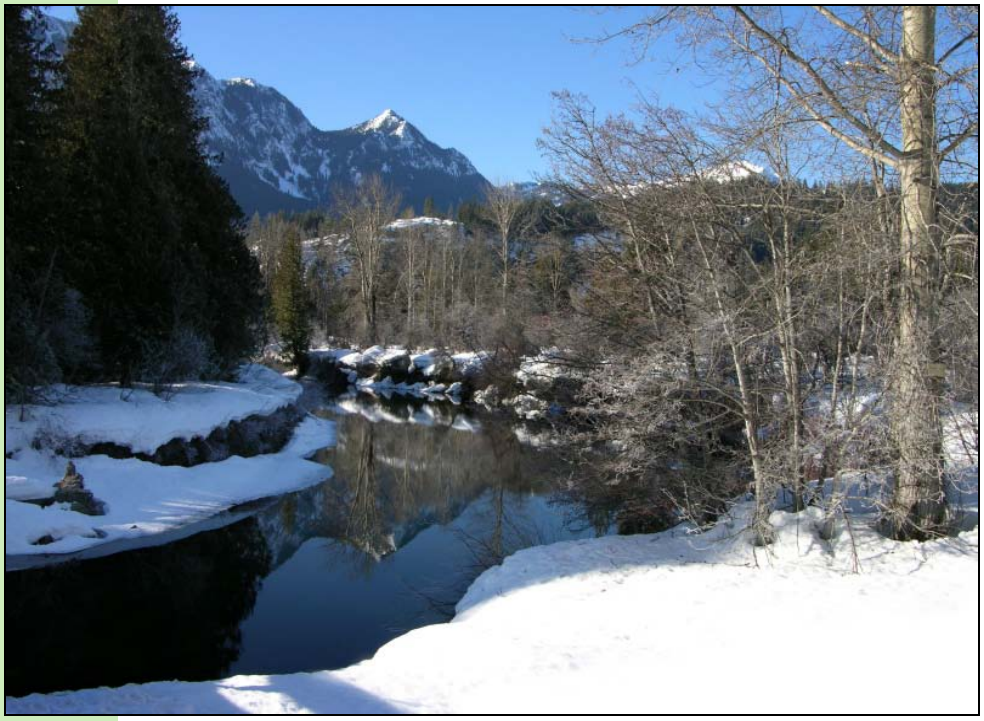

River and Stream Water Quality Monitoring Report

Water Year 2008

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Cover photo: White River at Road 6500 (by Chris Coffin).

River and Stream
Water Quality Monitoring Report

Water Year 2008

by
David Hallock

Freshwater Monitoring Unit
Environmental Assessment Program
Washington State Department of Ecology
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Waterbody Number: Statewide

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Abstract

The Washington State Department of Ecology (Ecology) collected monthly water quality data at 103 stream monitoring stations during Water Year 2008 (October 1, 2007 through September 30, 2008). We also collected 30-minute interval temperature data at 37 sites, mostly from July through September 2008.

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 2008.

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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Many Department of Ecology staff contributed time, effort, and expertise to the Water Year 2008 program.

- Bill Ward, Daniel Sherratt, Jim Ross, Jason Myers, Craig Homan, Chris Coffin, and Casey Clishe collected samples. These guys spent long hours behind the wheel in all kinds of weather, traffic, and road conditions. Without their dedication, Appendix D would be much longer.
- Bill Ward conducted the continuous stream temperature monitoring project.
- Brad Hopkins and Jim Ross reviewed the draft report, and Will Kendra and Mindy Roberts reviewed the Trends section of the report.
- Cindy Cook and Joan LeTourneau formatted and edited the final report.

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- Deborah Case, Nancy Rosenbower, and Nancy Jensen performed sample tracking services.
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- Sally Cull, Meredith Jones, Dean Momohara, and Sara Sekerak worked on low-level metals.
- Leon Weiks, Sally Cull, and Dean Momohara provided sample container supplies and transport services.
- Stuart Magoon kept the “train on the track” and moving in the right direction.

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) 2008, we monitored 21 additional stations associated with special projects (and external funding). Eight of these were in the Eastern Region, four in the Northwest Region, and nine in the Southwest region. Twelve of these stations were associated with the "Intensively Monitored Watersheds" project (see www.ecy.wa.gov/programs/eap/imw). Seven stations were added as part of a larger Spokane River study, one was added to evaluate fecal coliform bacteria concentrations entering the state in the Palouse River, and one was added to pilot a program for monitoring continuous dissolved oxygen.

This WY only, we sampled hardness and alkalinity every other month at all stations. This was requested and funded by Ecology's Water Quality Program to support the needs of permit writers for receiving water data.

We also 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.

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/2002/2002-index.html).
- Identify trends in water quality characteristics (e.g., Hallock, 2005a).
- 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 2008 monitoring program, discuss data quality, and present results. More detailed analyses and interpretations of ambient monitoring data are reported elsewhere.

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, 2005a).

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/2002/2002-index.html).

Methods

Sampling Network

The ambient monitoring network in WY 2008 consisted of monthly water collection at 62 long-term stations, 20 regional ("basin") stations, and 21 special project stations (Table 1 and Appendix A).

We sampled all stations year-round except for three special project stations. We replaced the Spokane River near Monroe Street station with the Sandifer Bridge station in April because the Monroe Street station was a bank sample that may not have been adequately mixed. We started sampling the Black River (WRIA 23) station weekly beginning in late August, mainly to support a continuous oxygen pilot project.

- *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. These stations may not include 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 2008 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 2008. See Appendix A.

Key	Station	Location	Status[a]	Key	Station	Location	Status[a]
1	01A050	Nooksack R @ Brennan	C	53	27B070	Kalama R near Kalama	C
2	01A120	Nooksack R @ No Cedarville	C	54	27D090	EF Lewis R near Dollar Corner	C
3	03A060	Skagit R near Mount Vernon	C	55	28B070	Washougal R @ Washougal	B
4	03B050	Samish R near Burlington	C	56	28C070	Burnt Br Cr @ mouth	B
5	04A100	Skagit R @ Marblemount	C	57	29B090	White Salmon R @ Husum Street	B
6	05A070	Stillaguamish R near Silvana	C	58	29D070	Rattlesnake Cr near mouth	B
7	05A090	SF Stillaguamish @ Arlington	C	59	31A070	Columbia R @ Umatilla	C
8	05A110	SF Stillaguamish near Granite Falls	C	60	32A070	Walla Walla R near Touchet	C
9	05B070	NF Stillaguamish @ Cicero	C	61	33A050	Snake R near Pasco	C
10	05B110	NF Stillaguamish near Darrington	C	62	34A070	Palouse R @ Hooper	C
11	07A090	Snohomish R @ Snohomish	C	63	34A170	Palouse R @ Palouse	C
12	07C070	Skykomish R @ Monroe	C	64	34A200	Palouse R near Stateline	S2
13	07D050	Snoqualmie R near Monroe	C	65	34B110	SF Palouse R @ Pullman	C
14	07D130	Snoqualmie R @ Snoqualmie	C	66	35A150	Snake R @ Interstate Bridge	C
15	08C070	Cedar R @ Logan St/Renton	C	67	35B060	Tucannon R @ Powers	C
16	08C110	Cedar R near Landsburg	C	68	36A070	Columbia R near Vernita	C
17	09A080	Green R @ Tukwila	C	69	37A090	Yakima R @ Kiona	C
18	09A190	Green R @ Kanaskat	C	70	37A205	Yakima R @ Nob Hill	C
19	10A070	Puyallup R @ Meridian St	C	71	37F070	Sulfur Ck Wasteway @ McGee Rd	B
20	10C095	White R @ R Street	B	72	39A090	Yakima R near Cle Elum	C
21	10H070	Lk Tapps Tailrace @ E. Valley Hwy	B	73	41A070	Crab Cr near Beverly	C
22	10I050	Joe's Cr @ SR 509	B	74	45A070	Wenatchee R @ Wenatchee	C
23	11A070	Nisqually R @ Nisqually	C	75	45A110	Wenatchee R near Leavenworth	C
24	12B070	Leach Cr near Steilacoom	B	76	45J070	Nason Cr near mouth	B
25	13A060	Deschutes R @ E St Bridge	C	77	45K070	White R near mouth	B
26	15A070	Dewatto R near Dewatto	B	78	45L070	Little Wenatchee R near mouth	B
27	15B050	Chico Cr near Chico	B	79	46A070	Entiat R near Entiat	C
28	15C070	Clear Cr @ Silverdale	B	80	48A070	Methow R near Pateros	C
29	15D070	Tahuya R @ Tahuya River Rd	B	81	48A140	Methow R @ Twisp	C
30	15F050	Big Beef Cr @ mouth	S1	82	48A150	Methow R @ Winthrop	B
31	15L050	Seabeck Cr @ mouth	S1	83	48B070	Chewack R @ Winthrop	B
32	15M070	Llt Anderson Cr @ Anderson Hill Rd	S1	84	49A070	Okanogan R @ Malott	C
33	15N070	Stavis Cr near mouth	S1	85	49A190	Okanogan R @ Oroville	C
34	16A070	Skokomish R near Potlatch	C	86	49B070	Similkameen R @ Oroville	C
35	16C090	Duckabush R near Brinnon	C	87	53A070	Columbia R @ Grand Coulee	C
36	18B070	Elwha R near Port Angeles	C	88	54A070	Spokane R @ Long Lake (USGS)	S3
37	19C060	West Twin R near mouth	S1	89	54A090	Spokane R @ Ninemile Bridge	S3
38	19D070	East Twin R near mouth	S1	90	54A120	Spokane R @ Riverside State Pk	C
39	19E060	Deep Cr near mouth	S1	91	55B070	Little Spokane R near mouth	C
40	20B070	Hoh R @ DNR Campground	C	92	56A070	Hangman Cr @ mouth	C
41	22A070	Humptulips R near Humptulips	C	93	57A123	Spokane R @ Sandifer Bridge	S3
42	23A070	Chehalis R @ Porter	C	94	57A125	Spokane R below Monroe Street	S3
43	23A160	Chehalis R @ Dryad	C	95	57A140	Spokane R @ Plante's Ferry Park	S3
44	23E060	Black R @ Hwy 12	S4	96	57A148	Spokane R @ Barker Rd	S3
45	24B090	Willapa R near Willapa	C	97	57A150	Spokane R @ Stateline Bridge	C
46	24F070	Naselle R near Naselle	C	98	57A240	Spokane R @ Lake Coeur d'Alene	S3
47	25D050	Germany Cr @ mouth	S1	99	59A140	Colville R @ Newton Rd	B
48	25E060	Abernathy Cr near mouth	S1	100	60A070	Kettle R near Barstow	C
49	25E100	Abernathy Cr @ DNR	S1	101	61A070	Columbia R @ Northport	C
50	25F060	Mill Cr near mouth	S1	102	62A090	Pend Oreille R @ Metaline Falls	B
51	25F100	Mill Cr @ DNR	S1	103	62A150	Pend Oreille R @ Newport	C
52	26B070	Cowlitz R @ Kelso	C				

[a] Status: C = long-term, B = basin, S1 = IMW Support, S2 = fecal coliform bacteria only, S3 = Spokane River Project, S4 = Black River continuous oxygen pilot.

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 12 water quality parameters monthly at all except a few special project stations in WY 2008 (Table 2).

Table 2. Water quality parameters monitored in Water Year 2008.

Parameter	Method	Reporting Limit
alkalinity	EPA 310.2	5 mg/L
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
temperature	SM 2550 B	NA
turbidity	SM 2130	0.5 NTU

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

Besides the 12 water quality parameters, we also record 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. 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, 2007), ambient monitoring quality assurance documents (Hallock and Ehinger, 2003; Hallock 2007; and Hopkins, 1996), and Manchester Environmental *Laboratory Users Manual* (MEL, 2008).

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 2008. However, we expect to move three long-term monitoring stations at the end of next water year. In all cases, we plan to sample both the old and the new site concurrently for one year:

- 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 plan to move 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 plan to move 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 plan to move this station 0.6 miles upstream to Methow River near Pateros at Metal Bridge (48A075).

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

Our goal is to collect temperature data at 30-minute intervals at many of our long-term and most current basin ambient monitoring stations as well as at some special request stations. We fell short of that goal in 2008, deploying temperature loggers at only 48 sites. Data were successfully retrieved from 37 sites, and a few more loggers may still be retrieved as water levels drop. The purpose of this monitoring effort is to collect summer, diel (24-hour) temperature data that may be used for trend analyses and to determine compliance with water quality standards.

Two Onset StowAway TidbiT® temperature loggers were deployed at each site, one in water and one in air. All loggers were shaded with a PVC pipe and installed in a location representative of the surrounding environment. Stream temperature loggers were installed 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.

We try to deploy the loggers by early July and retrieve them in September. Detailed protocols are found in Ward (2003) and quality control requirements in Ward (2005).

We have also begun a year-round continuous temperature monitoring effort at several of our stations and hope to expand on this in the future.

Metals Monitoring

Metals monitoring continued in WY 2008 at 12 stations (Table 3). Metals samples were collected every other month beginning in October 2007 (except for 1 missed sample). Samples

were analyzed for hardness, total mercury, and total recoverable and dissolved arsenic, cadmium, chromium, copper, lead, nickel, silver, and zinc. Collection and analytical methods are discussed in more detail in 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.

Table 3. Water Year 2008 bi-monthly sampling stations for metals.

Station	Name	Station	Name
03A060	Skagit R near Mount Vernon	37F080	Sulfur Cr @ Holaday Road
12B070	Leach Cr near Steilacoom	41A070	Crab Cr near Beverly
15B050	Chico Cr near Chico	49B070	Similkameen R @ Oroville
15C070	Clear Cr @ Silverdale	53A070	Columbia R @ Grand Coulee
26B070	Cowlitz R @ Kelso	57A150	Spokane R @ Stateline Bridge
28B070	Washougal R @ Washougal	61A070	Columbia R @ Northport

Nitrogen in Puget Sound Rivers

Nitrogen is the nutrient most typically limiting to algal growth in marine (salt-water) systems. Increased nitrogen concentrations in Puget Sound can lead to increased algal growth. This report includes a trend analysis of total nitrogen (TN) and nitrate plus nitrite-nitrogen (NO23) data from Ecology's River and Stream Monitoring Program. Trends in ammonia are not included because at most stations we detected ammonia in less than 50% of the samples.

I evaluated trends at all 24 long-term stations in Puget Sound (Table 4). However, 11 of these stations are upstream from others. Trends at the downstream stations are most directly related to effects on the marine environment.

I used two different date ranges in the analysis. We began sampling TN in WY 1994; however, our station network was not fully stable until the following water year so I began the TN analysis with October 1994 (WY 1995). I used the same date for an NO23 analysis in order to be comparable to the TN analysis. However, I conducted a second NO23 analysis beginning in WY 1988, the year we began sampling NO23. For both TN and NO23, I used data collected through September 2008. Flow data were only available through September 2007, however, so flow-adjusted trends stop one year earlier. Therefore, flow-adjusted trends may not be fully comparable to the base trend.

I analyzed trends for all months and for the summer growing season (July through September).

In most cases, I converted data below reporting limits to ½ the reporting limit. However, the TN reporting limit increased from 0.01 to 0.025 mg/L in 2002. Because a reporting limit change can bias a trend analysis, I converted data less than 0.025 mg/L at two stations with a high percentage of low concentrations to ½ the current, higher, reporting limit.

For trend analyses, I used the seasonal Kendall test. I flow-adjusted the data by conducting a hyperbolic regression for each station of the form

$$TN \text{ (or } NO23) = a + b1 * (1/(1+b2*Flow)))$$

where a, b1, and b2 are empirically-determined coefficients. I then analyzed the residuals of the regression for trends.

I determined instantaneous flux by multiplying the concentration (mg/L) times the flow at the time of sampling (cfs) and then multiplying by a unit conversion factor (73.40), resulting in units of kilogram per month. Yield was determined by dividing the flux by the watershed area in square kilometers. This simple procedure should not be confused with more sophisticated load analyses. However, we are interested here in trend results and comparative yields, not the actual yields at particular stations. A complete loading/yield analysis is a possible subject for a future report.

I used WQHydro (Aroner, 2008) for all standard statistical analyses.

There are a few points to consider when evaluating the reported trends:

- Because our network was not stable until WY 1995, NO23 trend analyses at different stations prior to that date may not be comparable, since different years may be included.
- Grab samples are typically less representative than horizontally and vertically integrated samples.
- We do not specifically target collection of stormwater data, so nutrient concentrations related to runoff and flushing effects have a high probability be missed.

However, the last two points are generally more problematic with sediment-associated parameters such as total phosphorus, than with TN or NO23 (see Hallock, 2005b).

Table 4. Long-term ambient monitoring stations in Puget Sound area rivers.
"" in the downstream (D/S) column indicates stations that are nearest the Sound (13 total).*

D/S	ID	Station Name	D/S	ID	Station name
*	01A050	Nooksack R @ Brennan		07D050	Snoqualmie R near Monroe
	01A120	Nooksack R @ North Cedarville		07D130	Snoqualmie R @ Snoqualmie
*	03A060	Skagit R near Mount Vernon	*	08C070	Cedar R @ Logan St/Renton
*	03B050	Samish R near Burlington		08C110	Cedar R near Landsburg
	04A100	Skagit R @ Marblemount	*	09A080	Green R @ Tukwila
*	05A070	Stillaguamish R near Silvana		09A190	Green R @ Kanaskat
	05A090	SF Stillaguamish @ Arlington	*	10A070	Puyallup R @ Meridian St
	05A110	SF Stillaguamish near Granite Falls	*	11A070	Nisqually R @ Nisqually
	05B070	NF Stillaguamish @ Cicero	*	13A060	Deschutes R @ E St Bridge
	05B110	NF Stillaguamish near Darrington	*	16A070	Skokomish R near Potlatch
*	07A090	Snohomish R @ Snohomish	*	16C090	Duckabush R near Brinnon
	07C070	Skykomish R @ Monroe	*	18B070	Elwha R near Port Angeles

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 quality assurance, 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 deionized 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, 133 field QC samples were processed: 11 field blanks, 61 field duplicates (sequential), and 61 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 to the primary database.
- Plots of flow versus stage height are visually checked for anomalies.

Flows were plotted against stage 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 normal monitoring surveys.

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

Results and Discussion

The primary purpose of this report is to present the results of Ecology's stream monitoring in WY 2008. The main body of the report describes the sampling program and interprets QC results. This report also includes an analysis of nitrogen trends in Puget Sound. Appendix C contains results for each station monitored in WY 2008. 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 WY 2008, 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 5 and 6. 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 14,244 possible standard water quality results in WY 2008, 253 results (1.8%) were missed. Most of these (204) were missed because the station was inaccessible or frozen. Other reasons for missing results include sampler error (28) and equipment problems (18). Appendix D gives more detailed explanations for each missed sample.

Instantaneous discharge was recorded at all of the 62 long-term stations, although data were not available for January through September at the South Fork Stillaguamish at Arlington (05A090). On 3 other occasions at different long-term stations, flows were either not available or could not be determined because the sampler did not record the stage. Flows at the Nisqually River at Nisqually (11A070) are coded as estimates because the nearest gage was a considerable distance upstream. Flows at the Stillaguamish River near Silvana (05A070) are coded as estimates because the stage-flow relationship was unusually poor.

Discharge was recorded at 29 of the 41 basin and special stations. Discharge was not recorded during some months at several basin stations for various reasons.

Table 5. Water quality criteria in the 2006 water quality standards associated with aquatic life uses. [a]

Results outside the ranges indicated do not meet the criterion.

Aquatic Life Use	Temperature (7DADM)[b]	Oxygen (1-day minimum)	pH
Char spawning	<=9°C		
Char spawning and rearing	<=12°C	>9.5 mg/L	6.5<=pH<=8.5
Salmon and trout spawning	<=13°C		
Core summer salmonid habitat	<=16°C	>9.5 mg/L	6.5<=pH<=8.5
Salmonid spawning rearing and migration	<=17.5°C	>8.0 mg/L	6.5<=pH<=8.5
Salmonid rearing and migration only	<=17.5°C	>6.5 mg/L	6.5<=pH<=8.5
Non-anadromous interior redband trout	<=18°C	>8.0 mg/L	6.5<=pH<=8.5
Indigenous warm water species	<=20°C	>6.5 mg/L	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 = seven day average of the daily maximum temperature. There are additional temperature criteria during specified seasons for some waterbodies.

Table 6. Water quality criteria in the 2006 water quality standards associated with contact recreation.[a]

Results outside the ranges indicated 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.

Continuous Temperature Monitoring

We successfully monitored continuous temperature at thirty-three western Washington and four eastern Washington stations (Table 7). Six eastern Washington water loggers were not retrieved due to high flows. We hope to retrieve these loggers when flows drop. Four loggers were lost or damaged. Unfortunately, due to schedule problems, a few eastern Washington loggers were deployed late and may have missed the highest seasonal 7-day average maximum periods.

Table 7. Temperature summary for Water Year 2008 (°C).

Results exceeding 1997 criteria and 7DADM results 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	**18.2**	14-Aug 19:30	**17**	14-Aug	9-Jul	29-Sep
01N060	18	16	17.5	16-Aug 22:30	**17.1**	16-Aug	9-Jul	29-Sep
01U070	18	16	**20.3**	16-Aug 17:30	**19**	14-Aug	9-Jul	29-Sep
03B050	18	16	17.1	13-Jul 18:30	**16.5**	12-Jul	9-Jul	29-Sep
04A100	16	16	13.4	16-Aug 19:30	12.6	6-Aug	9-Jul	29-Sep
05A070	18	17.5	**22.4**	16-Aug 20:00	**21**	15-Aug	9-Jul	29-Sep
05B070	18	16	**21.1**	16-Aug 19:00	**19.8**	15-Aug	9-Jul	29-Sep
05B110	18	12	17.8	16-Aug 17:30	**16.4**	14-Aug	9-Jul	29-Sep
07D050	18	17.5	**21.2**	17-Aug 17:30	**20**	17-Aug	28-Jul	29-Sep
07D130	18	16	**19.6**	16-Aug 20:00	**18.3**	15-Aug	8-Jul	29-Sep
08C070	18	16	**19.5**	16-Aug 19:00	**18.5**	15-Aug	8-Jul	1-Oct
08C110	16	16	14.2	16-Aug 18:00	13.7	14-Aug	8-Jul	1-Oct
09A190	16	16	**18.2**	16-Aug 18:00	**17.3**	14-Aug	8-Jul	1-Oct
10C095	18	16	**19**	16-Aug 17:00	**18.1**	14-Aug	14-Jul	24-Sep
10H070	18	17.5	16.2	22-Sep 18:30	15.7	21-Sep	8-Jul	24-Sep
10I050	16	16	**18.2**	24-Aug 18:30	**16.5**	23-Aug	14-Jul	1-Oct
11A070	18	16	16.8	16-Aug 17:30	15.9	15-Aug	14-Jul	24-Sep
12B070	16	16	**17.3**	20-Aug 22:00	15.8	22-Aug	8-Jul	24-Sep
13A060	18	17.5	**19.8**	16-Aug 19:00	**18.5**	15-Aug	14-Jul	23-Sep
16A070	16	16	13.8	16-Jul 18:00	13.2	19-Jul	16-Jul	17-Sep
16C090	16	16	14.1	16-Aug 18:00	13.2	16-Aug	16-Jul	17-Sep
18B070	16	16	15.6	16-Aug 17:00	15.5	13-Sep	16-Jul	17-Sep
20B070	16	16	**16.8**	14-Aug 21:30	**16.2**	14-Aug	16-Jul	17-Sep
22A070	18	16	**21.6**	16-Aug 19:30	**19.6**	14-Aug	16-Jul	17-Sep
23A070	18	17.5	**24.7**	16-Aug 18:30	**22.8**	16-Aug	14-Jul	23-Sep
23A160	18	16	**25**	16-Aug 17:00	**22.8**	15-Aug	15-Jul	22-Sep
23G070	18	16	**25.6**	17-Aug 4:00	**24**	15-Aug	15-Jul	25-Sep
26B070	18	17.5	17.1	16-Aug 16:30	16.5	28-Jul	22-Jul	22-Sep
27B070	18	16	**18.5**	16-Aug 20:00	**17.6**	15-Aug	15-Jul	23-Sep
27D090	18	16	**26**	16-Aug 17:00	**24.1**	14-Aug	15-Jul	23-Sep
28C070	18	17.5	**23.1**	16-Aug 19:00	**21.9**	15-Aug	15-Jul	23-Sep
29B090	18	16	10.5	22-Jul 15:30	10.2	15-Aug	22-Jul	23-Sep
29D070	18	16	**22.1**	17-Aug 18:30	**21.1**	16-Aug	22-Jul	23-Sep
34A170	20	20	**24**	18-Aug 18:00	**23.3**	16-Aug	29-Jul	8-Oct
35B060	18	17.5	**24.2**	18-Aug 16:00	**23.5**	15-Aug	29-Jul	8-Oct
49A190	18	17.5	**26.6**	17-Aug 18:00	**25.7**	16-Aug	4-Aug	5-Oct
59A140	18	17.5	**22.8**	17-Aug 20:00	**22.1**	16-Aug	5-Aug	7-Oct

[a] Seven-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.

The seasonal maximum at most stations (25 stations; 68%) failed to meet 1997 water quality criteria. Likewise, the 7DADM failed to meet the basic 2006 criteria at most stations (27 stations; 73%). Although these percentages are lower than last year, that is likely an artifact of fewer successful deployments in eastern Washington in 2008 and not necessarily an indication of cooler stream temperatures.

The four monitored stations with the warmest seasonal water temperatures in 2008 were:

- Okanogan River at Oroville, 49A190, 26.6 ºC.
- East Fork Lewis River, 27D090, 26.0 ºC.
- South Fork Chehalis River at Beaver Creek, 23G070, 25.6 ºC.
- Chehalis River at Dryad, 23A160, 25.0 ºC.

Metals Monitoring

During WY 2008, of the 1,224 possible metals results (12 stations x 6 months x 17), we failed to collect 17 results. The field staff could not sample the Columbia River at Northport in February due to snow. Of the 639 dissolved metals and total mercury results reported, 8 (1.2%) exceeded 2006 Washington State water quality standards chronic criteria (Table 8). Dissolved zinc exceeded the criterion in the Spokane River at Stateline every time it was sampled, and dissolved lead exceeded the criterion in June. The Spokane River has a TMDL for metals, mostly due to legacy contamination from upstream mining practices. Three of the four highest mercury results were from Leach Creek near Steilacoom; one result exceeded the mercury criterion. Leach Creek is on the current 303(d) List for mercury (listing ID 3745).

Table 8. Metals results from Water Year 2007 exceeding the 2006 water quality standards criteria.

Station	Name	Date	Metal	Hardness (mg/L)	Result (µg/L)	Chronic Criterion (µg/L)	Acute Criterion (µg/L)	Percent Over Chronic Criterion
57A150	Spokane R @ Stateline Br	10/2/2007	Zn_DIS	21.6	28.8	28.5	31.2	1
57A150	Spokane R @ Stateline Br	12/11/2007	Zn_DIS	22.5	49.1	29.5	32.3	66
57A150	Spokane R @ Stateline Br	2/19/2008	Zn_DIS	23.2	50.3	30.3	33.2	66
57A150	Spokane R @ Stateline Br	4/14/2008	Zn_DIS	23	62.3	30.1	33.0	107
57A150	Spokane R @ Stateline Br	6/10/2008	Zn_DIS	17.2	45.7	23.5	25.8	94
57A150	Spokane R @ Stateline Br	6/10/2008	Pb_DIS	17.2	1.48	0.35	9.1	317
57A150	Spokane R @ Stateline Br	8/12/2008	Zn_DIS	18.5	33.4	25.0	27.4	34
12B070	Leach Cr near Steilacoom	8/20/2008	Hg	72	0.037	0.012	2.1[a]	208

Zn DIS – dissolved zinc.
Pb_DIS – dissolved lead.
Hg – mercury.

Nitrogen in Puget Sound Area Rivers

Concentration Trends

Globally conducting a large number of trends at multiple stations will likely identify some trends as statistically significant that are, in fact, due to random chance. Selecting individual trends from a bulk analysis is statistically suspect, at least at the reported level of confidence. Nevertheless, meaningful patterns may emerge from this type of analysis, and consistent trends at a given station in multiple parameters lend confidence that the trend is environmental and not random.

Note, also, that the time period selected can affect the trend. Trends in short time periods may be different than trends in long time periods. In particular, even long-term trends are not necessarily predictive of short-term future conditions.

There are several trend patterns at our long-term Puget Sound area stations worthy of note (Table 9 and Appendix E, Table E-1).

- Only one station displayed a consistent trend in flow (specifically, instantaneous flow at the time of sampling). Both annual and summer flows increased in the Skokomish River (16A070) in both time periods evaluated.
- Statistically significant TN concentration trends were uniformly down. The Stillaguamish, Cedar, and Skokomish Rivers (05A070, 08C070, and 16A070, respectively) exhibited consistent downward trends for all analyses (annual, summer, and both adjusted and unadjusted for flow).
- Statistically significant NO23 trends were more mixed. Concentrations in the Cedar and Skokomish Rivers again declined, but concentrations in the Deschutes and Elwha Rivers have increased. The increase in the Deschutes appears to have begun in 2001 (Figure 1).
- Summer NO23 concentrations, in particular, show indications of increasing in the Snohomish, Green, and Deschutes Rivers (07A090, 09A190, 13A060, respectively). Concentrations are likely declining in the North Fork Stillaguamish, Cedar, and Skokomish Rivers (05B070 and 05B110, 08C070, and 16A070, respectively).

Table 9. Statistically significant (p<0.10) trends in flow, total nitrogen, and nitrate plus nitrite.

"All" refers to all months; "Sum" includes July through September; "FA" indicates data were flow-adjusted, "95" and "88" indicate data records beginning in WY 1995 or WY 1988, respectively; shaded station names indicate downstream stations; arrows indicate increasing (↑) and decreasing (↓) trends; id=Insufficient Data.

Station	Flow				TN				NO23							
	All		Sum		All	FA All	Sum	FA Sum	All		FA All		Sum		FA Sum	
	95	88	95	88	95	95	95	95	95	88	95	88	95	88	95	88
01A050					↓											
01A120					↓	↓										
03A060				↓	↓										↑	
03B050					↓		↓			↓						
04A100				↓	↓											
05A070					↓	↓	↓	↓		↓				↓		
05A090	id	id	id	id		id	↓	id			id	id	↓		id	id
05A110	id	id	id	id		id		id			id	id			id	id
05B070					↓		↓						↓	↓		
05B110					↓								↓	↓	↓	
07A090														↑		↑
07C070																
07D050					↓											
07D130																↑
08C070					↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓	↓
08C110					↓				↓		↓		↓			
09A080								↓								
09A190														↑		↑
10A070					↓									↑		
11A070		↓			↓					↓				↓		
13A060									↑	↑		↑	↑	↑		↑
16A070	↑	↑	↑	↑	↓	↓	↓	↓		↓		↓		↓	↓	↓
16C090																
18B070									↑		↑					

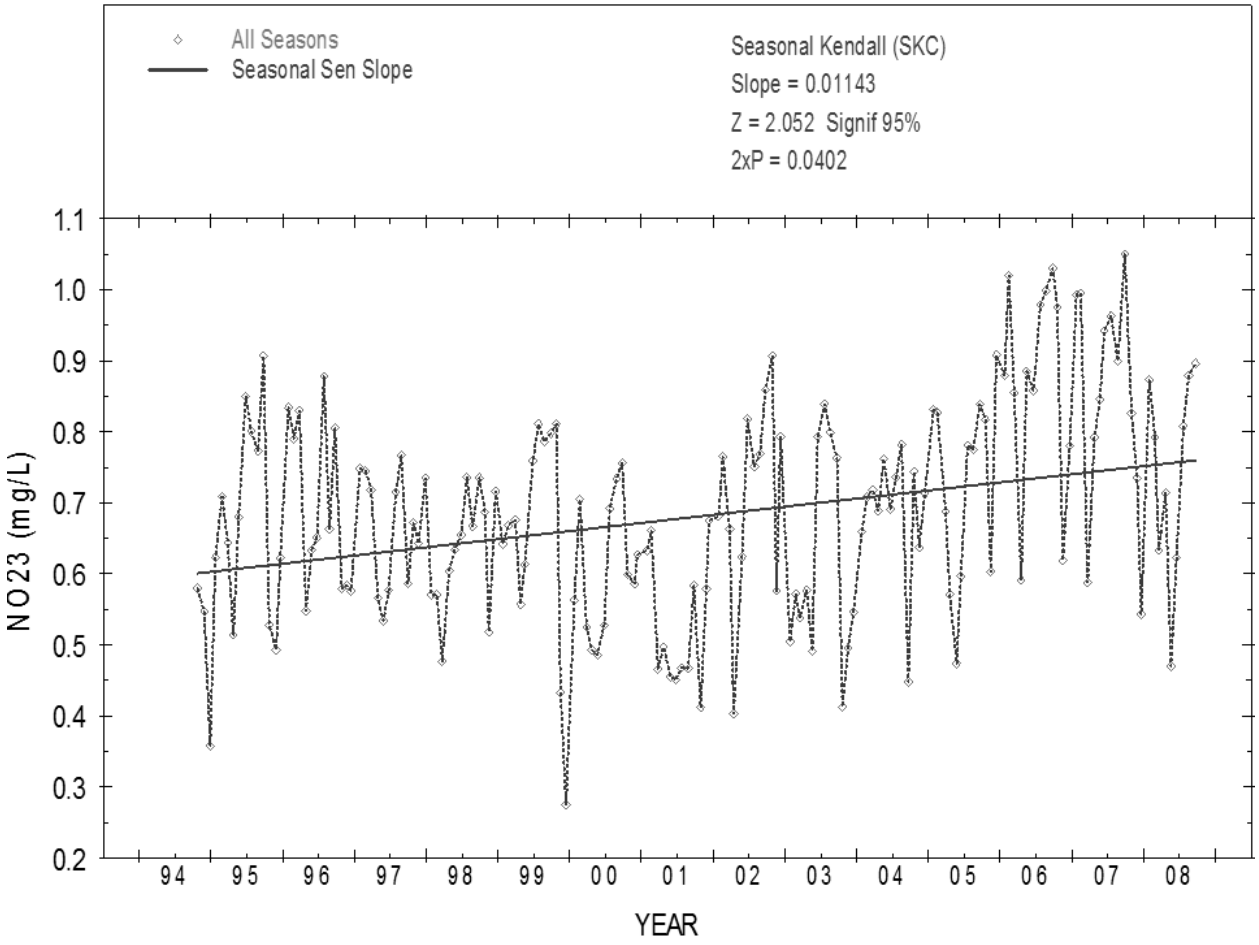


Figure 1. Nitrate plus nitrite-nitrogen in the Deschutes River at E Street.

Flux and Yield

Flux is the amount of a substance passing a sampling station in a specified time period, and *yield* is flux normalized for a watershed area. Flux is typically higher in larger watersheds with more runoff. Yields, on the other hand, may indicate higher natural sources in the watershed, or greater human impacts. Flux relates more directly to impacts on Puget Sound while yield relates more to what is happening in the watershed. If flows are low, flux may be low despite high yields. Nevertheless, areas with higher yields may be more responsive to management actions.

The pattern of year-round yields was similar for TN, NO23 since 1995, and NO23 since 1988. The Samish River (03B050) had the highest yields, followed by the Stillaguamish and Nooksack Rivers (05A070 and 01A050). (Table 10 and Appendix E, Table E-2.)

Table 10. Average yields at long-term Puget Sound stations (kg/month/sq. km.).

"All" refers to all months, "summer" includes July through September. Data are from WY 1995 through WY 2007 unless otherwise indicated. Shaded station names indicate downstream stations. Darker shading in the table body indicates higher relative yield within a column.

Station	TN (all)	NO23 (all)	NO23 (all-1988-2007)	TN (summer)	NO23 (summer)	NO23 (summer-1988-2007)
01A050	75.3	59.0	57.0	16.0	13.0	12.9
01A120	46.8	35.6	34.0	12.1	8.8	8.5
03A060	24.7	16.9	17.3	7.8	4.5	4.9
03B050	88.7	73.5	75.6	9.9	8.6	9.1
04A100	14.4	9.6	9.4	7.2	5.1	5.2
05A070	76.3	57.2	54.4	11.4	7.5	7.8
05B070	62.9	48.8	48.3	9.6	6.5	6.8
05B110	65.8	48.9	46.7	5.3	3.9	3.9
07A090	56.9	43.9	43.2	11.8	8.3	7.4
07C070	39.0	30.1	27.7	8.9	5.5	4.9
07D050	66.9	50.7	50.7	12.6	9.2	9.2
07D130	47.1	38.7	38.1	12.6	10.1	9.7
08C070	37.4	32.2	31.2	8.3	6.4	6.1
08C110	30.0	25.6	26.3	15.2	13.5	13.1
09A080	47.4	36.6	34.4	10.6	7.6	7.6
09A190	22.6	17.1	17.0	4.1	2.3	1.9
10A070	34.9	24.6	25.4	9.5	6.3	6.0
11A070	33.7	21.1	22.4	7.0	4.6	5.1
13A060	50.5	42.1	41.6	15.6	14.0	13.0
16A070	14.7	9.6	12.1	2.7	1.7	1.7
16C090	9.7	6.1	5.9	2.5	1.2	1.1
18B070	10.8	4.3	4.1	3.3	0.8	0.7

The pattern for July through September yields was also similar for TN, NO23 since 1995, and NO23 since 1988. However, the pattern in summer yields differed from the year-round yield. For summer months, the Nooksack, Cedar, and Deschutes Rivers (01A050, 08C110, and 13A060, respectively) had the highest yields (Figure 2, Table 10, and Appendix E, Table E-2).

