

Wenatchee R nr Leavenworth

45A110

Class: AA
Rivermile: 35.6
Latitude: 47 40 34.4
Longitude: 120 44 02.3
Waterbody: WA-45-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/7/2008	10:20	10.6	669	40	10.3	7.53	1	0.05	0.01 U	0.01 U	0.005 U	0.003 U	0.6	19
		pH measured @ 10.9°C. Barometric pressure recorded approximately 25' above water level. No stage -- dry under RP.												
11/19/2008	12:50	5.7	4160	30	11.7	7.26	3	0.063	0.01 U	0.054	0.005 U	0.003 U	1.8	1 UJ
		pH measured @ 5.9°C.												
12/3/2008	9:20	5.1	2550	32	11.7	7.39	1	0.08	0.01 U	0.053	0.005 J	0.003 U	0.7	1
		pH measured @ 5.5°C. Pressured measured @ ≈ 30' above water surface.												
1/12/2009	11:50		5020											
		Station skipped because of dangerous access due to heavy traffic and snow on bridge (no place to stand).												
2/2/2009	8:45	1.4	1650	41	12.6	7.02	1	0.087	0.01 U	0.054	0.008	0.003 J	0.5 J	
		pH measured @ 2.2°C. Pressure measured @ ≈ 25'.												
3/4/2009	10:12	3.5	1410	52	12.2	8.1	1	0.08	0.01 U	0.034	0.0077	0.003 U	1.4	1 J
		pH measured @ 4.6°C. Pressure measured @ ≈ 24' > water level. No stage taken, dry below RP.												
4/14/2009	8:33	3.5	2490	58	11.9	7.55	2	0.075	0.01 U	0.036	0.0107	0.0043	1.3	6 J
		pH measured @ 5.5°C. Pressure measured @ ≈ +25'< the water surface. Light rain.												
5/12/2009	9:25	6.2	5690	37.1	11.83	7.46	5	0.086	0.01 U	0.056	0.0097	0.0041	2.1	6
		pH measured @ 6.9°C. Barometric pressure measured @ ≈ 25' > water surface.												
6/3/2009	8:22	6.8	136000	25	11.1	7.14	17	0.093	0.01 U	0.057	0.0152	0.0032	2.5	9
		Pressure measured @ ≈ + 20' > water surface. pH measured @ 8.3C.												
7/8/2009	8:40	12	3230	30	10.1	7.41	3	0.038	0.01 U	0.017	0.0053	0.0034	1.2	5
		pH measured @12.5°C. Barometric pressure measured @ approximately 25 ft. above water surface.												
8/12/2009	9:10	15.7	843	40	9.59	7.51	2	0.036	0.01 U	0.01	0.005 U	0.003 U	0.9	8
		pH measured @ 16.4°C. Pressure measured @ ≈ 25' > water surface. Dry under RP -- no stage. Light rain.												
9/14/2009	8:35	16.4	686	43	8.9	7.34	1 U	0.043	0.01 U	0.01	0.005 U	0.003 U	0.5 U	7
		pH was measured @ 15.7°C. Stage is from a secondary RP. Primary RP was dry. Because of low water this station was sampled by hand under the bridge.												

Conventional Data Report

Entiat R nr Entiat

46A070

Class: A
Rivermile: 1.5
Latitude: 47 39 47.5
Longitude: 120 15 02.3
Waterbody: WA-46-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/7/2008 8:25	9.5	130	91	11	8.2	3	0.19	0.01 U	0.134	0.005 U	0.003 U	1	17
pH measured @ 9.8°C. Barometric pressure recorded approximately 20' above water level.													
11/19/2008 10:10	3.2	412	60	13.1	8.05	2	0.12	0.01 U	0.097	0.005 U	0.0031	0.5	2 J
pH measured @ 4.4°C. No stage recorded.													
12/3/2008 11:38	3.6	254	69	13.4	7.66	2	0.1	0.01 U	0.077	0.005 UJ	0.0034	1	2
pH measured @ 4.5°C. Pressured measured @ ≈ 15' above water surface.													
1/12/2009 10:35	1.5		90	13.7	7.61	3	0.134	0.01 U	0.106	0.0096	0.0058	1.2	2
pH measured @ 2.3°C. Barometric pressure measured @ ≈ 15' above water level. Overcast, no precip.													
2/2/2009 10:55	1.2	185	97	13.8	7.93	1	0.137	0.01 U	0.113	0.0077	0.0045 J	0.7 J	
pH measured @ 1.9°C. Pressure measured @ ≈ 15'.													
3/4/2009 12:30		175											
Station skipped because of shipping schedules													
4/14/2009 10:45	5.9	305	96	12.5	7.84	2	0.051	0.01 U	0.013	0.0072	0.0047	0.8	2 J
pH measured @ 6.8°C. Pressure measured @ ≈ +15'< the water surface.													
5/12/2009 11:39	7.9	778	64.3	11.93	8.26	9	0.059	0.01 U	0.017	0.0128	0.0051	2	2
pH measured @ 8.3°C. Barometric pressure measured @ ≈ 15' > water surface.													
6/3/2009 10:38	7.4	2390	33	11.4	7.41	20	0.07	0.01 U	0.038	0.026	0.0066	4.4	5
Pressure measured @ ≈ + 15' > water surface. pH measured @ 9.3°C.													
7/8/2009 11:31	13.6	449	55	10.3	7.79	3	0.052	0.01 U	0.037	0.007	0.0062	0.8	5
pH measured @14.5°C. Barometric pressure measured @ approximately 20 ft. above water surface.													
8/12/2009 10:27	16.9	153	81	9.59	8.03	2	0.148	0.01 U	0.105	0.0057	0.0039	0.9	28
pH measured @ 17.5°C. Pressure measured @ ≈ 15' > water surface.													
9/14/2009 10:55	17	107	97	10	8.5	2	0.192	0.01 U	0.132	0.006	0.0041	0.6	10
pH was measured @ 18.1°C. Temperature TidBit missing from site. New irrigation diversion and woody debris structure being installed just downstream of the monitoring site.													

Conventional Data Report

Methow R nr Pateros

48A070

Class: A
Rivermile: 5
Latitude: 48 04 28.5
Longitude: 119 57 24.3
Waterbody: WA-48-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 13:50		442											
No samples were taken here this month.													
11/3/2008 12:35	7.8	452	178	11.6	8.49	5	0.282	0.01 U	0.208	0.0057	0.003 U	0.7	4
Sampled from left banks under the bridge. Lots of fishermen upstream of bridge.													
12/1/2008 12:35		679											
No samples were collected at this site this month.													
1/5/2009 12:20		575											
Due to heavy snowfall, there was no safe access to the bank. No samples collected.													
3/2/2009 12:53		442											
I attempted to sample here, however, due to fresh snow and ice on the bank creating dangerous conditions, no samples were collected this month.													
4/6/2009 12:40	9.7	461	183	11.7	8.49	9	0.257	0.01 U	0.177	0.0075	0.003 U	1.3	1 U
5/4/2009 14:00	10.6	1900	118 J	11.1	8.6	10	0.073	0.01 U	0.015	0.0137	0.003 U	3	1
6/1/2009 12:55		7810											
No samples collected at this site this month.													
7/6/2009 13:50	18.3	1410	110	9.5	8.23	3	0.1	0.01 U	0.058	0.0069	0.0043	0.9	6
8/3/2009 13:45	22.4	626	140	8.4	8.46	2	0.151	0.01 U	0.073	0.0075	0.003 U	0.8	6
9/14/2009 13:40		351											
No samples taken.													

Conventional Data Report

Methow River nr Pateros @ Metal Br.

48A075

Class: A
Rivermile: 5.6
Latitude: 48 04 34.6
Longitude: 119 58 07.1
Waterbody: WA-48-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 13:10	12.9 J	442	172	11.1	8.37	3	0.24	0.01 U	0.185	0.0062	0.003 U	0.8	22
11/3/2008 12:10	7.7	452	178	11.5	8.31	3	0.261	0.01 U	0.207	0.005 U	0.003 U	0.5	4
12/1/2008 12:20	3.7	679	152	13	8.38	2	0.182	0.01 U	0.151	0.005 U	0.003 U	0.6	1
1/5/2009 12:08		575											
Due to dangerous conditions on the bridge and no safe parking, no samples were collected at this site.													
2/2/2009 11:45	4.1		204	14.57	8.31	1	0.202	0.01 U	0.173	0.0056	0.003 U	0.7	3
Really windy during tapedown. This measurement is not reliable.													
3/2/2009 12:20		442	174	12.96	8.43	3	0.242	0.01 U	0.185	0.0089	0.003 U	1.4	1
4/6/2009 12:20	9.5	461	182	11.8	8.48	3	0.25	0.01 U	0.178	0.0055	0.003 U	1.2	1 U
5/4/2009 13:20	10.5	1900	118 J	11.3	8.65	9	0.08	0.01 U	0.016	0.0137	0.0031	2.5	2
RP +\- 0.6 due to heavy wind.													
6/1/2009 12:45	10.1	7810	60	10.8	7.9	39	0.094	0.01 U	0.038	0.0377	0.0038	14	8
7/6/2009 13:45		1410											
No samples collected at this site due to road construction.													
8/3/2009 13:20	22	626	140	8.5	8.4	2	0.152	0.01 U	0.074	0.0068	0.003 U	0.9	3
9/14/2009 13:15	18	351	178	9.1	8.48	2 U	0.25	0.01 U	0.171	0.0076	0.003 U	0.5 U	1