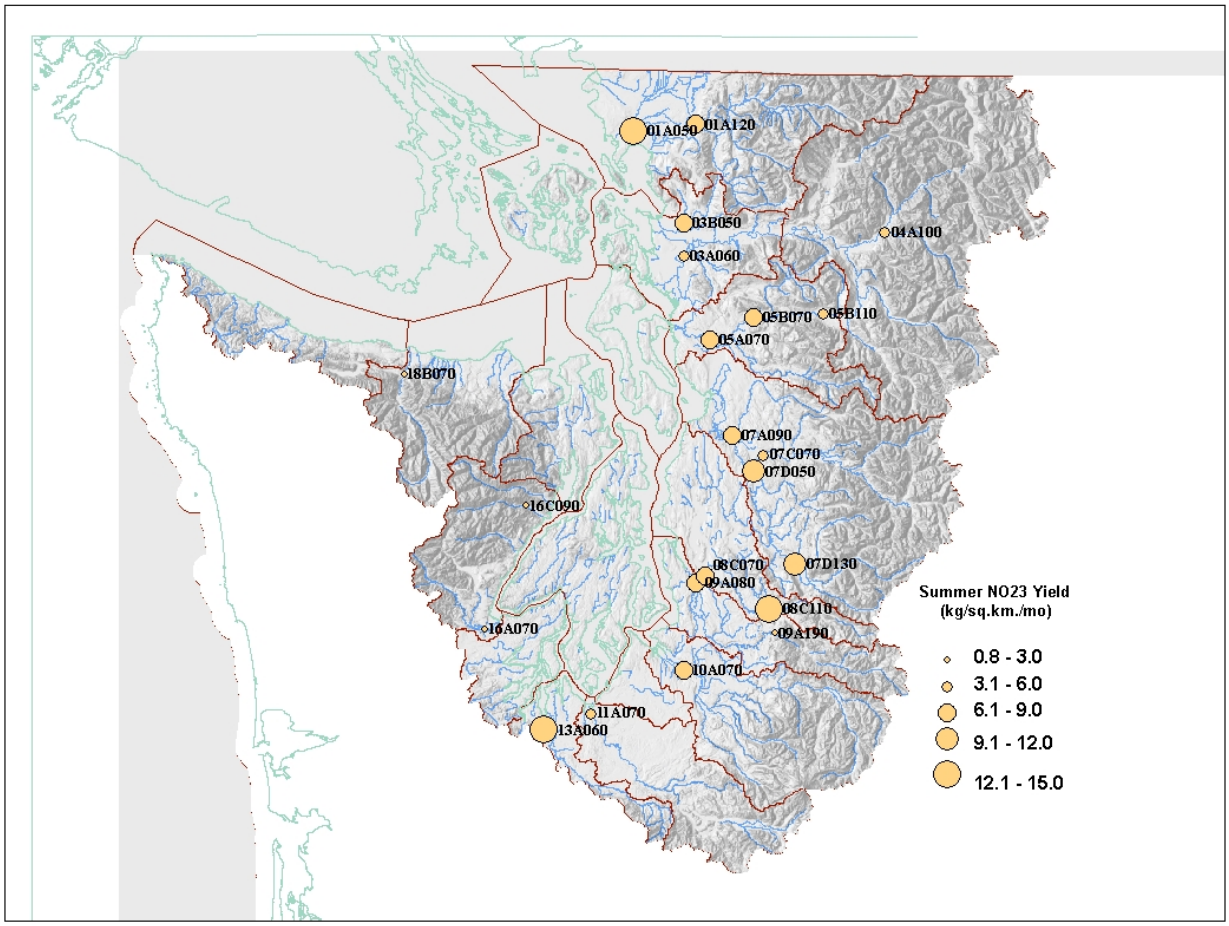


Figure 2. Yields at long-term Puget Sound stations.

The relative year-round yield results are consistent with those reported by Embry and Inkpen (1998). Note, however, that besides using a different data period, Embry and Inkpen reported inorganic nitrogen yields (NO23 plus ammonia). Also, Embry and Inkpen did not include upstream stations in their analysis.

Summer flux was similar at the two stations with the largest watershed areas, the Skagit River near Mount Vernon (03A060; 8010 sq. km.) and the Snohomish River at Snohomish (07A090; 4439 sq. km.). Year-round, however, flux was greater at the Snohomish station, despite the smaller watershed area, due to the higher yield (Table 11 and Appendix E, Table E-2).

Yield trends, where significant, were mainly downward (Table 12 and Appendix E, Table E-1). However, trends increased at three stations (07C070-Skykomish River at Monroe, 09A190-Green River at Kanaskat, and 10A070-Puyallup River at Meridian Street), but only during summer months and only in the longer data series. (Yield trends and flux trends are equivalent, since for a given station, yield is flux divided by a constant.)

Table 11. Flux at long-term Puget Sound stations (kg/month).

"All" refers to all months; "summer" includes July through September. Data are from WY 1995 through WY 2007 unless otherwise indicated. Shaded station names indicate downstream stations. Darker shading in the table body indicates higher relative flux within a column.

Station	TN (all)	NO23 (all)	NO23 (all-1988-2007)	TN (summer)	NO23 (summer)	NO23 (summer-1988-2007)
01A050	154071	120719	116627	32737	26599	26395
01A120	72242	54953	52484	18678	13584	13121
03A060	197868	135383	138587	62484	36049	39253
03B050	20216	16752	17231	2256	1960	2074
04A100	46993	31328	30676	23496	16643	16970
05A070	110072	82518	78479	16446	10820	11252
05B070	42682	33115	32775	6514	4411	4614
05B110	13975	10385	9918	1126	828	828
07A090	252593	194883	191775	52383	36846	32850
07C070	84242	65018	59833	19224	11880	10584
07D050	119230	90403	90403	22429	16374	16374
07D130	45746	37587	37004	12238	9810	9421
08C070	18017	15512	15030	3998	3083	2939
08C110	9479	8089	8310	4803	4266	4139
09A080	54076	41712	39248	12056	8624	8712
09A190	13463	10186	10127	2442	1370	1132
10A070	84882	59878	61946	23218	15416	14570
11A070	62145	38910	41307	12909	8483	9405
13A060	21058	17555	17347	6505	5838	5421
16A070	8643	5644	7114	1587	999	999
16C090	1658	1043	1009	427	205	188
18B070	8224	3274	3122	2513	609	533

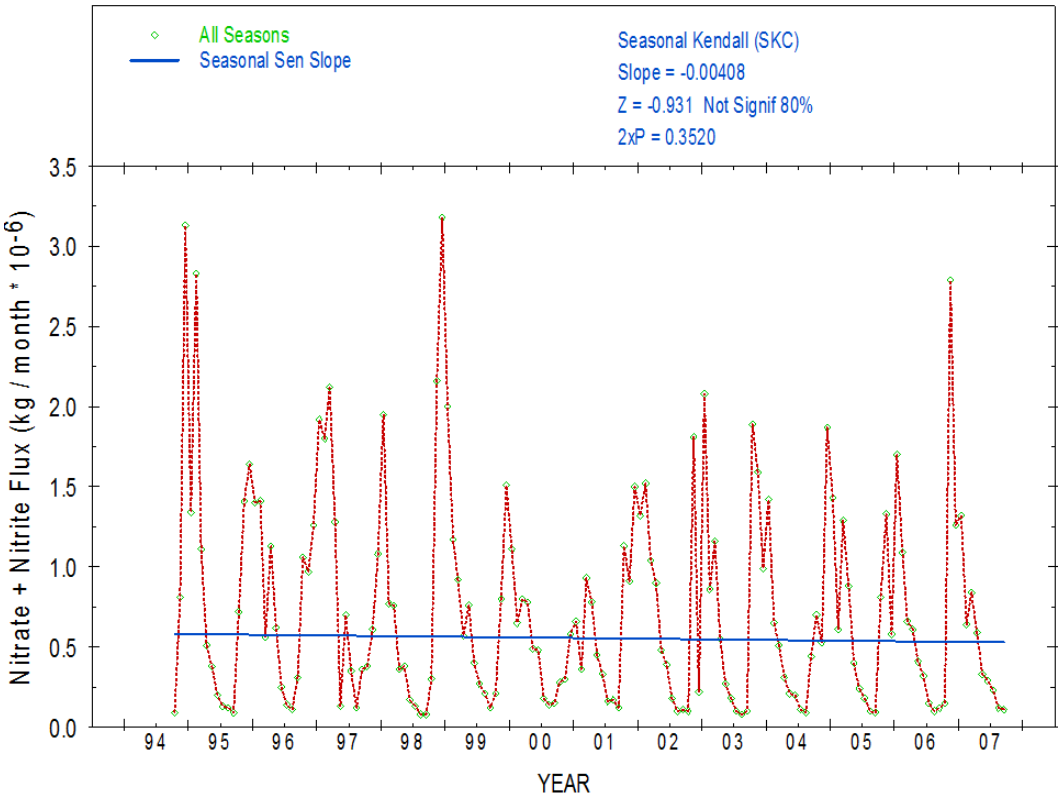
There was no significant trend in the NO23 flux from all major rivers entering Puget Sound, but there was a small decreasing trend in TN (Figure 3). The flux itself was highly seasonal. Both NO23 and TN were highest in the winter, especially November through January, and lowest in the summer. However, there were no seasonal components to the trends.

Total flux should have the strongest relationship to nitrogen-related trends within Puget Sound. This analysis implies that the freshwater contribution to nitrogen in the marine environment has not increased in the last 15 years. However, nitrogen trends from other potentially significant sources are unknown, and these may also affect marine nitrogen concentrations. These sources include loading downstream of our monitoring stations (for example, wastewater treatment plant discharges directly to Puget Sound), loading from smaller tributaries, loading associated with storm events, and loading from groundwater. Other factors that might affect the relationship between freshwater flux and marine nitrogen concentrations include freshwater residence time in Puget Sound, nitrogen sedimentation rate in Puget Sound, and biological exchange of atmospheric nitrogen.

Table 12. Trends in total nitrogen and nitrate plus nitrite yields.

"All" refers to all months; "Sum" includes July through September; "1995" and "1988" indicate data records of WY 1995 through WY 2007 or WY 1988 through WY 2007, respectively. Shaded station names indicate downstream stations; arrows indicate statistically significant increasing (↑) and decreasing (↓) trends at the 90% confidence level; id=Insufficient Data.

Station	TN		NO23			
	all	sum	all		sum	
	1995	1995	1995	1988	1995	1988
01A050	↓					
01A120	↓					
03A060	↓		↓	↓		↓
03B050	↓		↓	↓		
04A100						
05A070	↓	↓	↓		↓	
05A090	id	id	id	id	id	id
05A110	id	id	id	id	id	id
05B070						↓
05B110	↓		↓	↓		
07A090						
07C070						↑
07D050			↓	↓		
07D130	↓					
08C070	↓					
08C110						
09A080						
09A190						↑
10A070						↑
11A070	↓	↓		↓		↓
13A060						
16A070				↓		
16C090						
18B070						



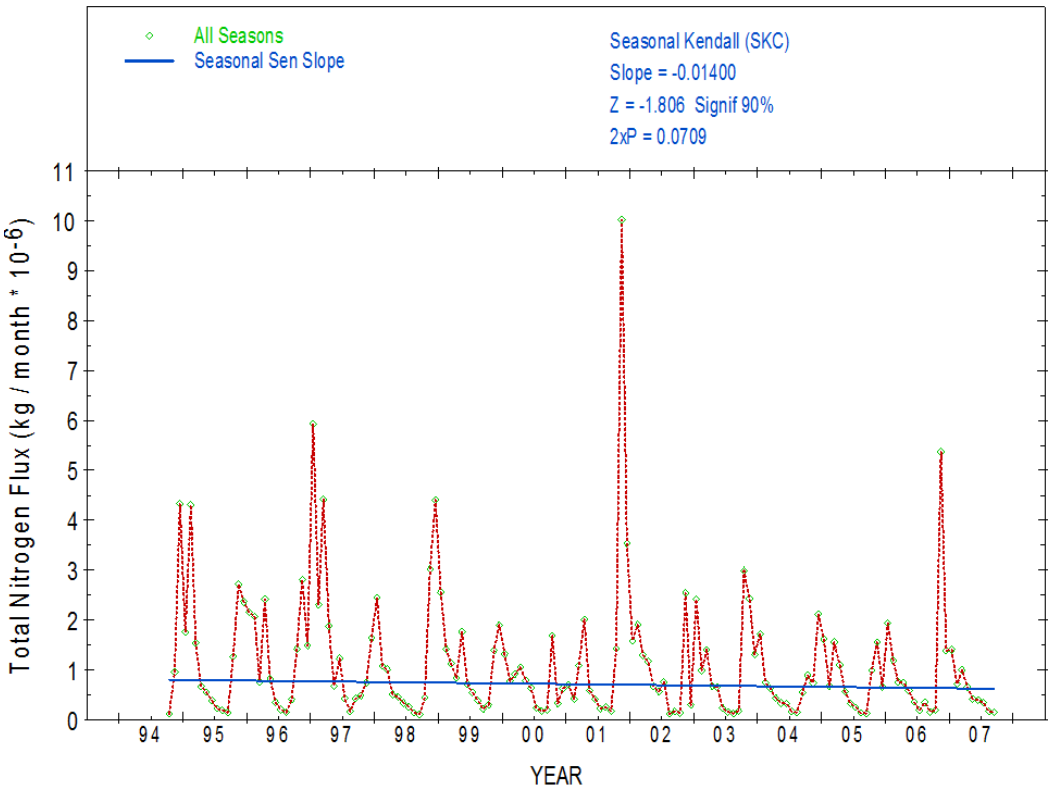


Figure 3. Nitrate plus nitrite (top) and total nitrogen (bottom) flux entering Puget Sound from the 13 largest rivers (see Table 4).

Quality Assurance

In 2008 we collected more than 18,000 non-QC water quality results, including metals and various other parameters in addition to the standard 12 parameters listed under *Sample Collection and Analysis*.

- Thirty-six results (0.2%) were coded "4" indicating that the data are usable, but there were questions about the quality. These were mostly nutrients where the result for the total fraction was less than the dissolved fraction by a sufficiently large margin to render one or both results questionable.
- Twenty 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. Fourteen of these were temperature results from one survey where the thermistor calibration had shifted about 3°C. Four were dissolved total nitrogen results that were rejected due to nitrogen contamination from the cellulose acetate filter.

The nitrogen contamination issue became apparent during analysis of the data, when the analyst discovered that the dissolved TN results were frequently greater than the whole water TN. A series of experiments showed that about 0.7 µg N/cm^2 can leach from the filters. This is generally not a problem for small syringe-type filters, though they should be thoroughly rinsed. But the 142 mm diameter filters used by ambient samplers can contaminate samples even when rinsed according to standard protocols. These filters should be avoided when sampling dissolved nitrogen.

MEL assigned a qualifier to 14% of results. A total of 264 results (1.5%) were qualified as estimates ("J"), 2191 results (12%) as below the reporting limit ("U"), and 11 results (0.1%) were coded for both reasons ("UJ"). Eighty-one percent of all ammonia results were below the reporting limit, as were 15% of orthophosphate results (Table 13).

Data verification identified no instances where results in the EIM database were different than results in our primary database. However, 5 results were not found in EIM for unknown reasons; these were subsequently loaded.

There were 24 instances where results in our preliminary web database differed from those in our primary database. Sixteen of these were field data qualified or corrected in the primary database after uploading data to the web. Seven were results that did not get uploaded to the web at all. One result found on the web was not in our primary database (it was removed from the web).

Table 13. Results qualified by Manchester Environmental Laboratory as being below the reporting limit.

Parameter	Reporting Limit (mg/L except NTU for turbidity)	Number of results coded U or UJ	Number of results recorded	Percent of results coded U or UJ
Alkalinity	5	0	578	0.0%
ammonia	0.01 (most)	936	1158	80.8%
fecal coliform	1	139	1169	11.9%
hardness	Not specified	0	578	0.0%
metals	Various	492	1207	40.8%
nitrate+nitrite	0.01	69	1158	6.0%
nitrogen, total	0.025	7	1158	0.6%
organic carbon, diss.	1	14	122	11.5%
organic carbon, total	1	39	230	17.0%
orthophosphate	0.003	176	1157	15.2%
phosphorus, total	0.001	161	1158	13.9%
suspended solids	1 (mostly)	100	1179	8.5%
turbidity	0.5	69	1158	6.0%

Comparison to Quality Control Requirements

Decision Quality Objectives

Decision quality objectives (DQOs) are based on RMS values by concentration range (Table 14). 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 have a variance of zero for sample pairs below this limit.

In general, variability of repeated measures followed the expected pattern of field sequential samples > field split samples > lab split samples. In a few cases, field sequential samples 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 and somewhat lower than the unusually high variability reported last year.

Three 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. Two ammonia ranges failed, each due to a single split pair with a particularly high variance. One phosphorus range failed due to two particularly poor split pairs.

Table 14. 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	$s_{error\ (mp)}$ [a]	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	0.80 0.63 0.58 1.67	7 28 6 20	NA 0.00 0.91 0.35	0 4 3 8	No lab splits	
Fecal col. bacteria (colonies /100 mL)	1-1000 >1000	88 176	10.3 NA	61 0	No field splits		4.23 NA	181 0
NH_3-N (µg N/L)	≤20 >20-100 >100	1.76 8.8 17.6	1.33 **16.6** NA	57 4 0	**1.88** **11.9** NA	57 4 0	0.26 3.94 NA	65 5 0
Nitrogen, total (µg N/L)	≤100 >100-200 >200-500 >500	8.8 17.6 44 88	8.49 11.1 12.1 **198**	10 11 13 27	4.72 4.27 7.78 **215**	13 11 14 23	2.34 4.74 3.92 17.3	16 18 17 23
NO_3NO_2-N (µg N/L)	≤100 >100-200 >200-500 >500	8.8 17.6 44 88	1.33 2.72 3.72 **102**	19 9 14 19	0.58 0.92 2.07 32.3	19 10 12 20	0.68 0.78 1.39 8.50	25 14 15 18
Oxygen, dissolved (mg O_2 /L)	≤ 8 > 8-10 > 10-12 >12	0.70 0.88 1.06 2.11	NA 0.04 0.12 0.08	0 8 32 20	No field splits		No lab splits	
pH	All	0.66	0.06	61	0.01	16	No lab splits	
Phosphorus, soluble reactive (µg P/L^{-1})	≤50 >50-100 >100	4.4 8.8 17.6	1.48 0.46 NA	58 3 0	1.43 1.19 NA	57 3 0	0.30 0.37 1.22	94 6 3
Phosphorus, total (µg P/L)	≤50 >50-100 >100	4.4 8.8 17.6	2.71 5.38 **56.7**	48 8 5	**5.55** 2.71 10.2	48 7 6	1.06 3.14 **30.3**	64 11 6
Solids, suspended (mg /L)	≤10 >10-20 >20-50 >50	0.88 1.76 4.4 8.8	0.58 **2.45** 1.32 **98**	46 5 4 6	No field splits		0.56 1.36 1.77 7.92	66 31 21 9
Temperature (°C)	All	2.64	0.09	59	No field splits		No lab splits	
Turbidity (NTU)	≤10 >10-20 >20-50 >50	0.88 1.76 4.4 8.8	0.43 1.12 2.5 **22.0**	49 4 2 5	No field splits		0.19 0.71 1.41 7.9	83 8 1 6

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

Seven 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. Most high RMSs occurred in the upper concentration range and can be attributed to one or two pairs with poor variance. As in years past, the variability in sequential samples for total suspended solids (TSS) concentrations tends to be particularly high. This underscores the inherent variability in measurements of stream sediment.

The criteria in Table 14 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 Quality Assurance Monitoring Plan (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 15.

No field split samples exceeded MQO criteria. Even sequential samples, which include instream variability, were all within MQO criteria.

Blanks

Almost all results for analyses of blank samples were "below reporting limits," and less than 3 µS (micro Siemens) for specific conductivity (Table 16). 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 13). Protocols specify that four dissolved metals blank samples should be submitted annually, one from each run. Each of the samples was analyzed for the eight dissolved metals. Two dissolved zinc results exceeded reporting limits of 1 µg/L (reported concentrations were 1.1 and 1.6 µg/L).

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 15. Average relative standard deviation of replicate samples collected in Water Year 2007.

"n" is the number of sample pairs. No results exceeded QAMP MQO criteria (Hallock, 2007).

Parameter (units)	Precision MQO (%)	Sequential Sample RSD (%)	*n*	Field Split RSD (%)	*n*
Alkalinity	10	0.6	29	No field splits	
Carbon, total organic	10	4.0	16	2.2	15
Carbon, dissolved organic	10	3.1	10	5.0	8
Specific conductance	10	0.5	61	0.13	15
Fecal col. bacteria (>20 colonies /100 mL)	50% < 20 90% < 50	30 19	46 15	No field splits	
Hardness	10	1.3	29	0.9	28
NH_3-N	10	6.9	61	5.8	61
Nitrogen, total	10	5.3	61	3.0	61
NO_3NO_2-N	10	1.9	61	0.9	61
Oxygen, dissolved	10	0.6	60	No field splits	
pH	10	0.5	61	No field splits	
Phosphorus, soluble reactive	10	5.9	61	4.6	60
Phosphorus, total	10	9.5	61	8.2	61
Solids, suspended	15	10.1	61	No field splits	
Temperature	10	0.5	59	No field splits	
Turbidity	15	11	60	No field splits	

Table 16. Results of field process blank (deionized water) samples.

Parameter	Reporting Limit	# Above Reporting Limit (concentration)	Sample Size, *n*
Metals (µg/L)	Various	2 (both dissolved zinc, 1.1 and 1.6 µg/L)	4 samples x 8 dissolved analytes
Carbon, dissolved organic (mg/L)	1	0	2
Carbon, total organic (mg/L)	1	0	3
Hardness (mg/L)	0.3	1 (0.44 mg/L)	6
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: 1.6 µS, std dev: 1.5)	11
Suspended solids (µg/L)	1	0	5
Total nitrogen (µg/L)	25	0	11
Total phosphorus (µg/L)	5	0	10
Turbidity (NTU)	0.5	0	6

Continuous Temperature Monitoring

Post-deployment calibration checks using a certified reference thermometer met or exceeded criteria for all instruments (Ward, 2005).

Most western Washington temperature loggers were deployed by mid-July, and most eastern Washington loggers were deployed between mid-July through the first week of August. Almost all western Washington loggers recorded the seasonal 7-day average maximums, and many of the eastern Washington loggers did not.

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 2008 by Ecology's River and Stream monitoring program can be used without qualification.
- Annual nitrogen yields in Puget Sound area watersheds were highest in the Samish, Nooksack, and Stillaguamish watersheds. Summer nitrogen yields were highest in the Nooksack, Cedar, and Deschutes watersheds.
- Among the 13 major rivers tributary to the Puget Sound, the Snohomish River represents the largest single source of nitrogen to Puget Sound.
- All long-term total nitrogen (TN) and most nitrate plus nitrite-nitrogen (NO23) trends, where significant, were down (decreasing concentrations). However, NO23 trends were clearly increasing in the Deschutes River at E Street, especially since 2001. (Note that the time period selected for analysis affects trends results.)

Recommendations

- When sampling dissolved nitrogen, small syringe-type filters should be thoroughly rinsed and the larger 142 mm diameter filters should not be used at all without extensive pre-rinsing and running extra blanks. This is due to nitrogen contamination from cellulose-acetate filters.
- All eastern Washington temperature loggers should be installed by early July to ensure they record the seasonal 7-day average maximums. Additional efforts should be made to retrieve (or replace) them before the streamflows increase in the fall. Otherwise there is a significant risk of data loss before they can be retrieved the following summer.
- Assisting with the deployment and retrieval of temperature loggers should be one of the assigned and scheduled duties of ambient monitoring staff in each of Ecology’s four regions. However, temperature monitoring should be conducted in a coordinated and consistent manner statewide.

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Appendices

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Appendix A. Station Description and Period of Record

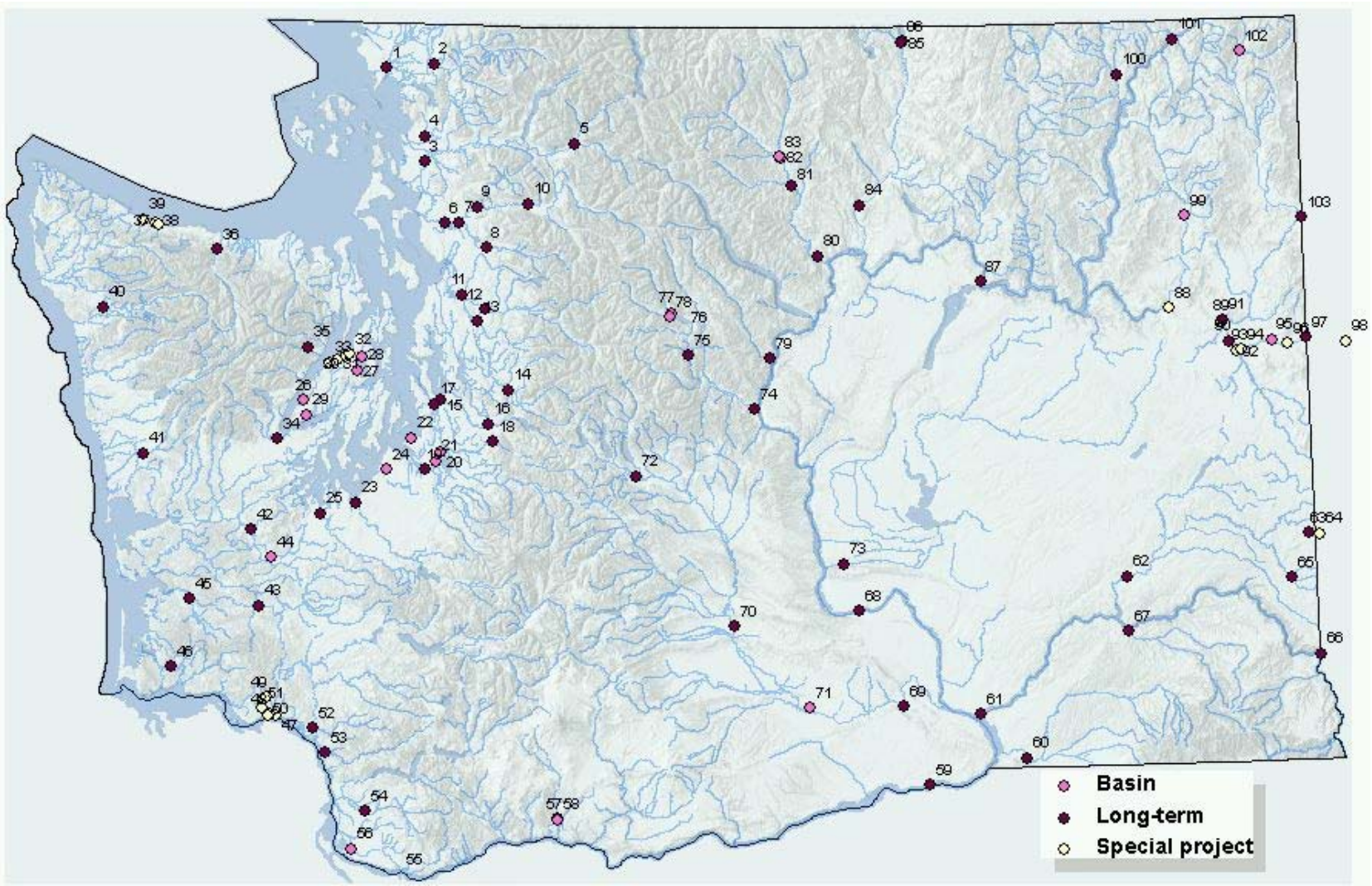

Figure A-1. Map showing stations monitored in Water Year 2008.

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			
03B080	Samish R. nr Prairie	B				X	
03C060	Friday Cr Blw Hatchery	B		X		X X	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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 @ Arlington	L		X X XX	XXXXXXXXXX	XX X XXXXX	XXXXXXXXXX
05A110	SF Stillaguamish nr Granite Falls	L	X XXXXXXX	X		X XXXXX	XXXXXXXXXX
05B070	NF Stillaguamish @ Cicero	L	XXXXXXXX	XX X XX	XXXXXXXXXX	XX X XXXXX	XXXXXXXXXX
05B090	NF Stillaguamish R @ Oso	B		X			
05B110	NF Stillaguamish nr Darrington	L		X		X XXXXX	XXXXXXXXXX
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	
07B090	Pilchuck R nr Lake Stevens	B		X			
07B120	Pilchuck R @ Robe-Menzel Rd.	B					X
07B150	Pilchuck R @ Menzel Lake Rd.	B					X

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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	
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			

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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 XXXXXXXXXX	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			
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	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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			
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

Station Number	Name	Long-term or Basin	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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	
15E070	Union R nr Belfair	B				X	X
15F050	Big Beef Cr @ Mouth	B					XXXXX
15G050	Little Mission Cr. @ Hwy 300	B					X

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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			
19B070	Hoko R nr Mouth	B		X			
19B090	Hoko R nr Sekiu	B		XX			
19C060	West Twin R. nr mouth	B					XXXXX

Station Number	Name	Long-term or Basin	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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 XXXXXXXXXX	X XXX XX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
22B070	WF Hoquiam R nr Hoquiam	B	XXXXX	XX		X	
22C050	Chehalis R nr Montesano	B		XX XX	XXXXXXXXXX	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	XXXXXXXXXX	XX X XXX	XXXXXXXXXX	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 XXXXXXXXXX	XXXX XXXXX	XXXXXXXXXX	XXXXXXXXXX	XXXXXXXXXX
23A100	Chehalis R @ Prather Rd	B				XXX	XXXX
23A110	Chehalis R @ Galvin	B		X X X			
23A120	Chehalis R @ Centralia	B		XX	XXXXXXXXXX	XX X	
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

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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			
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			

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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	
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
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		

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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
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	
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				

Station Number	Name	Long-term or Basin	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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				
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
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			

Station Number	Name	Long-term or Basin	Water Year Sampled					
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->	
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	XXXXXXXXXX	
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	
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	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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
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

Station Number	Name	Long-term or Basin	Water Year Sampled				
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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
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	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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
39A060	Yakima R @ Ellensburg	B				XX	XX
39A070	Yakima R nr Thorp	B		X X			
39A080	Yakima R @ Cle Elum	B	X XXXXXXXXXX	X			
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

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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
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

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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			
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

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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			
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	

Station Number	Name	Long-term or Basin	Water Year Sampled <---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->
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
57A144	Spokane River @ Sullivan Rd.	B					X
57A145	Spokane R @ Trent Br	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
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	

Station Number	Name	Long-term or Basin	Water Year Sampled					
			<---1960s--->	<---1970s--->	<---1980s--->	<---1990s--->	<---2000s--->	
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	XXXXXXXXXX	
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, and 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 Sep 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.
- October 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.
- November, 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.
- January 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?).
- Sep 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.
- October 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.
- Sep 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.
- November 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.
- Sep 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.

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.
- March 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.

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Appendix C. Water Year 2008: 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: Chris Coffin (509.454.4257; ccof461@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: Craig Homan (425.649.7008;chom461@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 2008.

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 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
10/23/2007 15:50	7.8	7340	70	11.3	7.42	215	0.448	0.01 U	0.355	0.156	0.01	120	68
	Lots of debris in water												
11/27/2007 16:00	3.9	2330	120	12.63	7.55	21	0.56	0.015	0.475	0.033	0.0098	9.9	52
12/18/2007 15:45	4.7	2850	121	12.2	7.44	18	0.775	0.032	0.678	0.027	0.01	12	18
1/29/2008 16:05	2	1820	156	12.83	7.33	9	0.859	0.033	0.802	0.023	0.0079	5.7	13
	Dry												
2/26/2008 16:25	6.7	2180	130	12.34	7.53	8	0.726	0.025	0.65	0.021	0.0086	4.7	1
	Strong manure odor												
3/18/2008 16:10	7	3080	118	11.9	7.44	18	0.731	0.023	0.611	0.035	0.0096	11	16
4/22/2008 14:50	8.2	1950	123	11.74	7.58	9	0.544	0.02	0.49	0.016	0.0059	4.3	1
5/20/2008 15:10	7	15000	48	12.1	7.27	510	0.18	0.01 U	0.115	0.397	0.006	290	48
6/17/2008 15:30	10.5	6290	67	11.2	7.49	54	0.18	0.01 U	0.137	0.067	0.007	28	21
7/29/2008 16:00	13.7	2460	85	10.5	7.7	18	0.12	0.01 U	0.102	0.027	0.0084	10	14
8/19/2008 15:30	13.7 J	2580	77	10.3	7.51	139	0.16	0.01 U	0.134	0.213	0.0059	100	89
	Silty												
9/23/2008 14:50	11.1 J	1310	107	11.1	7.72	18	0.22	0.01 U	0.182	0.031	0.0092	7.9	40

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
10/23/2007 15:00	7.9	7080	62	11.4	7.53	177	0.24	0.01 U	0.186	0.133	0.0047	70	6
Lots of debris in water.													
11/27/2007 15:15	4.4	2350	96	12.53	7.61	15	0.297	0.01 U	0.245	0.015	0.0049	11	25
12/18/2007 14:55	4.3	2830	91	12.3	7.59	19	0.375	0.01 U	0.327	0.023	0.0058	7.7	10
1/29/2008 15:15	2.4	1620	111	13.33	7.89 J	4	0.36	0.01 U	0.293	0.0078	0.0048	2.1	2
Mixed rain and snow													
2/26/2008 15:30	5.4	1770	99	13.06	7.7	9	0.287	0.01 U	0.271	0.013	0.0039	6.5	1
Strong manure odor													
3/18/2008 14:50	7	2590	89	12.2	7.62	14	0.292	0.01 U	0.269	0.022	0.0048	9.8	1
4/22/2008 14:00	7.7	1890	98	12.13	7.73	4	0.245	0.01 U	0.221	0.0089	0.0032	2.6	1 U
5/20/2008 14:15	6.5	18800	45	12.3	7.24	870	0.17	0.01 U	0.1	0.741	0.0058	320	100
Many logs going by.													
6/17/2008 14:45	9.3	7610	58	11.5	7.37	32	0.099	0.01 U	0.07	0.035	0.0036	17	7
7/29/2008 14:35	11.9	2450	77	11.2	7.81	11	0.055	0.01 U	0.039	0.016	0.003 U	1.6	1
8/19/2008 14:40	12.8 J	2800	69	10.4	7.57	118	0.078	0.01 U	0.068	0.163	0.0041	90	41
Silty													
9/23/2008 14:00	10.3 J	1390	96	11.4	7.77	7	0.11	0.01 U	0.089	0.014	0.0033	4.9	7
Manure odor													

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
10/24/2007	10:30	8.2	16900	47	11	8.07	32	0.15	0.01 U	0.102	0.018	0.0043	6.2	7
11/28/2007	9:40	5.4	9670	66	12.03	7.48	9	0.16	0.01 U	0.12	0.005 U	0.0035	2.6	13
12/19/2007	10:05	5.8	13500	60	12	7.42 J	92	0.22	0.011	0.182	0.037	0.0045	11	4 J
		Lots of new logs up against bridge supports												
1/30/2008	10:00	3.3	12400	68	12.93	7.51	21	0.17	0.01 U	0.12	0.014	0.0037	4.4	4
2/27/2008	9:30	5	11100	69	12.75	7.43	15	0.17	0.01 U	0.151	0.013	0.003 U	4.4	1
3/19/2008	8:50	5.5	11300	71	12.3	7.47 J	11	0.16	0.01 U	0.143	0.0081	0.0032	2.8	3
4/23/2008	9:20	7.5	8470	74	11.64	7.62	6	0.142	0.01 U	0.112	0.0063	0.0033	1.6	1
5/21/2008	9:15	6.6	64800	33	12	7.2	220	0.13	0.01 U	0.09	0.167	0.0038	90	52
6/18/2008	8:55	9	22200	39	11.5	7.35	22	0.095	0.01 U	0.062	0.018	0.003 U	8.7	17
7/30/2008	8:05	11.8	14700	44	11	7.33	25	0.059	0.01 U	0.044	0.017	0.003 U	4.6	8 J
8/20/2008	9:10	13.7 J	11600	45	9.9	7.29	60	0.062	0.01 U	0.049	0.0658	0.006	27	59
		Silty												
9/24/2008	8:40	11 J	6720	61	10.5	7.34	9	0.085	0.01 U	0.056	0.011	0.003 U	2.4	9

Metals 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		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
10/24/2007	10:30		21.1	0.1 U	0.02 U	0.92	0.33	1.12	0.	61	0.2	0.032	0.002 U	0.65	0.75	5 U	1
12/19/2007	10:05		27.4	0.1 U	0.02 U	3.4	0.55	2.66	0.	63	0.47	0.025	0.0046	1.36	1.09	5	1.6
2/27/2008	9:30		29.5	0.1 U	0.02 U	0.75	0.31	0.97	0.	52	0.14	0.02 U	0.002 U	0.82	0.65	5 U	3.72
4/23/2008	9:20		33.8	0.1 U	0.02 U	0.68	0.32	0.62	0.	31	0.1 U	0.02 U	0.002 U	0.67	0.6	5 U	1 U
6/18/2008	8:55		16.7	0.1 U	0.02 U	1.6	0.32	1.57	0.	49	0.26	0.028	0.0025	0.69	0.82	5 U	1.6
8/20/2008	9:10		20.5	0.1 U	0.02 U	1	0.25 U	2.23	0.	4	0.31	0.02 U	0.002 U	0.32	0.69	5 U	1 U