Conventional Data Report

Methow R @ Twisp

48A140

Class: A
Rivermile: 39.4
Latitude: 48 21 33.5
Longitude: 120 06 51.3
Waterbody: WA-48-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 12:00	9.1 J	363	142	11.3	8.3	2	0.22	0.01 U	0.161	0.005 U	0.003 U	0.5 U	14
11/3/2008 10:55	6.9	390	154	11.4	8.13	2	0.2	0.01 U	0.147	0.005 U	0.003 U	0.7	10
Stage height reading taken from USGS Gage House													
12/1/2008 11:15	3.7	566	130	12.4	8.18	1	0.16	0.01 U	0.132	0.005 U	0.003 U	0.5 U	10
Stage reading taken from USGS gage house													
1/5/2009 11:05	0.4	446	152	13.5	8.1	1 U	0.231	0.01 U	0.206	0.0066	0.003 U	0.5 U	4
Ice chunks floating in river.													
2/2/2009 10:30	5.3	457	180	13.76	8.14	2	0.194	0.01 U	0.155	0.0057	0.0032	0.5	12
GH reading = -0.1													
3/2/2009 11:30		396	148	12.96	8.09	2	0.208	0.01 U	0.166	0.0063	0.003 U	1.9	1
4/6/2009 11:15	7.2	424	157	11.8	8.16	3	0.213	0.01 U	0.16	0.0059	0.0035	0.5 U	1 U
5/4/2009 12:10	7.6	1970	102 J	12.1	8.33	9	0.111	0.01 U	0.058	0.0158	0.0033	3.7	1 UJ
gage house reading @ 12:35													
6/1/2009 11:05	8.2	7920	58	11	7.7	24	0.09	0.01 U	0.04	0.0231	0.0039	8.3	3
Gage house reading taken at 11:36													
7/6/2009 12:45		1390	96	10.19	8.06	3	0.086	0.01 U	0.052	0.0076	0.0041	0.6	140
Sampler forgot to record temperature and stage reading at this site.													
8/3/2009 12:00	17.6	539	122	9.4	8.37	3	0.148	0.01 U	0.08	0.0068	0.0038	0.9	16
9/14/2009 12:15	14.9	279	150	9.9	8.43	1 U	0.23	0.01 U	0.171	0.0054	0.003 U	0.5	4

Conventional Data Report

Twisp River nr Mouth

48D070

Class: A
Rivermile: 0.35
Latitude: 48 22 00.5
Longitude: 120 07 20.7
Waterbody: WA-48-1030

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008	11:15	9 J	42	182	11.1	8.27	1 U	0.2	0.01 U	0.167	0.005 U	0.003 U	0.5 U	12
		Due to shallow conditions, grab samples were taken from the right bank ~15yds upstream of bridge (including metals).												
11/3/2008	10:25	6.1	60	170	11.7	8.22	1 U	0.09	0.01 U	0.052	0.005 U	0.003 U	0.5 U	3
		Due to shallow conditions, grab samples were taken from the right bank ~15 feet upstream of bridge.												
12/1/2008	10:30	2.3	124	128	12.9	8.19	1 U	0.048	0.01 U	0.03	0.005 U	0.003 U	0.5 U	3
		Due to shallow conditions, grab samples were taken from the right bank ~10ft upstream.												
1/5/2009	10:30	0.4	229	160	13.1	8	2	0.088	0.01 U	0.059	0.005 U	0.003 U	0.5 U	1 U
		Samples were pulled from the bridge.												
2/2/2009	9:45	4.4	187	188	13.86 J	8.09	2	0.078	0.01 U	0.044	0.0075	0.0032	0.7	1
		After the DO titration was complete, the burette stopcock failed again. This released a stream of thiosulfate into the sample, after the starch was added. The titration was complete, but the failure occurred while reading the result. This result is acc												
3/2/2009	11:00		72	162	13.46	8.14	2	0.06	0.01 U	0.029	0.0069	0.003 U	0.6	2
		Fresh snow.												
4/6/2009	10:40	5	85	186	12.2	8.23	2	0.071	0.01 U	0.032	0.005 U	0.003 U	0.8	2
		No RP this month.												
5/4/2009	11:35	6.6	299	140 J	11.7	8.32	2	0.033	0.01 U	0.012	0.0058	0.0034	1.1	1 U
		Possible channel clearing; large boulder moved downstream.												
6/1/2009	10:35	6.5	1540	60	11.4	7.9	21	0.064	0.01 U	0.019	0.0283	0.003 U	9.1	12
		Metals												
7/6/2009	11:50	12.2	353	84	9.69	8.1	4	0.053	0.01 U	0.02	0.0086	0.0043	1.6	230 J
8/3/2009	11:20	17.3	89	130	8.9	8.31	3 U	0.116	0.01 U	0.068	0.005 U	0.003 U	0.6	20
9/14/2009	11:50	15.5	30	180	9.3	8.45	1 U	0.229	0.01 U	0.18	0.005	0.003 U	0.8	7

Metals Data Report

Twisp River nr Mouth

48D070

Class: A
Rivermile: 0.35

Latitude: 48 22 00.5
Longitude: 120 07 20.7
Waterbody: WA-48-1030

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/6/2008	11:15		85.3		0.02 U		0.35		0.25		0.02 U	0.002 U	0.4			1
12/1/2008	10:30		58.4		0.02 U		0.42		0.32		0.02 U	0.002 U	0.37			1.7
2/2/2009	9:45		70		0.02 U		0.41		0.28		0.02 U	0.002 U	0.34			1.1
4/6/2009	10:40		91.6		0.02 U		0.3		0.26		0.02 U	0.002 U	0.34			1
6/1/2009	10:35		25.8		0.02 U		0.25 U		0.56		0.02 U	0.002 U	0.17			1.7
8/3/2009	11:20		59.5		0.02 U		0.31		0.3		0.02 U	0.002 U	0.39			1.3

Conventional Data Report

Okanogan R @ Malott

49A070

Class: A
Rivermile: 17
Latitude: 48 16 49.5
Longitude: 119 42 16.2
Waterbody: WA-49-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008	10:10	13.3 J	936	302	9.4	8.35	4	0.15	0.01 U	0.012	0.014	0.003 U	1.4	21
		Began raining slightly at approx. 10:00.												
11/3/2008	9:15	7.8	1000	290	10.1	8.15	4	0.16	0.01 U	0.034	0.019	0.003 U	1.9	13
12/1/2008	9:10	3.3	1410	260	13	8.11	4	0.155	0.01 U	0.054	0.0157 J	0.0049	1.6	8
1/5/2009	9:15		1420											
		The river was frozen at this site, no samples collected.												
2/2/2009	8:50		1240											
		Site frozen, no samples collected.												
3/2/2009	10:08	2.3	767	315	13.36	8.23	3	0.169	0.01 U	0.062	0.0201	0.0057	1.4	2
		Stopped raining.												
4/6/2009	9:20	9.8	539	317	11	8.37	4	0.155	0.01 U	0.026	0.0174	0.0044	1.3	1
5/4/2009	10:20	13.6	2020	203 J	9.6	8.17	14	0.11	0.01 U	0.01 U	0.0295	0.0042	5.1	10 J
6/1/2009	9:30	12.3	11400	68	10.19	7.73	178	0.131	0.01 U	0.03	0.178	0.0053	75	100
		Lots of woody debris floating on the surface.												
7/6/2009	10:50	22.6	1950	166	8.3	8.1	7	0.095	0.01 U	0.01	0.016	0.0062	2.3	37
8/3/2009	10:15	26	1000	246	6.8	8.18	3	0.151	0.01 U	0.01 U	0.0143	0.005	1.5	64
9/14/2009	10:50	19.5	837	286	8.4	8.11	2	0.154	0.01 U	0.018	0.0137	0.0055	1	100

Conventional Data Report

Okanogan R @ Oroville

49A190

Class: A
Rivermile: 78
Latitude: 48 56 20.6
Longitude: 119 25 36.2
Waterbody: WA-49-1040

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008	7:30	15.8 J	462	299	7.4	8.23	2	0.257	0.01 U	0.01 U	0.016	0.003 U	1.4	9
11/3/2008	7:15	10.3	365	310	9.69	8.41	4	0.21	0.01 U	0.01 U	0.026	0.004	4.5	2
		Met with Mike Cantwell with the Lake Osoyoos Association. There is growing interest in the water quality in the streams and rivers around the Oroville area. Mike came to watch how our sampling is done. There is a possibility of doing some side-by-side												
12/1/2008	7:00	5.8	382	317	10.9	8.13	4	0.192	0.01 U	0.01 U	0.0264	0.0032	3.8	2 J
		Garbage pile on right bank below the bridge.												
1/5/2009	7:30	1.4	307	336	12.7	8.47	3	0.184	0.01 U	0.01 U	0.0297	0.003 U	2.9	1
		Large chunks of ice floating in the river.												
2/2/2009	7:30	7.7	230	404	13.26 J	8.49	3	0.192	0.01 U	0.01 U	0.029	0.0034	1.6	28
		Geese in river upstream of the bridge before sampling. During DO titration, the stopcock on on the burette failed, releasing a stream of thiosulfate into the sample before the starch was added. The sample was "saved," and the result is reasonable. Howe												
3/2/2009	8:00	3.1	191	337	12.16	8.38	5	0.257	0.029	0.01 U	0.0305	0.0039	2.5	1 J
		Raining while sampling.												
4/6/2009	7:45	7.6	108	326	11.1	8.44	3	0.217	0.01 U	0.01 U	0.0174	0.0036	1.6	2
		No meter check at this site.												
5/4/2009	8:00	11	172	343 J	10.6	8.44	4	0.213	0.01 U	0.01 U	0.0186	0.003	1.9	6
6/1/2009	7:45	20.9	1280	336	9.5	8.62	4	0.234	0.013	0.01 U	0.0142	0.0078	1.4	11
7/6/2009	8:45	19.1	177	322	8.6	8.56	3	0.235	0.01 U	0.01 U	0.0124	0.0046	1.6	22 J
8/3/2009	8:30	26.6	225	305	7.6	8.52	4	0.256	0.01 U	0.01 U	0.0117	0.0034	2.7	36 J
		Low velocity, appears stagnant. Lots of aquatic vegetation.												
9/14/2009	9:00	18.2	260	312	8.1	9.45	2	0.222	0.01 U	0.01 U	0.0118	0.0032	1.3	8

Conventional Data Report

Similkameen R @ Oroville

49B070

Class: A
Rivermile: 5
Latitude: 48 56 04.6
Longitude: 119 26 31.2
Waterbody: WA-49-1030

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008	8:30	12.9 J	381	211	10	8.3	2	0.055	0.01 U	0.01 U	0.005 U	0.003 U	0.9	12
11/3/2008	8:45	8.4	519	200	11.2	8.23	1	0.057	0.01 U	0.012	0.005 U	0.003 U	0.6	2
		Still raining												
12/1/2008	7:30	2.7	970	172	13.3	7.96 J	2	0.076	0.01 U	0.031	0.005 UJ	0.003 U	1.2	6
		Slight drizzle while sampling. The pH reading was erratic. When checking the calibration of the meter, the reading was off more than 0.1 pH units. Therefore the result was qualified as an estimate.												
1/5/2009	8:00		1011											
		The river was frozen at this site, no samples collected.												
2/2/2009	8:00		1220											
		Site frozen, no samples collected.												
3/2/2009	9:40	2.5	431	230	13.66	8.34	5	0.089	0.01 U	0.02	0.0108	0.003 U	1.1	1 U
		Raining while sampling.												
4/6/2009	8:15	8.2	392	232	11.5	8.29	2	0.074	0.01 U	0.01 U	0.007	0.0032	1.3	1 U
5/4/2009	8:45	10.7	2318	150 J	11.4	8.2	14	0.099	0.01 U	0.01 U	0.0244	0.0032	6.5	15
		Counter on the WWG flips over at 0.85 not .00												
6/1/2009	8:05	9.3	12689	64	12.1	7.87	130	0.12	0.01 U	0.021	0.132	0.0041	50	33
		Turbulent where WWG hits the water. The counter on the gage turns late at 0.80.												
7/6/2009	9:20	15.6	1800	136	9.19	8.17	7	0.079	0.01 U	0.01 U	0.0143	0.0046	3.5	17
		WWG turns late at .08.												
8/3/2009	9:00	23.8	700	164	7.9	8.29	10	0.091	0.01 U	0.01 U	0.0342	0.0034	24	52
		Dead fish in river. Water was merky in appearance.												
9/14/2009	9:20	19	500	184	8.6	8.3	2	0.086	0.01 U	0.01 U	0.0073	0.0037	0.8	6
		WWG counter flips at 0.80. There was a dead fish in the water downstream of the bridge.												

Conventional Data Report

Columbia R @ Grand Coulee

53A070

Class: A
Rivermile: 596
Latitude: 47 57 55.5
Longitude: 118 58 55.1
Waterbody: WA-CR-1050

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 15:10	18.3 J	176800	134	7.9	7.91	1 U	0.11	0.01 U	0.077	0.0068	0.0038	0.5 U	1
	D.O. #7												
11/3/2008 14:30	14.6 J	151100	138	8.8	8.05	15	0.14	0.01 U	0.087	0.0093	0.0044	0.5 U	1 U
	Temperature reading taken from TSS bottle immediately after retrieval.												
12/1/2008 14:20	11.3	150300	142	9.69	8.22	1 U	0.143	0.01 U	0.102	0.005 UJ	0.0046	0.5 U	1 U
1/5/2009 14:45	4.9	182500	150	11.4	7.62	1 U	0.179	0.01 U	0.122	0.0075	0.0042	0.5 U	1 U
	Lots of snow and sand on the bridge.												
2/2/2009 14:15	5.3	135400	178	12.76	8.05	1 U	0.219	0.01 U	0.174	0.0104	0.0038	0.7	1 U
	Lots of sand and gravel on bridge walkway.												
3/2/2009 14:40	6.8	131100	148	13.36	8.06	1	0.239	0.01 U	0.199	0.0095	0.003 U	0.7	1
	There was an obvious heavy sheen on the surface of the river along the right bank. Obviously I couldn't tell what it was by looking at it, but it appeared to be oil. If it was oil, it was a large amount.												
4/6/2009 14:40	6 J	135800	148	13.1	8.16	1	0.207	0.01 U	0.165	0.0104	0.003 U	0.6	1 U
	Sheen on right bank 35yds below bridge.												
5/4/2009 15:45	7.2	281700	154 J	12.7	8.31	2	0.272	0.01 U	0.207	0.0119	0.0031	1.6	1 U
6/1/2009 14:20	12	336200	136	11	8.17	4	0.16	0.015	0.06	0.01	0.003 U	1	1 U
7/6/2009 15:00	15.9	381600	126	10	8.1	1 U	0.107	0.018	0.039	0.0076	0.0037	0.6	1 J
8/3/2009 15:30	17.5	295700	128	8.3	7.92	1 U	0.137	0.01 U	0.05	0.0068	0.0032	0.7	1 U
	Apparently there was another oil spill at Grand Coulee Dam later in the day, after I had sampled.												
9/14/2009 15:30	19.2	129700	130	7.8	7.87	1 U	0.165	0.01 U	0.066	0.0082	0.003 U	0.5 U	1 U

Conventional Data Report

Hawk Creek @ Miles-Creston Rd.

53C070

Class: FIN
Rivermile: 5
Latitude: 47 48 10.2
Longitude: 118 17 58.9
Waterbody: WA-53-4000

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/6/2008 16:35	11.3 J		304	10.1	8.23	2	0.869	0.01 U	0.647	0.062	0.0572	1.1	39
	D.O. #9												
11/3/2008 16:00	8.6		310	10.8	8.34	3	0.908	0.01 U	0.778	0.068	0.0577	0.7	9
12/1/2008 15:40	7.4		314	11.9	8.19	3	1.13	0.01 U	1.04	0.0723	0.069	1.3	13
1/5/2009 16:25	1.2		318	11.9	8.13	17	1.24	0.02	1.05	0.102	0.0696	10	44
	Lots of snow on the bridge. Small amount of snow in TSS bottle. Unable to get RP.												
2/2/2009 15:45	7.3		378	12.46	8.32	7	1.16	0.01 U	1.05	0.0799	0.0729	1.7	20
	Forgot to take pressure reading.												
3/2/2009 16:10	7.1		301	11.55	8.3	12	1.2	0.01 U	1.06	0.0976	0.0694	4.6	1 U
4/6/2009 16:10	12.2		314	10.19	8.34	14	1.9	0.01 U	1.6	0.0964	0.0741	5.1	3
5/4/2009 17:30	12.6		338 J	10.04	8.59	13	1.33	0.01 U	1.17	0.0848	0.0605	3.3	3
6/1/2009 16:20	17.7		312	9.5	8.9	9	1.13	0.012	0.941	0.0867	0.0661	3.4	100
7/6/2009 16:00	16.2		292	9.3	8.95	13	0.915	0.01	0.728	0.0882	0.0704	4.5	51 J
8/3/2009 16:50	18.9		298	9	8.92	7	0.748	0.012	0.554	0.0758	0.062	2.2	95
9/14/2009 16:45	15		308	9	8.5	6	0.851	0.01 U	0.673	0.0796	0.0609	2.2	49

Conventional Data Report

Spokane R @ Long Lake

54A070

Class: A
Rivermile: 33.3
Latitude: 47 50 20.6
Longitude: 117 51 08.9
Waterbody: WA-54-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 15:40	13 J	6100	205	8.1	8.11	4	1.09	0.013	0.925	0.019	0.0099	2.5	1 U
11/18/2008 15:30	9.3	4600	204	9.34	8.05	2	1.11	0.026	0.942	0.029	0.023	1	1 U
12/9/2008 14:40	7.1	6100	200	10.15	7.97	1	1.06	0.018	0.976	0.0395	0.0316	0.9	1 U
Lots of debris (gravel) on bridge walkway.													
1/20/2009 14:25		9500											
Unable to access bridge, snow piled over the handrail. No samples collected.													
2/10/2009 15:45		6100											
Due to snow level on the bridge walkway, there was no safe place to pull samples from. No samples collected this month.													
3/17/2009 15:30	4.4	10000	122	13.2	7.87	11	2.06	0.02	1.6	0.0816	0.041	20	1
Lots of sand and gravel on the bridge walkway.													
4/14/2009 16:30	7	17660	102	13.26	7.7	7	0.958	0.01 U	0.851	0.0531	0.0171	9.5	1 J
Lots of and and gravel on bridge walkway.													
5/12/2009 14:50	9.2	19220	84	13.1	7.99	5	0.317	0.01 U	0.216	0.0176	0.0045	4.9	1 U
Windy. Lots of sand, gravel, and debris.													
6/9/2009 15:30	16.4	8830	72	10.19	7.86	3	0.256	0.019	0.154	0.0139	0.0064	1.4	1 U
Lots of sand and gravel on bridge walkway.													
7/14/2009 16:00	18.7	6100	140	9.3	8.19	2	0.662	0.024	0.553	0.0093	0.0062	0.8	1 J
Ducks in river upstream of the bridge while sampling.													
8/11/2009 15:05	19	4600	194	6.6	7.07 J	2 U	1.05	0.033	0.884	0.0103	0.0042	0.5	
Ducks swimming under bridge while sampling.													
9/22/2009 16:09	18.1	3100	224	6.2	7.94	1 U	1.19	0.01 U	1.07	0.0235	0.0117	0.6	1 U
Sand and gravel on bridge walkway													