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
10/24/2007 9:40	9.4	175	82	10.7	7.43	9	0.656	0.017	0.467	0.021	0.01	5.3	27
11/28/2007 9:05	4.7	151	85	12.23	7.42	6	0.805	0.019	0.647	0.019	0.0077	5.5	55
	Salmon												
12/19/2007 9:25	6.2	499	67	12	7.23	65	1.17	0.016	1.01	0.0901	0.0093	34	200 J
	Deeper and faster than normal. Very silty												
1/30/2008 9:25	3.5	239	84	13.03	7.35	9	1.03	0.018	0.816	0.022	0.0069	7.9	51
2/27/2008 8:10	6.3	234	77	12.34	7.42	9	0.835	0.01 U	0.749	0.019	0.0049	5.5	23 J
3/19/2008 8:15	5.9	301	71	12.2	7.37	8	0.802	0.01 U	0.711	0.021	0.0055	5.5	9
	Rick Haley sampled at the same time. DO = 11.7, turbidity = 4.34, conductivity = 70.2, pH = 7.58												
4/23/2008 8:30	8.3	176	79	11.14	7.42	6	0.717	0.012	0.648	0.02	0.0067	4.9	27 J
5/21/2008 8:40	10.4	383	59	11	7.27	20	0.486	0.025	0.352	0.042	0.0066	15	460
6/18/2008 8:10	11.4	178	73	10.7	7.38	7	0.571	0.01 U	0.442	0.02	0.0055	4.9	54
7/30/2008 7:35	12.3	43	114	10.4	7.59	3	0.707	0.01 U	0.615	0.01	0.0036	1.3	170 J
8/20/2008 8:10	14.3 J	54	112	9.19	7.41	4	0.67	0.01 U	0.562	0.021	0.0081	3.6	490
	Rick Haley from Skagit County doing side-by-side sampling: Temp=14.3, conductivity = 113, pH = 7.17												
9/24/2008 8:10	10.6 J	52	111	9.9	7.43	5	0.695	0.025	0.548	0.026	0.0096	4.7	54

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
10/23/2007 13:05	7.8	7520	43	11.6	7.41	8	0.1	0.01 U	0.061	0.0086	0.003 U	1.8	4
11/27/2007 12:50	7.2	4350	61	12.03	7.65	1	0.081	0.01 U	0.055	0.005 U	0.003 U	0.5 U	1
12/18/2007 12:55	6.5	4890	59	12	7.51	3	0.09	0.01 U	0.073	0.005 U	0.003 U	2	1
1/29/2008 13:00	3.7	7670	69	12.33	7.62 J	2	0.09	0.01 U	0.055	0.005 U	0.003 U	0.6	1 U
	Snow												
2/26/2008 13:40	5.4	4140	67	13.16	7.53	1 U	0.081	0.01 U	0.061	0.005 U	0.003 U	0.5 U	1 U
3/18/2008 12:50	4.9	5990	67	12.9	7.64 J	1	0.084	0.01 U	0.058	0.005 U	0.003 U	0.6	1 U
	After recalibration pH = 7.35 at 6.6C. Bridge being inspected by WA DOT.												
4/22/2008 12:20	6.1	4510	70	12.53	7.73	1	0.08	0.01 U	0.06	0.005 U	0.003 U	0.8	1 U
5/20/2008 12:25	6.2	16500	27	12.3	6.95	85	0.11	0.01 U	0.076	0.0565	0.003 U	18	9
6/17/2008 12:30	7.8	5750	31	12.2	7.27	2	0.087	0.01 U	0.056	0.048	0.003 U	1.6	1 U
7/29/2008 12:55	10.7	5440	43	11.4	7.58	1	0.063	0.01 U	0.051	0.005 U	0.003 U	1.6	1
8/19/2008 12:40	11.5 J	4540	43	11.2	7.53	1	0.067	0.01 U	0.052	0.0055	0.003 U	1.2	12
9/23/2008 12:15	9.6 J	4050	53	11.6	7.63	1	0.087	0.01 U	0.06	0.005 U	0.003 U	0.9	1 U

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
10/23/2007	9:20	7.2	4864 J	38	11.7	8.06	36	0.298	0.01 U	0.216	0.034	0.0055	21	12
		Changed battery in pH meter and recalibrated. 2nd pH was 6.95 @ 11.3 celsius												
11/27/2007	9:50	3.8	1589 J	68	12.53	7.39	5	0.387	0.017	0.323	0.012	0.0075	4.1	20
12/18/2007	9:20	4.6	3435.8 J	56	12.6	7.33	13	0.511	0.014	0.457	0.036	0.007	24	22
		Strong manure odor from field bordering road approaching station												
1/29/2008	9:30	3.1	1268 J	76	12.73	7.44	3	0.43	0.01 U	0.375	0.013	0.0093	2.8	12
		Rain												
2/26/2008	10:30	5.3		58	12.75	7.35	13	0.285	0.01 U	0.276	0.022	0.0054	15	4
		Due to lack of keys to gage box, stage will need to be determined based on measurement with tape. This will be done in March.												
3/18/2008	9:50	5.2	3793 J	51	12.5	7.42	25	0.295	0.01 U	0.269	0.042	0.013	21	11
4/22/2008	9:15	5.7	2087 J	60	12.03	7.34	10	0.285	0.01 U	0.243	0.015	0.005	5.2	10
5/20/2008	9:15	6.5	12455 J	26	12.1	7	117	0.15	0.01 U	0.108	0.0851	0.0043	55	40
6/17/2008	9:25	10.1	5078 J	33	11	7.13	24	0.13	0.01 U	0.081	0.028	0.0042	12	19
7/29/2008	9:55	14.8	1127 J	52	10.8	7.4	4	0.094	0.01 U	0.042	0.0093	0.0058	1.8	32
8/19/2008	9:40	17 J	628 J	68	9	7.31	4	0.15	0.01 U	0.086	0.018	0.0096 J	1.6	740 J
9/23/2008	9:30	11 J	736 J	74	10.5	7.15	3	0.17	0.01 U	0.103	0.014	0.0058	1.8	110

Conventional Data Report

SF Stillaguamish @ 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
10/23/2007	10:20	7.1	1650	33	11.5	7.28	34	0.22	0.01 U	0.151	0.044	0.0043	26	8
11/27/2007	10:30	3.5	518	60	13.13	7.45	5	0.367	0.021	0.294	0.011	0.0054	4.9	35
12/18/2007	10:10	4.7	720	51	12.7	7.34	17	0.431	0.012	0.393	0.039	0.0053	31	19
1/29/2008	10:15	2.5 Rain		65	13.13	7.49	3	0.45	0.01 U	0.384	0.01	0.0067	4	10
2/26/2008	11:05	5.1		51	13.16	7.44	64	0.268	0.01 U	0.247	0.0788	0.0047	65	3
3/18/2008	10:30	4.9		45	12.7	7.4	33	0.25	0.01 U	0.225	0.0597	0.0046	45	5
4/22/2008	9:55	5.4		52	12.33	7.43	43	0.282	0.01 U	0.238	0.044	0.0039	38	6
5/20/2008	10:00	6.2		24	12.5	7.03	163	0.14	0.01 U	0.1	0.166	0.0042	110	81
6/17/2008	10:05	9		29	11.5	7.18	17	0.13	0.01 U	0.082	0.023	0.003	8.9	24
7/29/2008	10:30	14		41	10.6	7.54	3	0.088	0.01 U	0.047	0.007	0.003 U	2.3	28
8/19/2008	10:20	16.9 J		54	9.3	7.45	2	0.12	0.01 U	0.087	0.0058	0.0032 J	1.3	51
9/23/2008	10:05	10.5 J		59	11.1	7.45	4	0.19	0.01 U	0.129	0.011	0.003	3	89

Conventional Data Report

SF Stillaguamish 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
10/23/2007	8:10	6.7	1604	30	12.1	7.49	37	0.18	0.01 U	0.121	0.044	0.0037	21	4
11/27/2007	8:10	3.2	464	51	13.53	7.49	91	0.2	0.01 U	0.15	0.153	0.0048	130	13
		Turbid												
12/18/2007	8:05	4.1	658	43	13	7.53	33	0.255	0.011	0.216	0.049	0.0048	32	4
1/29/2008	8:15	1.4	241	54	13.73	7.55	5	0.21	0.01 U	0.172	0.0085	0.0054	6.5	4
		Rain. Unlike most rain events, the river isn't turbid this time, perhaps because there is snow.												
2/26/2008	9:20	3.9	604	43	13.67	7.38	59	0.15	0.01 U	0.132	0.0649	0.0043	55	2
		Had to sample from bridge because I forgot the keys to the gate in the other vehicle												
3/18/2008	8:35	4.1	923	39	13.1	7.42	106	0.17	0.01 U	0.138	0.133	0.0044	80	11
4/22/2008	8:00	4.3	557	45	12.83	7.45	27	0.159	0.01 U	0.129	0.036	0.0034	22	3
5/20/2008	8:10	5.1	5337	21	13.2	6.99	150	0.13	0.01 U	0.077	0.114	0.0034	80	100 J
6/17/2008	8:15	6.9	1738	24	12.4	7.23	18	0.086	0.01 U	0.055	0.023	0.003 U	11	36
7/29/2008	8:24	13	415	32	10.8	7.49	3	0.048	0.01 U	0.021	0.005 U	0.003 U	2.6	12
8/19/2008	8:30	15 J	223	42	9.9	7.52	4	0.071	0.01 U	0.033	0.0069	0.0046 J	2	26 J
9/23/2008	8:10	9.6 J	241	47	11.3	7.54	5	0.15	0.01 U	0.098	0.014	0.0039	5.7	36
		Water tidbit missing. Pulled air tidbit.												

Conventional Data Report

NF Stillaguamish @ 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
10/23/2007	11:00	7.2	2670	42	11.5	7.33	23	0.303	0.01 U	0.235	0.028	0.0054	11	6
11/27/2007	11:00	4.1	1050	68	12.63	7.46	6	0.421	0.04	0.323	0.027	0.0082	5.9	21
12/18/2007	10:50	4.8	1740	60	12.5	7.42	14	0.43	0.01 U	0.392	0.027	0.0069	9.3	11
1/29/2008	10:50	2.7 Rain	863	75	13.03	7.58	3	0.33	0.01 U	0.281	0.01	0.0087	2.3	5
2/26/2008	11:40	5	1560	59	13.36	7.52	4	0.254	0.01 U	0.237	0.014	0.0055	3.8	3
3/18/2008	11:05	5	2240	51	12.7	7.35	10	0.27	0.01 U	0.235	0.024	0.0052	11	1
4/22/2008	10:25	5.2	1260	61	12.63	7.59	5	0.226	0.01 U	0.182	0.012	0.005	2.4	6
5/20/2008	10:30	6	7020	26	12.4	6.99	151	0.13	0.01 U	0.097	0.133	0.0046	80	56
6/17/2008	10:35	7.3	2670	32	12	7.15	17	0.11	0.01 U	0.07	0.028	0.004	7.9	35
7/29/2008	10:55	13.5	616	58	11.3	8.1	2	0.057	0.01 U	0.022	0.0068	0.004	1.1	23
8/19/2008	10:50	14.9 J	378	71	9.9	7.59	3	0.081	0.01 U	0.041	0.011	0.0056 J	1.1	31
9/23/2008	10:35	9.7 J	352	79	11.5	7.7	3	0.14	0.01 U	0.059	0.013	0.0068	1.9	49

Conventional Data Report

NF Stillaguamish 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
10/23/2007 11:50	7	552	35	11.5	7.34	2	0.22	0.01 U	0.155	0.0065	0.0033	1.1	5
11/27/2007 11:45	4.2	184	55	12.23	7.4	1	0.22	0.01 U	0.18	0.005 U	0.0045	0.7	1
12/18/2007 11:40	5.1	283	51	12.1	7.26	3	0.253	0.01 U	0.22	0.0064	0.0048	1.6	13 J
1/29/2008 11:35	1.1	148	59	12.93	7.48 J	1	0.24	0.01 U	0.199	0.005 U	0.005	0.6	3
	Tapedown washer was covered in snow, could not be found. Above stage is an estimate based on doing a tapedown above the shallow area in the general vicinity where the washer would be. Snowing												
2/26/2008 12:30	5	312	51	12.95	7.41	2	0.19	0.01 U	0.163	0.005 U	0.0035	0.7	1 U
3/18/2008 11:40	4.9	375	46	12.4	7.45 J	2	0.17	0.01 U	0.151	0.0055	0.0033	1	1 U
4/22/2008 11:15	4.9	222	50	12.53	7.49	1 U	0.151	0.01 U	0.127	0.005 U	0.003 U	0.6	1 U
5/20/2008 11:15	5.4	3549	21	12.5	6.81	75	0.1	0.01 U	0.074	0.0811	0.0036	39	35
6/17/2008 11:25	7	533	27	11.8	7.14	2	0.091	0.01 U	0.05	0.0099	0.0034	1.4	8 J
7/29/2008 11:45	11.3	125	41	11	7.47	1	0.082	0.01 U	0.058	0.005 U	0.0032	0.5 U	14
8/19/2008 11:40	13.1 J	92.5	48	10.7	7.69	1	0.088	0.01 U	0.058	0.0057	0.0036 J	0.5 U	11
9/23/2008 11:15	9.4 J	68.5	60	11.3	7.64	2	0.12	0.01 U	0.075	0.0068	0.0043	0.8	8 J

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
10/22/2007 13:05	7.4	15301	31	11.5	7.11	24	0.313	0.012	0.237	0.036	0.0063	14	30
11/26/2007 13:30	4.1	5429	46	12.33	7.19	3	0.338	0.01 U	0.273	0.0743	0.0055	2.2	5
12/17/2007 13:00	5.4	8344	52	11.9	7	10	0.477	0.02	0.408	0.022	0.0067	10	18
1/28/2008 13:25	3.1	5015	60	12.63	7.01 J	4	0.48	0.019	0.427	0.017	0.0063	3.7	10
2/25/2008 14:30	6.7	6364	51	12.34	7.08	6	0.35	0.01 U	0.317	0.012	0.0049	3.1	4
3/17/2008 13:45	5.9	8945	47	12.3	7.2	6	0.342	0.01 U	0.303	0.016	0.0056	5	5
4/21/2008 12:50	6.4	7723	52	12.03	7.11	7	0.371	0.01 U	0.302	0.028	0.0055	5.5	10
5/19/2008 12:35	8	39405	21	12.3	6.76	110	0.14	0.01 U	0.096	0.0752	0.0033	60	52
6/16/2008 13:40	10.3	18620	29	11.4	7.04	15	0.15	0.01 U	0.108	0.02	0.0034	8.2	10
7/28/2008 13:35	14.4	6032	38	10.7	7.3	6	0.11	0.01 U	0.075	0.0076	0.003 U	3.3	16
8/18/2008 14:40	17.9 J	3697	45	9.19	7.15	5	0.13	0.01 U	0.088	0.011	0.003 U	2.3	48
9/22/2008 13:45	13.1 J	3160	58	9.8	7.21 J	5	0.269	0.01 U	0.197	0.022	0.006	3	100

Lots of leaf debris in water.

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
10/22/2007 12:10	7.2	10404 J	29	11.8	7.15	15	0.25	0.01 U	0.185	0.015	0.0045	8.2	17
	Many fishermen												
11/26/2007 12:45	4.5	4628 J	37	12.63	7.2	2	0.2	0.01 U	0.17	0.005 U	0.003 U	1.7	6
12/17/2007 12:00	5	5120 J	38	12.5	7.11	7	0.24	0.01 U	0.219	0.013	0.0042	7.4	10
1/28/2008 12:40	2.8	3160 J	45	13.23	7.11	2	0.28	0.01 U	0.238	0.0054	0.0037	2.3	1 U
2/25/2008 12:55	5.8	4223 J	42	12.95	7.17	3	0.2	0.01 U	0.195	0.0063	0.003	2.1	2
	Van broken into												
3/17/2008 12:45	5.2	5212 J	39	13.1	7.15	5	0.2	0.01 U	0.184	0.0069	0.0034	3.6	7
4/21/2008 11:55	5.9	4898 J	41	12.63	7.21	5	0.215	0.01 U	0.185	0.0079	0.0033	3	2
5/19/2008 12:00	6.4	53300 J	20	12.7	6.76	95	0.13	0.01 U	0.076	0.084	0.003 U	65	6
6/16/2008 12:50	8.9	11943 J	24	12.1	7.05	16	0.098	0.01 U	0.062	0.013	0.003 U	7.1	2
7/28/2008 12:40	13.5	4416 J	29	11.1	7.5	4	0.06	0.01 U	0.034	0.005 U	0.003 U	2.1	1
8/18/2008 13:40	15.7 J	3125 J	33	10	7.24	3	0.055	0.01 U	0.04	0.0053	0.003 U	2.5	20
9/22/2008 13:00	12.6 J	2623 J	42	11.1	7.52	6	0.12	0.01 U	0.083	0.0084	0.003 U	2	70

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
10/22/2007 11:10	7.1	4793 J	31	11.9	7.03	35	0.375	0.01 U	0.291	0.031	0.0062	22	38
11/26/2007 11:45	4	1774 J	54	12.13	7.01 J	3	0.412	0.013	0.325	0.013	0.0068 J	2.2	10
After recalibration, pH = 7.08. Strong manure odor at station.													
12/17/2007 11:10	5.6	2432 J	57	11.6	7.04	9	0.526	0.029	0.447	0.025	0.008	10	24
1/28/2008 11:45	3.2	1722 J	67	12.33	6.95	5	0.56	0.023	0.461	0.014	0.0062	3.7	22
2/25/2008 11:55	6.3	2027 J	55	12.04	6.9	3	0.396	0.01 U	0.361	0.013	0.0044	3.6	1
Very windy, therefore 1-2 foot error in stage measurement. Strong manure odor.													
3/17/2008 11:55	6.2	3128 J	51	12	6.97	7	0.395	0.01 U	0.342	0.019	0.0065	4.6	14
4/21/2008 11:00	6.3	2643 J	56	11.94	7.23 J	6	0.39	0.01 U	0.32	0.017	0.006	3.8	22
After recalibration pH was 6.97. Due to wind the tape down measurement could be off as much as 0.3.													
5/19/2008 11:00	9.2	14290 J	20	12.1	6.68	68	0.18	0.01 U	0.117	0.048	0.0032	29	68
6/16/2008 11:50	10.6	6143 J	31	11	6.95	17	0.21	0.01 U	0.15	0.021	0.0045	7.5	13
7/28/2008 11:35	15.2	1722 J	47	10.1	7.28	6	0.16	0.018	0.112	0.0081	0.0034	2.2	9
8/18/2008 12:50	20.1 J	1096 J	58	8.69	7.18	3	0.18	0.01 U	0.131	0.012	0.0043	1.2	28
9/22/2008 12:10	13.3 J	1129 J	69	10	7.32	8	0.365	0.011	0.288	0.022	0.0074	3.5	120

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
10/22/2007 10:05	6.7	4980	24	11.8	7.41	25	0.271	0.01 U	0.216	0.021	0.0032	14	16
11/26/2007 10:40	3.6	1130	42	12.33	7.01 J	2	0.271	0.01 U	0.228	0.005 U	0.0038	1.1	3
12/17/2007 10:05	4.7	1520	43	11.9	7.15	4	0.314	0.01 U	0.28	0.0067	0.0044	3.5	6
1/28/2008 10:45	3.1	1040	55	12.33	7.06	2	0.36	0.01 U	0.312	0.0057	0.0034	2	3
2/25/2008 10:45	5.4	1730	45	12.44	6.96	4	0.27	0.01 U	0.252	0.0081	0.003 U	2.6	6
3/17/2008 10:50	5	2090	43	12.4	7.34 J	6	0.26	0.01 U	0.239	0.0087	0.0036	7	4
4/21/2008 10:00	4.8	1720	47	12.33	7.13 J	4	0.277	0.01 U	0.234	0.033	0.0035	3.1	6
5/19/2008 10:05	5.8	11800	17	12.5	6.83	36	0.12	0.01 U	0.097	0.029	0.003 U	14	9
6/16/2008 10:40	7.3	5120	22	12	7.14	9	0.13	0.01 U	0.095	0.01	0.0032	5.1	1 U
7/28/2008 10:15	12.3	1350	35	10.4	7.23 J	2	0.12	0.01 U	0.087	0.005 U	0.0032	1.4	35
Temp changed from 13.3 to 12.3. Presumed recording error identified during Tidbit review.													
8/18/2008 11:50	15.7 J	791	47	9.1	7.08	3	0.15	0.01 U	0.117	0.0067	0.003 U	0.9	88
9/22/2008 10:45	11 J	914	46	10.19	7.15	4	0.22	0.01 U	0.174	0.011	0.0035	1.8	92

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	Flow	Conduc-tivity	Oxygen	ph	Suspend. Solids	Total Pers. N.	Ammonia Nitrogen	Nitrate+ Nitrite	Total Phosp.	Soluble Reactive P	Turbid-ity	Fecal Coliforms
	deg. C	CFS	umhos/cm	mg/L	std units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	#/100/mL
10/22/2007 14:15	9.6	485	76	11.3	7.58	5	0.371	0.012	0.282	0.017	0.011	1.6	21
11/26/2007 14:40	6.1	398	71	12.33	7.66	2	0.258	0.01 U	0.217	0.0085	0.0071	0.5 U	7
12/17/2007 14:35	7.7	481	72	11.7	7.51	2	0.387	0.01 U	0.354	0.0099	0.0091	1.3	12
1/28/2008 15:05	5.7	436	78	12.43	7.41 J	2	0.39	0.01 U	0.349	0.0098	0.0091	1	9
	Started raining hard												
2/25/2008 15:45	7.9	768	60	12.34	7.44	3	0.274	0.01 U	0.253	0.0097	0.0063	0.7	2
3/17/2008 14:55	7.3	1160	54	12.2	7.46 J	5	0.269	0.01 U	0.239	0.0094	0.0063	1.4	2
4/21/2008 15:30	9	467	74	12.53	8.03	2	0.28	0.01 U	0.249	0.0082	0.0051	0.7	2
5/19/2008 13:45	11.6	1800	42	11	7.22	34	0.15	0.01 U	0.119	0.03	0.0046	11	40
6/16/2008 14:45	12.4	1510	43	11.2	7.26	7	0.14	0.013	0.099	0.01	0.0048	2.5	20
7/28/2008 14:40	16.9	224	82	12.8	9.04	4	0.078	0.01 U	0.026	0.0051	0.0034	3.3	20
8/18/2008 16:35	15.2 J	227	84	10.4	7.7	3	0.2	0.01 U	0.13	0.0097	0.005	0.8	360 J
9/22/2008 14:45	13 J	262	81	11.2	7.95 J	14	0.22	0.01 U	0.186	0.016	0.0082	0.9	71

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
10/22/2007	9:15	8.3	377	60	11.1	7.48	1 U	0.275	0.01 U	0.233	0.013	0.0068	0.5 U	1
11/26/2007	9:30	6.7	441	54	11.64	7.52 J	1 U	0.18	0.01 U	0.155	0.005 U	0.0046	0.5 U	1 U
12/17/2007	9:10	6.6	500	52	11.7	7.55	1	0.19	0.01 U	0.183	0.005 U	0.0061	0.5 U	2
1/28/2008	9:45	5.8	437	60	12.43	7.64 J	1 U	0.24	0.01 U	0.199	0.0056	0.0067	0.5 U	3
		Sample taken at 276th Ave SE bridge due to snow. Changed pH standards again and recalibrated due to poor after sample check.												
2/25/2008	9:30	5.8	748	48	12.55	7.38	1	0.21	0.01 U	0.166	0.0059	0.0046	0.5 U	1
3/17/2008	9:20	5.6	973	43	12.3	7.5	1 U	0.17	0.01 U	0.162	0.005 U	0.0051	0.5 U	3
4/21/2008	9:00	7	480	57	11.74	7.62 J	1 U	0.205	0.01 U	0.199	0.0068	0.007	0.5 U	63
5/19/2008	9:20	9.8	1770	36	11.2	7.25	8	0.13	0.01 U	0.1	0.0057	0.0032	2.1	1 U
6/16/2008	9:45	9.2	1460	36	11.4	7.26	2	0.11	0.01 U	0.08	0.005 U	0.0039	0.9	1
7/28/2008	9:10	10.9	386	63	11.8	7.76 J	1	0.14	0.01 U	0.124	0.005 U	0.0049	0.5 U	8 J
8/18/2008	10:40	12 J	355	63	10.3	7.55	2	0.16	0.01 U	0.145	0.0086	0.0059	0.6	6
9/22/2008	9:15	10.9 J	351	65	10.5	6.85	1	0.19	0.01 U	0.153	0.0075	0.007	0.5 U	85

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
10/22/2007	14:50	9.7	999	86	10.1	7.33	5	0.598	0.038	0.404	0.0432	0.02	3.6	57
11/26/2007	15:25	3.9	836	91	12.03	7.33	3	0.462	0.021	0.37	0.023	0.011	1.9	49
12/17/2007	15:15	6.8	910	100	11.1	7.24	10	0.702	0.029	0.59	0.035	0.016	5.4	10
		Stage data went missing when notebook fell out of pocket on the Stillaguamish the following day												
1/28/2008	16:00	4	812	130	11.84	7.02	6	0.838	0.039	0.679	0.029	0.0099	3.8	6
		End of day pH check off. After recalibration the sample pH was again 7.02 at 5.0 degrees.												
2/25/2008	16:20	7.3	1390	84	11.83	7.32	9	0.538	0.01 U	0.481	0.023	0.011	2.4	4
3/17/2008	15:30	7	1850	73	11.7	7.52 J	9	0.483	0.01 U	0.409	0.03	0.015	6.2	26
		After recalibration pH was 7.18 at 8.9C												
4/21/2008	16:00	7.5	1640	73	11.74	7.41	12	0.385	0.01 U	0.321	0.021	0.0097	2.4	6
5/19/2008	14:20	9.1	6250	37	11.1	7.06	87	0.12	0.01 U	0.092	0.0767	0.0085	45	52
6/16/2008	15:15	10.3	2460	53	11.1	7.25	12	0.2	0.01 U	0.155	0.027	0.0093	5.9	17
7/28/2008	15:20	17.6	366	163	11.1	7.37	4	0.335	0.018	0.216	0.031	0.007	0.9	22
8/18/2008	17:15	18.7 J	287	175	8	7.02	7	0.594	0.087	0.393	0.0585	0.011	4.5	570 J
		Barely flowing, tide may be influencing. Stage taken at 1845 due to sample processing and flat tire.												
9/22/2008	15:25	14.5 J	393	112	9.4	7.28	12	0.504	0.029	0.376	0.0546	0.014	4.8	380
		pH was 7.40 before recalibration												

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
10/22/2007 8:15	8	669	50	11.3	7.7	2	0.24	0.011	0.171	0.012	0.0074	3.4	12
11/26/2007 8:30	3.7	592	49	12.63	7.6	2	0.22	0.01 U	0.178	0.0072	0.0079	1.2	1 U
12/17/2007 8:15	4.1	525	47	12.4	7.41	4	0.23	0.01 U	0.205	0.0089	0.0098	2	13
I suspect that I misread the barometer at this station. Based on the Cedar River measurement and historic comparisons, I think a value of 29.20 would be more appropriate.													
1/28/2008 9:05	2.6	368	50	13.03	7.41	2	0.28	0.01 U	0.241	0.0073	0.0099	0.8	6
Initial pH calibrations went well but check after first sample was poor. Changed pH standards and recalibrated after measuring sample.													
2/25/2008 8:30	5.5	878	44	12.55	7.45	2	0.19	0.01 U	0.178	0.012	0.0079	0.6	2
3/17/2008 8:20	5.4	1190	41	12.4	7.38	2	0.18	0.01 U	0.154	0.0089	0.0099	0.8	1
4/21/2008 8:00	5.8	1130	42	12.43	7.48	2	0.126	0.01 U	0.104	0.0083	0.0062	0.9	1 U
5/19/2008 8:30	8	5350	31	12.1	7.2	39	0.077	0.01 U	0.038	0.0503	0.0095	33	23
6/16/2008 8:45	7.7	2000	35	11.7	7.19	2	0.082	0.01 U	0.041	0.013	0.0095	2.7	8
Not turbid. Still running high.													
7/28/2008 8:15	11.9	185	46	10.6	7.74	1	0.072	0.01 U	0.022	0.005 U	0.0052	0.5 U	11 J
8/18/2008 9:10	13.9 J	135	52	9.8	7.41	2	0.15	0.035	0.044	0.008	0.0061	0.6	18
9/22/2008 8:10	13.1 J	215	53	10	7.47	2	0.21	0.016	0.134	0.013	0.0073	0.8	35 J

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
10/31/2007	10:33	5.3	1420	92	12.3	7.4	36	0.343	0.027	0.25	0.0484	0.027	6.2	12
11/28/2007	10:05	5	1690	90	12.7	7.48	24	0.352	0.013	0.264	0.032	0.023	4.3	12 J
12/19/2007	12:45	5.5	2260	88	12.1	7.41	58	0.502	0.037	0.395	0.0795	0.024	11	100
1/30/2008	9:35	2.7	1570	102	13	7.37	10	0.671	0.041	0.483	0.045	0.029	4.1	22 J
2/27/2008	11:45	5.7	2560	81	12.55	7.48	16	0.386	0.016	0.326	0.028	0.017	3	12
3/19/2008	10:40	5.2	3190	77	13	7.44	13	0.409	0.01 U	0.323	0.032	0.019	2.5	15
4/23/2008	10:25	7.3	2170	85	11.9	7.46	10	0.322	0.011	0.255	0.033	0.02	2.3	13
5/21/2008	9:55	7.6	11800	39	11.75	7.3	481	0.11	0.01 U	0.072	0.151	0.012	140	15
6/18/2008	9:40	9	5700	52	11.5	7.41	179	0.13	0.01 U	0.085	0.117	0.012	26	9
7/23/2008	10:20	11.3	3450	57	11.3	7.24	78	0.11	0.01 U	0.087	0.0954	0.018	45	28
8/20/2008	9:50	13.5	3220	62	10.6	7.38	443	0.13	0.01 U	0.106	0.392	0.025	180	230
9/24/2008	9:43	10.1	1180	91	10.8	7.58	36	0.24	0.013	0.193	0.0768	0.0329	19	42 J

Conventional Data Report

White River @ R Street

10C095

Class: A
Rivermile: 8
Latitude: 47 16 29.4
Longitude: 122 12 28.4
Waterbody: WA-10-1030

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
10/31/2007 9:27	4.2	902	88	12.9	7.63	33	0.256	0.02	0.193	0.033	0.019	5.9	15 J
11/28/2007 9:00	4.2	973	86	13.1	7.59	24	0.286	0.01 U	0.222	0.027	0.017	4	7 J
RP location had logs, may affect result													
12/19/2007 11:05	9	1100	84	12.7	7.56	55	0.492	0.01 U	0.43	0.055	0.026	5.8	21
1/30/2008 8:35	2.1	982	92	13.8	7.57	11	0.608	0.021	0.465	0.034	0.03	3.4	36 J
2/27/2008 10:25	5.3	1120	72	12.81	7.84	20	0.287	0.01 U	0.25	0.018	0.012	1.7	4
3/19/2008 9:20	4.8	1150	72	13.5	7.54	33	0.346	0.031	0.275	0.022	0.017	3.2	11 J
Attached the RP washer to the RP.													
4/23/2008 9:15	6.8	1500	76	12.3	7.77	11	0.205	0.01 U	0.164	0.016	0.014	2.1	9 J
5/21/2008 8:50	7.9	8050	41	11.55	7.31	515	0.09	0.01 U	0.051	0.254	0.011	160	27 J
6/18/2008 8:25	8.6	2840	50	11.6	7.45	628 J	0.079	0.01 U	0.055	0.182	0.0094	37	6 J
7/23/2008 8:50	12.4	1290	60	10.9	7.53	108	0.068	0.01 U	0.054	0.0847	0.016	55	26
8/20/2008 8:50	13.9	1050	64	10.5	7.59	318	0.098	0.01 U	0.088	0.314	0.028	110	81 J
9/24/2008 8:35	9.8	666	85	11.1	7.54	50	0.15	0.01 U	0.125	0.0622	0.022	20	16

Conventional Data Report

Lk Tapps Tailrace @ E. Valley Hwy.

10H070

Class: A
Rivermile: 0.3
Latitude: 47 14 17.4
Longitude: 122 13 42.2
Waterbody: WA-10-1035

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
10/31/2007 10:00	11.8	96	61	11.4	7.46	2	0.1	0.015	0.015	0.0055	0.003 U	2.2	1
11/28/2007 9:30	8.6	199	64	12.9	7.45	2	0.13	0.012	0.032	0.0062	0.003 U	5.9	5 J
12/19/2007 12:10	6.6	51	64	13.1	7.5	1	0.12	0.01 U	0.043	0.0077	0.003 U	2.2	6
1/30/2008 9:05	4.3	32	68	13.3	7.48	1 U	0.19	0.01 U	0.085	0.0094	0.0062	1.3	1 UJ
2/27/2008 10:55	5.1	31	66	13.36	7.58	2	0.18	0.01 U	0.099	0.0064	0.0034	0.9	9
3/19/2008 10:00	7.2	31	65	13.4	7.58	2	0.2	0.011	0.094	0.0094	0.0038	0.9	1 U
4/23/2008 9:48	9.2	31	66	12.4	7.58	2	0.181	0.017	0.072	0.014	0.0036	1.9	1 U
5/21/2008 9:17	12.3	767	65	11.25	7.5	3	0.16	0.01 U	0.024	0.011 J	0.003 U	1.7	1 UJ
6/18/2008 8:55	12.1	69	66	11.7	7.37	3	0.13	0.01 U	0.01 U	0.0082	0.003 U	1.4	1 UJ
7/23/2008 9:30	13.3	51	65	11.1	7.27	2	0.13	0.01 U	0.01 U	0.01	0.003 U	1.7	2
8/20/2008 9:15	13.9	34	65	11	7.13	2	0.13	0.02	0.013	0.013	0.0058	2.6	1 U
9/24/2008 9:10	15.1	31	65	10	7.17 J	3	0.12	0.018	0.016	0.012	0.0032	4.9	340 J

Conventional Data Report

Joe's Creek @ SR 509

10I050

Class: AA
Rivermile: 0.1
Latitude: 47 19 37.4
Longitude: 122 22 36.4
Waterbody: WA-10-2040

Date/Time	Temp	Flow	Conduc-tivity	Oxygen	ph	Suspend. Solids	Total Pers. N.	Ammonia Nitrogen	Nitrate+ Nitrite	Total Phosp.	Soluble Reactive P	Turbid-ity	Fecal Coliforms
	deg. C	CFS	umhos/cm	mg/L	std units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	#/100/mL
10/24/2007 13:40	10		257	10.4	8.03	5	1.4	0.01 U	0.011	0.0534	0.0496	1.2	6
11/28/2007 11:50	7.9		248	11.44	8.05	4	1.25	0.01 U	1.2	0.041	0.0388	1	1
	Salmon												
12/19/2007 12:45	8.5		180	11.3	7.83	22	1.07	0.01 U	0.956	0.0722	0.0467	13	76
	pH prior to midday check was 8.02. Recalibrated due to 0.13 difference with standard. Post-recalibration value is entered above												
1/30/2008 12:35	6.8		216	11.74	8.06	55	1.38	0.033	1.14	0.0543	0.0385	4.3	12
2/27/2008 11:45	10.2		243	11.32	8.06	12	1.92	0.042	1.61	0.0758	0.0458	6.2	17
3/19/2008 11:00	9		238	11.4	8.19 J	3	1.27	0.01 U	1.32	0.041	0.0406	1.3	2
	Reported bucket of paint thrown into stream, cleaned up by Federal Way												
4/23/2008 12:30	10.5		244	11.14	8.29	2	1.31	0.01 U	1.28	0.044	0.0407	1.1	5
5/21/2008 12:15	13.5		237	10.3	8.06	5	0.949	0.01 U	0.929	0.049	0.038	1.9	46
6/18/2008 11:45	11.3		262	10.7	8.11	2	1.51	0.01 U	1.44	0.054	0.0522	1	88
7/30/2008 10:35	12.6		267	10.6	8.12	20 J	1.26	0.01 U	1.2	0.0585	0.0509	0.8	61
8/20/2008 11:30	13.8 J		233	9.69	7.95	21	1.41	0.01 U	1.19	0.0947	0.0753	5.2	370
9/24/2008 11:00	10.8 J		267	10.6	8.12	2	1.47	0.01 U	1.41	0.0582	0.0544	1.1	9

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
10/31/2007 13:15	8.4	675	81	11.4	7.64	8	0.24	0.013	0.182	0.0238	0.01	11	4
11/28/2007 12:15	6.2	1163	75	12.3	7.6	9	0.295	0.01 U	0.212	0.03	0.0096	12	12
12/19/2007 15:25	6.1	2610	60	11.8	7.4	24	0.396	0.014	0.318	0.0523	0.011	24	11
1/30/2008 11:35	4.1	2104	68	12.7	7.56	6	0.39	0.01 U	0.301	0.015	0.01	7.2	9
2/27/2008 14:45	6.5	1447	75	12.75	8	6	0.416	0.01 U	0.364	0.021	0.0092	5.1	2
3/19/2008 12:40	6.1	1644	72	12.8	7.64	5	0.415	0.01 U	0.335	0.019	0.01	4.7	1 U
4/23/2008 12:50	7.7	1320	73	12	7.65	4	0.338	0.01 U	0.272	0.014	0.0097	2.8	1
5/21/2008 12:30	8.8	3981	60	11.5	7.57	32	0.15	0.01 U	0.102	0.023 J	0.006	13	17
6/18/2008 12:00	9.8	2315	56	11.6	7.64	6	0.16	0.01 U	0.092	0.017	0.0059	4.8	10
7/23/2008 12:50	11.4	1135	64	12.5	7.66	5	0.12	0.01 U	0.067	0.0092	0.0041	2.9	8
8/20/2008 13:00	14.3	1011	61	10.7	7.63	7	0.15	0.01 U	0.108	0.02	0.013	7	14
9/24/2008 13:03	12.6	977	61	10.5	7.52	7	0.14	0.01 U	0.097	0.02	0.009	10	3

Conventional Data Report

Leach Cr nr Steilacoom

12B070

Class: AA
Rivermile: 0.3
Latitude: 47 11 53.4
Longitude: 122 31 21.5
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
10/31/2007 11:55	9.1	8.5	310	11	7.83	1	1.9	0.01 U	2.47	0.039	0.041	0.5	66
11/28/2007 11:20	7.8	8.5	286	11.6	7.75	1	1.8	0.01 U	1.7	0.034	0.0382	1.5	630 J
12/19/2007 14:05	7.1	59	108	11.2	7.31	86	0.619	0.025	0.46	0.0923	0.029	19	4900
1/30/2008 10:45	5.9	14	260	12	7.58	5	1.5	0.049	1.2	0.043	0.034	3.8	1500
2/27/2008 13:35	9.3	12	306	11.42	7.59	25	1.7	0.015	1.38	0.0743	0.0403	6.8	500
3/19/2008 11:50	8.9	8.5	293	12	7.75	2	2.19	0.01 U	1.81	0.04	0.0409	0.9	550
	Attached RP washer.												
4/23/2008 11:50	10.1	10	261	11.3	7.67	3	1.65	0.01 U	1.53	0.0459	0.0333	2.4	150 J
5/21/2008 10:50	11.8		274	10.05	7.63	5	1.79	0.012	1.86	0.0551	0.0434	2.6	340
6/18/2008 10:40	11.7		307	10.7	7.78	2	1.96	0.01 U	1.9	0.0521	0.0466	1.5	60
7/23/2008 12:10	12.4		312	10.5	7.72	3	1.84	0.01 U	1.82	0.0545	0.0459	1.1	130
8/20/2008 12:00	15.9		166	9.19	7.39	191	1.04	0.023	0.734	0.286	0.0765	55	7500 J
9/24/2008 11:55	11.5		309	10.3	7.65	2	1.74	0.01 U	1.63	0.0527	0.0498	0.8	310

Metals Data Report

Leach Cr nr Steilacoom

12B070

Class: AA
Rivermile: 0.3
Latitude: 47 11 53.4
Longitude: 122 31 21.5
Waterbody:

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
10/31/2007	11:55		134	0.1 U	0.02 U	0.5 U	1.3	0.55	0.	47	0.1 U	0.02 U	0.002 U	1.53	2	5 U	1.9
12/19/2007	14:05		47.4	0.1 U	0.02 U	2.8	0.74	4.08	1.	75	4.18	0.353	0.012	0.85	2.95	16	7.2
2/27/2008	13:35		126	0.1 U	0.02 U	1.2	1.1	1.97	0.	71	2.57	0.076	0.0074	1.54	3.08	13	5.51
4/23/2008	11:50		106	0.1 U	0.02 U	0.5 U	1.1	1.37	1.	11	0.55	0.11	0.002 U	1.13	2.3	10	4.9
6/18/2008	10:40		124	0.1 U	0.02 U	0.5 U	1.39	0.55	0.	49	0.3	0.092	0.002 U	1.89	2.44	5 U	3.8
8/20/2008	12:00		72	0.21	6.66	0.02 U		0.98	10.6	2	.38	18.6	0.467	0.037	1.23	9.05	47	6.3

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
10/31/2007	14:00	7.8	140	132	11.2	7.45	2	0.935	0.012	0.826	0.0215	0.017	1.6	11
		moved to day 3												
11/28/2007	13:05	5.6	213	117	11.8	7.39	2	0.836	0.01 U	0.735	0.017	0.016	2.1	16
		Moved to day 3												
12/19/2007	9:40	6.4	896	71	11.5	7.26	60	0.629	0.01 U	0.543	0.0815	0.015	35	69
1/29/2008	16:45	4.9	404	108	11.8	7.32	8	1.03	0.012	0.873	0.028	0.017	5.7	58
2/27/2008	16:15	8.4	386	104	11.68	7.32		0.854	0.01 U	0.792	0.018	0.013	2.4	6
3/18/2008	16:25	8.6	508	92	12	7.4	6	0.67	0.01 U	0.633	0.022	0.013	5	3
4/22/2008	17:35	9.1	347	108	12.1	7.53	3	0.752	0.01 U	0.714	0.027	0.01	2	4
5/20/2008	16:35	13.9	390	88	10.55	7.56	4	0.525	0.01 U	0.47	0.022 J	0.0094	3.4	50
6/17/2008	16:00	13.6	245	110	10.6	7.49	3	0.716	0.01 U	0.623	0.023	0.015	2.1	11
7/22/2008	18:30	15.7	108	140	10.9	7.69	4	0.844	0.01 U	0.808	0.026	0.013	2.9	26
8/19/2008	17:25	16.6	97	147	10.3	7.61	3	0.961	0.01	0.879	0.033	0.018	1.9	27
9/23/2008	16:28	13		147	10.7	7.48	4	1	0.01 U	0.896	0.029	0.021	2.1	44

Conventional Data Report

Dewatto R nr Dewatto

15A070

Class: AA
Rivermile: 2.5
Latitude: 47 28 08.3
Longitude: 123 01 35.6
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
10/24/2007 17:00	9.1		64	10.7	7.44	1 U	0.21	0.01 U	0.115	0.012	0.0086	0.7	6
11/28/2007 14:50	4.3		59	12.43	7.34	1 U	0.22	0.01 U	0.14	0.0091	0.0088	0.5	4
12/19/2007 17:10	6.2		29	11.5	6.81	63	0.18	0.01 U	0.11	0.042	0.0047	24	58
Staff gauge bent. River deep and fast. pH difference with standard was 0.06. Pre-recalibration value is entered above. Post-recalibration value was 6.89													
1/30/2008 16:30	4.5		51	12.23	7.2	2	0.13	0.01 U	0.066	0.0074	0.0076	1.1	8
2/27/2008 14:45	7.9		56	11.93	7.33	2	0.06	0.01 U	0.032	0.008	0.0065	0.5	1 U
3/19/2008 14:35	7.8		60	11.8	7.45	1	0.093	0.01 U	0.031	0.01	0.008	0.5	1
4/23/2008 15:45	9.3		62	10.74	7.39	1	0.059	0.01 U	0.019	0.046	0.0076	0.7	1 U
5/21/2008 15:00	14.5		72	9.8	7.35	1	0.064	0.01 U	0.023	0.01 J	0.0081	0.7	2
6/18/2008 14:45	13.2		70	10.1	7.42	1 U	0.09	0.01 U	0.028	0.011	0.0082	0.9	25
7/30/2008 14:05	14.7		78	9.8	7.55	1	0.09	0.01 U	0.03	0.014	0.0096	0.8	7
8/20/2008 14:50	15 J		77	9.19	7.43	4	0.11	0.01 U	0.032	0.02	0.015	1.4	160
9/24/2008 14:15	11.9 J		79	10.19	7.45	3	0.086	0.01 U	0.019	0.018	0.01	0.8	7
Could not find water tidbit. Left air tidbit in place.													

Conventional Data Report

Chico Cr nr Chico

15B050

Class: A
Rivermile:
Latitude: 47 35 46.3
Longitude: 122 42 25.5
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
10/23/2007 11:55	10.7		89	11	7.21	2	0.579	0.01 U	0.431	0.04	0.011	1.5	7
	No stage datum at this station. 1st sample at this location. Sampled for metals. Chum salmon spawning here.												
11/14/2007 12:20	7.6		98	9.4	7.06	20	1.77	0.775	0.638	0.119	0.0923	10	35
	I sampled at the Erlands Point road bridge after looking at the Kittyhawk road bridge at the mouth. I concluded there was too much tidal influence at the Kittyhawk road location for a valid freshwater sample. LARGE numbers of chum salmon spawning in th												
12/11/2007 9:25	5.3		72	12.4	7.14	11	0.592	0.079	0.345	0.031	0.022	4.8	14 J
	Sampled for metals. The banks at the sampling location are heavily eroded including loss of riprap protecting the bridge. Spawned out chum salmon carcasses are abundant.												
1/15/2008 11:45	4.3		62	12.8	7.46	5	0.439	0.065	0.287	0.016	0.0093	1.9	7
	Calibrated pH meter at this station and the next.												
2/12/2008 12:05	6.6		65	12.2	6.85	2	0.464	0.034	0.327	0.013	0.0098	1	23
	Sampled for metals at this station today.												
3/11/2008 12:03	8.2		80	12.15	6.45 J	2	0.47	0.01 U	0.364	0.014	0.011	0.6	110
	Did not for sample for metals today.												
4/8/2008 11:50	8.1		75	11.8	7.12	2	0.417	0.011	0.324	0.017	0.013	0.7	80
	Sampled for metals today. The stage was taken as a "tapedown" value from a reference point established on the downstream side of the bridge. The reference point is a stainless steel washer epoxied to the concrete of the bridge.												
5/20/2008 12:00	14.6		89	11.3	7.6	1	0.384	0.01 U	0.325	0.025 J	0.017	0.7	44
	The stage was calculated as the tapedown distance from a reference point (RP) on the road bridge. The RP is a stainless steel washer epoxied to the downstream side of the bridge.												
6/10/2008 12:05	11.6		87	10.9	7.3	1	0.46	0.022	0.345	0.02	0.012	0.8	23
	The stage is the tapedown distance (corrected) from the reference point (stainless steel washer) epoxied to the downstream side of the bridge. Sampled for metals.												
7/16/2008 11:35	15.7		103	9.55	6.91	1 U	0.645	0.012	0.559	0.03	0.019	0.6	24
	The stage is a corrected tapedown distance from a reference point on the downstream side of the bridge.												
8/12/2008 12:05	15 J		109	11.5	7.01	3	0.828	0.01 U	0.704	0.021	0.01	1	25
	The stage is the corrected tapedown distance from a reference point on the downstream side of the bridge. Riprap construction underway on the left bank upstream of the bridge.												
9/17/2008 11:35			116	10	6.95	9	0.931	0.01 U	0.871	0.025	0.011	7.5	38 J
	The stage is a corrected tapedown distance from a reference point on the downstream side of the bridge.												

Metals Data Report

Chico Cr nr Chico

15B050

Class: A
Rivermile:
Latitude: 47 35 46.3
Longitude: 122 42 25.5
Waterbody:

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
10/23/2007	11:55		40.6	0.1 U	0.02 U	0.5 U	0.47	0.6 0.	56	0.1 U	0.02 U	0.002 U	0.38	0.44	5 U	1 U
12/11/2007	9:25		29.9	0.1 U	0.02 U	1	0.45	1.53 0.	77	0.23 0.034		0.0027 0.48		0.37	5 U	1.2
2/12/2008	12:05		29.9	0.1 U	0.02 U	0.5 U	0.44	0.72 0.	51	0.1 U	0.026	0.002 U	0.35	0.19	5 U	1 U
4/8/2008	11:50		33.5	0.1 U	0.02 U	0.5 U	0.49	0.9 0.	52	0.1 U	0.02 U	0.002 U	0.34	0.25	7	1 U
6/10/2008	12:05		37.4	0.1 U	0.02 U	0.5 U	0.69	0.7 0.	64	0.1 U	0.02 U	0.002 U	0.9	0.28	5 U	1 U
8/12/2008	12:05		46	0.1 U	0.02 U	0.83	1.1	0.44 0.	64	0.13 0.02	U	0.002 U	0.35	0.24	5 U	4.3

Conventional Data Report

Clear Cr @ Silverdale

15C070

Class: A
Rivermile: 0.2
Latitude: 47 39 13.3
Longitude: 122 41 07.5
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
10/23/2007 12:50	10.1		168	10.4	7.54	2	0.676	0.014	0.46	0.037	0.023	1.5	68
No stage datum here. 1st sample at this station including metals. The pH and Conductivity probes were checked after this station and were in calibration.													
11/14/2007 12:55	6.5		159	11.1	7.33	10	1.01	0.112	0.607	0.046	0.03	6.9	110 J
Large number of chum salmon spawning in Clear Creek at the sampling location.													
12/11/2007 8:33	4.4		139	12	7	3	1.03	0.079	0.774	0.037	0.025	2.6	10 J
Sampled for metals. Heavy bank erosion at the sampling location.													
1/15/2008 12:20	3.7		117	12.3	6.63	2	0.837	0.047	0.571	0.031	0.015	3.2	15
2/12/2008 13:05	7.7		151	11.75	7.15	2	0.823	0.026	0.663	0.033	0.023	2.3	4
Sampled for metals at this station today.													
3/11/2008 12:55	8.2		168	11.8	7.05 J	4	0.745	0.01 U	0.544	0.033	0.024	2.7	10
The stage value entered is a positive distance from a reference point established on the bridge to the water surface using a weighted tape.													
4/8/2008 13:00	7.6		142	11.7	7.43	3	0.636	0.01 U	0.432	0.03	0.015	3.4	11
Sampled for metals today. The stage was taken as the "tapedown" value from a reference point established on the downstream edge of the culvert draining Clear Creek under the road. The reference point is a stainless steel washer epoxied to the topmost ed													
5/20/2008 12:45	12.8		171	10.15	7.83	3	0.743	0.027	0.611	0.0538	0.0346	2	100
The stage was calculated as the tapedown distance from a reference point (RP). The RP is a stainless steel washer epoxied to the downstream side of the culvert through which Clear Creek drains under the road.													
6/10/2008 12:55	10.3		160	10.3	7.6	3	0.724	0.022	0.557	0.05	0.03	4.9	130
The stage is the corrected tapedown distance from the reference point. The reference point is a stainless steel washer epoxied to the top of the downstream side of the culvert draining beneath the Clear Creek road.													
7/16/2008 12:05	12.6		172	10.15	7.51	2	0.649	0.012	0.566	0.049	0.0372	1.4	120
The stage is a tapedown distance from a reference point on the downstream side of the culvert.													
8/12/2008 13:02	13.4 J		172	10.25	7.67	2	0.577	0.01 U	0.514	0.0521	0.034	1.4	3300 J
The stage is the tapedown distance from a reference point on the downstream side of the culvert.													
9/17/2008 12:05			174	10.3	7.57	2	0.614	0.01 U	0.541	0.046	0.0384	1.8	150
The stage is a tapedown distance from a reference point on the downstream side of the culvert.													

Metals Data Report

Clear Cr @ Silverdale

15C070

Class: A
Rivermile: 0.2
Latitude: 47 39 13.3
Longitude: 122 41 07.5
Waterbody:

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
10/23/2007	12:50		79.8	0.1 U	0.02 U	1.9	2.2	0.61	0.	54	0.1 U	0.032	0.0027	1.27	1.54	5 U	1.8
12/11/2007	8:33		60.2	0.1 U	0.02 U	2	2.1	0.98	0.	85	0.16	0.061	0.0039	1.76	1.21	5 U	3.7
2/12/2008	13:05		72.1	0.1 U	0.02 U	1.9	2.2	0.81	0.	65	0.14	0.061	0.0026	1.59	1.26	5 U	4.4
4/8/2008	13:00		65.3	0.1 U	0.02 U	2.1	1.9	1.27	1		0.24	0.095	0.004	1.77	1.36	5.8	2.9
6/10/2008	12:55		71.5	0.1 U	0.02 U	2.3	2.2	1.16	0.	83	0.65	0.11	0.0042	1.58	1.62	6.2	3.3
8/12/2008	13:02		79.2	0.1 U	0.02 U	1.8	2.1	0.46	0.	32	0.1 U	0.035	0.002 U	0.76	1.6	5 U	2.3

Conventional Data Report

Tahuya R @ Tahuya River Rd

15D070

Class: AA
Rivermile: 3.4
Latitude: 47 24 27.3
Longitude: 123 00 24.5
Waterbody: WA-15-1010

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
10/24/2007 16:05	10.1		62	10	7.32	1	0.324	0.01 U	0.269	0.0071	0.0059	0.5 U	6
11/28/2007 14:00	5.4		55	11.44	7.25	2	0.304	0.01 U	0.246	0.005 U	0.0064	0.5 U	3
	Salmon												
12/19/2007 15:40	6.7		29	11.6 J	6.98	161	0.19	0.01 U	0.128	0.0824	0.0041	45	16
	Dissolved oxygen analysis performed with only 50 ml of sample. Tapedown bridge and staff plate wiped out by river two weeks prior												
1/30/2008 15:05	4.5		43	12.23	7.13	2	0.19	0.01 U	0.12	0.005 U	0.0054	1.1	1
	New temporary one lane bridge installed. New staff plate installed downstream of bridge. Stage on staff plate was 1.07. Did not establish new tapedown point.												
2/27/2008 14:15	8		47	11.83	7.23	1	0.11	0.01 U	0.096	0.005 U	0.0045	0.5 U	1 U
	Staff = 0.94												
3/19/2008 13:50	7.9		49	11.5	7.26	1 U	0.1	0.01 U	0.071	0.0055	0.0058	0.5 U	1 U
4/23/2008 14:40	9.2		51	10.64	7.14	2	0.099	0.01 U	0.082	0.0061	0.0062	0.8	1
	Staff = 0.85												
5/21/2008 14:30	13.6		57	9.69	7.03	2	0.087	0.01 U	0.053	0.0071 J	0.0077	1.2	14
	Staff = 0.72												
6/18/2008 14:00	13.1		61	9.6	7.16	2	0.093	0.01 U	0.048	0.0083	0.0074	1.1	4
7/30/2008 13:20	14.8		68	9.19	7.23	1 U	0.049	0.01 U	0.029	0.0094	0.0089	0.5 U	58
8/20/2008 14:00	15.5 J		68	8.5	7.12	2	0.067	0.01 U	0.029	0.012	0.012	0.6	83
9/24/2008 13:10	13.2 J		72	9.19	7.25	5	0.062	0.01 U	0.016	0.013	0.0094	0.8	12
	Pulled both tidbits. Air temp = 14.3												

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
10/23/2007	14:30	11.4	25.7	4220	11	7.38	2	0.286	0.01 U	0.13	0.02	0.011	0.8	8
		The conductivity value entered is in mS since I sampled at high tide the conductivity value was very high. [Changed from 4.22 to 4220 uS 15 Jan 08]												
11/14/2007	14:05	7.4	42.8	68	11.8	7.25	3	0.385	0.01 U	0.191	0.013	0.003 U	2.3	18
		A few chum salmon present at the weir but all the coho seen last month appear to have moved upstream. The flow was low and clear.												
12/11/2007	12:45	4.6	36.1	45	12.5	7.24	14	0.416	0.01 U	0.338	0.012	0.0056	4.2	7
		The access road leading to the field station has been washed out in two places. I walked into the station in order to sample. Extensive damage to the facility. Sampled upstream of the wier.												
1/15/2008	13:45	4.2	33.2	44	12.5	6.78	3	0.313	0.01 U	0.237	0.0084	0.004	3.3	7
		The road to the facility is still closed due to storm related damage. The walk in time adds about 30 minutes to the run time. No salmon present at this time.												
2/12/2008	15:15	6.9	31	47	12.2	7.37	2	0.317	0.01 U	0.226	0.006	0.0036	1.3	8
		The road to the station is still closed due to flood damage. According to personnel at the field station, a timetable for repair has not been set. Beavers are actively damming the wetland area adjacent to the stream with two new recently constructed lo												
3/11/2008	14:45	7	16.8	75	11.4	7.53 J	2	0.19	0.01 U	0.098	0.0087	0.005	1	1
		After we cleaned and recalibrated the pH meter the value of the sample was 7.68 which indicates that the recorded value may be valid.												
4/8/2008	14:30	8.2	20.8	60	11.7	7.27	1	0.198	0.01 U	0.11	0.0085	0.004	0.9	1 U
		The weir for capturing salmon smolts migrating downstream is now in place. The stream was so low that only one fan trap was fishing at the time. The road leading to the field station is still washed out. A date for repair is unknown.												
5/20/2008	14:41	15.5	18.1	79	10.5	7.59	1 U	0.18	0.01 U	0.108	0.012 J	0.0065	4.4	6
		The road is still washed out so walking in is necessary. I sampled at the mouth of the fan trap used for capturing outmigrating salmon.												
6/10/2008	14:30	11.7	18.1	82	10.8	7.51	2	0.24	0.01 U	0.168	0.011	0.0071	0.6	18
		The road to the facility is still in need of repair 6 months after the storm. The fan traps are no longer fishing. The stream is low and clear.												
7/16/2008	13:45	16.1	18.6	100	10.15	7.49	1 U	0.294	0.01	0.211	0.015	0.011	0.6	20
		Sampled at the weir at low tide. The road is still out.												
8/12/2008	14:25	15.3 J	18.6	94	10.1	7.48	1 U	0.18	0.01 U	0.13	0.017	0.009	0.7	7
		The road to the field station is still out. The stream was low and clear. I sampled upstream of the weir at high tide. The field station is falling into serious disrepair.												
9/17/2008	13:20		18.6	235	10.35	7.41	3	0.277	0.076	0.145	0.025	0.019	1.3	5
		I sampled below the wier at the UW field station during low tide. The road to the station has been repaired. I believe the elevated conductivity value to be due to the presence of over 3 dozen chum salmon at the sampling location. The conductivity prob												

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
10/23/2007 15:08	10.5	8.88	117	10.1	7.29	1 U	0.601	0.01 U	0.543	0.042	0.011	0.5 U	4
Seabeck creek is very low and clear. Leaves are created temporary controls in the channel altering flow and stage.													
11/14/2007 14:37	7.8	11.9	75	11	7.14	1 U	1.21	0.01 U	1.13	0.0085	0.0095	0.7	5
The stage was taken from the WDOE staff gage. The flow was low and clear. No evidence of salmon in the stream.													
12/11/2007 13:35	6.1	0.24	52	11.7	6.71	11	0.753	0.022	0.683	0.0092	0.0086	1.6	4
The staff gage, slant pipe, and turbidity probe at the sampling station have been dewatered due to channel shift and aggradation.													
1/15/2008 14:20	4.8	11.1	40	12.4	6.9	2	0.511	0.01 U	0.433	0.0055	0.0035	1	4 J
The stage was taken from the WDOE staff which is partially dewatered at this time due to channel changes from the December 3rd 2007 flood.													
2/12/2008 15:45	7	3.82	48	11.95	6.89	1 U	0.495	0.01 U	0.485	0.0058	0.0042	0.5 U	1
The stage was taken from the WDOE staff gage. The stream is low and clear.													
3/11/2008 15:40	9.1	0.58	84	11.4	7.64	1 U	0.599	0.01 U	0.562	0.0082	0.0089	0.5 U	1 U
The staff gage at this station is dewatered.													
4/8/2008 15:15	7.1	2.72	66	12.7	7.11	2	0.549	0.01 U	0.505	0.0066	0.007	0.5	3
The stage was an estimated value from the WDOE staff gage. The staff gage is now dewatered and the pressure transducer at the station is barely submerged.													
5/20/2008 14:50	12.3	0.61	88	10.5	7.47	1 U	0.605	0.01 U	0.602	0.014 J	0.0098	0.6	2
The staff gage is dewatered. The stage was calculated from a tapedown distance from a reference point (RP) located on the downstream side of the bridge.													
6/10/2008 15:15	10.1	0.58	91	10.7	7.4	2	0.689	0.01 U	0.657	0.012	0.0093	0.7	2
The stage is the tapedown distance from the reference point. The staff gage is still dewatered.													
7/16/2008 14:15	12.9	0.82	93	10.25	7.25	3	0.643	0.01 U	0.617	0.014	0.0093	0.9	160 J
The stage was taken from the WDOE staff gage. Clishe and Warnick re-connected the staff gage to the channel last week.													
8/12/2008 14:55	12.6 J	0.72	93	10.4	7.29	2	0.608	0.01 U	0.559	0.013	0.0094	0.5 U	37
The stage was taken from the WDOE staff gage.													
9/17/2008 14:05		0.72	95	10.7	7.34	1	0.59	0.01 U	0.553	0.017	0.0092	0.8	11
The stage was taken from the WDOE staff gage.													

Conventional Data Report

Lit 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
10/23/2007 13:35	9.5	1.38 J	111	11.2	7.52	1 U	0.563	0.01 U	0.491	0.016	0.0313	0.6	10
Stage taken from the DOE staff gage. QA here today.													
11/14/2007 13:30	7.1	1.38 J	109	11.45	7.33	1 U	0.931	0.01 U	0.854	0.03	0.026	0.9	1
The stage was taken from the WDOE staff gage at the flow monitoring station. The flow was low and clear.													
12/11/2007 11:45	5.2	40.9	76	12.3	7.22	12	0.963	0.01 U	0.929	0.02	0.017	2.6	7
The stage value was taken from the WDOE staff gage. Channel aggradation/substrate deposition massive with at least two feet of new sediment at the staff gage. Most of the recently placed LWD associated with the channel restoration project has been blown													
1/15/2008 13:00	4.3	20.2	66	12.7	6.62	9	0.777	0.01 U	0.696	0.014	0.01	1.5	4
The stage was taken from the WDOE staff gage.													
2/12/2008 13:40	7.8	3.72	81	11.9	7.09	2	0.723	0.01 U	0.681	0.019	0.017	1.3	2
The stage was taken from the DOE staff gage.													
3/11/2008 13:30	8.3	3.28	98	11.8	7.83 J	2	0.594	0.01 U	0.536	0.023	0.022	0.7	2
There is some question as to whether this pH value should be J coded because in order to calibrate the pH probe we had to soak it in 10 % HCl and then calibrate.													
4/8/2008 13:45	7.3	4.65	88	11.9	7.27	2	0.622	0.01 U	0.555	0.024	0.018	0.8	3
The stage was taken from the WDOE staff gage. Little Anderson creek is low and clear.													
5/20/2008 13:30	12.8	2.42	104	10.5	7.6	2	0.449	0.01 U	0.389	0.039	0.0316	1	7
The stage was taken from the WDOE staff gage. Little Anderson creek was low and clear.													
6/10/2008 13:45	9.8	2.85	103	10.8	7.36	2	0.533	0.01 U	0.473	0.034	0.022	1	35
The stage was taken from the WDOE staff gage. The stream remains very low, clear, and stable.													
7/16/2008 12:30	12.5	2.06	109	10.5	7.3	3	0.39	0.01 U	0.335	0.039	0.0309	1.1	16
The stage was taken from the WDOE staff gage. Little Anderson creek is low and clear.													
8/12/2008 13:36	12.6 J	2.06	109	10.4	7.44	9	0.352	0.01 U	0.29	0.047	0.028	2.7	12
The stage is the WDOE staff gage reading.													
9/17/2008 12:30		1.54	116	10.8	7.53	1	0.316	0.01 U	0.294	0.043	0.028	0.9	1
The stage was taken from the WDOE staff gage.													

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
10/23/2007 15:44	10		93	10.5	7.38	1	0.31	0.01 U	0.215	0.017	0.0324	0.5 U	1
I sampled upstream near the old WDOE flow station.													
11/14/2007 15:21	6.9		58	11.45	7.12	9	0.441	0.015	0.256	0.03	0.019	4	55
The flow was low and clear. I sampled at the bridge near the mouth at low tide.													
12/11/2007 14:30	5.4		58	12.2	6.98	12	0.273	0.013	0.236	0.021	0.014	4.9	5
Heavy sand/soil deposition in the entire Stavis creek floodplain.													
1/15/2008 15:15	4.4		51	12.7	6.83	25	0.23	0.01 U	0.17	0.019	0.0074	3.7	2
I sampled at the road bridge at low tide.													
2/12/2008 16:15	7.2		62	11.8	6.82	7	0.19	0.01 U	0.139	0.016	0.014	3.5	1
I sampled at the mouth today during an extreme low tide. This was the QA station today.													
3/11/2008 16:30	9.2		99	11.5	7.69	3	0.13	0.01 U	0.065	0.029	0.022	1.7	1
Sampled at the bridge during low tide.													
4/8/2008 16:00	7.3		89	11.4	7.23	10	0.135	0.01 U	0.065	0.027	0.017	2.1	31
Sampled at the road bridge during low tide. Stavis creek is low and clear.													
5/20/2008 15:30	14.1		110	9.85	7.54	3	0.14	0.01 U	0.072	0.044	0.028	1.3	12
I sampled from the county road bridge at low tide.													
6/10/2008 16:00	11.3		116	10.6	7.55	3	0.17	0.016	0.091	0.042	0.029	1.5	27
I sampled from the Stavis creek road bridge at low tide.													
7/16/2008 14:55	15.2		115	9.9	7.41	3	0.16	0.011	0.094	0.046	0.029	1.4	54
Sampled at the Stavis Creek road bridge during low tide.													
8/12/2008 15:35	13.6 J		103	10	7.36	2	0.13	0.01 U	0.073	0.048	0.0366	0.8	12
I sampled approximately 75 meters upstream from the Stavis creek road bridge at high tide.													
9/17/2008 14:40			123	10.4	7.42	2	0.12	0.01 U	0.087	0.046	0.0317	0.9	3
I sampled at the Stavis Bay road bridge at low tide.													

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
10/23/2007	9:30	9.1	1930	60	11	7.15	6	0.091	0.01 U	0.067	0.021	0.0059	6	2 J
		The stage was taken from the USGS wire weight gage on the bridge. The Skokomish was moderately high and emerald green.												
11/14/2007	9:40	7.2	1730	62	11.7	6.99	11	0.11	0.01 U	0.073	0.0094	0.0057	7.4	13
		The flow was moderately high and greenish/white in color. The stage was taken from the USGS wire weight gage.												
12/11/2007	8:05		1840											
		Unable to sample due to Highway 101 road closure.												
1/15/2008	9:45	5.1	2730	54	12.4	6.48	14	0.083	0.01 U	0.055	0.018	0.0064	12	4 J
		The stage was taken from the USGS staff gage.												
2/12/2008	9:15	5.9	2000	56	12.2	6.96	7	0.07	0.01 U	0.06	0.011	0.0061	7.2	1 J
		The stage was taken from the USGS wire weight gage on the highway 101 bridge.												
3/11/2008	9:45	5.8	2330	54	12.4	6.34 J	39	0.05	0.01 U	0.037	0.037	0.005	33	8
		The stage was taken from the USGS wire weight gage. The Skokomish was moderately high and turbid.												
4/8/2008	9:19	6.1	1430	64	12	7.07	4	0.047	0.01 U	0.032	0.0075	0.0058	2.3	7
		The stage was taken from the USGS wire weight gage.												
5/20/2008	9:15	7.9	1340	55	11.75	7.32	10	0.043	0.01 U	0.026	0.017 J	0.005	14	11 J
		The stage was taken from the USGS wire weight gage on the Highway 101 bridge. The river was high and turbid from snowmelt.												
6/10/2008	9:15	7.8	1110	62	11.5	7.28	4	0.044	0.01 U	0.019	0.0076	0.0044	3.2	27 J
		The stage was taken from the USGS wire weight gage on the highway 101 bridge.												
7/16/2008	9:00	9.8	737	70	10.8	6.93	2	0.059	0.015	0.025	0.006	0.004	1.3	20 J
		The stage was taken from the USGS wire weight gage on the highway 101 bridge.												
8/12/2008	9:05	9.6 J	610	70	10.6	7.02	2	0.051	0.01 U	0.025	0.01	0.0047	1	6 J
		The stage was taken from the USGS wire weight gage on the bridge. The Skokomish was low and clear.												
9/17/2008	9:00		480	73	10.19	7.08	3	0.046	0.01 U	0.038	0.0098	0.0069	1.6	10 J
		The stage was taken from the USGS wire weight gage on the bridge. The Skokomish is low and clear.												

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
10/23/2007 8:20	7.4	518	57	12.2	7.07	4	0.083	0.01 U	0.052	0.0099	0.003 U	3	7 J
The stage was taken from the USGS staff gage. A herd of 20 elk crossed the road approximately 1 mile downstream from the sampling station.													
11/14/2007 8:30	5.2	266	71	12.85	6.87	2	0.086	0.01 U	0.053	0.005 U	0.003 U	0.9	1 U
The stage was taken from the USGS staff gage. The Duckabush was low, clear, and cold.													
12/11/2007 7:00		358											
Unable to sample due to Highway 101 road closure.													
1/15/2008 8:15	3.7	398	70	13.3	6.52	3	0.055	0.01 U	0.03	0.005 U	0.003	1.6	2 J
The stage was taken from the USGS staff gage.													
2/12/2008 8:00	4.4	188	74	13.2	6.56	1 U	0.025 U	0.01 U	0.021	0.005 U	0.003 U	1	1 J
The Duckabush was low and clear. The stage was taken from the USGS staff gage. I calibrated the pH meter at the station and it checked o.k.													
3/11/2008 8:25	4.2	643	62	13.1	6.31 J	6	0.086	0.01 U	0.06	0.0057	0.0032	3.8	1 UJ
The stage was taken from the USGS gage.													
4/8/2008 7:50	5	146	81	12.75	7.27	2	0.036	0.01 U	0.02	0.0068	0.0034	0.5 U	4 J
The stage was taken from the USGS staff gage. The Duckabush is very low and cold.													
5/20/2008 8:05	5.4	379	47	12.9	7.31	24	0.075	0.01 U	0.046	0.024 J	0.0052	19	2 J
The stage was taken from the USGS staff gage. The river was high and turbid from snowmelt.													
6/10/2008 7:55	5.1	505	65	12.7	7.36	2	0.044	0.01 U	0.024	0.005 U	0.003 U	1.1	2 J
The stage was taken from the USGS staff gage. The river is moderately high with some snowmelt.													
7/16/2008 7:41	9.2	300	66	11.5	6.87	2	0.025 U	0.01 U	0.01 U	0.005 U	0.0042	1.6	8 J
The stage was taken from the USGS staff gage. The Duckabush was moderately high and clear.													
8/12/2008 7:44	10.6 J	126	81	11.2	7.21	1 U	0.025 U	0.01 U	0.01 U	0.005 U	0.003 U	0.5 U	3 J
The stage was taken from the USGS staff gage. The Duckabush was low and clear.													
9/17/2008 7:45		70 J	88	11.4	7.29	1	0.049	0.01 U	0.026	0.005 U	0.003 U	0.5 U	1 J
The stage was taken from the USGS staff gage which is almost completely dewatered. The Duckabush was low, clear, and cool.													

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
10/22/2007 17:45	9.2	1680	91	11.7	7.52	2	0.043	0.01 U	0.012	0.0054	0.003 U	2.4	1 U
11/13/2007 16:20	7.1	1150	94	12.6	7.26	3	0.045	0.01 U	0.022	0.005 U	0.003 U	2.7	2
12/10/2007 16:00	4.6	1730	75	12.8	6.42	155	0.077	0.01 U	0.046	0.392	0.0078	270	5
The Elwha river is very turbid and appears to be "boiling" gray mud.													
1/14/2008 16:00	4.4	1650	99	12.8	7.03	15	0.064	0.01 U	0.04	0.016	0.0054	21	2
The Elwha was green and moderately high.													
2/11/2008 17:00	4	809	110	13.45	7.2	6	0.057	0.01 U	0.028	0.018	0.0043	11	1
The Elwha was green/white in color.													
3/10/2008 18:11	5.3	1060	117	12.8	6.98	5	0.038	0.01 U	0.013	0.0065	0.0041	3.3	2
The Elwha was green and low. The Clallam county streamkeepers sampled here earlier today as part of the "side by side" program.													
4/7/2008 15:05	6.5	511	109	12.4	7.59	3	0.04	0.01 U	0.01	0.006	0.0042	1.2	1 U
The Elwha was low, clear, and cold.													
5/19/2008 15:50	6.9	5520	68	12.5	7.42	116	0.086	0.01 U	0.058	0.143	0.0054	120	
Sampled concurrently with the Clallam County streamkeepers. The Elwha was high and turbid with snowmelt and glacial flour.													
6/9/2008 16:15	7.7	2330	78	11.7	7.56	17	0.048	0.021	0.026	0.023	0.0039	16	3
7/15/2008 14:45	12.4	1590	75	11.3	7.64	9	0.025 U	0.01 U	0.01 U	0.013	0.003 U	7.3	16
The Elwha was moderately low in volume and greenish white in color.													
8/11/2008 15:20	14.7 J	765	90	10.6	7.61	2	0.031	0.01 U	0.01 U	0.0062	0.003 U	1.4	1 U
The Elwha was low and clear.													
9/16/2008 16:45		408	96	10.4	7.72	1	0.025 U	0.01 U	0.01 U	0.005 U	0.003 U	1.1	1 U
The Elwha river was low and clear.													

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
10/22/2007	14:05	10.1	66.6	72	11.1	7.19	13	1.08	0.01 U	0.997	0.005	0.0068	3.2	6
		Stage taken from the WDOE staff gage. West Twin river is virtually clear with a moderate flow.												
11/13/2007	13:23	7.5	117	73	11.8	6.97	7	1.02	0.01 U	0.954	0.01	0.0071	5.1	9
		The stage was taken from the WDOE staff gage. The flow was moderate and clear.												
12/10/2007	13:30	5.4	73.6	82	12.3	6.98	26	0.621	0.01 U	0.601	0.014	0.007	5.2	2
		The stage was taken from the WDOE staff gage.												
1/14/2008	14:00	6.3	173	62	12	7.23	53	0.558	0.01 U	0.532	0.038	0.0099	28	2
		The stage was taken from the WDOE staff gage.												
2/11/2008	13:45	6.2	125	62	12.9	7.17	13	0.472	0.01 U	0.451	0.013	0.0056	7.8	1 U
		The stage was taken from the DOE staff gage.												
3/10/2008	15:40	7	36.1	80	12.1	6.76	9	0.295	0.01 U	0.258	0.0074	0.0063	1.9	1
		The stage was taken from the WDOE staff gage. West Twin river is low and clear.												
4/7/2008	12:50	6.3	36.1	71	12.3	7.18	3	0.285	0.01 U	0.251	0.0067	0.0055	0.9	1
		The stage was taken from the WDOE staff gage.												
5/19/2008	13:40	9.4	40.7	75	11.4	7.29	11	0.094	0.01 U	0.072	0.014 J	0.0058	6.5	3
		The stage was taken from the WDOE staff gage.												
6/9/2008	13:45	8.4	18.2	85	11.6	7.45	1 U	0.085	0.01 U	0.052	0.0065	0.0063	0.6	12
		The stage was taken from the WDOE staff gage. West Twin river is low and clear.												
7/15/2008	12:55	12.8	5.87	97	10.7	7.26	1 U	0.094	0.01 U	0.053	0.008	0.0083	0.6	8
		The stage was taken from the WDOE staff gage. The smolt trap has been removed by the tribe. The river is low and clear.												
8/11/2008	13:31	13.4 J	4.56	103	10.19	7.23	1 U	0.071	0.01 U	0.031	0.01	0.0054	1	9
		The stage was taken from the WDOE staff gage.												
9/16/2008	14:05		3.84	104	10.6	7.31	1 U	0.15	0.039	0.118	0.0089	0.0066	0.5	11
		The stage was taken from the WDOE staff gage.												