Conventional Data Report

Spokane R @ Ninemile Br

54A090

Class: AA
Rivermile: 58
Latitude: 47 46 36.1
Longitude: 117 32 41.2
Waterbody: WA-54-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 14:05	12.1 J	2310	176	9.9	8.21	2	1.21	0.01 U	1.09	0.02	0.011	0.7	5
11/18/2008 13:20	8.5	2750	178	11.55	8.1	14	1.19	0.01 U	1.09	0.0803	0.0615	0.7	7
There was a breached structure on Ninemile Dam which is ~500yds upstream of the bridge. The structure was a plywood retaining wall built on top of the spillway to increase the depth of the pool behind the dam for electricity production purposes. Apparen													
12/9/2008 12:50	7	4100	130	11.65	7.9	2	0.819	0.01 U	0.75	0.0625	0.0424	0.6	4
The breached structure on top of Ninemile Dam was still allowing a large volume of water over the top of the spillway. There didn't appear to be as much woody debris in the water from the washed out structure.													
1/20/2009 12:50	3.4	10510	88	13.6	7.78	5	0.47	0.01 U	0.372	0.0285	0.0165	2.9	1
Water spilling over Ninemile Dam.													
2/10/2009 14:05	8.2	4842	124	12.4	7.8	5	0.75	0.01 U	0.693	0.0427	0.0256	5.4	3
Water coming over spillway on Ninemile Dam.													
3/17/2009 13:55		9620	112	13.2	7.64	79	2.64	0.02	2.14	0.172	0.0439	65	21
Water spilling over Ninemile Dam. The temperature reading was consistent, but hard to believe. I believe it should have an asterisk tied to it due to possible equipment failure, and qualified with a "J."													
4/14/2009 14:45	5.6	16002	76	13.26	7.8	19	0.503	0.01 U	0.402	0.0557	0.0171	11	16 J
Water over Ninemile dam. Lots of sand and gravel on bridge walkway.													
5/12/2009 13:30	9.7	18968	70	12.2	7.89	9	0.268	0.01 U	0.192	0.0173	0.0047	3.6	1
Windy. Water spilling over the top of Ninemile Dam.													
6/9/2009 13:30	14.2	8748	100	10.5	8.03	3	0.445	0.01 U	0.381	0.0133	0.0065	1.1	9
Water spilling over Ninemil Dam													
7/14/2009 14:45	17.4	2930	178	9.8	8.23	4	0.954	0.01 U	0.892	0.0187	0.0119	1.6	21 J
8/11/2009 13:30	18	1150	202	9.8	8.4 J	2	1.3	0.01 U	1.18	0.016	0.0073	0.6	25 J
9/22/2009 14:20	13.3	1195	290	10.1	8.38	2	2.65	0.01 U	2.83	0.0247	0.0145	0.8	3
Metals													

Metals Data Report

Spokane R @ Ninemile Br

54A090

Class: AA
Rivermile: 58
Latitude: 47 46 36.1
Longitude: 117 32 41.2
Waterbody: WA-54-1020

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
9/22/2009	14:20		131		0.053		0.63		0.75		0.083	0.002 U	0.27			8.9

Conventional Data Report

Spokane R @ Riverside State Pk

54A120

Class: A
Rivermile: 66
Latitude: 47 41 47.6
Longitude: 117 29 51.8
Waterbody: WA-54-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 13:10	11.4 J	2210	174	10.4	8.27	1	1.24	0.01 U	1.09	0.024	0.0088	0.5	5
11/18/2008 12:35	8.6	2380	174	11.15	8.14	2	1.21	0.01 U	1.09	0.075	0.0638	0.5 U	7
12/9/2008 12:10	7.2	3870	128	11.65	8.08	2 U	0.797	0.01 U	0.745	0.06	0.0503	1.1	5
Swift current made it hard to submerge LLT, temperature reading was taken as the probe skipped along the surface.													
1/20/2009 12:10	3.6	9200	88	13.9	7.81	3	0.537	0.01 U	0.409	0.0344	0.0233	1.7	4
High velocity made it difficult to submerge LLT.													
2/10/2009 13:15	8.3	4580	120	12.6	7.88	3	0.843	0.01 U	0.782	0.0623	0.0429	4.9	4
3/17/2009 13:15	4.1	7330	108	13.1	7.64	70	2.25	0.014	2.2	0.154	0.0557	50	28
High velocity made it difficult to submerge LLT													
4/14/2009 13:55	5.5	14400	74	13.46	7.8	19	0.502	0.01 U	0.388	0.0496	0.0202	9.7	19 J
Due to high velocity, samples were pulled from the right bank ~20yds downstream of the bridge with a sample pole.													
5/12/2009 13:00	9.1	18000	68	12.9	7.83	6	0.263	0.01 U	0.186	0.0176	0.0053	3.2	2
Windy.													
6/9/2009 13:00	14.3	8990	92	10.7	8.04	2	0.438	0.01 U	0.371	0.0127	0.0076	0.9	7
7/14/2009 14:10	16.8	2790	174	9.5	8.31	2	1.2	0.01 U	1.1	0.0183	0.0128	0.7	14
8/11/2009 12:45	16.5	1280	226	9.69	8.18 J	1	1.81	0.01	1.66	0.024	0.0092	0.7	17 J
9/22/2009 13:30	12.2	1320	278	10.5	8.38	3	3.33	0.01 U	2.2	0.0345	0.0103	0.9	30

Conventional Data Report

Spokane R @ Fort Wright Br

54A130

Class: A
Rivermile: 69.8
Latitude: 47 40 49.6
Longitude: 117 27 10.8
Waterbody: WA-54-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
3/17/2009 12:45		9080											
no samples collected this month.													
4/14/2009 13:15	5.1	15940	70	14.07	7.87	22	0.397	0.01 U	0.295	0.0385	0.0086	8	17 J
5/12/2009 11:55	8.9	18241	66	13.3	7.88	6	0.196	0.01 U	0.106	0.0141	0.0049	3.2	4
Windy.													
6/9/2009 12:25	14.1	8969	86	10.7	8.03	2	0.257	0.01 U	0.2	0.0099	0.005	1.3	9
7/14/2009 13:30	17.1	2915	160	9.4	8.14	1	0.578	0.01 U	0.531	0.0075	0.0066	0.8	6 J
8/11/2009 12:15	16.3	1299	207	9.69	8.36 J	1	0.816	0.01 U	0.742	0.0052	0.0032	0.5 U	9
9/22/2009 13:00	11.7	1336	257	10.8	8.45	3 U	0.986	0.01 U	0.963	0.0089	0.0037	0.8	11

Conventional Data Report

Little Spokane R nr Mouth

55B070

Class: A
Rivermile: 1.1
Latitude: 47 46 58.6
Longitude: 117 31 49.8
Waterbody: WA-55-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 14:45	8.1 J	403	286	10.25	8.36	3	1.34	0.01 U	1.23	0.011 J	0.0055	1	11
11/18/2008 14:45	8	437	288	10.15	8.23	3	1.41	0.01 U	1.28	0.014 J	0.01	0.8	4
12/9/2008 13:25	7.1		288	10.35	8.23	4	1.39	0.01 U	1.34	0.0189	0.0126	1	13
1/20/2009 13:25	5.5	467	294	11.1	8.25		1.44	0.01 U	1.28	0.0506	0.0139	2.1	11
TSS bottle broke in transit. Sample lost.													
2/10/2009 14:30	10	452	278	10.8	8.24	5	1.37	0.01 U	1.32	0.018	0.012	1.9	28
3/17/2009 14:35	6.5	721	260	10.5	8.02	27	1.26	0.01 U	1.12	0.0699	0.0261	14 J	22
I checked ELLT 11 at this site. The thermometer reading= 9.5C; the thermister reading= 9.6C.													
4/14/2009 15:00	8.6	1140	182	10.05	7.84	19	0.745	0.01 U	0.53	0.0815	0.0315	12	64 J
5/12/2009 13:55	12.9	750	224	9.1	8.1	14	0.941	0.01 U	0.796	0.0408	0.0219	4.3	8
Windy.													
6/9/2009 14:00	13.8	484	262	9.8	8.45	7	1.13	0.01 U	1.03	0.0279	0.0146	1.7	18
7/14/2009 15:10	15.4	416	283	8.5	8.34	5	1.24	0.01 U	1.16	0.018	0.0144	1.6	36 J
8/11/2009 14:00	14.4	370	290	9.3	8.27 J	3	1.23	0.01 U	1.17	0.0121	0.0079	1	26
Fishermen under bridge while sampling.													
9/22/2009 15:50	11.9	376	289	9.6	8.38	2	1.29	0.01 U	1.22	0.0125	0.0076	1	35