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
10/22/2007 15:15	10.1	312	77		7.33	5	1.47	0.01 U	1.36	0.014	0.0092	3	1 U
No dissolved oxygen sample at this station--lab processing error.													
11/13/2007 14:55	7.2	408	73	12.3	7.09	8	1.13	0.01 U	1.05	0.013	0.0077	6	6
Stage was taken from the WDOE staff gage. The river was dropping and clearing.													
12/10/2007 14:34	5	63.6	76	12.95	7.07	10	0.57	0.01 U	0.574	0.015	0.0083	7.7	1 U
The stage was taken from the WDOE staff gage. This value sets a new low point due to the loss of the control structure downstream.													
1/14/2008 15:15	5.7	205	58	12.3	7.27	55	0.459	0.01 U	0.443	0.043	0.013	35	6
The stage was taken from the WDOE staff gage.													
2/11/2008 15:45	6	144	60	12.7	7.4	19	0.408	0.01 U	0.413	0.021	0.0085	14	1
The stage was taken from the DOE staff gage. A group of 5 alders on the left bank collapsed Sunday night and now span the entire stream forming a complete blockage. This has the potential to form a large jam right at Josey Paul's property.													
3/10/2008 16:45	6.5	61.1	76	12.4	6.92	3	0.269	0.01 U	0.231	0.0083	0.0073	2.1	1 U
The stage was taken from the WDOE staff gage. East Twin river is low and clear.													
4/7/2008 13:45	5.4	47.1	75	12.5	7.11	3	0.284	0.01 U	0.245	0.0069	0.0059	1.4	1
The stage was taken from the WDOE staff gage. East Twin river was low and clear.													
5/19/2008 14:24	8.4	59.5	74	11.6	6.75	7	0.08	0.01 U	0.058	0.014 J	0.0066	7.1	2
The stage was taken from the WDOE staff gage.													
6/9/2008 15:00	7.9	21.1	87	11.8	7.5	1	0.15	0.039	0.079	0.0086	0.0068	0.7	24
The stage was taken from the WDOE staff gage. East Twin river is low and clear.													
7/15/2008 13:40	13.1	8.09	104	11.2	7.59	2	0.14	0.01 U	0.071	0.0085	0.0062	0.5	3
The stage was taken from the WDOE staff gage. The river is low and clear.													
8/11/2008 14:15	14 J	7.27	110	11.05	7.83	1 U	0.083	0.01 U	0.036	0.0098	0.0052	0.5	7
The stage was taken from the WDOE staff gage.													
9/16/2008 15:30		6.44	116	10.9	7.67	1	0.22	0.01 U	0.173	0.011	0.0087	0.7	15
The stage was taken from the WDOE staff gage.													

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
10/22/2007 13:15	10.3	81.8	73	10.5	6.86	5	1.18	0.01 U	1.07	0.017	0.0071	3.4	14
Stage taken from the WDOE staff gage. Deep creek is moderately high with some color.													
11/13/2007 12:30	7.5	93.8	72	11.2	6.8	5	1.01	0.01 U	0.913	0.013	0.0065	3.8	7
The stage was taken from the WDOE staff gage. The flow was moderate and clear.													
12/10/2007 12:45	5.4	91.2	77	12.2	6.61	8	0.615	0.01 U	0.59	0.019	0.0071	4.5	9
The stage was taken from the WDOE staff gage which appears secure.													
1/14/2008 13:00	6.4	2007	61	11.7	7.27	21	0.558	0.01 U	0.505	0.018	0.0063	11	3
The stage was taken from the WDOE staff gage.													
2/11/2008 13:00	6.2	167	64	12.8	6.92	10	0.44	0.01 U	0.491	0.01	0.0055	5.2	1 U
The stage was taken from the DOE staff gage. I sampled on the east (right) bank because of the larger contribution of a small tributary that joins Deep Creek just upstream from the bridge. This tributary is high in tannins and brown in color. There are													
3/10/2008 14:45	7.3	58.4	78	12.3	6.92	4	0.282	0.01 U	0.245	0.0067	0.0035	2.5	1 U
The stage value is taken from the WDOE staff gage. Deep Creek is low and clear.													
4/7/2008 12:05	5.8	59.6	70	12.2	7.15	3	0.31	0.01 U	0.257	0.011	0.0048	1.5	1
Stage was taken from the WDOE staff gage. Deep creek is low and clear.													
5/19/2008 12:50	9.7	39.5	78	11.3	7.34	3	0.1	0.01 U	0.063	0.011 J	0.0051	1.7	2
The stage was taken from the WDOE staff gage under the highway bridge. Deep creek was low and almost clear.													
6/9/2008 12:45	8.5	20.1	93	11.2	7.33	1 U	0.084	0.01 U	0.044	0.0065	0.0057	0.6	9
The stage was taken from the WDOE staff gage. Deep creek is low and clear. The smolt trap is still in place and fishing upstream from the sampling station.													
7/15/2008 12:25	12.5	6.4	109	10.3	7.37	1 U	0.11	0.01 U	0.041	0.0075	0.0053	0.5 U	7
The stage was taken from the WDOE staff gage. The smolt trap has been removed. The river is low and clear.													
8/11/2008 12:45	14.1 J	5.51	115	9.69	7.15	1 U	0.09	0.01 U	0.036	0.011	0.0055	0.6	23
The stage was taken from the WDOE staff gage. I sampled at high tide from the bridge.													
9/16/2008 13:05		4.34	120	10.05	7.15	1	0.098	0.01 U	0.041	0.008	0.004	0.7	6
The stage was taken from the WDOE staff gage. Deep creek is low and clear. I sampled at high tide.													

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
10/22/2007 11:30	8.8	5730	61	11.9	7.19	79	0.18	0.01 U	0.131	0.0572	0.0043	40	51
Raining hard at this station. The Hoh was moderately high and brown.													
11/13/2007 10:55	7	4660	66	12	7.02	35	0.18	0.01 U	0.137	0.0594	0.0046	36	60 J
Flow was moderate and brownish/gray in color.													
12/10/2007 11:05	5.3	2680	81	12.6	6.98	24	0.13	0.01 U	0.123	0.03	0.0045	11	7 J
The Hoh was green/gray in color. A massive terrace of substrate at least 10 feet high has either been exposed or deposited by flood waters along the left bank upstream of the sampling station. The boat launch is gone.													
1/14/2008 11:15	5.8	4100	63	12.25	7.1	36	0.13	0.01 U	0.104	0.03	0.0083	21	5 J
Gray green in color and modately high in flow.													
2/11/2008 11:20	4.7	3360	67	13.1	7.4	18	0.13	0.01 U	0.107	0.016	0.0031	12	5 J
The Hos was greenish/white in color and moderately high. Bank erosion at the sampling location in the Oxbow campground was severe this winter, espcecially during the December 3rd flood. The unimproved boat launch that was here last winter is gone.													
3/10/2008 13:05	6.9	1870	78	12.2	6.4	5	0.067	0.01 U	0.045	0.0097	0.003 U	5.8	9
I checked the calibration values of both meters at this station and found them to be o.k.. As a side note, Lake Quinalt and the river, which we don't sample at this time, continue to be extremely turbid following the December 2007 great flood. A very la													
4/7/2008 10:30	5.2	2110	60	12.35	6.48	15	0.128	0.01 U	0.076	0.017	0.0041	9.1	35 J
The Hoh was low, cold, and brownish green in color. All fishing in the Hoh river was closed on April 3rd, 2008 in order to attempt to achieve the escapement goal for wild steelhead.													
5/19/2008 11:15	7	4620	72	12	7.24	112	0.059	0.01 U	0.049	0.0799	0.0041	39	13 J
The Hoh was high in flow and turbid with snowmelt/glacial flour.													
6/9/2008 11:00	7.6	2220	83	11.9	7.33	8	0.035	0.01 U	0.024	0.0084	0.0035	5	5 J
The river is low and greenish/white from a small amount of snowmelt and glacial flour. Cold rain here.													
7/15/2008 10:45	10	1900	77	11.55	6.89	8	0.069	0.016	0.014	0.009	0.003 U	7.5	5 J
The Hoh was moderately low and greenish/white in color.													
8/11/2008 11:05	11.3 J	1350	76	11.2	7	6	0.056	0.01 U	0.014	0.012	0.003 U	6.7	6 J
The Hoh was low and greenish white in color from some snowmelt.													
9/16/2008 10:35		868	86	11.3	7.16	3	0.025 U	0.01 U	0.015	0.005 U	0.0048	3.6	16 J
The Hoh was relatively and almost clear.													

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
10/22/2007	9:45	9.1	3890	48	11.85	7.15	29	0.23	0.01 U	0.171	0.038	0.0062	30	7 J
		The Humptulips was moderately high and greenish brown in color. The stage was taken from the USGS wire weight gage on the bridge.												
11/13/2007	9:10	7.3	3510	45	12.2	6.72	52	0.2	0.01 U	0.165	0.0648	0.0033	50	30 J
		The stage was taken from the USGS wire weight gage. The flow was moderately high and brown with heavy leaf litter.												
12/10/2007	9:20	5.8	1580	55	12.3	6.82	6	0.18	0.01 U	0.171	0.012	0.0044	5.8	3 J
		The Humptulips is greenish/white in color and surprisingly low.												
1/14/2008	9:15	6.2	2950	48	11.95	6.9	22	0.16	0.016	0.129	0.028	0.0051	21	5 J
		The stage was taken from the USGS wire weight gage on the bridge. The river was moderately high and greenish white in color. No fish, no fisherman.												
2/11/2008	9:20	5.3	3870	47	12.75	6.88	30	0.17	0.015	0.138	0.032	0.0046	25	1 J
		The stage was taken from the USGS wire weight gage on the bridge. The river was moderately high and greenish/brown in color.												
3/10/2008	11:29	7.2	842	54	12.2	6.67	2	0.12	0.016	0.067	0.005 U	0.003 U	0.8	1 J
		The stage was taken from the USGS wire weight gage on the bridge. The river was surprisingly low and clear. The sampling times are unusually late on this run due to computer problems this morning.												
4/7/2008	8:50	5.8	1460	46	12.2	7.01	5	0.13	0.01 U	0.083	0.0062	0.005	3.7	10 J
		The stage was taken from the USGS wire weight gage. The Humptulips was low, cold, and green.												
5/19/2008	9:30	10.1	1000	50	11.65	7.22	3	0.066	0.027	0.034	0.0076 J	0.0052	3.5	6 J
		The stage was taken from the USGS wire weight gage. The river was low and green in color with no evidence of snowmelt.												
6/9/2008	9:20	9.1	675	55	11.6	7.01	2	0.098	0.01 U	0.048	0.0055	0.0056	0.9	13 J
		The stage was taken from the USGS wire weight gage on the highway 101 bridge. The river is low and clear.												
7/15/2008	9:15	14.9	257	64	9.85	6.89	1	0.087	0.01 U	0.035	0.005 U	0.0051	0.5	15 J
		The stage was taken from the USGS wire weight gage on the highway 101 bridge. Cattle were seen upstream of the bridge on the left bank.												
8/11/2008	9:05	14.1 J	253	65	10.1	7.11	1 U	0.11	0.014	0.028	0.008	0.0044	0.5 U	100 J
		The stage was taken from the USGS wire weight gage. The operation of the wire weight gage will be compromised if the riprap from the construction currently underway extends much further into the stream.												
9/16/2008	8:45		245	66	10.3	7.09	1 U	0.094	0.01 U	0.06	0.0057	0.006	0.5 U	40 J
		The stage was taken from the USGS wire weight gage. The construction project for protecting the left bank and the approach to the Highway 101 bridge has been completed. The wire weight gage is still functional. The project design is interesting. Some												

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
10/30/2007 16:50		898	104	11	7.36	3	0.739	0.02	0.538	0.032	0.021	2.6	8 J
	White soapy film on water												
11/27/2007 17:35	4.6	1660	99	12.6	7.26	2	0.71	0.01 U	0.591	0.029	0.016	2.8	4
12/17/2007 8:15	6	5270	79	11.3	7.14	34	0.675	0.01 U	0.569	0.117	0.013	80	160
1/28/2008 8:15	2.8	3720	100	12.6	7.08	18	0.776	0.013	0.695	0.038	0.011	14	19 J
	No RP - gage lock frozen. Stage based on RP from bolt, converted back to WWG scale after measuring both in April.												
2/27/2008 15:00	7.7	3580	94	11.42	7.13	14	0.678	0.01	0.617	0.034	0.012	9.5	11
3/18/2008 15:25	7.4	5640	83	11.8	7.17	19	0.602	0.01 U	0.534	0.039	0.011	14	26
4/22/2008 16:25	7.9	3200	104	11.6	7.31	8	0.517	0.01 U	0.462	0.0354	0.0086	6.3	13
5/20/2008 15:24	17.4	1730	115	10.05	7.55	9	0.42	0.01 U	0.33	0.022 J	0.0058	2.9	5
6/17/2008 15:00	15.3	1500	82	10.4	7.46	6	0.495	0.014	0.374	0.026	0.013	2.9	7
7/22/2008 15:26	19.2	524	108	10.15	7.81	3	0.537	0.01 U	0.44	0.018	0.0053	1.7	11
8/19/2008 16:10	20.4	439	106	9 J		2	0.587	0.011	0.46	0.024	0.012	1.3	16
	pH not recorded. Over-ran DO endpoint.												
9/23/2008 15:10	15.7	425	109	10.8	7.87	2	0.669	0.011	0.532	0.026	0.017	1.1	11 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
10/29/2007 8:50	6.4	166	73	11.7 J	7.55 J	4	0.415	0.01 U	0.337	0.0081	0.0076	0.8	33
DO overran by .6													
11/26/2007 9:15	3.7	287	67	13	7.36	1	0.5	0.01 U	0.444	0.0086	0.0081	0.9	41
Shocked pH meter, checked calibration, recalibrated, pH origanally was 6.99 @ 4.2c													
12/19/2007 7:50	6.1	2370	50	14	7.09	710	0.495	0.01 U	0.368	0.754	0.0095	650	45 J
Collected stream side samples collected and no RP. Bridge washed out.													
1/29/2008 15:25	2.4	417	63	13.6	7.26	17	0.43	0.01 U	0.356	0.027	0.0087	12	30 J
2/25/2008 9:30	5.7	510	61	12.55	7.98	8	0.314	0.01 U	0.3	0.018	0.0079	8.1	12 J
3/17/2008 8:40	5.5	972	61	12.7	7.25	30	0.387	0.01 U	0.339	0.05	0.0087	24	15
4/21/2008 8:05	5.1	339	69	12.5	7.43	4	0.288	0.01 U	0.247	0.014	0.0072	3.1	22
5/19/2008 9:25	15.2	193	70	9.54	7.63	3	0.2	0.01 U	0.103	0.015 J	0.0063	1.6	66
6/16/2008 8:10	12.1	249	70	10.19	7.8	5	0.24	0.01 U	0.149	0.015	0.0059	2.3	190
7/21/2008 8:30	17.4	42	82	7.6	7.6	20	0.16	0.01 U	0.069	0.023	0.0077	2.8	65 J
8/18/2008 8:30	19.2	27	91	8.19	7.67	5	0.13	0.01 U	0.039	0.02	0.008	2.1	43
9/22/2008 8:17	14.1	32	86	9.3	7.45	2	0.098	0.01 U	0.011	0.015	0.0058	1.7	65

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
8/28/2008 10:37	16.4 J	61.6	113	7.62									
Check samples for hydrolab deployment													
9/4/2008 10:50	15.8 J	51.8	114	8.45									
Check samples for hydrolab deployment													
9/11/2008 13:15	16.4 J	42.1	122	8.75									
Check samples for hydrolab deployment													
9/16/2008 11:10		39.6	121	8.21									
Check samples for hydrolab deployment													
9/22/2008 10:40	15.1 J	42.1	122	8.4									
Check samples for hydrolab deployment													
9/30/2008 14:50			123	9.07									
Check samples for hydrolab deployment													

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
10/29/2007 10:15	7.8	240	68	11.3	7.08 J	2	0.711	0.01 U	0.605	0.01	0.007	1.3	23
11/26/2007 11:00	4.8	411	64	12.4	7.01	2	0.822	0.01 U	0.759	0.0083	0.0058	1.4	20
12/17/2007 10:10	6.5	938	59	11.6	6.98	31	0.778	0.01 U	0.727	0.037	0.0091	13	60
1/28/2008 9:55	3.3	411	62	12.8	7.14 J	5	0.825	0.01 U	0.733	0.013	0.007	2.8	13 J
2/25/2008 11:15	7.7	435	60	12.24	7.49	3	0.694	0.023	0.625	0.0094	0.0052	1.5	11
3/17/2008 9:45	6.8	844	58	12	7.08	6	0.722	0.01 U	0.685	0.014	0.0064	3.2	46
4/21/2008 9:10	6.1	432	61	12	7.21	3	0.563	0.01 U	0.535	0.012	0.0052	1.2	21
5/19/2008 10:25	16.9	166	66	9.24	7.19	2	0.394	0.01 U	0.291	0.017 J	0.0047	1.2	24
6/16/2008 9:10	12.9	216	64	10	7.35	3	0.409	0.025	0.318	0.012	0.0039	1.4	40
7/21/2008 9:50	17.4	60	72	8.6	7.27	3	0.258	0.01 U	0.176	0.014	0.0041	1.4	36
8/18/2008 9:37	19.5	37	79	7.7	7.23	4	0.23	0.021	0.102	0.02	0.0048	1.9	100
9/22/2008 9:43	14.7	41	75	9	7.12	5	0.285	0.01 U	0.157	0.021	0.0032	2.1	160

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
10/29/2007 11:35	8.1	224	57	11.9	7.62 J	1	0.562	0.01 U	0.501	0.0085	0.0092	0.9	35
11/26/2007 12:30	5.2	246	55	13	7.26	1	0.583	0.01 U	0.539	0.0079	0.0082	0.6	18
12/17/2007 11:40	6.5	520	51	12.4	7.33	7	0.478	0.01 U	0.461	0.015	0.0084	5	57
1/28/2008 11:30	4.1	207	54	13.2	7.39 J	1 U	0.54	0.01 U	0.496	0.0087	0.0094	0.9	14
2/25/2008 13:20	7.6	213	53	12.44	7.52	1	0.487	0.01 U	0.455	0.0087	0.008	0.5	23
3/17/2008 11:15	6.5	520	50	12.8	7.29	3	0.475	0.01 U	0.468	0.011	0.0079	1.7	34
4/21/2008 10:40	5.5	215	54	13.2	7.45	1	0.4	0.01 U	0.397	0.009	0.0073	0.8	18
5/19/2008 11:56	13.8	150	56	10.75	7.48	2	0.299	0.01 U	0.275	0.014 J	0.0064	1.1	9
6/16/2008 10:20	10.1	232	55	11.9	7.52	1	0.42	0.01 U	0.355	0.0072	0.0052	0.9	29
7/21/2008 11:20	15	53	62	10.4	7.55	1	0.258	0.01 U	0.21	0.0097	0.006	0.7	15
8/18/2008 11:00	16.5	29	64	9.9	7.45	1	0.266	0.01 U	0.19	0.013	0.0051	1	150
9/22/2008 11:29	12.9	38	62	10.19	7.22	2	0.15	0.01 U	0.076	0.0096	0.003 U	0.9	37

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
10/29/2007 15:15	8.1	34.4	60	11.8	7.28 J	1 U	0.61	0.01 U	0.537	0.0059	0.0072	0.5 U	31
11/26/2007 16:25	4.4	64.3	53	12.6	7.22	1	0.65	0.01 U	0.621	0.0054	0.0055	0.6	13
Too dark for staff reading													
12/17/2007 15:45	5.9	124	49	12.2	7.26	5	0.724	0.01 U	0.708	0.015	0.0078	4.5	39
1/28/2008 16:40	4.3	70.7	50	12.7	7.28	2	0.687	0.01 U	0.619	0.0079	0.008	1.2	4
2/27/2008 10:45	6	130	44	12.65	7.33	5	0.581	0.01 U	0.573	0.0097	0.0063	1.4	19
3/17/2008 15:05	6.4	179	43	12.7	7.24	5	0.54	0.01 U	0.526	0.013	0.0072	2.7	15
4/21/2008 15:00	5.6	83.4	47	12.6	7.35	3	0.444	0.01 U	0.451	0.013	0.0064	0.8	2
5/19/2008 16:15	15.7	32.7	53	9.74	7.4	2	0.356	0.016	0.317	0.014 J	0.009	1.2	10
Birds in pool where samples were taken													
6/16/2008 14:30	12.8	45.6	52	10.6	7.49	2	0.417	0.01 U	0.346	0.011	0.0075	0.9	27
7/21/2008 16:05	16.8	9.99	65	9.69	7.39	1 U	0.317 J	0.037 J	0.272 J	0.01	0.0078	0.7	20
8/18/2008 16:20	16.7	6.85	73	9.6	7.4	2	0.312	0.01 U	0.243	0.012	0.0066	1.1	160 J
9/22/2008 15:25	13.1	30.9	74	10.1	7.24	1 U	0.312	0.01 U	0.232	0.014	0.0086	0.7	180
Upstream channelization and downstream impoundment have changed the flow relationship at this station since August's visit.													

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
10/29/2007	14:15	7.7	15.4	49	12	6.97 J	1 U	0.287	0.01 U	0.23	0.0056	0.0054	0.5	13
11/26/2007	15:15	3.8	32.6	42	13.1	7.2	1 U	0.359	0.01 U	0.316	0.005 U	0.004	0.7	5
		Sampled above fish weir.												
12/17/2007	15:00	6.2	101	36	12.5	7.2	3	0.43	0.01 U	0.394	0.0096	0.0052	2.6	25
1/28/2008	15:35	4.4	67.1	37	12.9	7.24	1 U	0.4	0.01 U	0.345	0.005 U	0.0052	0.9	7
2/25/2008	16:40	7.4	110	36	12.44	7.28	2	0.291	0.01 U	0.28	0.0072	0.0049	0.9	3
		Van stuck in the mud, end of the day.												
3/17/2008	14:00	6.5	155	34	12.8	7.19	3	0.325	0.01 U	0.314	0.0076	0.005	1.5	13 J
4/21/2008	14:00	5.9	77.2	37	12.9	7.24	2	0.264	0.01 U	0.256	0.005 U	0.0041	1.3	1 U
5/19/2008	15:20	14.7	37.3	42	10.2	7.28	2	0.23	0.01 U	0.163	0.013 J	0.0056	1.1	11
6/16/2008	13:40	12	54.1	38	10.9	7.33	2	0.277	0.01 U	0.204	0.008	0.0054	1	34
7/21/2008	15:00	15.4	13.2	49	10.19	7.48	1 U	0.19	0.01 U	0.156	0.01	0.0056	0.9	18
8/18/2008	15:20	16.3	9.74	57	10.19	7.56	3	0.251	0.01 U	0.187	0.011	0.0056	1	170 J
9/22/2008	14:25	12.4	9.52	57	10.8	7.43	1	0.18	0.01 U	0.111	0.012	0.0062	1	43

Conventional Data Report

Abernathy Cr. @ DNR

25E100

Class: A
Rivermile: 1
Latitude: 46 15 52.4
Longitude: 123 11 03.4
Waterbody: WA-CR-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
10/29/2007 14:45	8.3	21.5	47		7.26 J	1 U							
11/26/2007 16:00	4.5	30.9	43		7.28	2 U							
12/17/2007 14:35	5.9	54.6	39	12.4	7.19	1 U							
1/28/2008 16:00	3.2		39	13.4	7.24	1 U							
2/27/2008 10:00	5.8	58.5	38	12.49	7.31	1 U							
Elk carcass downstream of sample area.													
3/17/2008 14:35	6.1	190	36	12.9	7.22	2							
4/21/2008 14:35	5.6	36.2	39	12.7	7.29	1							
5/19/2008 15:53	13.1	18.8	43	10.15	7.44	1							
6/16/2008 14:10	11.3	26.7	41	11	7.44	1							
7/21/2008 15:48	15	6.57	47	10.4	7.46	1 U							
8/18/2008 15:50	14.5	6.41	50	10.19	7.48	1 U							
9/22/2008 14:54	12.2	6.01	51	10.6	7.36	1 U							

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
10/29/2007 12:50	6.9 Staff=1.85	45	37	12.1	7.4 J	1 U	0.15	0.01 U	0.142	0.005 U	0.0039	0.7	15
11/26/2007 13:45	3.3 staff=2.06	33.7	34	13.3	7.03	1	0.253	0.01 U	0.208	0.005 U	0.003 U	0.7	10
12/17/2007 13:05	6.1	141	30	12.5	7.04	2	0.344	0.01 U	0.308	0.0085	0.003 U	3.5	32
1/28/2008 12:50	4	82	32	13	7.32 J	1	0.36	0.01 U	0.325	0.005 U	0.003 U	0.9	4
2/25/2008 15:00	7.6 staff=2.28	95.3	30	12.55	7.28	1	0.305	0.01 U	0.288	0.0067	0.003 U	0.8	9
3/17/2008 12:30	6.3	141	29	12.8	7.08	2	0.325	0.026	0.285	0.005 U	0.0031	1.4	27
4/21/2008 12:20	5.5	78.4	32	12.7	7.18	1	0.267	0.01 U	0.257	0.0073	0.003 U	0.9	5
5/19/2008 13:54	13.5	11.8	34	10.35	7.29	2	0.24	0.01 U	0.179	0.0078 J	0.0032	1.2	24
6/16/2008 11:50	10.5	67.1	31	10.8	7.13	2	0.264	0.034	0.165	0.011	0.0073	0.9	8
7/21/2008 13:20	14.1	18.3	38	10.4	7.26	2	0.2	0.01 U	0.177	0.006	0.0038	0.6	47 J
8/18/2008 13:25	15.4	12.6	42	10.1	7.35 J	1	0.23	0.01 U	0.195	0.0072	0.0047	0.8	240
9/22/2008 13:03	11.9	11.8	44	10.7	7.34	1 U	0.2	0.01 U	0.139	0.0067	0.0039	1	51

Conventional Data Report

Mill Cr. @ DNR

25F100

Class: A
Rivermile: 4
Latitude: 46 13 07.4
Longitude: 123 12 47.4
Waterbody: WA-CR-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
10/29/2007 13:45	7.5	15.8	29		7 J	1 U							
11/26/2007 14:42	3.8	24.2	27		6.88	1 U							
12/17/2007 13:55	6.6	67.7 J	26	12.3	6.83	1							
1/28/2008 14:39	4.2	40.1	27	12.8	6.98	1 U							
2/25/2008 15:35	7.2	52.9	26	12.14	7.06	1 U							
3/17/2008 13:25	6.2	68.9	24	12.8	6.93	2							
4/21/2008 13:20	5.6	40.1	27	12.8	6.97	1 U							
5/19/2008 14:31	13.6	20.4	28	9.94	7.02	1							
6/16/2008 13:00	10.8	39.3	26	11.2	7.09	1							
7/21/2008 14:14	14.7	9.87	32	10.3	6.91	1 U							
8/18/2008 14:30	15.9	6.12 J	34	9.9	6.95	1 U							
9/22/2008 13:45	12.3	5.72	35	10.7	6.95	1 U							

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	Flow	Conduc-tivity	Oxygen	ph	Suspend. Solids	Total Pers. N.	Ammonia Nitrogen	Nitrate+ Nitrite	Total Phosp.	Soluble Reactive P	Turbid-ity	Fecal Coliforms
		deg. C	CFS	umhos/cm	mg/L	std units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	#/100/mL
10/30/2007	15:00	9.7	5380	86	11.3	7.63	62	0.14	0.01 U	0.088	0.026	0.006	4.4	9
		Moved to Day 2												
11/27/2007	15:55	7.6	5900	90	11.8	7.47	29	0.2	0.01 U	0.148	0.02	0.006	28	24 J
		Moved to day 2.												
12/18/2007	16:00	7.4	12700	70	12.1	7.35	134	0.25	0.016	0.205	0.127	0.0073	45	17
1/29/2008	13:55	4.5	11000	74	12.7	7.43	79	0.26	0.01 U	0.205	0.038	0.0076	13	10 J
2/27/2008	12:10	6.3	9070	78	12.44	7.39	89	0.24	0.01 U	0.218	0.023	0.006	7.5	6
3/17/2008	15:50	6.9	10600	70	12.8	7.32	144	0.354	0.01 U	0.328	0.0579	0.0079	16	10
4/21/2008	16:05	7	7320	81	12.3	7.43	43	0.244	0.01 U	0.212	0.0341	0.006	8.2	8
5/19/2008	17:00	11.7	10400	67	10.75	7.34	1080	0.17	0.01 U	0.104	0.713	0.008	550	45
6/16/2008	15:55	11.6	14300	69	11.3	7.5	123	0.14	0.01 U	0.106	0.0877	0.0051	26	14
7/21/2008	17:25	15.8	5190	90	10.4	7.51	48	0.077	0.01 U	0.046	0.048	0.0046	18	6
8/18/2008	17:10	13.9	5600	84	10.5	7.58	29	0.077	0.01 U	0.046	0.024	0.0047	5.3	35
9/22/2008	16:08	12.7	6100	79	10.6	7.37	22	0.09	0.01 U	0.044	0.013	0.0042	3.8	14

Metals 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		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
10/30/2007	15:00		27.4	0.1 U	0.02 U	0.5 U	0.26	1.65	0.	65	0.1 U	0.02 U	0.002 U	0.31	0.26	5 U	1.6
12/18/2007	16:00		23.1	0.1 U	0.02 U	0.85	0.28	5.98	1.	2	0.44	0.034	0.0048	0.37	0.52	5	1.3
2/27/2008	12:10		25.2	0.1 U	0.02 U	0.5 U	0.25 U	2.19	0.	81	0.12	0.02 U	0.002 U	0.28	0.38	5 U	1 U
4/21/2008	16:05		26.3	0.1 U	0.02 U	0.5 U	0.28	1.95	0.	88	0.1 U	0.021	0.002 U	0.23	0.27	5 U	1.2
6/16/2008	15:55		23.7	0.1 U	0.02 U	0.6	0.29	4.65	0.	96	0.28	0.033	0.002 U	0.33	0.35	5 U	1 U
8/18/2008	17:10		27.5	0.1 U	0.02 U	0.5 U	0.25 U	1.5	0.	63	0.1 U	0.02 U	0.002 U	0.1 U	0.3	5 U	1 U

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
10/30/2007 14:10	7.7	220 J	53	12.3	7.71	1	0.263	0.01 U	0.208	0.011	0.013	0.7	4
+,- 0.5' for RP													
11/27/2007 15:08	5	360 J	52	13.5	7.61	2	0.448	0.01 U	0.404	0.011	0.011	1.8	20
+-0.5 on RP, conductivity meter got changed to T ref 20, was rechecked later.													
12/18/2007 15:05	6.3	734 J	46	12.2	7.44	11	0.529	0.01 U	0.52	0.021	0.012	6.5	20
1/29/2008 13:20	4	482 J	49	13.4	7.46	3	0.603	0.01 U	0.524	0.012	0.013	2	1
2/26/2008 17:50	5.7	4235 J	43	12.85	7.41	3	0.504	0.01 U	0.463	0.0099	0.0098	1.4	7 J
fisherman upstream													
3/18/2008 13:30	6.8	1404 J	42	13.1	7.39	8	0.577	0.01 U	0.58	0.016	0.011	4.8	24
4/22/2008 14:35	6	1404 J	45	13.1	7.63	4	0.429	0.01 U	0.435	0.011	0.0094	2.2	2
Windy, RP is estimate + or - 1 ft.													
5/20/2008 13:33	5.7	1668 J	30	12.01	7.35	21	0.16	0.01 U	0.131	0.024 J	0.0082	11	57
6/17/2008 13:05	10.1	692 J	38	12.1	7.8	4	0.21	0.01 U	0.173	0.012	0.0096	1.9	9
7/22/2008 14:55	14.5	177 J	53	11.7	8.32	4	0.12	0.01 U	0.058	0.012	0.0064	1.2	6
8/19/2008 14:15	14.6	179 J	59	11.4	8.19	3	0.2	0.01 U	0.138	0.022	0.015	0.8	38
9/23/2008 13:20	11.3	146 J	62	11.3	7.75	2	0.18	0.013	0.114	0.02	0.017	0.7	40
Fishermen and fish carcasses above sample location													

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
10/30/2007	13:10 7.9	967	44	12.6	8.05	1	0.23	0.01 U	0.179	0.005 U	0.0034	0.5	1 U
11/27/2007	14:02 5.3	531	39	13.5	7.58	1 U	0.427	0.01 U	0.37	0.005 U	0.0034	1.6	12
12/18/2007	14:15 6.3	556	39	12.4	7.33	1	0.503	0.01 U	0.48	0.0052	0.0049	1.5	12
1/29/2008	12:30 3.7	636	39	13.2	7.39	2	0.516	0.01 U	0.447	0.0062	0.0055	2.6	14
2/26/2008	16:50 6.1	806	34	12.95	7.5	1	0.314	0.01 U	0.296	0.005 U	0.0042	0.7	1
3/18/2008	12:40 7.2	2820	30	12.8	7.31	10	0.4	0.01 U	0.386	0.013	0.0051	5.1	14
4/22/2008	13:45 6.5	636	36	12.9	7.68	2	0.302	0.01 U	0.274	0.0051	0.003	1.4	5
5/20/2008	12:47 8.6	1765	22	12.06	7.4	3	0.09	0.01 U	0.065	0.0068 J	0.0032	1.2	19
6/17/2008	12:05 11.3	701	32	12.1	8.06	2	0.18	0.01 U	0.133	0.0056	0.0038	0.8	4
7/22/2008	14:09 17.3	102	54	10.19	7.51	2	0.22	0.01 U	0.159	0.006	0.0049	0.6	5
8/19/2008	13:15 19.3	75.2	61	10.1	8.05	2	0.286	0.01 U	0.212	0.0094	0.0037	0.7	36
9/23/2008	12:10 12.8	65.5	63	10.9	7.77	2	0.23	0.01 U	0.161	0.0069	0.0049	0.9	26

Conventional Data Report

Washougal R @ Washougal

28B070

Class: A
Rivermile: 3
Latitude: 45 35 10.4
Longitude: 122 21 14.3
Waterbody: WA-28-2030

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
10/30/2007	11:15	8.7	208	32	12.1	7.75	1 U	0.23	0.01 U	0.176	0.0054	0.0045	0.7	10
		RP not do able												
11/27/2007	11:40	4.5	417	30	13.6	7.26	4	0.375	0.01 U	0.326	0.0061	0.0052	2.2	15
		Hard to keep rope off bridge when sampling, may have knocked debris into samples.												
12/18/2007	12:25	5.6	643	29	12.7	7.25	2	0.365	0.01 U	0.344	0.0079	0.0061	1.7	7
1/29/2008	10:15	3.7	557	31	13.1	7.17	2	0.522	0.01 U	0.448	0.0083	0.0071	1.5	8
2/26/2008	14:30	6.1	1079	24	13.06	7.29	1	0.24	0.01 U	0.229	0.0056	0.0061	0.7	2
3/18/2008	10:55	6.6	4882	21	12.7	7.12	23	0.301	0.01 U	0.284	0.039	0.0054	13	32
4/22/2008	11:20	5.6	665	27	13	7.56 J	1	0.27	0.01 U	0.258	0.0063	0.0043	1.7	10
5/20/2008	10:40	9.3	1326	19	11.45	7.23	3	0.094	0.01 U	0.068	0.0069 J	0.0031	1.6	58
6/17/2008	10:05	11.2	547	27	12.3	7.4	2	0.259	0.01 U	0.217	0.0072	0.0048	1.4	12
7/22/2008	11:40	17.3	165	38	10.1	7.88	2	0.22	0.01 U	0.139	0.011	0.0061	0.9	14
8/19/2008	10:35	18.9	149	44	10.3	7.99	2	0.27	0.01 U	0.197	0.013	0.0068	1	130
9/23/2008	10:25	12.7	110	42	11.1	7.82	3	0.17	0.01 U	0.146	0.01	0.0059	1	56

Metals Data Report

Washougal R @ Washougal

28B070

Class: A
Rivermile: 3
Latitude: 45 35 10.4
Longitude: 122 21 14.3
Waterbody: WA-28-2030

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
10/30/2007	11:15		11.5	0.1 U	0.02 U	0.5 U	0.25 U	0.92 0.	35	0.1 U	0.02 U	0.002 U	0.11	0.26	5 U	1 U
12/18/2007	12:25		9.61	0.1 U	0.02 U	0.5 U	0.25 U	0.38 0.	33	0.1 U	0.02 U	0.002 U	0.11	0.19	5 U	7.3
2/26/2008	14:30		8.64	0.1 U	0.02 U	0.5 U	0.25 U	0.37 0.	23	0.1 U	0.02 U	0.002 U	0.1 U	0.3	5 U	1 U
4/22/2008	11:20		9.27	0.1 U	0.02 U	0.5 U	0.25 U	0.34 0.	2	0.1 U	0.02 U	0.002 U	0.1 U	0.18	5 U	1.4
6/17/2008	10:05		8.82	0.1 U	0.02 U	0.5 U	0.25 U	0.34 0.	24	0.1 U	0.02 U	0.002 U	0.13	0.23	5 U	1 U
8/19/2008	10:35		16.2	0.1 U	0.02 U	0.5 U	0.25 U	0.61 0.	45	0.1 U	0.02 U	0.002 U	0.1 U	0.38	5 U	1 U