Conventional Data Report

Hangman Cr @ Mouth

56A070

Class: A
Rivermile: 0.6
Latitude: 47 39 16.6
Longitude: 117 27 15.8
Waterbody: WA-56-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 12:00	8.7 J	16	392	11.6	8.44	3	1.04	0.01 U	0.745	0.022	0.011	0.9	11
	City crew working on bridge.												
11/18/2008 11:40	4.3	53	360	13.11	8.29	1	1.27	0.01 U	0.956	0.022	0.012	1.2	15
12/9/2008 11:20	3.1	35	342	13.26	8.32	2	1.65	0.01 U	1.46	0.0337	0.0185	1.7	15
1/20/2009 10:45	0.6	220	220	14.1	7.84	10	4.68	0.03	4.18	0.139	0.0635	20	7
	Water was brownish in color.												
2/10/2009 12:30	5.3	220	174	13	7.85	28	3.28	0.029	2.95	0.239	0.071	100	89 J
	Water appeared brown in color. The solids in the water made filtering for dissolved organic carbon very difficult.												
3/17/2009 12:30	2.9	1840	152	12.5	7.63	248	6.73	0.057	6.28	0.474	0.0939	210	49
	Began to rain/snow/hail.												
4/14/2009 12:55	6.8	1360	126	11.05	7.82	55	3.03	0.01 U	2.24	0.208	0.0744	65	92 J
5/12/2009 11:25	13.2	241	206	10	8.24	7	1.58	0.01 U	1.29	0.0645	0.028	8.4	5
	Windy.												
6/9/2009 11:50	16.1	71	304	10.9	8.68	6	0.976	0.01 U	0.63	0.0441	0.0132	3.3	52
	Not much flow.												
7/14/2009 12:45	18	25	391	10.9	8.65	3	1.18	0.01 U	0.898	0.0481	0.0422	2.2	25 J
8/11/2009 11:45	18.4	19	394	11.4	8.48 J	2	0.979	0.011	0.701	0.0296	0.0164	1	36 J
9/22/2009 12:15	12.5	16	400	12.1	8.52	1 U	1.09	0.016	0.828	0.0308	0.02	0.8	55

Conventional Data Report

Spokane River@Sandifer Bridge

57A123

Class: A
Rivermile: 72.6
Latitude: 47 39 23.6
Longitude: 117 27 14.8
Waterbody: WA_57-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 11:25	11.2 J	2210	146	9.9	8.15	1 U	0.58	0.01 U	0.455	0.0077 J	0.003 U	0.5 U	3
D.O. #149 broke while sampling, used #22 as a replacement.													
11/18/2008 11:10	8.5	2370	146	10.15	8.05	1	0.545	0.01 U	0.488	0.0069 J	0.0044	0.5 U	1
12/9/2008 10:50	7	3850	108	11.45	7.88	1	0.375	0.01 U	0.314	0.0137	0.0056	0.5	2
1/20/2009 10:20	3.5	9110	76	14.1	7.65	2	0.28	0.011	0.15	0.0103	0.0039	0.8	3
High velocity made it difficult to submerge LLT.													
2/10/2009 12:00	8.1	4600	104	12.4	7.87	2	0.388	0.01 U	0.314	0.0098	0.0054	1.2	1
3/17/2009 11:35	4.2	7220	84	12.9	7.76	2	0.259	0.01 U	0.182	0.0135	0.0033	1.4	1 U
High velocity made it difficult to submerge LLT.													
4/14/2009 12:30	4.7	14600	64	14.47	7.85	5	0.168	0.01 U	0.081	0.0143	0.0034	2.3	4 J
5/12/2009 11:00	8.7	18100	62	13.5	7.75	5	0.173	0.01 U	0.084	0.0145	0.0042	2.8	2
Windy.													
6/9/2009 11:15	13.8	15700	82	10.9	8.01	2	0.254	0.01 U	0.187	0.0095	0.0047	1	10
7/14/2009 12:15	15.8	2750	150	9.19	8.16	2	0.542	0.01 U	0.505	0.0079	0.0062	0.8	18 J
A man on the bridge told me he could predict the water quality to exact concentrations just by looking at it, he was serious.													
8/11/2009 11:15	15.8	1290	194	9.6	8.35	1	0.741	0.01 U	0.687	0.0059	0.003 U	0.5 U	4
9/22/2009 11:45	10.9	1310	254	10.6	8.33	1 U	0.988	0.01 U	0.952	0.0079	0.0035	0.5 U	14

Conventional Data Report

Spokane River @ Plante's Ferry Park

57A140

Class: A
Rivermile: 84.7
Latitude: 47 41 48.6
Longitude: 117 14 31.8
Waterbody: WA-57-1010

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008	10:30	11.3 J		114	9.6	7.9	1 U	0.43	0.01 U	0.336	0.0071 J	0.0037	0.5 U	4
		2 people wading along right bank upstream of the bridge.												
11/18/2008	9:55	8.1		116	10.35	7.81	3	0.45	0.01 U	0.374	0.0073 J	0.0046	0.5 U	1 U
		Another large flock of Geese upstream of bridge during sampling.												
12/9/2008	10:00	6.7		86	10.85	7.62	1	0.312	0.01 U	0.224	0.0115	0.0045	0.6	1
		Geese under bridge while sampling.												
1/20/2009	9:30	3.2		68	12.4	7.57	2	0.207	0.019	0.109	0.0103	0.004	0.8	1
2/10/2009	11:00	7.3		86	12	7.68	1	0.293	0.01 U	0.224	0.0094	0.0048	0.8	1
		Geese in river upstream of bridge while sampling.												
3/17/2009	10:45	3.8		74	12.4	7.58	2	0.219	0.01 U	0.134	0.0108	0.0033	1.3	3
		Windy.												
4/14/2009	11:30	4.2		58	12.86	7.69	5	0.14	0.01 U	0.059	0.0137	0.0036	2.3	2 J
		Visit with County Sherriff.												
5/12/2009	10:15	8.5		58	11.7	7.73	5	0.147	0.01 U	0.062	0.0146	0.0043	3.2	3
		Windy.												
6/9/2009	10:25	14.2		66	9.5	7.84	2	0.187	0.01 U	0.109	0.0091	0.0046	1	3
7/14/2009	11:10	18.1		106	8.4	7.92	2	0.385	0.01 U	0.33	0.0084	0.0063	1.1	21 J
		Lots of foot traffic on bridge. People along the banks downstream.												
8/11/2009	10:25	15.2		188	8.3	8.06	1	0.747	0.01 U	0.69	0.0068	0.0039	0.5	18 J
9/22/2009	10:40	14.6		150	8.5	7.93	2	0.641	0.01 U	0.572	0.0086	0.003 U	1	180 J
		There was a woman on the bridge that appeared to be cleaning the deck and rails. Very strange.												

Conventional Data Report

Spokane River @ Sullivan Rd.

57A146

Class: A
Rivermile: 87.7
Latitude: 47 40 21.1
Longitude: 117 11 47.2
Waterbody: WA-57-1020

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 9:45	11.8 J		66	9.69	7.72	1	0.257	0.01 U	0.153	0.0093 J	0.0066	0.5	6
	Sampled from downstream side of the bridge.												
11/18/2008 9:23	7.9		64	10.85	7.61	1	0.261	0.01 U	0.16	0.0088 J	0.005	0.5	1 U
12/9/2008 8:50	6.5		60	10.85	7.44	2 U	0.186	0.01 U	0.105	0.011	0.0048	0.6	2
1/20/2009 8:30	3.1		60	12.4	7.52	2	0.18	0.02	0.073	0.0113	0.004	1.2	1
2/10/2009 10:20	6.7		60	12.5	7.55	1	0.174	0.01 U	0.111	0.01	0.0049	1	1 U
3/17/2009 10:15	3.5		60	12.7 J	7.59	3	0.15	0.01 U	0.077	0.0107	0.003	1.8	2
	There was a water truck spraying gravel off of the sidewalks around the bridge before sampling. Suspicious activity in the parking lot. During DO titration, too much Sodium Thiosulfate was added. Result was derived by back titrating with potassium bi-i												
4/14/2009 10:45	4.1		54	12.96	7.75	9	0.144	0.01 U	0.04	0.0152	0.0032	2.1	1 UJ
5/12/2009 9:35	8.5		52	11.8	7.71	5	0.126	0.01 U	0.038	0.015	0.0045	2.5	1 U
	Windy.												
6/9/2009 9:45	14.6		48	9.6	7.79	2	0.096	0.01 U	0.024	0.0092	0.0046	1.2	5
	Lots of debris on bridge.												
7/14/2009 10:30	20.2		58	8.1	7.75	3	0.182	0.01 U	0.125	0.0089	0.0063	1.4	22 J
8/11/2009 9:45	18.8		88	7.9	7.88	1	0.391	0.01 U	0.302	0.0174	0.0041	0.5	13
9/22/2009 10:00	17.5		72	8.5	7.66	3	0.319	0.01 U	0.248	0.0107	0.003 U	1.3	170 J