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
10/30/2007 12:15	9.5		209	11.1	8	2	3.08	0.01 U	1.73	0.0661	0.065	1.5	97
11/27/2007 12:41	5.7		168	12.6	7.84	6	1.88	0.011	1.68	0.0798	0.0632	5.2	180
12/18/2007 13:25	8		124	11.4	7.7	11	2.19	0.02	1.88	0.0887	0.0518	12	980
1/29/2008 11:35	6		175	12.1	7.74	10	2.01	0.031	1.88	0.0791	0.055	10	260
	1230												
2/26/2008 16:00	9.8		188	11.73	8.06	5	2.41	0.01 U	2.19	0.0673	0.0574	3.9	37
	Forgot to take RP												
3/18/2008 12:00	9.9		114	11.5	7.7	23	1.33	0.012	1.34	0.0981	0.0509	16	700 J
4/22/2008 12:35	9.4		158	11.7	7.99	11	1.69	0.01 U	1.52	0.0543	0.028	6.6	1800
5/20/2008 11:35	16.4		149	8.39	7.73	115	1.69	0.148	1.17	0.245	0.0706	55	6300
6/17/2008 11:20	14.9	4.91	199	9.8	7.99	9	1.6	0.01 U	1.38	0.0753	0.0566	4.8	150
7/22/2008 12:55	16.7	3.34	211	9.8	8.06	4	1.31	0.01 U	1.24	0.083	0.0714	2.5	250
8/19/2008 12:00	17.9	3.34	129	8.69	7.65	6	1.42	0.088	1.04	0.0906	0.0572	4.5	7300 J
9/23/2008 11:20	12.1	2.5	207	10.3	7.98	3	1.49	0.01 U	1.36	0.0653	0.0586	2.2	270

Conventional Data Report

White Salmon R @ Husum St

29B090

Class: A
Rivermile: 6.6
Latitude: 45 47 57.4
Longitude: 121 29 07.2
Waterbody: WA-29-3010

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
10/30/2007	9:00	6.4		68	12.7	7.66	2	0.17	0.01 U	0.127	0.03	0.0322	1.1	2 J
11/27/2007	9:55	4.5		65	13.4	7.49	2	0.15	0.01 U	0.118	0.025	0.029	1.6	5
		Snow/ice on bridge, couldn't find RP												
12/18/2007	10:00	4.4		61	13.2	7.47	4	0.18	0.01 U	0.161	0.029	0.026	1.8	5
1/29/2008	8:35	4		64	13.4	7.09	4	0.2	0.01 U	0.17	0.03	0.03	1.8	2
2/26/2008	12:15	5.9		66	13.16	7.6	4	0.21	0.01 U	0.189	0.028	0.03	1.7	1
		Couldn't find RP												
3/18/2008	8:40	6.3		64	13.3	7.5	6	0.21	0.01 U	0.202	0.03	0.027	1.7	7 J
4/22/2008	9:45	6		63	13.1	7.62	3	0.216	0.01 U	0.198	0.029	0.026	1.4	13
5/20/2008	9:00	7.1		39	12.16	7.45	112	0.098	0.01 U	0.062	0.05	0.017	23	54 J
6/17/2008	8:25	8.5		50	12.2	7.53	12	0.12	0.01 U	0.086	0.029	0.022	3.3	29
7/22/2008	9:55	9.7		64	12.2	7.61	5	0.13	0.01 U	0.119	0.031	0.026	2.5	31
8/19/2008	8:40	9		68	12.3	7.58	5	0.15	0.01 U	0.151	0.037	0.029	2.7	45
9/23/2008	8:50	7.1		68	12.5	7.56	2	0.22	0.01 U	0.158	0.033	0.0347	1.6	35 J

Conventional Data Report

Rattlesnake Cr nr Mouth

29D070

Class: A
Rivermile: 0.05
Latitude: 45 47 49.8
Longitude: 121 29 06.4
Waterbody: WA-29-3015

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
10/30/2007 8:40	5.4		158	11.6	7.83	2	0.077	0.01 U	0.014	0.03	0.0344	0.5 U	34 J
11/27/2007 9:20	2		137	13.7	7.79	1 U	0.13	0.01 U	0.065	0.019	0.023	2	5
	Snow/ice on bridge, couldn't find RP												
12/18/2007 9:25	3.6		76	13.1	7.63	4	0.12	0.01 U	0.068	0.028	0.022	7	17
1/29/2008 8:10	1.6		68	13.5	7.19	1	0.11	0.01 U	0.05	0.02	0.02	4.3	7 J
	RP under snow												
2/26/2008 11:30	4.1		60	13.42	7.77	2	0.091	0.01 U	0.063	0.027	0.02	6.5	12
	Couldn't find RP												
3/18/2008 8:20	6		61	12.7	7.64	3	0.097	0.01 U	0.06	0.022	0.016	5	4 J
4/22/2008 9:20	5.6		73	12.5	7.78	2	0.048	0.01 U	0.01 U	0.019	0.015	2.5	4 J
5/20/2008 8:39	14.8		103	9.49	7.9	2	0.1	0.01 U	0.029	0.031	0.026	1.6	64 J
6/17/2008 8:10	13.5		118	10.19	7.91	3	0.12	0.01 U	0.053	0.033	0.0372	1	7
7/22/2008 9:32	17.3		151	9.4	7.88	2	0.21	0.01 U	0.143	0.043	0.0396	0.6	74
8/19/2008 8:20	17.8		172	9.19	7.89	3	0.374	0.01 U	0.26	0.061	0.0544	1.1	32
9/23/2008 8:29	9.4		169	10.8	7.88	2	0.11	0.01 U	0.058	0.039	0.0405	0.5	190 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
10/22/2007 13:45	14.8	108600	163		8.06	2	0.323	0.01 U	0.222	0.024	0.016	1.2	4
pH was measured @ 18.5° C. No DO was taken because of equipment failure and brain lapse (not in that order).													
11/12/2007 11:03	12.4	256900	113	10.71	8.14	2	0.317	0.01 U	0.25	0.016	0.015	1.1	4
pH measured @ 12.7°C. Severe dust storm with 60+ mph winds 10 miles upstream of site. Light rain at site.													
12/5/2007 11:50	8.4	233100	168	11.53	8.1	2	0.363	0.024	0.273	0.017	0.015	0.9	1 UJ
pH measured @ 9.1°C. Barometric press. measured at van approx. 60' above river level. High clouds, sunny.													
1/7/2008 12:00	4.9	313800	159	12.44	8	2	0.308	0.01 U	0.261	0.012	0.0092	1.5	3
pH measured @ 6.0°C. Barometric pressure measured @ approximately 50' >river. Sunny, windy, ground wet with some snow.													
2/11/2008 12:20	3.2	253700	181	13.57	8.18	2	0.369	0.01 U	0.336	0.01	0.005	2.1	1 U
pH measured @ 5.3°C. Barometric pressure was measured approximately 60' above the river. Windy.													
3/18/2008 11:35	5.6	296400	201	12.92	8.36	3	0.529	0.01 U	0.508	0.016	0.006	2	1 U
Fishing boat upstream, 1st nutrient sample bottle cracked, sample retaken @ 12:10													
4/15/2008 11:35	8.2	355700	186	13.1	8.47	5	0.427	0.01 U	0.354	0.024	0.004	2.8	2
5/6/2008 11:50	10.6	385500	162	12.5	8.46	4	0.365	0.01 U	0.301	0.017	0.003	2.8	1
Dam spilling. Gill net tied to stake at station.													
6/2/2008 12:45	13.6	781400	121	12.12	8	8	0.2	0.01 U	0.118	0.022	0.0058	5	6
pH measured @15.4°C. Barometric pressure taken approximately 60' above water surface. Water quite high. Rocks at normal sampling site were under water. Samples were taken out of direct flow but in area of good exchange and mixing.													
7/7/2008 11:15	17.7	542400	102	10.6	8.1	4	0.15	0.01 U	0.074	0.013	0.003 U	2.4	1
pH measured @ 19.6°C. Barometric pressure measured approximately 2' above water surface.													
8/11/2008 10:30	20.7	273400	129	9.69	8.12	3	0.16	0.01 U	0.072	0.015	0.0043	2.1	1 U
pH measured @ 21.3°C. Barometric pressure checked @ 60' above water surface.													
9/8/2008 11:33	19.7	239700	142	9.1	8.16	3	0.18	0.01 U	0.102	0.018 J	0.007	1.7	1 U
pH measured @ 19.8°C. Barometric pressure measured @ 60' above the water surface.													

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
10/22/2007 11:55	11.3	49	267		8.26	2	0.477	0.01 U	0.279	0.048	0.0445	1.4	26
pH was measured @ 15.7° C. No DO was taken because of equipment failure and brain lapse (not in that order).													
11/12/2007 9:38	7	59	263	10.71	8	4	0.455	0.01 U	0.316	0.027	0.021	1.1	23
pH measured @ 7.6°C. "J" stage due to strong winds during tapedown. Blowing dust.													
12/5/2007 10:27	8.5	1230	124	10.51	7.84	63	1.09	0.027	0.854	0.195	0.0798	34	450
pH measured @ 8.6°C. Water appears quite turbid. Barometric press. measured at van approx. 20' above river level.													
1/7/2008 10:20	4.5	735	126	12.44	8.06	11	0.887	0.01 U	0.766	0.0951	0.0779	7.1	120
pH measured @ 4.5°C. Barometric pressure measured @ approximately 25' >river. No tape-down because of high winds. Melting snow on ground but no precipitation.													
2/11/2008 10:48	6.4	1760	111	11.42	7.88	274	1.14	0.026	1.03	0.368	0.0827	130	140
pH measured @ 7.0°C. Barometric pressure was measured approximately 20' above the river.													
3/18/2008 10:00	7.4	1250	108	11.42	7.79	82	0.862	0.01 U	0.747	0.132	0.0679	25	47
Some woody debris, high water													
4/15/2008 8:35	7.1	2490	80	11.1	7.7	408	0.7	0.037	0.537	0.453	0.0587	150	150
Too windy for for RP, river high and muddy													
5/6/2008 10:15	12.6	1740	79	9.69	7.65	160	0.438	0.015	0.307	0.181	0.0451	37	240
Water high and brown.													
6/2/2008 10:45	14	1490	78	9.59	7.68 J	79	0.472	0.01 U	0.354	0.12	0.0442	19	27
pH measured @14.2°C. Barometric pressure taken approximately 20' above water surface. Windy. Water turbid. pH "J"ed because meter was 0.01 beyond tolerance at next calibration check at the following site.													
7/7/2008 9:30	22.7	107	219	8.08	7.96	8	0.617	0.01 U	0.43	0.0727	0.0437	4.3	200
pH measured @ 22.4°C. Barometric pressure measured approximately 15' above water surface.													
8/11/2008 8:50	20.1	15	418	8.5	8.21	6	1.38	0.029	1.09	0.0717	0.0491	3.7	37
pH measured @ 20.1°C. Barometric pressure checked @ 15' above water surface.													
9/8/2008 9:45	17.6	40	295	8.4	8.23	4	0.627	0.01 U	0.415	0.059	0.0434	2.3	31
pH measured @ 17.2°C. Barometric pressure measured @ 15' above the water surface.													

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
10/22/2007	11:05	15.1	85100	250		7.99	3	0.521	0.01 U	0.385	0.0529	0.057	2.3	1 U
		pH was measured @ 16.2° C. No DO was taken because of equipment failure and brain lapse (not in that order).												
11/12/2007	8:45	12.4	39000	324	9.59	7.97	3	0.759	0.01 U	0.629	0.0593	0.0594	1.8	2
		pH measured @ 11.4°C. Light rain, overcast, cool.												
12/5/2007	8:40	8.3	56700	302	10.51	8.06	3	0.735	0.016	0.606	0.0508	0.051	1.6	2 J
		pH measured @ 8.1°C. Barometric press. measured at van approx. 80' above river level. Weather was sunny and mild. Tug with barges working just u/s of sampling site. Sunny and clear with mild temps.												
1/7/2008	8:40	3.9	59900	269	12.65	8.11	2	0.708	0.01 U	0.637	0.035	0.03	2	1
		pH measured @ 4.2°C. Barometric pressure measured @ approximately 100' >river.												
2/11/2008	9:00	3.4	60100	341	12.65	8.24	2	1.12	0.01 U	1.06	0.042	0.0406	1.3	1
		pH measured @ 5.5°C. Barometric pressure was measured approximately 80' above the river.												
3/18/2008	8:45	5.7	96100	299	12.32	8.38	4	1.33	0.01 U	1.22	0.033	0.024	3.4	1 U
4/15/2008	10:10	8.6	136300	237	12.8	8.39	8	0.827	0.01 U	0.726	0.045	0.016	5.1	1 U
5/6/2008	9:15	10.7	209400	164	12.5	8.27	9	0.469	0.01 U	0.368	0.038	0.019	5.5	3
6/2/2008	9:15	12.9	325200	77	12.32	7.65	15	0.21	0.01 U	0.129	0.047	0.015	12	1
		pH measured @13.4°C. Barometric pressure taken approximately 80' above water surface. Windy; tugs and barge operating just upstream.												
7/7/2008	8:08	17.6	128200	70	10.2	7.55	6	0.15	0.01 U	0.069	0.021	0.0074	3.6	1 U
		pH measured @ 18.0°C. Barometric pressure measured approximately 15' above water surface.												
8/11/2008	7:25	20.3	59000	121	9.5 J	7.73	5	0.2	0.029	0.068	0.025	0.011	3.7	2
		pH measured @ 18.9°C. Barometric pressure checked @ 80' above water surface. DO was given a "J" because a bubble was discovered in the BOD bottle after field processing.												
9/8/2008	8:17	19.3	37100	157	8.4	7.86	5	0.294	0.02	0.161	0.04	0.024	3	1
		pH measured @ 17.6°C. Barometric pressure measured @ 10' above the water surface.												

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
10/10/2007 13:40	13.7	39	397	9.89	8.64	6	0.654	0.027	0.313	0.023	0.0073	3.7	15
11/6/2007 13:20	7	52	392	13.4	9.1	5	1.37	0.01 U	1.08	0.016	0.004	2.2	1
12/3/2007 14:40	3.9	96	321	12.52	8.39	6	2.58	0.01 U	1.86	0.104	0.094	3.2	38
1/15/2008 13:30	1.5	499	358	13.13	8.29	19	3.89	0.03	3.71	0.21	0.175	15	26 J
2/13/2008 13:40	1.7	1580	271	12.79	8.03	239	5.55	0.085	5.12	0.459	0.16	160	130
3/5/2008 13:30	3.8	2170	253	12.46	8.01	45	6.91	0.011	6.45	0.172	0.102	33	140
4/9/2008 14:35	8.4	1220	242	11.83	8.52	16	3.9	0.01 U	3.53	0.0567	0.027	11	2
5/7/2008 13:30	13.4	1660	118	9.89	8.07	28	0.673	0.01 U	0.559	0.0896	0.0369	13	200 J
6/4/2008 13:30	15.7	514	175	11.35	7.79	68	1.51	0.072	1.14	0.213	0.0907	75	96
7/9/2008 13:25	23.6 J	92	267	9.84	8.71	11	0.835	0.014	0.511	0.117	0.0747	4.4	55
	Low velocity; water appears stagnant.												
8/6/2008 13:45	23.7 J	29	330	8.69	8.46	5	0.785	0.035	0.466	0.0825	0.0544	4.4	22
	Low velocity.												
9/10/2008 13:15	18.5 J	35	347	9.84	8.74	10	0.536	0.011	0.199	0.039	0.015	5.1	9

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
10/10/2007 8:30	11.1	39	90	8.48	7.64	3	0.22	0.025	0.01 U	0.022	0.0053	2.5	33
11/6/2007 8:30	3	52	90	11.5	8.03	1	0.14	0.01 U	0.01 U	0.022	0.0079	1.5	4
12/3/2007 8:25	0.3	93	101	12.22	7.44	5	0.345	0.01 U	0.171	0.0574	0.028	6.1	92
1/15/2008 8:50	0	503	108	12.42	7.39	7	1.67	0.033	1.4	0.105	0.0556	19	43
	Ice covering most of river. No RP measured.												
2/13/2008 8:50	0.1	1550	116	12.08	7.16	31	2.77	0.052	2.93	0.18	0.112	36	380 J
	no stage height due to ice												
3/5/2008 9:00	1.6	2160	98	11.85	7.13	11	2.61	0.016	2.31	0.123	0.0655	22	41 J
	Recorded stage, 15.38, is presumed wrong.												
4/9/2008 8:35	4.5	1190	68	11.12	7.47	7	0.737	0.01 U	0.583	0.0712	0.034	16	25
5/7/2008 8:55	7.2	1600	35	10.4	7.03	28	0.104	0.01 U	0.033	0.0606 J	0.019	17	41
6/4/2008 8:55	10.2	514	45	8.94	7.34	6	0.13	0.01 U	0.024	0.041	0.016	7	27
7/9/2008 8:45	16.3 J	93	68	7.43	7.75	3	0.16	0.01 U	0.01 U	0.041	0.0041	1.7	63
8/6/2008 8:40	19.8 J	29	84	6.8	8.05	2	0.24	0.01 U	0.01 U	0.023	0.0048	1.8	170
9/10/2008 8:30	14.5 J	35	84	7.63	8.22	3	0.18	0.01 U	0.01 U	0.019	0.0066	1.8	210

Conventional Data Report

Palouse R nr Stateline

34A200

Class: A
Rivermile: 126.5
Latitude: 46 54 21.6
Longitude: 117 00 25.6
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
10/10/2007 8:12		7.5											2
	FC only												
11/6/2007 8:10		8.2											7
	FC only												
12/3/2007 8:05		55											36
	FC only												
1/15/2008 8:25		120											31
	FC only												
2/13/2008 8:30		681											500 J
	Fecal coliform only												
3/5/2008 8:30		428											71 J
	FC only												
4/9/2008 8:15		498											28
	Fecal coliform only												
5/7/2008 8:40		1430											54
	FC Only												
6/4/2008 8:35		297											41
	Fecal Coliform sample only.												
7/9/2008 8:15		38											67
	FC only.												
8/6/2008 8:15		13											80
9/10/2008 8:00		10											73
	Fecal Coliform only												

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
10/10/2007	9:15	11.8	2.5	636	7.07	7.91	3	6.33	0.01 U	4.85	0.193	0.181	6.3	31
11/6/2007	9:15	4.6	6.1	698	10.19	8.13	1	6.86	0.01 U	6.65	0.166	0.158	1.1	6
12/3/2007	9:30	2.9	67	309	11.11	7.58	30	2.1	0.071	1.66	0.306	0.145	55	1400 J
1/15/2008	9:45	0.6	40	429	12.32	7.81	14	6.19	0.021	5.87	0.195	0.142	22	49
2/13/2008	9:45	0.8	279	288	11.87	7.49	100	8.51	0.09	8.52	0.374	0.218	95	450
3/5/2008	9:35	2.4	130	274	11.85	7.52	20	10.3	0.016	9.96	0.234	0.152	50	76 J
4/9/2008	9:30	5.5	94	287	11.22	8	10	5.46	0.01 U	5.27	0.12	0.0705	16	140
5/7/2008	10:00	11.1	49	243	10	7.96	7	2.11	0.01 U	1.79	0.12	0.0724	12	49
6/4/2008	9:35	12.1	25	361	10.55	7.91	16	2.62	0.026	2.15	0.177	0.114	16	150
		stage=1.63												
7/9/2008	9:30	16.3 J	3.5	476	7.83	8.01	33	2.02	0.026	1.2	0.277	0.153	2.9	2600 J
		Low flow; samples taken on upstream side of bridge.												
8/6/2008	9:30	15.4 J	1.4	662	6.9	7.97	3	2.74	0.024	2.04	0.184	0.141	2.6	500
		Samples taken from upstream side of the bridge												
9/10/2008	9:15	12.3 J	4.1	690	7.33	7.97	4	6.38	0.017	6.03	0.13	0.119	2.3	130
		Samples taken from upstream side of bridge due to low flow.												

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
10/10/2007 10:25	16.2	17300	401	9.29	8.46	7	0.949	0.01 U	0.851	0.0816	0.0703	2.7	22
11/6/2007 10:30	10	14300	368	10.9	8.56	4	0.882	0.01 U	0.726	0.0516	0.0478	1.6	5
flow in DS direction detected													
12/3/2007 10:40	5.6	15100	361	11.81	8.4	6	0.952	0.01 U	0.773	0.044	0.0374	1.9	47
1/15/2008 10:55	3.9	18400	395	12.62	8.56	5	1.2	0.02	1.05	0.045	0.0404	1.9	6
2/13/2008 10:50	3.3	20600	392	13.19	8.58	9	1.39	0.01 U	1.19	0.045	0.021	4.1	5 J
downstream flow apparent													
3/5/2008 10:45	4.3	23100	354	12.36	8.35	8	1.27	0.01 U	1.07	0.0511	0.0318	5.6	5
4/9/2008 10:45	8.4	24900	310	11.02	8.59	14	0.99	0.045	0.714	0.0566	0.0345	5.7	1
5/7/2008 11:00	11	54000	139	10.2	8.23	35	0.316	0.01 U	0.191	0.0677 J	0.023	14	25
6/4/2008 10:45	11.5	91500	100	10.35	7.9	36	0.23	0.01 U	0.138	0.0517	0.022	15	13
7/9/2008 10:45	17.7 J	38200	137	8.64	8.16	8	0.258	0.01 U	0.122	0.029	0.013	2.8	4
8/6/2008 10:45	21.4 J	30300	234	8.1	8.42	12	0.343	0.01 U	0.191	0.0508	0.023	9.7	8
9/10/2008 10:30	19.9 J	17500	322	8.54	8.35	8	0.804	0.012	0.524	0.087	0.0773	2.4	100

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
10/10/2007 12:40	13.9	67	156	9.69	8.14	4	0.21	0.01 U	0.153	0.044	0.0419	2.1	11
11/6/2007 12:20	8.9	80	149	12	8.51	3	0.17	0.01 U	0.106	0.037	0.0374	1	7
12/3/2007 13:20	8.8	126	147	11.31	8.22	10	0.401	0.01 U	0.311	0.046	0.0406	2.6	49
1/15/2008 12:30	4.4	152	133	12.52	8.18	9	0.617	0.01 U	0.543	0.0503	0.0447	3.7	11
2/13/2008 12:45	6.6	269	139	11.77	7.94	67	1.13	0.01 U	1.06	0.09	0.054	19	30
3/5/2008 12:30	6.9	276	125	11.85	7.97	17	0.979	0.01 U	0.876	0.061	0.0493	8.9	3
4/9/2008 13:15	10.4	186	128	12.65	8.84	7	0.432	0.01 U	0.309	0.035	0.026	2.5	4
5/7/2008 12:30	10.9	728	94	10.3	7.78	183	0.806	0.011	0.685	0.199	0.0558	60	140
6/4/2008 12:10	11.2	952	77	9.74	7.66	95	0.413	0.014	0.307	0.148	0.0447	50	83
7/9/2008 12:20	18.7 J	121	114	9.94	8.47	7	0.1	0.01 U	0.01 U	0.0593	0.0315	1.6	92
8/6/2008 12:45	20.3 J	68	140	8.9	8.1	8	0.21	0.01 U	0.138	0.0583	0.0469	2.3	96
9/10/2008 12:00	16.1 J	67	144	12.36	9.11	7	0.08	0.01 U	0.01 U	0.045	0.0363	1.6	25

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
10/9/2007 12:10	15.9	48100	135	10	8.13	1	0.15	0.01 U	0.091	0.0056	0.0038	0.5	7
pH was measured @ 17.3° C.													
11/13/2007 12:10	12.6	60900	129	11.22	8.28	1	0.15	0.01 U	0.109	0.005 U	0.0043	1	15
pH measured @ 11.7°C.													
12/3/2007 13:45	9.4	61900	139	11.32	8.15	1 U	0.21	0.01 U	0.159	0.005 U	0.0055	0.6	1 U
pH measured @ 10.7°C. Barometric press. measured at van approx. 60' above river level. Very windy, ground damp but no precipitation.													
1/8/2008 12:40	5.1	149000	140	12.14	8.18	1	0.18	0.01 U	0.148	0.0059	0.0046	0.7	1 U
pH measured @ 5.3°C. Barometric pressure measured @ approximately 60' >river. Snow on ground. Wading sample near bank. Water high on bank with trees and grasses partially submerged.													
2/20/2008 11:16	3.3	88500	150	13.46	8.34	1	0.15	0.01 U	0.155	0.005 U	0.003 U	0.8	1 U
pH measured @ 4.2°C. Barometric pressure was measured approximately 60' above the river.													
3/17/2008 12:25	4.7	66100	150	13.32	8.32	1 U	0.2	0.01 U	0.159	0.005 U	0.003 U	0.6	1 U
4/14/2008 12:37	7.4	66300	160	13.1	8.4	2	0.259	0.01 U	0.191	0.0091	0.003 U	1	1 U
5/5/2008 12:05	9.6	98000	154	13.1	8.58	3	0.305	0.01 U	0.246	0.0063	0.003 U	2.1	8
6/3/2008 12:10	12.7	251000	120	12.12	8.07	4	0.15	0.01 U	0.085	0.012	0.003 U	4.1	6
pH measured @ 13.5°C. Barometric pressure measured approximately 60' above water surface. Very high water. Sample taken in flow but amid trees and grasses on the streambank.													
7/8/2008 13:00	16.6	197000	114	11.31	8.21	3	0.12	0.01 U	0.051	0.0072	0.003 U	1.4	13
pH measured @ 18.6°C. Barometric pressure measured approximately 60' above water surface. River quite high -- sampled from bank amid riparian trees and grasses.													
8/12/2008 13:27	20.2	152000	129	10	8.35	4	0.11	0.01 U	0.03	0.01	0.003 U	1.3	110
pH measured @ 20.3°C. Barometric pressure checked @ 60' above water surface.													
9/9/2008 12:41	19.8	88300	131	9.4	8.33	2	0.1	0.01 U	0.045	0.0056	0.003 U	1.1	1 UJ
pH measured @ 20.1°C. Barometric pressure measured @ 60' above the water surface.													

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
10/9/2007 13:40	14.8	1520	281	12.35	8.59	4	1.42	0.01 U	1.28	0.116	0.102	2.5	4
pH was measured @ 16.5° C.													
11/12/2007 12:18	9.3	1830	265	12.44	8.4	4	1.36	0.01 U	1.25	0.0614	0.0611	2.5	2
pH measured @ 9.7°C.													
12/5/2007 13:15	6.5	7310	145	11.22	7.92	227	1.11	0.063	0.759	0.51	0.102	150	790
pH measured @ 7.3°C. High clouds, sunny. Water appears quite turbid. Probable snowmelt and heavy rain in upper watershed. Excavation and construction on right and left riverbank at Kiona Bridge.													
1/7/2008 14:58	4.3	2330	229	13.87		4	1.2	0.01 U	1.16	0.0762	0.0769	2.8	74
pH not recorded due to the age and associated mental state of sampler. Barometric pressure measured @ approximately 12' >river. Sunny, ground wet with some snow.													
2/11/2008 14:38	5.9	2690	230	13.06	8.34	9	1.26	0.017	1.15	0.106	0.0917	7.1	8
pH measured @ 7.1°C. Barometric pressure was measured approximately 20' above the river.													
3/18/2008 13:40	9.2	3290	182	11.72	8.25	18	0.592	0.01 U	0.493	0.0787	0.0593	7.7	2
Construction on south downstream side of bridge													
4/15/2008 13:18	13.1	3870	169	10.5	8.13	48	0.634	0.019	0.472	0.131	0.0626	15	22
Stage height looked up on USGS website													
5/6/2008 13:20	16.5	2780	205	10.6	8.54	21	0.854	0.01 U	0.702	0.101	0.0675	9.8	23
GH was 4.79 but staff = 4.89.													
6/2/2008 14:05	16.4	5990	129	9.49	7.87	65	0.634	0.012	0.489	0.131	0.0511	24	37
pH measured @15.5°C. Barometric pressure taken approximately 10' above water surface. Benton High School science class at sampling at site													
7/7/2008 12:45	21.2	2850	141	9.09	8.13	28	0.638	0.011	0.547	0.0926	0.0433	11	33
pH measured @ 21.5°C. Barometric pressure measured approximately 12' above water surface.													
8/11/2008 11:51	21.7	1390	246	10.19	8.55	6	1.27	0.01 U	1.07	0.0761	0.0585	3.2	17
pH measured @ 22.0°C. Barometric pressure checked @ 15' above water surface.													
9/8/2008 12:21	19.7	1450	266	11.1	8.71	4	1.14	0.01 U	0.957	0.0833	0.0696	2.3	6
pH measured @ 20.2°C. Barometric pressure measured @ 20' above the water surface.													

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
10/9/2007 15:39	13.2	1870	122	11.63	8.48	6	0.253	0.01 U	0.159	0.038	0.0302	3.2	13
pH was measured @ 15.6° C. This was a wading sample approx 300 meters u/s of the site as there was bridge demolition work at the site.													
11/13/2007 13:35	6.9	1390	130	13.77	8.75	4	0.26	0.01 U	0.195	0.025	0.023	1.4	4
pH measured @ 7.1°C. pH checked a second time using conductivity sample.													
12/5/2007 15:10	3.6	3500 J	91	12.75	7.82	35	0.255	0.01 U	0.16	0.0507	0.026	24	55
pH measured @ 4.0°C. Barometric press. measured at van approx. 10' above river level. Sample taken by hand grab from left bank under new Highway 24 Bridge. Water appears turbid. High overcaast, winds calm.													
1/8/2008 15:55	1.5	1200 J	122	14.28	8.32	2	0.281	0.023	0.202	0.031	0.029	1.5	1 U
pH measured @ 2.2°C. Barometric pressure measured @ approximately 10' >river. Snowing with snow covering the ground.													
2/20/2008 14:55	5.3	1860	138	14.18	8.74	4	0.359	0.017	0.244	0.039	0.0353	2.7	1 U
pH measured @ 6.1°C. Barometric pressure was measured approximately 10' above the river. Wading sample.													
3/17/2008 15:40	6.7	2490	128	13.22	8.62	4	0.16	0.01 U	0.081	0.025	0.02	2.4	1
4/15/2008 14:55	6.8	4770	101	12.2	7.94	16	0.151	0.01 U	0.08	0.045	0.02	11	10
5/5/2008 14:25	11.8	4290	106	11.8	8.53	12	0.186	0.01 U	0.115	0.05		8.2	11
6/3/2008 14:15	10.9	6110	77	10.3 J	7.75	14	0.16	0.01 U	0.096	0.036	0.017	7.1	30
pH measured @11.8°C. Barometric pressure taken approximately 12' above water surface. "J" DO -- sampler failed and sample taken by inverting bottle while submerged.													
7/8/2008 14:25	16.9	3780	79	10	8.12	6	0.2	0.048	0.081	0.024	0.013	3.5	4
pH measured @ 18.5°C. Barometric pressure measured approximately 10' above water surface.													
8/12/2008 15:37	18.7	3330	89	9.5	8.29	8	0.2	0.01 U	0.108	0.034	0.019	3.7	18
pH measured @ 19.4°C. Barometric pressure checked @ 12' above water surface. N-nuts put in wrong bottle so results are from a composite of QC-1 and QC-2.													
9/9/2008 14:02	16.6	2680	87	10.19	8.57	11	0.094	0.01 U	0.039	0.04	0.019	8.6	21 J
pH measured @ 17.3°C. Barometric pressure measured @ 12' above the water surface.													

Conventional Data Report

Sulphur Creek @ Holaday Road

37F080

Class: B
Rivermile: 0.8
Latitude: 46 15 04.5
Longitude: 120 01 12.2
Waterbody: WA-37-1030

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
10/22/2007 8:38	12.1	164.96	544		8.06	14	5.86	0.055	5.51	0.122	0.111	6.8	260 J
pH was measured @ 12.4° C. No DO was taken because of equipment failure and brain lapse (not in that order).													
11/12/2007 13:18	11.9	73.3	116	9.69	8.27	13	8.47	0.065	8.42	0.241	0.23	6.1	312
pH measured @ 11.6°C.													
12/3/2007 15:30	12.2	73.28	783	9.69	8.23	44	9.3	0.098	8.64	0.273	0.225	19	2000 J
pH measured @ 12.1°C. Stage data from US Bureau of Rec. , Yakima Project, website. Barometric press. measured at van approx. 30' above river level.													
1/8/2008 14:18	9.1	63.89	743	10.4	8.27	96	9.32	0.086	9.18	0.353	0.234	31	1200
pH measured @ 8.4°C. Barometric pressure measured @ approximately 30' >river. Wading sample at Green valley Road approximately 0.5 mile upstream from Holaday Rd. site because of construction at Holiday Rd. Snowing with sloppy snow and mud on ground. Flow													
2/20/2008 13:47	11.1	70.04	782	11.53	8.41	44	9.18	0.078	9.13	0.355	0.317	12	770
pH measured @ 11.3°C. Barometric pressure was measured approximately 30' above the river. Construction was occuring just upstream of the Holaday Rd. site so this sample was taken approximately 1/2 mile upstream at the Green Valley Rd. bridge.													
3/17/2008 14:15	11.7	60.01	768	11.72	8.5	4	8.17	0.066	8.19	0.322	0.333	2.3	120
staff dry													
4/14/2008 13:50	14.3	147.28	286	11.1	8.84	33	2.07	0.023	1.94	0.117	0.073	6.9	270
5/5/2008 13:15	13.9	248.32	244	10.8	8.79	64	1.56	0.016	1.42	0.176	0.111	14	530
stage from staff gage, not GH.													
6/2/2008 15:40	19.5	123.48	299	9.19	8.41	40	2.84	0.027	2.51	0.263	0.206	21	570
pH measured @ 19.5°C. Barometric pressure measured approximately 25' above water surface. Stage not available at site due to vandalism of gage house door. Check stage on Bureau of Reclamation web site.													
7/7/2008 14:12	20	211.82	223	9.59	8.64	28	1.72	0.01 U	1.67	0.104	0.0591	11	510
pH measured @ 20.6°C. Barometric pressure measured approximately 25' above water surface.													
8/11/2008 13:35	19	321.2	225	9.3	8.35	43	2.15	0.013	1.42	0.123	0.0753	14	730
pH measured @ 19.6°C. Barometric pressure checked @ 30' above water surface.													
9/8/2008 14:15	18.9	337.7	245	9.5		36	1.94	0.01 U	1.86	0.118	0.0618	12	440
No pH due to operator transcription error. Barometric pressure measured @ 25' above the water surface. Stage checked on USBR website (http://www.usbr.gov/pn/hydromet/yakima/yakwebdayread.html) for 13:15 pst. From website, Q= 177.24 cfs.													

Metals Data Report

Sulphur Creek @ Holaday Road

37F080

Class: B
Rivermile: 0.8
Latitude: 46 15 04.5
Longitude: 120 01 12.2
Waterbody: WA-37-1030

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
10/22/2007	8:38		202	0.1 U	0.02 U	0.74	1.8	1.55	1.	01	0.35	0.025	0.002 U	1.72	5.43	5 U	1.9
12/3/2007	15:30		293	0.1 U	0.02 U	1.9	2.55	3.69	1.	62	1.09	0.046	0.0038	2.43	8.85	9.2	3.1
2/20/2008	13:47		304	0.1 U	0.02 U	1.5	2.2	2.31	1.	14	0.69	0.035	0.002 U	1.74	8.36	9.7	5
4/14/2008	13:50		104	0.1 U	0.02 U	1.1	0.99	1.65	0.	73	0.47	0.04	0.002 U	0.93	2.7	9.6	3.13
6/2/2008	15:40		109	0.1 U	0.02 U	1.7	1.2	2.94	0.	93	1.02	0.038	0.0024	1.56	3.54	8.5	1.8
8/11/2008	13:35		85.5	0.1 U	0.02 U	1.2	0.93	2.21	1.	01	0.74	0.046	0.0031	1.2	2.51	5.3	1.6

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
10/9/2007 8:51	10.7	430	61	10	7.52 J	1	0.036	0.01 U	0.01 U	0.005 U	0.0039	0.5	6
pH was measured @ 11.1° C. pH meter would not calibrate within 0.1units. (It calibrated to 0.11)													
11/13/2007 8:12	5.5	540	60	11.53	7.39	4	0.038	0.01 U	0.01 U	0.0082	0.0039	2.3	5
pH measured @ 3.0°C. Rec ent rain, overcast.													
12/3/2007 10:00	1.9	556	61	12.44	7.64	2	0.072	0.01 U	0.034	0.005 U	0.0041	1	3
pH measured @ 3.6°C. Barometric press. measured at van approx. 10' above river level. Weather -- rain on snow, very sloppy and damp with runoff coming off freeway bridge just upstream.													
1/8/2008 9:55	1.7	524	69	12.75	7.68	1	0.049	0.01 U	0.02	0.0056	0.0041	0.9	10
pH measured @ 2.3°C. Barometric pressure measured @ approximately 8' >river. Snowing with snow covering the ground.													
2/20/2008 8:30	2.3	580	86	12.24	7.46	1	0.068	0.01 U	0.028	0.005 U	0.003 U	0.8	12
pH measured @ 2.8°C. Barometric pressure was measured approximately 10' above the river. No tape down due to snow at the RP. Wading sample. Ice overhanging river on banks.													
3/17/2008 8:40	3.5	831	96	11.82	7.5	2	0.045	0.01 U	0.012	0.005 U	0.0036	0.7	9
Pressure below registering marks													
4/14/2008 8:52	4.4	1290	76	11.8	7.37	6	0.073	0.01 U	0.021	0.013	0.003 U	2.8	1
No barometer, pressure below the scale. Fisherman upstream.													
5/5/2008 9:00	5.6	1280	71	11.3	7.7	6	0.053	0.01 U	0.01 U	0.0089	0.003	3.4	5
Bridge construction on I-90 bridge. Water came up 0.1 foot before doing QC station. Light debris in water. Barometer off scale.													
6/3/2008 8:07	6.7	1070	61	10.1	7.62	5	0.042	0.01 U	0.015	0.011	0.0052	2.8	4
pH measured @ 7.7°C. Barometric pressure measured approximately 10' above water surface. Hand sampled while standing instream. Raining hard with runoff from roads and bridges. A calibration check was made on the pH meter after this sampling with good re													
7/8/2008 9:35	10.4	2610	56	9.89	7.59	4	0.056	0.01 U	0.013	0.0099	0.003 U	2.4	14
pH measured @ 13.1°C. Barometric pressure measured approximately 8' above water surface.													
8/12/2008 10:39	13.6	3520	55	9.4	7.69	2	0.039	0.01 U	0.01 U	0.0088	0.003 U	1.5	4
pH measured @ 15.0°C. Barometric pressure checked @ 6' above water surface.													
9/9/2008 8:18	13	860	59	8.8	7.61	3	0.046	0.01 U	0.012	0.0055	0.0037	1.4	9
pH measured @ 13.1°C. Barometric pressure measured @ 8' above the water surface.													