Conventional Data Report

Spokane R @ Stateline Br

57A150

Class: A
Rivermile: 96.35
Latitude: 47 41 54.6
Longitude: 117 02 40.7
Waterbody: WA-57-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 8:45	12.3 J	1610	48	9.4	7.56	5	0.15	0.01 U	0.05	0.011 J	0.0037	0.6	1
11/18/2008 8:40	8.1	1650	52	10.45	7.52	2	0.18	0.013	0.075	0.0092 J	0.0052	0.5	1 U
12/9/2008 8:00	6.5	3230	52	10.55	7.38	1	0.137	0.01 U	0.058	0.0111	0.0055	0.6	2
1/20/2009 7:50	3	9030	56	12.4	7.51	1	0.188	0.025	0.061	0.0101	0.0043	0.8	1 J
2/10/2009 9:00	6.5	3680	54	12.4	7.51	2 U	0.169	0.011	0.084	0.0107	0.0052	1.2	2
	Metals												
3/17/2009 9:30	3.3	6320	58	12.7	7.57	2	0.167	0.014	0.075	0.0148	0.0048	1.6	5
4/14/2009 9:45	3.9	13400	56	13.26	7.73	4	0.156	0.01 U	0.041	0.0125	0.0035	1.8	1 J
	Construction on bridge while sampling												
5/12/2009 9:05	8.4	16700	52	12	7.69	4	0.128	0.01 U	0.038	0.0149	0.0042	2.9	3
	Windy.												
6/9/2009 9:00	14.5	7920	46	9.9	7.81	2	0.112	0.01 U	0.018	0.0114	0.0048	1	4
7/14/2009 9:55	21.1	1980	46	8.19	7.62	2	0.133	0.018	0.049	0.009	0.0054	1.2	18 J
	Man walking dogs along the right bank.												
8/11/2009 9:15	21.9	463	52	7.8	7.62	2	0.249	0.022	0.137	0.0139	0.003 U	1	7
9/22/2009 9:10	19.2	742	52	8.1	7.6	2	0.23	0.01 U	0.118	0.0101	0.0032	0.9	30
	Metals												

Metals Data Report

Spokane R @ Stateline Br

57A150

Class: A
Rivermile: 96.35
Latitude: 47 41 54.6
Longitude: 117 02 40.7
Waterbody: WA-57-1010

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/14/2008	8:45		18.7		0.12		0.25 U		0.48		0.16	0.002 U	0.23			35.1
12/9/2008	8:00		21.8		0.162		0.25 U		0.51		0.078	0.002 U	0.3			55
2/10/2009	9:00		23		0.203		0.25 U		0.62		0.536	0.002 U	0.32			60.9
4/14/2009	9:45		22.5		0.16 J		0.25 UJ		0.74 J		0.473 J	0.002 U	0.35 J			53.3 J
6/9/2009	9:00		19.6		0.158		0.25 U		0.52		0.441	0.002 U	0.35			36.6
8/11/2009	9:15		21.6		0.096		0.25 U		0.49		0.089	0.002 U	0.26			27.8
9/22/2009	9:10		20.6		0.065		0.25 U		0.47		0.142	0.002 U	0.16			22.9

Conventional Data Report

Spokane R @ Lake Coeur d'Alene

57A240

Class: A
Rivermile: 111.7
Latitude: 47 40 33.7
Longitude: 116 48 16.7
Waterbody: WA-57-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/14/2008 7:55	12.8 J	2080	48	9.3	7.73	1	0.073	0.01 U	0.01 U	0.0066 J	0.0044		1
11/18/2008 7:50	8.3	1810	52	9.94	7.82	1	0.089	0.01 U	0.012	0.005 UJ	0.0079	0.7	1 U
Flock of Geese around dock prior to sampling.													
12/9/2008 7:05	6.9	3160	54	9.94	7.59	1	0.111	0.01 U	0.039	0.0086	0.0044	0.5 U	1 UJ
~200 Geese around the dock during sampling.													
1/20/2009 7:00	3.4	2600	56	11.3	7.91	1 U	0.121	0.01 U	0.047	0.0066	0.0052	0.5 U	2 J
Geese around dock while sampling.													
2/10/2009 8:00	6.6	5020	54	12.2	7.72	2	0.111	0.01 U	0.047	0.008	0.003 U	1.6	4
Snowing while sampling. The water level of the lake was down significantly.													
3/17/2009 8:45	3.2	6330	58	12.4	7.79	2	0.124	0.01 U	0.055	0.0096	0.0124	1.9	2
slow pH meter response time.													
4/14/2009 9:00	3.9	9440	57	12.86	8.15	3	0.103	0.01 U	0.033	0.0095	0.003 U	1.3	2 J
5/12/2009 8:25	7.9	15800	52	11.7	7.87	4	0.11	0.01 U	0.038	0.0135	0.0048	2.4	1 U
Windy.													
6/9/2009 7:50	14.3	19000	48	10.19	7.85	3	0.062	0.01 U	0.01 U	0.0103	0.0049	1.2	6
Geese and Seagulls on and around the dock before sampling.													
7/14/2009 8:40	20	2230	46	8.4	7.86	2	0.049	0.01 U	0.01 U	0.005	0.005	0.7	1 U
8/11/2009 8:10	22.1	1050	48	8	7.82 J	1 U	0.07	0.015	0.01 U	0.005 U	0.003 U	0.6	1
Birds on dock prior to sampling.													
9/22/2009 8:15	18.7	1250	46	8.6	7.94	1 U	0.074	0.01 U	0.01 U	0.0062	0.003 U	0.6	8

Conventional Data Report

Colville R @ Newton Rd

59A140

Class: FIN
Rivermile: 45.7
Latitude: 48 12 30.6
Longitude: 117 44 17.9
Waterbody: WA-59-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/7/2008 15:10	12.9 J	13 J	370	12.3	8.56	5	0.392	0.022	0.259	0.028	0.017	2.8	96
	Really high winds!												
11/4/2008 16:25	5.9	14 J	386	10.4	8.21	5	0.454	0.029	0.288	0.023	0.011	3.3	82
	Still raining.												
12/2/2008 13:45	5.8	14 J	396	11.7	8.25	5	0.582	0.033	0.401	0.0258	0.0123	3.9	25
	Staff = 2.70												
1/6/2009 15:20	0.9	13 J	398	11.4	8.02	68	0.566	0.044	0.399	0.112	0.0168	33	42
	Snowing hard. Lots of snow on the bridge. Small amount of snow in TSS bottle.												
2/3/2009 14:00	6	11 J	466	12.26	8.04	43	0.579	0.04	0.397	0.0875	0.0193	20	6
	Staff= 2.72												
3/3/2009 14:25	4.1	24 J	412	12.06	7.8	34	0.703	0.042	0.383	0.0825	0.0185	15	27
	Staff=3.48												
5/5/2009 14:30	12.4	34 J	276	11.95	8.66	16	0.256	0.01 U	0.077	0.0364	0.0124	5.5 J	36
6/2/2009 14:35	18.8	12 J	336	11.9	8.66	18	0.337	0.023	0.137	0.054	0.0203	11	340
	Staff has moved, reading = 2.78												
7/7/2009 15:45	21.4	10 J	353	11.6	8.55	5	0.311	0.01 U	0.01	0.0455	0.0164	3.1	160
8/4/2009 14:05	21.6	20 J	374	8.69	8.01	4	0.335	0.01	0.049	0.0484	0.0214	3.7	370
9/15/2009 14:20	16.8	11 J	366	11.5	8.44	7	0.432	0.016	0.264	0.0299	0.015	4.9	60

Conventional Data Report

Kettle R nr Barstow

60A070

Class: AA
Rivermile: 10.9
Latitude: 48 47 04.7
Longitude: 118 07 31.0
Waterbody: WA-60-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/7/2008 13:30	13.5 J	289	218	10.5	8.55	4	0.13	0.01 U	0.037	0.005 U	0.003 U	0.5 U	2
Large flock of Geese in the river, upstream of the bridge. No pH meter check.													
11/4/2008 14:00	5.8	469	206	10.4	8.34	1	0.17	0.01 U	0.103	0.0052	0.003 U	0.5 U	1 U
Still raining.													
12/2/2008 12:20	2.6	602	160	13.2	8.11	1 U	0.169	0.01 U	0.119	0.005 U	0.003 U	0.5	3
1/6/2009 13:00		829											
Site frozen, near white out conditions. No samples collected.													
2/3/2009 12:45		589											
Site frozen, no samples collected this month.													
3/3/2009 13:00	1.1	414	188	13.86	8.26	3	0.211	0.01 U	0.155	0.0097	0.003 U	0.8	1 U
Lots of sand and gravel on bridge.													
5/5/2009 13:05	9.2	7123	78	11.3	7.93	19	0.135	0.01 U	0.01 U	0.0356	0.003 U	5.5 J	15
Slightly raining.													
6/2/2009 13:15	10.6	15052	40.3	11.7	7.51	46	0.105	0.01 U	0.01 U	0.0586	0.0034	12	25
7/7/2009 13:20	18.2	2194	100	9.19	8.11	2	0.119	0.01 U	0.04	0.0286	0.0038	1.1	35 J
8/4/2009 12:35	24.1	630	155	8.4	8.49	1	0.112	0.01 U	0.011	0.0063	0.003 U	0.5	6
9/15/2009 12:50	18.4	229	214	9.4	8.51	2	0.135	0.01 U	0.018	0.0067	0.003 U	0.7	6

Conventional Data Report

Columbia R @ Northport

61A070

Class: AA
Rivermile: 735.1
Latitude: 48 55 20.7
Longitude: 117 46 35.9
Waterbody: WA-CR-1060

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/7/2008	11:45	14.8 J	69400	142	9.3	8.23	2	0.13	0.01 U	0.047	0.0051	0.003 U	0.7	44
		High Winds!												
11/4/2008	12:30	9.7 J	70300	140	9.9	8.14	2	0.12	0.01 U	0.048	0.005 U	0.003 U	0.7	26
		Temperature reading taken from TSS bottle immediately after retrieval. Still raining.												
12/2/2008	11:00	6.9	78500	154	10.9	7.96	2	0.147	0.01 U	0.1	0.005 U	0.003 U	0.5 U	1 U
1/6/2009	11:30		112000											
		There was no safe access to the bridge, and snow piled higher than the handrail. No samples collected.												
2/3/2009	11:45		77800											
		Due to dangerous parking conditions and lots of snow on the bridge walkway, no samples were collected this month.												
3/3/2009	11:55	3.1	79300	156	13.46	8.07	2	0.142	0.01 U	0.097	0.0069	0.003 U	0.7	2
		Lots of sand and gravel on bridge.												
5/5/2009	12:00	7.9	80100	148	11.65	8.15	3	0.122	0.01 U	0.065	0.0077	0.003 U	1.3 J	4
		Lots of sand and gravel on the bridge walkway.												
6/2/2009	12:10	12.9	174000	138	11.9	8.18	6	0.114	0.01 U	0.052	0.0135	0.003 U	2	1 U
7/7/2009	12:15	16.7	125000	128	9.8	8.27	3	0.099	0.01 U	0.03	0.01	0.003 U	1.1	3
8/4/2009	11:15	20.1	84800	126	8.8	8.49	3	0.107	0.01 U	0.019	0.0072	0.003 U	0.5 U	1
9/15/2009	11:45	18.7	75600	138	8.6	8.45	2	0.085	0.01 U	0.011	0.0061	0.003 U	0.8	2

Metals Data Report

Columbia R @ Northport

61A070

Class: AA
Rivermile: 735.1
Latitude: 48 55 20.7
Longitude: 117 46 35.9
Waterbody: WA-CR-1060

Date/Time		Flow CFS	Hardness mg/L	Tot. Rec. Cadmium ug/L	Dissolved Cadmium ug/L	Tot. Rec. Chromium ug/L	Dissolved Chromium ug/L	Tot. Rec. Copper ug/L	Dissolved Copper ug/L	Tot. Rec. Lead ug/L	Dissolved Lead ug/L	Total Mercury ug/L	Dissolved Nickel ug/L	Tot. Rec. Arsenic ug/L	Tot. Rec. Zinc ug/L	Dissolved Zinc ug/L
10/7/2008	11:45		63.9		0.02 U		0.25 U		0.63		0.23	0.002 U	0.43			1.6
12/2/2008	11:00		67		0.02 U		0.26		0.46		0.02 U	0.002 U	0.59			3
6/2/2009	12:10		61.5		0.02 U		0.25 U		0.79		0.063	0.002 U	0.21			1.7
8/4/2009	11:15		60.4		0.02 U		0.25 U		0.51		0.02 U	0.002 U	0.53			1.6

Conventional Data Report

Pend Oreille R @ Metaline Falls

62A090

Class: FIN
Rivermile: 27
Latitude: 48 51 53.7
Longitude: 117 22 23.9
Waterbody: WA-62-1010

Date/Time	Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/7/2008 9:55	15.2 J	27600	162	8.8	8.37	2	0.079	0.01 U	0.01	0.0051	0.003 U	0.9	3
11/4/2008 10:15	9	19500	164	10.19	8.23	1	0.084	0.01 U	0.01 U	0.0054	0.003 U	0.6	1 U
	Raining.												
12/2/2008 9:10	4.9	15400	172	10.19	8.19	1	0.07	0.01 U	0.01 U	0.005 UJ	0.003 U	0.7	1
1/6/2009 9:45		22700											
	Site frozen, no samples collected.												
2/3/2009 10:15	4	14300	218	13.96	8.39	2	0.084	0.01 U	0.019	0.0077	0.003 U	0.7	4
	Due to the snowload, these samples were collected from the downstream side of the bridge.												
3/3/2009 9:50	3.1	17900	180	13.36	8.33	3	0.074	0.01 U	0.01 U	0.0095	0.003 U	2.2	2
	Lots of sand and gravel on bridge.												
4/7/2009 9:55	5.6	14900	167	12.1	8.33	15	0.094	0.01 U	0.01 U	0.0092	0.003 U	1.8	1 U
5/5/2009 9:45	9.3	31300	160	11	8.15	5	0.063	0.01 U	0.01 U	0.0136	0.003 U	2.6 J	13
	Raining.												
6/2/2009 10:25	14.3	73000	140	11.6	8.28	9	0.103	0.01 U	0.01 U	0.0194	0.003 U	4.5	3
7/7/2009 10:45	16.4	29800	140	8.9	8.39	3	0.072	0.01 U	0.01 U	0.0132	0.0031	1.9	13 J
8/4/2009 10:00	24.1	14200	147	8.1	8.67	1	0.096	0.01 U	0.01 U	0.0096	0.003 U	0.9	2
9/15/2009 10:20	18.8	14800	160	8.6	8.54	3	0.106	0.01 U	0.01 U	0.0617	0.003 U	1	2

Conventional Data Report

Pend Oreille R @ Newport

62A150

Class: A
Rivermile: 88.2
Latitude: 48 11 06.7
Longitude: 117 02 05.7
Waterbody: WA-62-1020

Date/Time		Temp deg. C	Flow CFS	Conduc-tivity umhos/cm	Oxygen mg/L	ph std units	Suspend. Solids mg/L	Total Pers. N. mg/L	Ammonia Nitrogen mg/L	Nitrate+ Nitrite mg/L	Total Phosp. mg/L	Soluble Reactive P mg/L	Turbid-ity NTU	Fecal Coliforms #/100/mL
10/7/2008	8:05	15.6 J	27500	164	8.8	8.39	2	0.073	0.01 U	0.01 U	0.0056	0.003 U	1	5
11/4/2008	8:25	9	17200	168	10.1	8.27	2	0.075	0.01 U	0.01 U	0.0054	0.003 U	0.9	1 U
		Raining hard.												
12/2/2008	7:30	5.4	13300	178	10.9	8.21	1	0.077	0.01 U	0.013	0.005 UJ	0.003 U	0.9	1
		Lots of debris on bridge.												
1/6/2009	7:45	1.3	24400	184	11.9	8.1	2	0.117	0.01 U	0.066	0.0109	0.004	0.9	1 U
		Due to dangerous conditions on the bridge, samples were collected from the left bank with a painter's pole. Snowing during sampling.												
2/3/2009	8:15	4.6	13800	208	12.66	8.16	1 U	0.093	0.01 U	0.051	0.0087	0.0036	0.5	5
		Due to the snow load on the bridge, these samples were collected from the boat launch across the river.												
3/3/2009	8:15	3.3	16000 J	182	12.26	8.16	203	0.094	0.01 U	0.044	0.0086	0.003 U	1	1 U
		Raining, sampled from normal location on bridge.												
4/7/2009	8:05	5	16600	167	12.1	8.36	6	0.087	0.01 U	0.021	0.0088	0.003 U	2.5	1 U
5/5/2009	8:15	8.6	31600	164	11.5	8.45	5	0.059	0.01 U	0.01 U	0.0124	0.003 U	2.5 J	1
		Lots of sand and gravel on the bridge walkway.												
6/2/2009	8:45	13.4	74900	146 J	10.7	8.36	8	0.095	0.01 U	0.01 U	0.0174	0.003 U	5	2
		Geese upstream of bridge while sampling. Off white foam on surface near right bank.												
7/7/2009	9:05	16.4	30900	144	9	8.44	3	0.088	0.01 U	0.01 U	0.011	0.003 U	1.6	5
8/4/2009	8:20	22.9	13100	152	8.3	8.52	2	0.138	0.01 U	0.01 U	0.0068	0.003 U	1	1 U
9/15/2009	8:30	18.6	14900	164	8.4	8.53	2	0.157	0.01 U	0.01 U	0.0079	0.003 U	1.1	9

Appendix D. Water Year 2009: Missing data

Table D-1. Missing data for the 12 standard parameters.
"X"=missing

Station	Date	Remarks	Temperature	Conductivity	Oxygen	pH	Suspended Solids, total	Total Persulfate Nitrogen	Ammonia-nitrogen	Nitrate+nitrite-nitrogen	Phosphorus, total	Orthophosphate	Turbidity	Fecal Coliform Bacteria
01A050	2008/12/16	Inaccessible: frozen	x	x	x	x	x	x	x	x	x	x	x	x
03A060	2009/01/27	Sampler error: incorrect preservative									x			
03A060	2009/09/22	Unsafe: excessive boat traffic	x	x	x	x	x	x	x	x	x	x	x	x
05A110	2008/10/22	Sampler error: result not recorded	x											
05B110	2009/03/18	Sampler error: sample not sent to lab					x							
08C100	2008/12/15	Inaccessible: snow	x	x	x	x	x	x	x	x	x	x	x	x
08C100	2009/03/16	Inaccessible: road closure	x	x	x	x	x	x	x	x	x	x	x	x
08C110	2008/12/15	Inaccessible: snow	x	x	x	x	x	x	x	x	x	x	x	x
08C110	2009/03/16	Inaccessible: road closure	x	x	x	x	x	x	x	x	x	x	x	x
09A080	2008/12/15	Sampler error: sample froze			x									
09A190	2008/11/17	Sampler error: titration error			x									
09M050	2008/12/15	Inaccessible: access icy	x	x	x	x	x	x	x	x	x	x	x	x
09M050	2009/01/26	Inaccessible: gate blocked	x	x	x	x	x	x	x	x	x	x	x	x
11A070	2009/06/17	Sampler error: sample not processed			x									
12F090	2009/01/28	Sampler error: probe contaminated				x								
12F090	2009/06/17	Sampler error: sample not processed			x									
15M070	2009/05/12	Sampler error: titration error			x									
19E060	2009/01/12	Inaccessible: road closure	x	x	x	x	x	x	x	x	x	x	x	x
24F070	2009/07/21	Sampler error: result not recorded			x									
24F070	2009/09/21	Sampler error: result not recorded			x									
25C070	2009/07/21	Sampler error: sample not processed			x									
31A070	2009/08/15	Illness	x	x	x	x	x	x	x	x	x	x	x	x
31A070	2008/11/15	Sampler error: insufficient time	x	x	x	x	x	x	x	x	x	x	x	x
32A070	2008/11/18	Cooler delayed by airline.												x
32B075	2008/11/18	Cooler delayed by airline.												x
33A050	2008/11/18	Cooler delayed by airline.												x
34A070	2009/01/07	Inaccessible: frozen	x	x	x	x	x	x	x	x	x	x	x	x
36A070	2008/11/18	Cooler delayed by airline.												x
36A070	2009/08/15	Illness	x	x	x	x	x	x	x	x	x	x	x	x
37A090	2008/11/18	Cooler delayed by airline.												x
37A090	2009/01/07	Sampler error: sample spilled			x									
39A090	2009/08/15	Illness	x	x	x	x	x	x	x	x	x	x	x	x