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
10/9/2007 11:01	13.3	283	564	9.38	8.17	4	3.25	0.01 U	1.74	0.0533	0.0375	2.5	150
pH was measured @ 15.5° C.													
11/13/2007 10:39	7.3	165	717	11.22	8.39	8	3.38	0.01 U	2.22	0.0509	0.0354	8.1	26
pH measured @ 7.7°C. Air clear and dry.													
12/3/2007 12:15	6.1	195	830	11.63	8.37	6	2.95	0.011	2.7	0.0648	0.0507	4.6	47
pH measured @ 7.2°C. Barometric press. measured at van approx. 15' above river level. Windy, no rain or snow but ground wet. Wind blown debris on water surface.													
1/8/2008 11:37	1.7	180	793	12.75	8.31	14	3.16	0.018	3	0.0774	0.0556	13	14
pH measured @ 2.2°C. Barometric pressure measured @ approximately 13' >river. Snow covering the ground. Overcast with no precip.													
2/20/2008 10:10	3.9	187	762	11.83	8.44	21	2.56	0.019	2.31	0.147	0.116	14	14
pH measured @ 4.8°C. Barometric pressure was measured approximately 15' above the river.													
3/17/2008 10:27	7.8	152	755	11.42	8.51	15	3.37	0.01 U	3.21	0.0737	0.019	10	14
No pressure taken													
4/14/2008 11:00	12.5	205	595	9.6	8.39	60	1.61	0.017	1.43	0.11	0.027	26	62
Windy and dusty													
5/5/2008 10:55	15.5	242	520	8.4 J	8.42	62	1.45	0.015	1.24	0.0911	0.025	26	32
RP taken at green stripe. Overshot oxygen endpoint.													
6/3/2008 10:40	16.5	133	523	8.58	8.46	59	1.74	0.01 U	1.43	0.095	0.021	29	320
pH measured @ 16.4°C. Barometric pressure measured approximately 6' above water surface. Raining with runoff from road and bridge u/s of collection site.													
7/8/2008 11:20	21.8	108	532	8.18	8.52	85	1.49	0.016	1.24	0.137	0.012	39	310 J
pH measured @ 21.9°C. Barometric pressure measured approximately 14' above water surface.													
8/12/2008 12:15	21.2	192	466	8.19	8.4	64	1.69	0.01 U	1.41	0.0997	0.016	28	38
pH measured @ 21.2°C. Barometric pressure checked @ 8' above water surface.													
9/9/2008 10:43	17.5	257	474	8.6	8.33	17	1.47	0.01 U	1.2	0.05	0.018	8.3	65
pH measured @ 17.9°C. Barometric pressure measured @ 13' above the water surface.													

Metals 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		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
10/9/2007	11:01		208	0.1 U	0.02 U	0.5 U	1.4	1.24 1.	1	0.1 U	0.02 U	0.0023 1.46		4.99	5 U	2.4
12/3/2007	12:15		272	0.1 U	0.02 U	0.5 U	2.62	1.21 0.	99	0.1 U	0.02 U	0.002 U	1.64	6.5	5 U	1.9
2/20/2008	10:10		270	0.1 U	0.02 U	0.5 U	1.7	1.84 1.	21	0.24	0.02 U	0.002 U	1.27	6.32	5 U	1 U
4/14/2008	11:00		201	0.1 U	0.02 U	1.1	1.5	2.46 0.	99	0.52 0.033		0.002 U	0.87	4.98	5 U	2.17
6/3/2008	10:40		184	0.1 U	0.02 U	0.73	1.5	2.73 1.	02	0.57 0.022		0.0034 1.75		5.17	5 U	1.3
8/12/2008	12:15		181	0.1 U	0.02 U	0.73	1.4	2.33 1.	03	0.45 0.027		0.0023 1.08		4.56	5 U	1

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
10/10/2007 14:25	12.4	880	73	12.24	8.68	3	0.19	0.01 U	0.125	0.0091	0.0062	0.5	11
pH was measured @ 15.9° C. The river was backed up by high water in the Columbia River approximately 2.5 hours prior to sampling. The river had receded and there was definate outflow and riffles below the site at the time of sampling.													
11/14/2007 12:04	4.5	1250	62	14.08	7.95	1	0.15	0.01 U	0.095	0.005 U	0.0037	0.7	11
pH measured @ 5.3°C. Barometric pressure measured at bridge level approx. 80' above river.													
12/12/2007 13:40	2.2	2190	54	14.08	7.65	2	0.16	0.01 U	0.125	0.005 U	0.0036	0.8	3
pH measured @ 2.9°C. Barometric press. measured at van approx. 80' above river level. Overcast, cold, no precipitation.													
1/9/2008 13:15	0.8	957	75	14.99	7.7	1 U	0.296	0.01 U	0.193	0.005 U	0.0039	0.5 U	2
pH measured @ 1.6°C. Barometric pressure measured @ approximately 75' >river. Overcast. Snow and ice on ground.													
2/19/2008 14:52	2.8	880	95	14.48	8.3	1 U	0.23	0.01 U	0.186	0.006	0.0045	0.5 U	1 U
pH measured @ 4.0°C. Barometric pressure was measured approximately 80' above the river.													
3/19/2008 13:00	5.2	1410	98	14.02	8.62	2	0.15	0.01 U	0.092	0.005 U	0.0043	0.7	1 U
4/16/2008 12:35	7.2	2150	80	13.8	8.81	5	0.097	0.01 U	0.017	0.012	0.0036	2.3	1 U
5/7/2008 10:50	8.5	5170	54	11.9	7.99	26	0.142	0.01 U	0.068	0.018	0.003	4.6	15
Windy. Someone dumped oil on ground near pullout (reported to CRO).													
6/4/2008 13:06	8	10200	35	11.71	7.26	13	0.13	0.01 U	0.072	0.012	0.0031	3.6	8
pH measured @ 11.3°C. Barometric pressure measured approximately 50' above water surface.													
7/9/2008 11:15	14.3	5940	33	10.1	7.59	7	0.085	0.01 U	0.046	0.006	0.003 U	1.9	7
pH measured @ 17.0°C. Barometric pressure measured approximately 70' above water surface.													
8/13/2008 12:01	18.6	1180	58	9.5	7.92	3	0.19	0.01 U	0.128	0.0096	0.0034	1.3	5
pH measured @ 19.4°C. Barometric pressure checked @ 50' above water surface.													
9/10/2008 13:48	17.1	637	77	10.6	8.81	1	0.24	0.01 U	0.182	0.005 U	0.003 U	0.5	21
pH measured @ 17.9°C. Barometric pressure measured @ 80' above the water surface.													

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
10/10/2007	10:30	11.4	880	37	10.31	7.33	1	0.042	0.01 U	0.01 U	0.005 U	0.0031	0.5 U	4
		pH was measured @ 15.4° C. No tape-down was taken as it was dry under the RP. This was a wading sample because of shallow water under bridge sampling site.												
11/14/2007	10:44	5.4	1260	36	12.24	7.54	1 U	0.044	0.01 U	0.016	0.005 U	0.003 U	0.5 U	1 U
		pH measured @ 5.2°C. "J" stage because of a rock below RP. Samples were hand collected from right bank.												
12/12/2007	12:02	2.9	2190	33	12.75	7.2	1	0.084	0.01 U	0.065	0.005 U	0.003 U	0.8	1
		pH measured @ 3.4°C. Barometric press. measured at van approx. 30' above river level. Scattered clouds and sunny, cold.												
1/9/2008	12:30		957											
		No sample because deep fresh snow blocked access to the river and bridge walkway. Heavy, dangerous traffic on bridge.												
2/19/2008	11:35	1.1	880	46	13.16	7.24	1	0.087	0.01 U	0.05	0.005 U	0.003 U	0.5 U	1 U
		pH measured @ 1.9°C. Barometric pressure was measured approximately 30' above the river. No stage -- dry below RP.												
3/19/2008	11:16	3.6	1410	48	12.72	7.6	1 U	0.07	0.01 U	0.03	0.005 U	0.0031	0.7	1 U
4/16/2008	10:53	4.7	2150	45	12.4	7.48	3	0.1	0.01 U	0.052	0.0067	0.003 U	1.2	1
5/7/2008	9:40	6.1	5130	37	11.8	7.4	13	0.137	0.01 U	0.092	0.018	0.003 U	2.8	2 J
		DOT working on walkway structure under bridge. Bridge to be replaced in a few years. River high with some tiny detritus.												
6/4/2008	11:05	6.8	10300	27	11.41	7.05	7	0.11	0.01 U	0.071	0.0061	0.0031	2.1	1 U
		pH measured @ 7.8°C. Barometric pressure measured approximately 25' above water surface.												
7/9/2008	10:03	12	5890	24	10.1	7.19 J	6	0.07	0.01 U	0.033	0.0052	0.003 U	1.6	1
		pH measured @ 14.9°C. Barometric pressure measured approximately 25' above water surface.												
8/13/2008	10:35	16.1	1180	34	9.1	7.38	2	0.068	0.011	0.01 U	0.0065	0.003 U	1	3
		pH measured @ 16.6°C. Barometric pressure checked @ 25' above water surface.												
9/10/2008	11:19	13.9	637	39	9.6	7.48	1	0.029	0.01 U	0.01	0.005 U	0.003 U	0.6	3
		pH measured @ 14.1°C. Barometric pressure measured @ 25' above the water surface. No stage -- dry below RP.												

Conventional Data Report

Nason Cr. nr mouth

45J070

Class: AA
Rivermile: 1
Latitude: 47 48 00.4
Longitude: 120 42 59.3
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
11/14/2007 10:06	2.6	110	39	12.85	7.45	1 U	0.062	0.01 U	0.02	0.005 U	0.003	0.7	3
pH measured @ 2.6°C. Ice on the banks and river.													
12/12/2007 10:35	0.5	200	33	13.36	6.93	1	0.11	0.01 U	0.078	0.0056	0.0037	0.6	2
pH measured @ 0.7°C. Barometric press. measured at van approx. 15' above river level. No stage -- staff gage covered with ice. Ice over parts of the river. Scattered clouds and sunny, cold.													
1/9/2008 11:25	0.5	105	42	13.26	7.02	1 U	0.11	0.01 U	0.077	0.005 U	0.004	0.5 U	1 U
pH measured @ 0.8°C. Barometric pressure measured @ approximately 10' >river. No stage taken -- staff gage iced over. Ice covering ≈ 50% of river. Deep snow covering the ground.													
2/19/2008 10:50	0.5	86.5	52	12.85	7.1	1 U	0.072	0.01 U	0.053	0.005 U	0.0036	0.5	1
pH measured @ 1.5°C. Barometric pressure was measured approximately 12' above the river. No stage - staff covered with ice. Ice on river and overhanging from banks.													
3/19/2008 10:20	2.8	143	60	12.42	7.17	1	0.075	0.01 U	0.03	0.0063	0.0051	0.8	1
Pressure less than 28.00, could not get to staff, in snow													
4/16/2008 10:10	3.2	250	54	12.4	7.01	3	0.13	0.01 U	0.075	0.009	0.0039	1.4	1
5/7/2008 9:05	4.1	705	34	11.8	7.05	20	0.196	0.01 U	0.139	0.019	0.0037	3.6	1 UJ
River high with some tiny detritus. BP off scale by 0.12, but close enough to not J.													
6/4/2008 10:30	5	1452	23	11.61	7.03	8	0.089	0.01 U	0.047	0.008	0.0033	2	1
pH measured @ 5.8°C. Barometric pressure measured approximately 12' above water surface.													
7/9/2008 9:25	9.8	521	22	10.3	6.93 J	4	0.05	0.01 U	0.012	0.005 U	0.003 U	0.8	3
pH measured @ 11.3°C. Barometric pressure measured approximately 12' above water surface. "J"ed pH due to meter slow and drifting -- possibly due to low conductivity.													
8/13/2008 9:55	13.7	83.3	42	9.19	7.26	2	0.066	0.01 U	0.01 U	0.01	0.0033	1.5	10
pH measured @ 14.5°C. Barometric pressure checked @ 12' above water surface.													
9/10/2008 10:40	11.8	54.4	46	9.8	7.34	1	0.04	0.01 U	0.01 U	0.005 U	0.0047	0.7	4
pH measured @ 11.9°C. Barometric pressure measured @ 15' above the water surface.													

Conventional Data Report

White R. @ Road 6500 Bridge

45K050

Class: AA
Rivermile: 2.2
Latitude: 47 50 47.4
Longitude: 120 50 19.3
Waterbody: WA-45-5000

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
10/10/2007	9:19	7.7	266	30	10.71	6.99	1	0.079	0.01 U	0.05	0.005 U	0.0036	1.4	7
		pH was measured @ 10.9° C. Stage was measured by tape-down at the wire weight gage several miles upstream of the sample site at Flow station 45K070. A key has been procured and future measurements will be made using the WWG.												
11/14/2007	9:12	2.4	255	30	12.65	7.43	1 U	0.085	0.01 U	0.054	0.005 U	0.003 U	0.6	1
		pH measured @ 2.4°C. Staff gage = 3.72(J). Ice on the banks and river.												
12/12/2007	9:42	1.2	461	28	12.55	6.84	3	0.12	0.01 U	0.103	0.005 U	0.0032	0.9	1
		pH measured @ 0.9°C. Barometric press. measured at van approx. 20' above river level. Weather clear and cold.												
1/9/2008	10:48	0.7	178	34	12.75	7.13	1 U	0.11	0.01 U	0.078	0.0075	0.0036	0.5 U	1 U
		pH measured @ 0.9°C. Barometric pressure measured @ approximately 12' >river. Sunny. Ice on river. No stage taken -- deep snow on road to gage.												
2/19/2008	10:15	1.4	138	38	12.44	6.99	1 U	0.1	0.016	0.062	0.0068	0.0035	0.5 U	1 U
		pH measured @ 1.3°C. Barometric pressure was measured approximately 15' above the river. No stage taken because of ice in river obscuring staff and below RP.												
3/19/2008	9:30	3.5	220	37	11.32	7.12	1 U	0.094	0.01 U	0.06	0.006	0.0041	0.5 U	1 U
4/16/2008	9:20	3.4	411	32	11.6	6.99	2	0.222	0.108	0.127	0.0063	0.003 U	1.1	1 U
		Inflow from pipe 40' upstream on N. bank												
5/7/2008	8:25	3	1380	24	12	7.05	44	0.229	0.01 U	0.176	0.049	0.0031	6	1 J
		Beginning to get windy. River high with some tiny detritus. BP off scale by 0.15, but close enough to not J.												
6/4/2008	9:45	4.6	2227	21	11.61	7.01	27	0.14	0.01 U	0.103	0.017	0.0032	4.1	1
		pH measured @ 5.4°C. Barometric pressure measured approximately 15' above water surface.												
7/9/2008	8:03	8.3	1897	16	10.5	6.93 J	22	0.051	0.01 U	0.029	0.015	0.003 U	5.1	8
		pH measured @ 10.1°C. Barometric pressure measured approximately 15' above water surface. pH meter very slow and drifting, possibly because conductivity was so low.												
8/13/2008	9:20	11.7	371	27	9.4	7.12	4	0.039	0.01 U	0.015	0.0099	0.003 U	4.4	12
		pH measured @ 12.5°C. Barometric pressure checked @ 15' above water surface. No stage taken. Check stage on Ecology's stream gaging network.												
9/10/2008	9:51	10.7	189	31	9.5	7.16	2	0.065	0.01 U	0.032	0.005 U	0.0035	2.5	1
		pH measured @ 10.8°C. Barometric pressure measured @ 15' above the water surface.												

Conventional Data Report

Little Wenatchee @ 2 Rvr Grav.Pit

45L050

Class: AA
Rivermile: 2.2
Latitude: 47 49 51.4
Longitude: 120 50 43.3
Waterbody: WA-45-4000

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
10/10/2007 8:15	8		46	10.41	7.11	1 U	0.051	0.01 U	0.01 U	0.005 U	0.0034	0.5 U	3
	pH was measured @ 11.0° C. Stage was measured by tape-down at the wire weight gage several miles upstream of the sample site at Flow station 45L070. A key has been procured and future measurements will be made using the WWG.												
11/14/2007 8:35	2.4		38	12.55	7.64 J	1 U	0.061	0.01 U	0.025	0.005 U	0.003 U	0.5 U	1 U
	pH measured @ 2.7°C. Stage with tape down = 24.60. Ice on river bank and water.												
12/12/2007 9:00	0.9		33	12.85	6.86	1	0.1	0.01 U	0.082	0.005 U	0.003 U	0.5	1
	pH measured @ 1.1°C. Stage not taken as the road to the gage is closed due to snow. Ice on the banks of the river. Weather clear and quite cool (below freezing).												
1/9/2008 10:00	0.5		48	12.85	7.48	1 U	0.075	0.01 U	0.056	0.005 U	0.003 U	0.5 U	1
	pH measured @ 1.3°C. Barometric pressure measured @ approximately 50' >river. Snowshoed to river. ≈4ft snow on ground. Wading sample; warm feet -- cold hands. Sunny and cold. No stage - road to WWG closed for the winter.												
2/19/2008 9:30	0.5		54	12.34	6.99	1 U	0.061	0.01 U	0.045	0.005 U	0.003 U	0.5 U	1 U
	pH measured @ 1.1°C. Barometric pressure was measured approximately 30' above the river. No stage -- road to gage closed for the winter. Approximately 4 feet of snow on the ground.												
4/16/2008 8:40	2.8		44	12.1	7.2	2	0.14	0.01 U	0.111	0.005 U	0.003 U	0.5	1 UJ
5/7/2008 8:00	2.7		29	12.3	7.32	15	0.187	0.01 U	0.165	0.011	0.003 U	2.1	1 UJ
	Gate to WWG closed. River high with some tiny detritus. BP off scale by 0.12, but close enough to not J.												
6/4/2008 9:02	4		21	11.91	7.35	3	0.088	0.01 U	0.059	0.005 U	0.003 U	1.3	1
	pH measured @ 5.3°C. Barometric pressure measured approximately 12' above water surface. Tape-down measurement = 21.75'.												
8/13/2008 8:47	12.7		51	9	7.22	1 U	0.029	0.01 U	0.01 U	0.0058	0.004	0.5 U	16
	pH measured @ 14.7°C. Barometric pressure checked @ 20' above water surface. No stage taken. Check stage on Ecology's stream gaging network.												
9/10/2008 9:15	10.6		58	9.19	7.41	1 U	0.025 U	0.01 U	0.01 U	0.005 U	0.0032	0.5 U	1 U
	pH measured @ 10.6°C. Barometric pressure measured @ 10' above the water surface. Stage was measured with a tape-down.												

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
10/10/2007 12:33	11.1	136	106	11.63	8.36	2	0.18	0.01 U	0.136	0.005 U	0.0046	0.8	5
pH was measured @ 15.4° C. Recent rainfall prior to sampling.													
11/14/2007 13:01	3.4	156	97	13.77	8.02	1	0.15	0.01 U	0.114	0.005 U	0.0033	0.5 U	2
pH measured @ 4.0°C.													
12/12/2007 14:30	1	212	83	14.28	7.83	1	0.16	0.01 U	0.136	0.005 U	0.0045	0.6	1
pH measured @ 1.6°C. Barometric press. measured at van approx. 20' above river level. Foggy and cold. "J" stage because of ice on river and banks.													
1/9/2008 14:10	0.9	130	99	14.69	8.33	1	0.17	0.01 U	0.144	0.005 U	0.004	0.5 U	1 U
pH measured @ 1.4°C. Barometric pressure measured @ approximately 15' >river. Overcast. Deep snow on the ground.													
2/19/2008 13:55	2.9	120	115	13.97	8.48	1	0.15	0.01 U	0.115	0.005 U	0.0037	0.5 U	1 U
pH measured @ 3.4°C. Barometric pressure was measured approximately 20' above the river. "J" stage -- river was partially frozen over.													
3/19/2008 13:55	6.5	185	118	13.22	9.17	2	0.1	0.01 U	0.049	0.005 U	0.0043	0.5 U	1 U
4/16/2008 13:30	8.8	266	101	12.4	8.82	3	0.091	0.01 U	0.031	0.0094	0.0035	1	1 U
5/7/2008 11:50	9.1	711	65	11.7	8.24	27	0.191	0.01 U	0.12	0.023	0.0035	6.7	8 J
River high with some tiny detritus.													
6/4/2008 14:17	7.4	1790	36	11.71	7.3	12	0.078	0.01 U	0.043	0.011	0.0037	2.9	7
pH measured @ 8.8°C. Barometric pressure measured approximately 20' above water surface.													
7/9/2008 11:59	14.8	719	44	10.2	8.08	6	0.07	0.022	0.013	0.005 U	0.003 U	1.6	1
pH measured @ 16.3°C. Barometric pressure measured approximately 15' above water surface.													
8/13/2008 13:14	19.2	169	76	8.5	8.17	2	0.2	0.016	0.074	0.0076	0.0039	0.7	7 J
pH measured @ 19.7°C. Barometric pressure checked @ 15' above water surface.													
9/10/2008 14:46	16.1	107	94	9.9	8.69	2	0.16	0.01 U	0.113	0.005 U	0.0036	0.5 U	6
pH measured @ 16.7°C. Barometric pressure measured @ 20' above the water surface.													

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
10/8/2007 13:40	10.7	423	187	10.8	8.49	2	0.287	0.01 U	0.231	0.005 U	0.0031	0.9	1 U
11/5/2007 12:35	4.9	452	180	12.6	8.39	1	0.271	0.01 U	0.22	0.005 U	0.0034	0.6	1 U
12/5/2007 13:35	2.9	532	164	13.33	8.35	2	0.297	0.01 U	0.228	0.005 U	0.003 U	1.8	1 U
1/7/2008 13:50	0	632	185	13.83	8.25	2	0.295	0.01 U	0.271	0.005 U	0.0034	0.7	2
2/11/2008 13:35	0.2	632	187		8.56	3	0.286	0.01 U	0.25	0.005 U	0.003 U	1.5	1 U
	DO bottle not changed, no data collected												
3/3/2008 13:10	6.1	392	188	12.36	8.41	3	0.285	0.01 U	0.225	0.005 U	0.003 U	0.8	1 U
4/7/2008 13:50	8.9	491	180	11.73	8.6	4	0.227	0.01 U	0.171	0.005 U	0.0033	1.3	1 U
5/5/2008 13:00		2240											
	Bridge repairs in progress. No sampling access												
6/2/2008 15:30	9.9		60	10.85	7.71	75 J	0.11	0.01 U	0.066	0.021	0.004	16	11
	Samples taken under brige on left bank. Orthophosphate taken from TSS bottle.												
7/7/2008 14:20		2495											
	I was unable to access site due to heavy construction on the bridge and surrounding area.												
8/4/2008 14:15		655											
	Unable to access site. This site will need to be moved to another bridge upstream. The construction is complete, however there is no safe walkway or shoulder to sample from.												
9/8/2008 13:15	14.4 J	365	174	9.94	8.55	3	0.2	0.01 U	0.124	0.0077 J	0.003 U	2	3 J
	Due to dangerous sampling conditions on the bridge, these samples were taken ~10ft from the left bank below the bridge as grab samples.												

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	Flow	Conduc-tivity	Oxygen	ph	Suspend. Solids	Total Pers. N.	Ammonia Nitrogen	Nitrate+ Nitrite	Total Phosp.	Soluble Reactive P	Turbid-ity	Fecal Coliforms
		deg. C	CFS	umhos/cm	mg/L	std units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	#/100/mL
10/8/2007	12:30	8.9	352	154	11.11	8.29	2	0.23	0.01 U	0.194	0.005 U	0.0032	0.8	2
11/5/2007	11:45	5.2	374	148	12.1	8.31	2	0.22	0.01 U	0.178	0.005 U	0.0032	0.5	1 U
		new steps and door on USGS gaging station!												
12/5/2007	12:40	2.5	506	138	13.23	8.19	7	0.2	0.01 U	0.156	0.005 U	0.003 U	1.2	3
		No gage reading recorded/access blocked by snow.												
1/7/2008	12:40	1.4	331	158	13.33	8.15	1 U	0.252	0.01 U	0.214	0.005 U	0.0033	0.5	1
		no safe parking near gage house. Flow not recorded.												
2/11/2008	12:25	2.6	303	162	13.7	8.46	2	0.24	0.01 U	0.205	0.005 U	0.003 U	0.6	3
		no access to gage building due to snow												
3/3/2008	12:00	5.1	312	158	12.46	8.25	3	0.23	0.01 U	0.18	0.005 U	0.003 U	0.5	1 U
4/7/2008	12:45	6.9	409	154	11.83	8.29	5	0.209	0.01 U	0.164	0.0051	0.0038	1	1 U
5/5/2008	12:25	7.8	2300	102	10.91	7.04	69	0.31	0.01 U	0.219	0.048 J	0.0044	18	16
6/2/2008	14:20	8.9	8790	58	10.75	7.52	22 J	0.12	0.01 U	0.062	0.013	0.0041	6.1	12
7/7/2008	13:15	11.9 J	2470	82	10.15	8.19	6	0.066	0.01 U	0.029	0.0059	0.003 U	2.4	4
8/4/2008	13:30	16.3 J	545	128	9.8	8.19	2	0.15	0.01 U	0.109	0.005 U	0.0031	0.6	6
9/8/2008	12:00	13 J	292 J	148	10.45	8.22	1	0.23	0.01 U	0.202	0.005 U	0.0031	0.5 U	6

Conventional Data Report

Methow R @ Winthrop

48A150

Class: A
Rivermile: 49.8
Latitude: 48 28 24.5
Longitude: 120 10 39.3
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
10/8/2007	11:40	7.5	300	134	11.61	8.31	1	0.1	0.01 U	0.054	0.005 U	0.0036	0.8	3
11/5/2007	11:00	4.5	300	136	12.6	8.32	2	0.14	0.01 U	0.106	0.005 U	0.0045	0.5 U	1
12/5/2007	11:40	4.1	385	129	12.52	8.16		0.16	0.01 U	0.135	0.005 U	0.003 U	0.7	1
1/7/2008	12:05	1.3	281	131	13.03	8.22	4	0.2	0.01 U	0.173	0.005 U	0.004	0.7	6
2/11/2008	11:50	1.8	241	133	13.29	8.31	2	0.19	0.01 U	0.16	0.005 U	0.003 U	0.8	6
3/3/2008	11:25	3.9	255	131	12.56	8.1	2	0.17	0.01 U	0.123	0.005 U	0.0034	0.5 U	1
4/7/2008	12:10	6	354	133	11.83	8.14	2	0.145	0.01 U	0.094	0.005 U	0.004	0.5 U	1 U
5/5/2008	11:55	6.6	2110	85	11.53	7.78	86	0.434	0.01 U	0.325	0.0621 J	0.0072	25	3
6/2/2008	13:45	8.8	7280	54	10.65	7.53	19 J	0.13	0.01 U	0.069	0.011	0.0041	4.6	6
		Even though this station is below the confluence of the Chewuch and Methow river, it is apparent that there is little mixing of the two. Perhaps this is due to the high water levels of both rivers. There is a strong color difference between the right an												
7/7/2008	12:30	11.5 J	1910	78	9.74	7.87	6	0.069	0.01 U	0.025	0.0088	0.003 U	2.4	7
		There appears to be little mixing between Chewech and Methow rivers. Samples and measurements were taken where mixing seemed to be the greatest.												
8/4/2008	12:30	15 J	477	114	9.69	8.1	1	0.078	0.01 U	0.04	0.005 U	0.0033	0.5	7
9/8/2008	11:25	11.4 J	255	128	10.65	8.19	1	0.12	0.01 U	0.082	0.0062 J	0.0039	0.5	7

Conventional Data Report

Chewuch R @ Winthrop

48B070

Class: AA
Rivermile: 0.2
Latitude: 48 28 38.5
Longitude: 120 11 11.3
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
10/8/2007 11:10	7.1	134	121	11.71	8.33	2	0.88	0.01 U	0.026	0.005 U	0.0037	0.9	8
11/5/2007 10:40	3.1	124	115	12.7	8.07	1 U	0.13	0.01 U	0.079	0.005 U	0.0047	0.5 U	3
12/5/2007 11:10	0.4	167	98	13.53	7.96	2	0.253	0.01 U	0.18	0.0076	0.0033	1.1	2
1/7/2008 11:40		253											
heavy ice. Not sample taken													
2/11/2008 11:35		110											
no sample taken due to ice													
3/3/2008 11:05	3.1	96	125	12.76	8.28	3	0.17	0.01 U	0.117	0.005 U	0.0033	0.6	2
4/7/2008 11:25	5.2	119	124	12.34	8.24	2	0.14	0.01 U	0.074	0.005 U	0.0041	0.8	1 U
5/5/2008 11:05	6.3	976	78	11.02	7.87	133	0.527	0.01 U	0.396	0.0839	0.0086	26	8
6/2/2008 13:15	8.8	2610	40	10.15	7.52	30 J	0.19	0.01 U	0.096	0.016	0.0056	5.3	24
7/7/2008 11:50	12.9 J	494	76	9.54	8.06	17	0.1	0.01 U	0.019	0.023	0.0033	4.8	16
8/4/2008 12:00	15.6 J	164	110	9.69	8.18	3	0.075	0.01 U	0.017	0.005 U	0.0044	0.6	11
9/8/2008 10:45	11.5 J	98	126	10.15	8.21	2	0.093	0.01 U	0.04	0.0066 J	0.0042	0.5 U	16

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
10/8/2007 10:05	11.8	1000	305	9.59	8.33	5	0.18	0.01 U	0.031	0.017	0.0035	1.9	12
11/5/2007 9:30	5.3	1040	271	11.4	8.3	4	0.15	0.01 U	0.03	0.014	0.0031	2.3	9
12/5/2007 10:00	1.1	900	297	13.13	8.28	2	0.22	0.01 U	0.108	0.011	0.0052	1.6	6
1/7/2008 10:20	0.1	1690	276	13.08	8.11	3	0.24	0.01 U	0.114	0.011	0.0087	1.3	7
2/11/2008 10:40		1270											
no sample taken due to ice													
3/3/2008 10:00	5.6	801	321	12.06	8.39	3	0.18	0.01 U	0.035	0.013	0.0047	1.7	1
4/7/2008 10:10	8.8	1040	311	10.61	8.32	6	0.146	0.01 U	0.01 U	0.013	0.012	1.8	3
5/5/2008 9:55	14.5	1950	218	9.38	8.07	17	0.135	0.01 U	0.01 U	0.026 J	0.0034	7.8	18
6/2/2008 11:50	12.1	15100	114	10.35	7.93	87	0.14	0.01 U	0.031	0.047	0.0046	27	39
7/7/2008 10:30	18.1 J	4880	142	8.44	8.05	30	0.11	0.01 U	0.011	0.044	0.003 U	9	40
8/4/2008 10:45	21 J	1220	240	7.8	8.3	2	0.093	0.01 U	0.01 U	0.0083	0.0045	1	18
Lots of vegetation floating in the river.													
9/8/2008 9:25	18.1 J	1380	269	8.34	8.33	7	0.16	0.01 U	0.02	0.018 J	0.004	1.4	13

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
10/8/2007 7:50	14.1	416	315	8.38	8.18	7	0.313	0.02	0.016	0.03	0.0033	3.9	3
11/5/2007 7:50	9.1	360	318	9.4	8.37	4	0.22	0.01 U	0.01 U	0.025	0.0056	2.8	1
12/5/2007 7:50	4.1	281	321	10.9	8.23	2	0.25	0.01 U	0.032	0.016	0.003	2.4	2 J
1/7/2008 8:25	1	215	342	12.47	8.08	2	0.343	0.015	0.066	0.014	0.0067	1	2
2/11/2008 8:40	1.5	286	333	12.38	8.13	2	0.299	0.024	0.076	0.013	0.003 U	1	5
3/3/2008 8:20	3.8	240	345	12.96	8.12	2	0.294	0.01 U	0.065	0.014	0.0051	1	1
4/7/2008 8:00	5.9	551	336	11.63	8.12	6	0.244	0.013	0.01 U	0.012	0.0032	2	1 U
5/5/2008 8:00	11.7	474	335	10.91	8.39	9	0.189	0.01 U	0.01 U	0.022 J	0.003 U	4.7	1 U
6/2/2008 8:50	11.9	3350	326	9.54	8.39	5	0.2	0.01 U	0.01 U	0.013	0.0055	1.4	3
No blanks taken at this site													
7/7/2008 8:15	21.1 J	959	289	8.14	8.66	5	0.23	0.015	0.01 U	0.0099	0.003 U	1.5	8
8/4/2008 8:15	21.7 J	210	296	8.19	8.62	4	0.22	0.01 U	0.01 U	0.011	0.0049	2	6
9/8/2008 7:30	18.9 J	882	312	8.74	8.66	4	0.23	0.01 U	0.01 U	0.016 J	0.0051	2.5	9

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
10/8/2007	8:20	11.2	409	201	10.4	8.33	3	0.076	0.01 U	0.01 U	0.005 U	0.0031	1.2	3
11/5/2007	8:20	4.6	556	194	12.4	8.37	2	0.076	0.01 U	0.015	0.005 U	0.0031	1.2	7
12/5/2007	8:30	3.6	1877	204	13.53	8.28	15	0.11	0.01 U	0.059	0.008	0.003	5.9	11 J
1/7/2008	8:40	0	778	206	14.04	8.25	6	0.15	0.01 U	0.05	0.0081	0.007	1.7	1 U
2/11/2008	9:15	0.1	766	194	14.61	8.39	3	0.13	0.01 U	0.067	0.0063	0.0041	1.6	1 U
		no stage height measured due to ice												
3/3/2008	8:40	5.5	449	219	12.36	8.45	3	0.075	0.01 U	0.01 U	0.0056	0.0036	1.3	1 U
4/7/2008	8:45	9.1	409	226	11.22	8.41	3	0.076	0.01 U	0.01 U	0.005 U	0.0037	1	1 U
5/5/2008	8:30	12.8	2001	160	10.4	8.22	16	0.117	0.01 U	0.01 U	0.024 J	0.003	8.3	24
6/2/2008	9:47	8.7	15982	76	12.16	7.94	79	0.14	0.01 U	0.029	0.047	0.0047	31	44
		Blanks were taken at this site at 10:25am, conductivity of blanks =1.0; press= 28.67												
7/7/2008	9:00	15.5 J	3911	110	9.84	8.11	17	0.095	0.01 U	0.01 U	0.02	0.0042	5.7	17
8/4/2008	9:00	18.5 J	855	172	8.8	8.26	2	0.062	0.01 U	0.01 U	0.005 U	0.004	1.1	6
9/8/2008	8:15	17.2 J	523	186	9.14	8.36	1	0.07	0.01 U	0.01 U	0.0071 J	0.0033	0.7	2 J

Metals 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		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
10/8/2007	8:20		93.3	0.1 U	0.02 U	0.5 U	0.42	1.04	0.	72	0.1 U	0.02 U	0.002 U	0.73	2.11	5 U	1 U
12/5/2007	8:30		92.7	0.1 U	0.02 U	0.74	0.61	2.09	0.	66	0.28	0.02 U	0.002 U	0.64	2.74	5 U	1.4
2/11/2008	9:15		96.3	0.1 U	0.02 U	0.5 U	0.64	1.06	0.	64	0.15	0.02 U	0.002 U	0.65	1.75	5 U	4.5
4/7/2008	8:45		99.3	0.1 U	0.02 U	0.5 U	0.52	0.97	0.	78	0.1 U	0.02 U	0.002 U	0.6	2.39	5 U	1 U
6/2/2008	9:47		33.4	0.1 U	0.02 U	3	0.39	8.16	1.	66	0.74	0.03	0.01	0.62	4.71	6.5	1.5
8/4/2008	9:00		78.2	0.1 U	0.02 U	0.5 U	0.53	1	0	.84	0.1 U	0.02 U	0.002 U	0.58	3.06	5 U	1 U