Station	Date	Remarks	Temperature	Conductivity	Oxygen	pH	Suspended Solids, total	Total Persulfate Nitrogen	Ammonia-nitrogen	Nitrate+nitrite-nitrogen	Phosphorus, total	Orthophosphate	Turbidity	Fecal Coliform Bacteria
41A070	2008/11/18	Cooler delayed by airline.												x
41A070	2009/02/02	Cooler delayed by airline.												x
45A070	2009/02/02	Cooler delayed by airline.												x
45A110	2009/01/12	Inaccessible: snow	x	x	x	x	x	x	x	x	x	x	x	x
45A110	2009/02/02	Cooler delayed by airline.												x
46A070	2009/02/02	Cooler delayed by airline.												x
46A070	2009/03/04	Sampler error: insufficient time	x	x	x	x	x	x	x	x	x	x	x	x
48A075	2009/01/05	Inaccessible: bridge unsafe	x	x	x	x	x	x	x	x	x	x	x	x
48A075	2009/07/06	Inaccessible: road construction	x	x	x	x	x	x	x	x	x	x	x	x
48A140	2009/07/06	Sampler error: result not recorded	x											
49A070	2009/01/05	Inaccessible: frozen	x	x	x	x	x	x	x	x	x	x	x	x
49A070	2009/02/02	Inaccessible: frozen	x	x	x	x	x	x	x	x	x	x	x	x
49B070	2009/01/05	Inaccessible: frozen	x	x	x	x	x	x	x	x	x	x	x	x
49B070	2009/02/02	Inaccessible: frozen	x	x	x	x	x	x	x	x	x	x	x	x
54A070	2009/01/20	Inaccessible: snow	x	x	x	x	x	x	x	x	x	x	x	x
54A070	2009/02/10	Inaccessible: snow	x	x	x	x	x	x	x	x	x	x	x	x
54A070	2009/08/11	Sampler error: no sample sent to lab												x
55B070	2009/01/20	Sample lost: bottle broke in transit					x							
57A240	2008/10/14	Sample Lost: faulty container leaked											x	
59A140	2009/04/15	Equipment problems: van broke down	x	x	x	x	x	x	x	x	x	x	x	x
60A070	2009/01/06	Inaccessible: frozen	x	x	x	x	x	x	x	x	x	x	x	x
60A070	2009/02/03	Inaccessible: frozen	x	x	x	x	x	x	x	x	x	x	x	x
60A070	2009/04/15	Equipment problems: van broke down	x	x	x	x	x	x	x	x	x	x	x	x
61A070	2009/01/06	Inaccessible: snow	x	x	x	x	x	x	x	x	x	x	x	x
61A070	2009/02/03	Inaccessible: snow	x	x	x	x	x	x	x	x	x	x	x	x
61A070	2009/04/15	Equipment problems: van broke down	x	x	x	x	x	x	x	x	x	x	x	x
62A090	2009/01/06	Inaccessible: frozen	x	x	x	x	x	x	x	x	x	x	x	x

Appendix E. Glossary, Acronyms, and Abbreviations

Glossary

A**mbient:** Background or away from point sources of contamination.

Anadromous: Types of fish, such as salmon, that go from the sea to freshwater to spawn.

Anthropogenic: Human-caused.

Basin: A drainage area or watershed in which all land and water areas drain or flow toward a central collector such as a stream, river, or lake at a lower elevation.

Bi-monthly: Every other month.

Char: Char (genus *Salvelinus*) are distinguished from trout and salmon by the absence of teeth in the roof of the mouth, presence of light colored spots on a dark background, absence of spots on the dorsal fin, small scales, and differences in the structure of their skeleton. (Trout and salmon have dark spots on a lighter background.)

Conductivity: A measure of water's ability to conduct an electrical current. Conductivity is related to the concentration and charge of dissolved ions in water.

Conversion Factor: Water quality criteria were initially developed for total metals and adjusted with a "conversion factor" so that the criteria would apply to the dissolved fraction of the metals. Because the conversion factor derived from the test water and not from ambient water, it should not be used to routinely exchange dissolved and total metals fractions for ambient waters.

Dissolved oxygen: A measure of the amount of oxygen dissolved in water.

Exceeded: Did not meet.

Fecal coliform: That portion of the coliform group of bacteria which is present in intestinal tracts and feces of warm-blooded animals as detected by the product of acid or gas from lactose in a suitable culture medium within 24 hours at 44.5 plus or minus 0.2 degrees Celsius. Fecal coliform are "indicator" organisms that suggest the possible presence of disease-causing organisms. Concentrations are measured in colony forming units per 100 milliliters of water (cfu/100 mL).

Geometric mean: A mathematical expression of the central tendency (an average) of multiple sample values. A geometric mean, unlike an arithmetic mean, tends to dampen the effect of very high or low values, which might bias the mean if a straight average (arithmetic mean) were calculated. This is helpful when analyzing bacteria concentrations, because levels may vary anywhere from 10 to 10,000 fold over a given period. The calculation is performed by either: (1) taking the nth root of a product of n factors, or (2) taking the antilogarithm of the arithmetic mean of the logarithms of the individual values.

Hardness: A measure of the dissolved solids in a water sample (e.g., calcium, magnesium).

Nutrient: Substance such as carbon, nitrogen, and phosphorus used by organisms to live and grow. Too many nutrients in the water can promote algal blooms and rob the water of oxygen vital to aquatic organisms.

Parameter: A physical chemical or biological property whose values determine environmental characteristics or behavior.

pH: a measure of the acidity or alkalinity of water. A low pH value (0 to 7) indicates that an acidic condition is present, while a high pH (7 to 14) indicates a basic or alkaline condition. A pH of 7 is considered to be neutral. Since the pH scale is logarithmic, a water sample with a pH of 8 is ten times more basic than one with a pH of 7.

Salmonid: Any fish that belong to the family *Salmonidae*. Basically, any species of salmon, trout, or char. www.fws.gov/le/ImpExp/FactSheetSalmonids.htm

Spatial: How concentrations differ among various parts of the river.

Stage height: Water surface elevation.

Synoptic survey: Data collected simultaneously or over a short period of time.

Temporal: Characterize over time (e.g., temporal trends).

Thermistors: Data loggers.

Total maximum daily load (TMDL): A distribution of a substance in a waterbody designed to protect it from exceeding water quality standards. A TMDL is equal to the sum of all of the following: (1) individual wasteload allocations for point sources, (2) the load allocations for nonpoint sources, (3) the contribution of natural sources, and (4) a margin of safety to allow for uncertainty in the wasteload determination. A reserve for future growth is also generally provided.

Total suspended solids: Portion of solids retained by a filter.

Turbidity: A measure of water clarity. High levels of turbidity can have a negative impact on aquatic life.

Water Year (WY) 2008: October 1, 2007 through September 30, 2008.

Watershed: A drainage area or basin in which all land and water areas drain or flow toward a central collector such as a stream, river, or lake at a lower elevation.

7DADM: Seven-day average of the daily maximum temperature.

Acronyms and Abbreviations

DQO	Data quality objective
Ecology	Washington State Department of Ecology
EIM	Environmental Information Management database
IMW	Intensively Monitored Watersheds
EPA	U.S. Environmental Protection Agency

LIMS	Laboratory Information Management System
MEL	Manchester Environmental Laboratory
MQO	Measurement quality objective
NF	North Fork
NO23	Nitrate plus nitrite-nitrogen
QA	Quality assurance
QAMP	Quality Assurance Management Plan
QC	Quality control
RMS	Root mean squared
RSD	Relative standard deviation
SF	South Fork
SM	Standard method
Std dev	Standard deviation
TMDL	(See Glossary above)
TN	Total nitrogen
TP	Total phosphorus
TSS	Total suspended solids
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
WQI	Water Quality Index
WRIA	Water Resources Inventory Area
WY	Water year

Units of Measurement

°C	degrees centigrade
cfs	cubic feet per second
g	gram, a unit of mass
kg	kilograms, a unit of mass equal to 1,000 grams.
mg/L	milligrams per liter (parts per million)
mL	milliliters
NTU	nephelometric turbidity units
s.u.	standard units
µg/L	micrograms per liter (parts per billion)
µS/cm	microsiemens per centimeter, a unit of conductivity