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
10/8/2007 15:40	17.5	128000	129	8.38	7.99	1 U	0.13	0.01 U	0.087	0.013	0.0049	0.5	1 U
11/5/2007 14:20	14.4	105600	130	9.19	8.1	1 U	0.14	0.01 U	0.104	0.005	0.0046	0.5 U	1 U
12/5/2007 15:25		55800	135	10.1	8.06	1 U	0.18	0.01 U	0.127	0.0051	0.0045	0.5	1 U
backup thermistor cable too short for this station.													
1/7/2008 15:40		228600	151	11.46	7.99	1 U	0.19	0.01 U	0.15	0.005 U	0.0041	0.5	1 U
Thermistor too short for temp measurement													
2/11/2008 15:35		185400	152		8.32	1	0.21	0.01 U	0.171	0.005 U	0.003 U	0.6	1 U
DO bottle not changed, no data collected. Thermistor too short for temperature measurement													
3/3/2008 14:45		184000	163	12.76	8.16	1 U	0.19	0.01 U	0.165	0.005 U	0.003 U	0.6	1
Thermistor cable too short for temperature measurement													
4/7/2008 15:40		137000	162	12.75	8.26	1	0.258	0.01 U	0.207	0.0072	0.003 U	0.8	1 U
thermistor too short to record temp.													
5/5/2008 14:45	7.4	269200	155	12.24	8.23	2	0.274	0.01 U	0.208	0.015 J	0.003 U	1.1	1 U
6/2/2008 17:22	11.5	434200	123	10.95	7.94	1 U	0.16	0.01 U	0.077	0.0086	0.003 U	1.4	1 U
Filtered metals sample was poured back into its origional container.													
7/7/2008 15:45	13.5 J	458000	122	10.45	8.02	1 U	0.2	0.039	0.048	0.0065	0.003 U	0.7	1
8/4/2008 16:00	19.6 J	329900	130	9	8.01	2 U	0.11	0.01 U	0.034	0.005 U	0.003 U	0.5	1 U
9/8/2008 15:10	19.8 J	220000	130	8.04	8.06	2 U	0.11	0.01 U	0.059	0.0057 J	0.003 U	0.5	1 U

Metals 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		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
10/8/2007	15:40		64.7	0.1 U	0.02 U	0.5 U	0.26	0.54	0.	52	0.81	0.02 U	0.002 U	0.64	0.41	5 U	2.3
12/5/2007	15:25		67.9	0.1 U	0.02 U	0.5 U	0.55	1.01	0.	52	0.53	0.045	0.002 U	0.54	0.55	6.8	1 U
2/11/2008	15:35		75	0.1 U	0.02 U	0.5 U	0.44	0.63	0.	44	0.1 U	0.02 U	0.002 U	0.59	0.42	5 U	3.1
4/7/2008	15:40		74.9	0.1 U	0.02	0.5 U	0.32	0.64	0.	56	0.1 U	0.022	0.0024	0.59	0.44	5 U	3.1
6/2/2008	17:22		56.4	0.1 U	0.021	0.5 U	0.33	1.36	1.	05	0.35	0.067	0.0029	0.78	0.54	6.8	6.5
8/4/2008	16:00		62.4	0.1 U	0.02 U	0.5 U	0.42	0.8	0.	73	0.1 U	0.02 U	0.002 U	0.49	0.58	5 U	1.2

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
10/2/2007 15:10	15.2	3150	261	6.46	8.05	2	1.45	0.01 U	1.54	0.0186	0.016	2.1	1 U
11/13/2007 14:55	9.5	210	220	9.55	8.24	3	1.11	0.028	1.11	0.016	0.012	1.4	1 U
12/11/2007 15:35		4700	204	10.5	8.12	5	1.08	0.025	0.995	0.02	0.018	0.9	1 U
	Thermistor cable too short for temperature measurement												
1/14/2008 14:50	3.8 J	6100	165	11.31	8	2	0.882	0.011	0.812	0.034	0.0327	1.7	1
	Thermistor too short for measurement; temp from pH probe.												
2/19/2008 15:35	3.8	4410	197	11.11	7.96	8	1.16	0.011	1.04	0.0502	0.0466	1.8	1 U
3/10/2008 15:05	5.3	6450	175	11.21	7.93	4	1.64	0.013	1.49	0.0625	0.051	6.8	1 U
4/14/2008 15:45	7.5	6680	132	11.77	8.15	5	0.972	0.01 U	0.874	0.037	0.02	2.7	1 U
5/12/2008 15:00	9.5	22770	79		7.82	3	0.33	0.01 U	0.216	0.011	0.0035	2.5	1
	DO not recorded												
6/10/2008 18:00	11.6	26320	59		7.88	6	0.21	0.01 U	0.139	0.013	0.0037	4.1	2
	No DO (lost lid)												
7/15/2008 16:20	18.2 J	6170	104	8.94	7.88	2	0.482	0.024	0.355	0.0073	0.003 U	1.1	1 U
8/12/2008 15:05	19.1 J	4840	172	7.63	7.78	3	0.856	0.01 U	0.773	0.015	0.0072	0.9	1
9/16/2008 15:15	17.4 J	4750	224	7.3	8.13	2	1.2	0.01 U	1.05	0.013	0.0074	0.9	1 U

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
10/2/2007 13:30	11.9	2090	233	9.89	8.3	3	1.56	0.01 U	1.49	0.0226	0.017	1.3	40
11/13/2007 13:05	8.8	2540	184	10	8.15	2	1.36	0.027	1.33	0.039	0.0365	0.9	17
12/11/2007 14:10		4010	131	11.51	7.93	2	0.748	0.01 U	0.691	0.022	0.021	1	5
thermistor cable too short for temp measurement													
1/14/2008 13:18	5	3880	163	11.71	7.91	4	1.38	0.014	1.26	0.0665	0.0575	4.1	7
2/19/2008 13:55	3.9	3920	160	11.91	7.85	4	1.7	0.01	1.46	0.0731	0.0608	7.7	1 U
3/10/2008 13:00	4.9	6230	134	12.22	7.81	11	2.54	0.051	2.31	0.0678	0.0448	8.4	2
4/14/2008 14:04	8	7360	109	11.67	7.86	6	0.878	0.01 U	0.781	0.037	0.024	3.5	1 J
5/12/2008 13:35	8.1	21600	67	12.85	7.68	8	0.262	0.01 U	0.196	0.0098	0.0033	3.3	1
6/10/2008 16:20	12.1	28210	58		7.81	6	0.22	0.01 U	0.147	0.011	0.0031	3.6	7
No DO (lost lid)													
7/15/2008 14:30	18.7 J	3990	154	9.44	8.34	4	0.779	0.01 U	0.721	0.0094	0.0039	1	19
8/12/2008 13:15	16.3 J	1820	222	9.14	7.93	3	1.53	0.01 U	1.35	0.015	0.0072	0.9	8
9/16/2008 13:15	15.4 J	1710	208	9.15	8.3	2	1.4	0.01 U	1.29	0.018	0.012	0.5	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
10/2/2007 12:50	11.8	1640	209	10	8.33	2	1.38	0.01 U	1.27	0.0227	0.01	1.6	33
11/13/2007 12:15	8.5	2140	172	10.7	8.24	1	1.12	0.01 U	1.01	0.03	0.024	0.6	7
12/11/2007 13:35	5.3	3710	127	11.91	8.01	2	0.757	0.01 U	0.717	0.029	0.023	1	4
1/14/2008 12:30	5.1	3230	150	11.91	7.95	3	1.24	0.011	1.14	0.0708	0.064	3.6	3
2/19/2008 12:55	4.3	3050	150	12.32	7.91	2	1.29	0.01 U	1.31	0.0786	0.0703	4.9	9
3/10/2008 12:10	4.7	4540	136	12.22	7.77	14	3.08	0.01 U	2.64	0.0813	0.0574	11	7
4/14/2008 13:15	7.2	6620	108	11.77	7.78	6	0.893	0.01 U	0.817	0.0626	0.0479	4.3	260 J
5/12/2008 12:45	8	21000	65	13.46	7.73	6	0.27	0.01 U	0.191	0.0089	0.0032	3.1	3 U
6/10/2008 15:20	12.1	28300	59	11.45	7.82	4	0.264	0.01 U	0.193	0.011	0.004	2.6	7
Sampled from right bank because of high water levels creating dangerous conditions on bridge. DO sampled at the same spot.													
7/15/2008 13:45	19.7 J	3890	148	9.34	8.39	2	0.857	0.01 U	0.793	0.01	0.0051	0.8	42
8/12/2008 12:35	15.7 J	1570	216	9.94	8.1	1	1.57	0.01 U	1.38	0.015	0.0057	0.5 U	13
9/16/2008 12:30	14.8 J	1620	202	9.3	8.17	2	1.46	0.01 U	1.33	0.019	0.0082	0.5	12

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
10/2/2007 13:55	10.5	384	299	9.39	8.36	2	1.39	0.01 U	1.25	0.0087	0.0081	1.7	29
11/13/2007 13:40	7.7	423	296	10.1	8.42	2	1.39	0.01 U	1.3	0.0075	0.0076	0.9	13
12/11/2007 14:35	5	470	284	10.7	8.22		1.34	0.01 U	1.3	0.017	0.014	2.2	19
1/14/2008 13:45	6.5	464	279	18.58	8.25	6	1.35	0.01 U	1.25	0.016	0.013	3.4	22
2/19/2008 14:35	6.3	462	284	10.8	8.17	6	1.35	0.01 U	1.27	0.013	0.011	2.1	10
3/10/2008 13:25	6.6	670	260	10.2	8.07	20	1.25	0.01 U	1.09	0.033	0.02	11	32
4/14/2008 14:30	10.3	1272	183	8.83	7.71	20	0.876	0.01 U	0.646	0.0627	0.0306	13	100 J
5/12/2008 14:00	11.5	1015	176	9.38	7.92	12	0.672	0.01 U	0.52	0.0412 J	0.017	5.3	25
6/10/2008 17:00	11.1	686	225		8.31	11	0.965	0.01 U	0.866	0.028	0.014	3.5	40
	No DO (lost lid)												
7/15/2008 15:00	16.2 J	419	268	9.34	8.4	5	1.07	0.01 U	1.03	0.012	0.0051	1.5	33
8/12/2008 14:08	14.3 J	382	278	9.04	8.05	5	1.26	0.01 U	1.17	0.014	0.0094	1.4	44
9/16/2008 13:45	12.6 J	396	282	9.4	8.3	4	1.25	0.01 U	1.19	0.013	0.0067	1.3	10

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
10/2/2007 12:00	10.6	12	414	10.7	8.35	2	1.01	0.01 U	0.78	0.0175	0.01	1.6	45
11/13/2007 11:30	4.4	17	391	12.6	8.55	2	0.8	0.01 U	0.611	0.013	0.0096	1	8
12/11/2007 12:50	0	76	274	13.03	8.07	4	2.19	0.016	1.76	0.084	0.039	23	140
1/14/2008 11:48	0.5	440	179	12.92	7.85	10	4.98	0.026	4.66	0.137	0.0823	24	47
2/19/2008 12:10	0.4	436	188	12.82	7.76	22	5.82	0.045	5.55	0.116	0.1	38	17
3/10/2008 11:35	3.8	1440	212	11.81	7.67	52	10.2	0.037	9.35	0.192	0.106	50	25
4/14/2008 12:30	11.4	1020	154	9.54	7.85	22	3.47	0.01 U	3.25	0.0988	0.0441	23	48
5/12/2008 11:55	11.6	281	148	10.91	8.35	4	0.943	0.01 U	0.696	0.032	0.015	5.9	9
6/10/2008 14:20	14	115	253	10.35	8.01	4	1.01	0.01 U	0.787	0.039	0.016	2.6	21
D.O. sample was taken from left bank approx. 10 yards downstream of bridge.													
7/15/2008 12:45	18.7 J	17	368	11.45	8.59	6	0.849	0.012	0.607	0.041	0.017	0.8	41
Homeless camp ~15 yards downstream of bridge.													
8/12/2008 11:45	16 J	15	402	10.65	8.17	1	1.11	0.01 U	0.807	0.031	0.016	1.4	41
9/16/2008 11:40	13 J	12	400	11.5	8.45	9	1.07	0.01 U	0.85	0.038	0.0084	1.6	26

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
4/14/2008 12:05	6.8		88	12.2	7.79	2	0.265	0.02	0.189	0.0098	0.0041	1.5	280 J
	Entered manually.												
5/12/2008 11:35	7.8		60	13.87	7.64	4	0.18	0.01 U	0.105	0.0072	0.003 U	2.6	3 U
6/10/2008 13:25	11.9		51	12.46	7.81	4	0.12	0.01 U	0.064	0.0083	0.003 U	2.8	4
	High water level and velocity made it difficult to sample, and thermistor would not fully submerge. Lost the lid to the D.O. sampler along with BOD bottle #5. D.O. sample was taken from the left bank approx. 50 yards upstream from bridge.												
7/15/2008 12:15	17.9 J		128	9.24	8.12	1	0.477	0.01 U	0.422	0.005 U	0.003 U	0.6	39
	The swift current made it difficult to submerge the LLT. The temperature reading was taken as the thermistor skipped along the surface.												
8/12/2008 10:41	15.5 J		184	10.35	8.14	1	0.79	0.01 U	0.699	0.0091	0.0032	0.5 U	15
9/16/2008 11:15	14.4 J		174	8.5	8.06	1 U	0.698	0.01 U	0.625	0.0063	0.0036	0.5 U	7

Conventional Data Report

Spokane R blw Monroe St.

57A125

Class: A
Rivermile: 73.1
Latitude: 47 39 37.6
Longitude: 117 25 35.8
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
10/2/2007 11:35	11.7	1640	182	8.88	8.06	5	0.667	0.01 U	0.611	0.004	0.003 U	2.7	15
11/13/2007 10:55	8.4	2140	149	9.85	8.08	1	0.558	0.01 U	0.479	0.005 U	0.0036	1	8
12/11/2007 12:20	5.1	3710	109	11.41	7.84	2	0.354	0.01 U	0.303	0.0058	0.0057	1	6
1/14/2008 11:20	5.4	3210	119	11.51	7.89	2	0.432	0.01 U	0.356	0.0063	0.0056	1	2
2/19/2008 11:45	4.4	3050	118	11.91	7.87	5	0.393	0.01 U	0.325	0.0069	0.005	0.5 U	2
3/10/2008 11:05	4.4	4540	94	12.22	7.74	3	0.296	0.01 U	0.221	0.0067	0.0035	1.1	1

Conventional Data Report

Spokane River @ Plante's Ferry Park

57A140

Class: A
Rivermile: 84.6
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
10/2/2007 10:30	12.5		123	8.98	7.76	2	0.443	0.01 U	0.368	0.0036	0.003 U	1.7	41
11/13/2007 10:20	7.9		116	10.4	8	1	0.437	0.01 U	0.351	0.0069	0.005	0.8	2
12/11/2007 11:20	4.9		86	11.11	7.64	1 U	0.265	0.01 U	0.205	0.008	0.0062	0.6	2
1/14/2008 10:23	4.4		93	11.41	7.78	1	0.318	0.01 U	0.25	0.0088	0.0061	0.6	4
2/19/2008 10:45	2.9		95	12.12	7.64	1	0.292	0.01 U	0.235	0.0051	0.0044	0.6	1
3/10/2008 10:15	3.7		78	12.12	7.59	2	0.22	0.01 U	0.146	0.0057	0.0039	0.7	1 U
4/14/2008 11:05	5.9		72	11.57	7.62	3	0.199	0.01 U	0.114	0.011	0.0042	1.6	11
5/12/2008 10:35	7.1		58	12.04	7.6	4	0.2	0.01 U	0.097	0.0076	0.003 U	2.4	3
6/10/2008 12:20	11.9 Raining		48	10.85	7.87	4	0.096	0.01 U	0.042	0.0085	0.003 U	2.6	1 U
7/15/2008 11:20	17.7 J		102	8.14	7.87	2	0.361	0.01 U	0.302	0.005 U	0.003 U	0.9	3
8/12/2008 9:52	15.7 J		166	8.04	7.92	2 U	0.72	0.01 U	0.647	0.0081	0.0052	0.5 U	28
9/16/2008 9:40	15.1 J		138	8.3	7.95	4	0.541	0.01 U	0.488	0.0059	0.0031	0.6	11

Conventional Data Report

Spokane R @ Barker Rd

57A148

Class: A
Rivermile: 90.4
Latitude: 47 40 40.6
Longitude: 117 09 14.7
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
10/2/2007	10:00	13.7	1230	54	9.19	7.59	3	0.22	0.01 U	0.123	0.0045	0.0031	1.7	53
11/13/2007	9:45	7.4	1520	55	10.8	7.78	2	0.19	0.016	0.091	0.01	0.0073	0.9	9
12/11/2007	10:20	4.5	3020	54	11.31	7.5	1	0.13	0.01 U	0.06	0.0069	0.0067	0.8	5
1/14/2008	9:45	3.6	2490	55	11.71	7.58	1	0.18	0.012	0.073	0.0065	0.0064	1	3
2/19/2008	10:05	2	2390	59	12.62	7.54	2	0.15	0.01 U	0.07	0.0055	0.0045	0.7	4
3/10/2008	9:40	3.3	3990	59	12.47	7.52	2	0.17	0.01 U	0.065	0.0069	0.0039	0.8	1 U
4/14/2008	10:30	5.4	5960	59	11.77	7.56	3	0.145	0.012	0.06	0.01	0.004	1.3	5
		checkbar reading for stage was inconsistent. Used historic value												
5/12/2008	9:55	7.7	21100	56	12.04	7.6	3	0.16	0.01 U	0.081	0.0081	0.003 U	2.1	4
6/10/2008	11:20	11.9	26200	42	11.1	7.86	3	0.073	0.01 U	0.01 U	0.009	0.003 U	2.5	1 U
7/15/2008	10:20	20.5 J	2650	44	8.14	7.58	5	0.1	0.01 U	0.026	0.0066	0.003 U	0.9	8
		Construction on this bridge will begin by the end of the month. The bridge will be completely removed, therefore these may be the last samples we collect at this site.												
8/12/2008	9:15		724											
		Not able to access site. Bridge being replaced.												
9/16/2008	9:00		992											
		Unable to access site												

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
10/2/2007 9:10	14.1	1240	53	8.98	7.46	2	0.2	0.019	0.09	0.0043	0.003 U	1.5	13
11/13/2007 9:10	7.9	1520	53	10.45	7.73	2	0.17	0.019	0.052	0.011	0.0066	1	4
12/11/2007 9:35	4.8	3020	54	11.01	7.47	1 U	0.14	0.01 U	0.058	0.0069	0.0069	0.8	7
1/14/2008 9:15	3.8	2490	54	11.71	7.56	1	0.15	0.01 U	0.06	0.0074	0.0056	1.5	9
2/19/2008 9:40	2.3	2370	58	12.62	7.55	2	0.14	0.01 U	0.06	0.005 U	0.0045	0.7	1 U
3/10/2008 9:05	3.2	3970	59	12.42	7.43	2	0.16	0.01 U	0.064	0.0066	0.0043	0.8	1
4/14/2008 9:50	5.2	5990	59	11.97	7.54	2	0.138	0.012	0.062	0.0085	0.0038	1.1	2
5/12/2008 9:15	7.6	21200	56	12.24	7.52	3	0.16	0.01 U	0.083	0.0081	0.003 U	2.4	1 U
6/10/2008 9:30	11.8	26100	41	11.15	7.89	3	0.068	0.01 U	0.01 U	0.0078	0.0057	2.4	1 U
7/15/2008 9:30	20.2 J	2650	44	7.93	7.49	3	0.1	0.01 U	0.026	0.006	0.003 U	1	7
8/12/2008 8:44	21 J	724	48	8.14	7.58	1	0.279	0.026	0.121	0.0097	0.004	0.9	5
9/16/2008 8:30	18.1 J	1000	46	8.35	7.56	3	0.15	0.01 U	0.07	0.0095	0.0042	0.9	6 J

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
10/2/2007	9:10	1240	21.6	0.13	0.076	0.5 U	0.25 U	0.61	0.	5	1.21	0.12	0.002 U	0.28	0.43	33	28.8
11/13/2007	9:10	1520															
12/11/2007	9:35	3020	22.5	0.19	0.15	0.5 U	0.25 U	0.73	0.	57	0.83	0.1	0.002 U	0.33	0.42	51.8	49.1
1/14/2008	9:15	2490															
2/19/2008	9:40	2370	23.2	0.18	0.13	0.5 U	0.25 U	0.74	0.	59	0.97	0.17	0.002 U	0.29	0.46	60.9	50.3
3/10/2008	9:05	3970															
4/14/2008	9:50	5990	23	0.19	0.18	0.5 U	0.25 U	0.7	0.	59	1	0.14	0.002 U	0.39	0.56	64.7	62.3
5/12/2008	9:15	21200															
6/10/2008	9:30	26100	0.27	17.2		0.214	0.5 U	0.28	1.07	0.	77	11.6	1.48	0.002 U	0.38	0.74	52.2	45.7
7/15/2008	9:30	2650															
8/12/2008	8:44	724	18.5	0.15	0.097	0.5 U	0.25 U	0.68	0.	51	1.19	0.099	0.002	0.26	0.44	34	33.4
9/16/2008	8:30	1000															

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
10/2/2007 8:10	14.7	1770 J	49	8.68	7.26	1	0.094	0.01 U	0.01 U	0.0026	0.003 U	1.7	8
11/13/2007 8:20	9.1	1930 J	50	9.75	7.6	2	0.071	0.01 U	0.01 U	0.005 U	0.003 U	1.5	2
12/11/2007 8:35	5.7	3650 J	51	10.3	7.3	1 U	0.1	0.01 U	0.034	0.005 U	0.004	0.5 U	1 U
1/14/2008 8:10	3.9	2960 J	53	11.11	7.34	1	0.11	0.01 U	0.03	0.006	0.003 U	1.5	4
2/19/2008 8:30	2.3	2800 J	58	12.12	7.29	1	0.13	0.01 U	0.035	0.005 U	0.0041	0.7	2
3/10/2008 8:25	2.9	4630 J	56	12.42	7.28	1	0.098	0.01 U	0.034	0.005 U	0.003 U	0.7	1
4/14/2008 8:20	4.4	6670 J	56	12.38	7.45	2	0.118	0.01 U	0.034	0.0055	0.0031	1	1 UJ
5/12/2008 8:20	8.5	21200 J	55	11.63	7.46	2	0.15	0.01 U	0.074	0.0052	0.003 U	1.7	1 U
6/10/2008 8:20	11.5	26200 J	42	10.15	7.56	3	0.07	0.01 U	0.01 U	0.0079	0.0064	2.4	1
7/15/2008 8:15	19.5 J	3220 J	44	8.34	7.7	2	0.079	0.012	0.01 U	0.005 U	0.003 U	1	5
8/12/2008 7:15	20.6 J	1190 J	44	8.14	8.12 J	3	0.098	0.01 U	0.01 U	0.0074	0.004	0.7	4
9/16/2008 7:45	17.8 J	1450 J	46	8.4	7.6	2	0.054	0.01 U	0.01 U	0.0056	0.003 U	1.1	2 J

Conventional Data Report

Colville R @ Newton Rd

59A140

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

Date/Time	Temp	Flow	Conduc-tivity	Oxygen	ph	Suspend. Solids	Total Pers. N.	Ammonia Nitrogen	Nitrate+ Nitrite	Total Phosp.	Soluble Reactive P	Turbid-ity	Fecal Coliforms
	deg. C	CFS	umhos/cm	mg/L	std units	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	#/100/mL
10/9/2007 14:25	12		380	12.92	8.58	4	0.33	0.01 U	0.207	0.02	0.015	2.4	8
11/7/2007 13:20	6.6		384	12.5	8.56	3	0.408	0.01 U	0.297	0.015	0.01	2.3	5
12/4/2007 15:05			300	11.31	8.01	27	1.05	0.041	0.644	0.134	0.106	23	600
1/8/2008 15:20	2		401	13.53	8.13	13	0.566	0.025	0.379	0.036	0.02	7.3	190
2/12/2008 14:15	3.7		408	12.18	8.32	17	0.544	0.018	0.358	0.033	0.02	5.8	31
3/11/2008 16:20	5.1		379	11.75	7.87	17	0.774	0.014	0.409	0.0655	0.028	15	7
4/8/2008 15:05	7.2		327	14.18	8.57	7	0.568	0.01 U	0.218	0.032	0.014	7.3	2
5/6/2008 14:25	11.9		206	11.22	8.38	17	0.241	0.01 U	0.059	0.048 J	0.012	15	31
	SCCD installing staff gage												
6/3/2008 15:27	14.8		310	10.05	8.35	18	0.366	0.014	0.159	0.039	0.015	10	91
	Stevens County Conservation District has installed a new staff guage. The first reading was 3.49.												
7/8/2008 16:00	20.3 J		340	12.76	8.85	8	0.299	0.011	0.051	0.046	0.016	6	140
8/5/2008 14:30	19.9 J		370	12.2	8.43	5	0.22	0.01 U	0.01 U	0.029	0.011	3.1	31
9/9/2008 13:45	14.2 J		357	14.27	8.77	5	0.318	0.01 U	0.162	0.019	0.0095	3.8	88

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
10/9/2007 12:35	11.1	281	211	11.31	8.54	2	0.14	0.01 U	0.049	0.005 U	0.003 U	0.7	5
11/7/2007 11:55	4	421	180	12.7	8.46	1	0.14	0.01 UJ	0.074	0.005 U	0.0032	0.5 U	9
12/4/2007 12:50		367	220	13.83	8.29 J	2	0.318	0.01 U	0.241	0.005 U	0.003 U	0.5	5
pH and conductivity measured 45 minutes later, at next station.													
1/8/2008 13:50	0.2	401	197	12.32	8.41	1	0.308	0.01 U	0.251	0.005 U	0.0039	0.5 U	1 U
2/12/2008 12:40		562											
not sampled due to ice													
3/11/2008 15:05	5.5	432	193	12.76	8.5	4	0.17	0.01 U	0.061	0.005 U	0.003 U	0.9	1 U
4/8/2008 13:40	8.2	543	177	11.93	8.45	4	0.163	0.01 U	0.059	0.0071	0.0034	0.5	1 U
5/6/2008 12:35	9.7	6630	75	11.32	7.87	48	0.167	0.01 U	0.01 U	0.043 J	0.003 U	14	31
6/3/2008 13:45	10.1	14100	45	12.26	7.34	45	0.12	0.01 U	0.01 U	0.042	0.004	9.4	31
7/8/2008 14:25	18.9 J	2490	90	8.94	8.13	5	0.11	0.01 U	0.017	0.0065	0.003 U	1.2	10
8/5/2008 13:00	20.7 J	464	170	8.9	8.41	1	0.13	0.01 U	0.03	0.005 U	0.0032	0.5	11
9/9/2008 12:25	16.8 J	285	188	9.24	8.53	1	0.083	0.01 U	0.013	0.005 U	0.0031	0.5 U	1

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
10/9/2007	11:30	12.5	74300	145	9.59	8.17	2	0.14	0.01 U	0.065	0.005 U	0.003 U	1.2	30
11/7/2007	10:50	8.7	76600	134	10.5	8.28	1	0.14	0.01 U	0.08	0.005 U	0.003 U	0.6	24
12/4/2007	11:50		100000	154	11.71	8.12	2	0.14	0.01 U	0.088	0.005 U	0.003 U	1.3	4
1/8/2008	12:50		96600											
		Big snow berms and no safe location to park. No sample taken.												
2/12/2008	11:55		70600											
		no safe access due to snow. Not sampled												
3/11/2008	14:05		60200	162	12.46	8.19	1	0.16	0.01 U	0.097	0.005 U	0.003 U	0.8	2
		thermistor cable too short for temperature measurement												
4/8/2008	12:30		57100	156	12.34	8.17	2	0.151	0.01 U	0.093	0.005 U	0.003 U	1.2	1
		thermistor too short to record temp.												
5/6/2008	11:35	7.9	93200	147	11.93	8.17	4	0.151	0.01 U	0.069	0.005 U	0.003 U	1.5	1
6/3/2008	11:45	10.6	216000	131	12.16	8.04	9	0.12	0.01 U	0.061	0.011	0.003 U	4.1	11 J
7/8/2008	13:20	15.7 J	180000	130	10.35	8.27	4	0.12	0.01 U	0.039	0.0082	0.003 U	2	4
8/5/2008	11:30	19.4 J	82700	132	9	8.37	2	0.096	0.01 U	0.024	0.0074	0.003 U	1	47
9/9/2008	11:15	16.6 J	78900	134	8.94	8.35	4	0.097	0.01 U	0.036	0.0052	0.003 U	0.9	57

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
10/9/2007	11:30		72.8	0.1 U	0.02	0.5 U	0.3	0.67	0. 54	0.38	0.02 U	0.0026	0.67	0.54	5 U	1.6
12/4/2007	11:50		73.2	0.1 U	0.02 U	0.5 U	0.34	0.62	0. 52	0.24	0.036	0.002 U	0.62	0.44	5 U	2.5
4/8/2008	12:30		74.5	0.1 U	0.024	0.5 U	0.28	0.88	0. 58	0.53	0.04	0.002 U	0.6	0.47	7.2	1.8
6/3/2008	11:45		63	0.1 U	0.02 U	0.5 U	0.36	1.87	1. 08	2.51	0.1	0.0051	0.81	0.68	6.9	2.5
8/5/2008	11:30		64.4	0.1 U	0.022	0.5 U	0.4	0.79	0. 6	0.22	0.02 U	0.002 U	0.52	0.53	5 U	1.1

Conventional Data Report

Pend Oreille R @ Metaline Falls

62A090

Class: A
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
10/9/2007 9:30	12.6	23300	172	9.39	8.49	2	0.74	0.01 U	0.01 U	0.0051	0.003 U	1.2	1
11/7/2007 9:25	8.1	14500	165	10.6	8.59	1	0.069	0.01 U	0.01 U	0.0051	0.003 U	0.6	4
12/4/2007 9:10		25400	172	12.02	8.32	2	0.073	0.01 U	0.01 U	0.005 U	0.003 U	0.7	4
1/8/2008 10:25	1.5	15300	176	12.62	8.37	1	0.085	0.01 U	0.027	0.005 U	0.003 U	0.8	120
2/12/2008 9:45	0.4	14200	179	12.79	8.29	3	0.063	0.01 U	0.024	0.005 U	0.003 U	1.2	1
3/11/2008 11:30	4.4	11300	176	12.36	8.35	2	0.091	0.011 U	0.014	0.005 U	0.003 U	1	1 U
4/8/2008 10:10	5.6	16000	170	12.14	8.4	4	0.09	0.01 U	0.01 U	0.0062	0.003 U	1.6	1 U
5/6/2008 9:45	9.7	31200	157	11.22	8.4	4	0.09	0.01 U	0.01 U	0.017 J	0.003 U	2.3	2
6/3/2008 9:50	12	92300	128	12.46	8.03	13	0.1	0.01 U	0.019	0.015	0.003 U	8.7	11
7/8/2008 11:30	17.1 J	56400	142	10.45	8.33	8	0.099	0.01 U	0.01 U	0.012	0.003 U	3.8	1
8/5/2008 9:45	20.4 J	13900	146	8.5	8.53	3	0.091	0.01 U	0.01 U	0.0086	0.003 U	1.9	1
	Oil-like sheen on surface												
9/9/2008 9:30	17.9 J	17800	154	9.29	8.61	2	0.078	0.01 U	0.01 U	0.0067	0.003 U	1.2	1 U
	Lots of debris/macrophytes on surface.												

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
10/9/2007 7:35	12.6	17000	172	9.49	8.39	2	0.82	0.01 U	0.01 U	0.0056	0.003 U	1.3	1
11/7/2007 7:45	8.8	13800	164	10.19	8.31	1	0.091	0.01 U	0.01 U	0.0053	0.003 U	1	7
12/4/2007 7:25		29400	171	11.71	8.18	3	0.079	0.01 U	0.01 U	0.0057	0.003 U	2.1	4
1/8/2008 8:10	1.7	14600	174	12.12	8.35	4	0.095	0.01 U	0.035	0.0059	0.003	1.2	1 U
2/12/2008 7:55		12500											
No access…snow too deep along walkway													
3/11/2008 8:05	4.1	9050	171	12.36	8.19	2	0.1	0.01 U	0.033	0.005 U	0.003 U	1	1 U
4/8/2008 8:15	5.1	13800	167	12.14	8.35	3	0.125	0.036	0.021	0.005	0.0037	1.9	1 U
5/6/2008 8:10	9.2	30200	157	11.63	8.37	6	0.086	0.01 U	0.01 U	0.016 J	0.003 U	3.4	2
6/3/2008 8:05	11.1	95100	136	10.8	8.13	9	0.1	0.01 U	0.024	0.017	0.003	7.1	1
7/8/2008 8:15	17.2 J	5520	143	9.64	8.44	5	0.093	0.01 U	0.01 U	0.0089	0.003 U	2.9	2
8/5/2008 7:45	20.3 J	14300	178	8.6	8.41	2	0.078	0.01 U	0.01 U	0.005 U	0.003 U	1.1	1
9/9/2008 8:00	18 J	16700	154	8.74	8.53	1	0.074	0.01 U	0.01 U	0.005 U	0.003 U	0.9	1
Lots of garbage in river (buckets, shopping cart, etc).													

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Appendix D. Water Year 2008: Missing data

Table D-1. Missing data for the 12 standard parameters.
"X"=missing, "-" =not scheduled for collection.

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
13A060	2/27/2008	Sampler error: sample lost					x							
16A070	12/11/2007	Inaccessible: road closed	x	x	x	x	x	x	x	x	x	x	x	x
16C090	12/11/2007	Inaccessible: road closed	x	x	x	x	x	x	x	x	x	x	x	x
18B070	5/19/2008	Sampler error: bottle not securely capped												x
19D070	10/22/2007	Sampler error: processing error			x									
23A070	10/30/2007	Sampler error: result not recorded	x											
23A070	8/19/2008	Sampler error: data not recorded				x								
25E100	10/29/2007	Sampler error: not collected			x			-	-	-	-	-	-	-
25E100	11/26/2007	Sampler error: not collected			x			-	-	-	-	-	-	-
25F100	10/29/2007	Sampler error: not collected			x			-	-	-	-	-	-	-
25F100	11/26/2007	Sampler error: not collected			x			-	-	-	-	-	-	-
31A070	10/22/2007	Equip. malfunction			x									
32A070	10/22/2007	Equip. malfunction			x									
33A050	10/22/2007	Equip. malfunction			x									
37A090	1/7/2008	Sampler error: data not recorded				x								
37F080	10/22/2007	Equip. malfunction			x									
37F080	9/8/2008	Sampler error: data not recorded				x								
45A110	1/9/2008	Inaccessible: snow or ice	x	x	x	x	x	x	x	x	x	x	x	x
45L050	3/19/2008	Inaccessible: snow or ice	x	x	x	x	x	x	x	x	x	x	x	x
45J070	10/20/2007	Sampler error: Not selected in time	x	x	x	x	x	x	x	x	x	x	x	x
45L050	7/9/2008	Inaccessible: mosquitoes?	x	x	x	x	x	x	x	x	x	x	x	x
48A070	2/11/2008	Sampler error: DO bottle not changed			x									
48A070	5/5/2008	Inaccessible: bridge construction	x	x	x	x	x	x	x	x	x	x	x	x
48A070	7/7/2008	Inaccessible: bridge construction	x	x	x	x	x	x	x	x	x	x	x	x
48A070	8/4/2008	Inaccessible: bridge construction	x	x	x	x	x	x	x	x	x	x	x	x
48A150	12/5/2007	Sample lost (no record)					x							
48B070	1/7/2008	Inaccessible: snow or ice	x	x	x	x	x	x	x	x	x	x	x	x
48B070	2/11/2008	Inaccessible: snow or ice	x	x	x	x	x	x	x	x	x	x	x	x
49A070	2/11/2008	Inaccessible: snow or ice	x	x	x	x	x	x	x	x	x	x	x	x
53A070	12/5/2007	Equip. malfunction: backup thermistor cable too short	x											
53A070	1/7/2008	Equip. malfunction: backup thermistor cable too short	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
53A070	2/11/2008	Equip. malfunction: backup thermistor cable too short; sampler error: DO bottle not changed	x		x									
53A070	3/3/2008	Equip. malfunction: backup thermistor cable too short	x											
53A070	4/7/2008	Equip. malfunction: backup thermistor cable too short	x											
54A070	12/11/2007	Equip. malfunction: backup thermistor cable too short	x											
54A070	5/12/2008	Sampler error: data not recorded			x									
54A070	6/10/2008	Sampler error: sampler lid lost			x									
54A090	12/11/2007	Equip. malfunction: backup thermistor cable too short	x											
54A090	6/10/2008	Sampler error: sampler lid lost			x									
55B070	6/10/2008	Sampler error: sampler lid lost			x									
57A148	8/12/2008	Inaccessible: Bridge construction	x	x	x	x	x	x	x	x	x	x	x	x
57A148	9/16/2008	Inaccessible: Bridge construction	x	x	x	x	x	x	x	x	x	x	x	x
59A140	12/4/2007	Equip. failure: thermistor failed	x											
60A070	12/4/2007	Equip. failure: thermistor failed	x											
60A070	2/12/2008	Inaccessible: snow or ice	x	x	x	x	x	x	x	x	x	x	x	x
61A070	12/4/2007	Equip. failure: thermistor failed	x											
61A070	1/8/2008	Inaccessible: snow or ice	x	x	x	x	x	x	x	x	x	x	x	x
61A070	2/12/2008	Inaccessible: snow or ice	x	x	x	x	x	x	x	x	x	x	x	x
61A070	3/11/2008	Equip. malfunction: backup thermistor cable too short	x											
61A070	4/8/2008	Equip. malfunction: backup thermistor cable too short	x											
62A090	12/4/2007	Equip. failure: thermistor failed	x											
62A150	12/4/2007	Equip. failure: thermistor failed	x											
62A150	2/12/2008	Inaccessible: snow or ice	x	x	x	x	x	x	x	x	x	x	x	x

DO – dissolved oxygen.

Appendix E. Nitrogen Trends in Puget Sound Rivers

Table E-1. Tabulated trends at long-term ambient monitoring stations in Puget Sound.
*N = number of data points; Z =test statistic; 2*P = 2-tailed probability; test = statistical test used. (sk = seasonal Kendall; mk = Mann-Kendall; c = corrected for auto correlation.)*

Station ID	Years	N	Slope	Z	2*P	test
Flow All Seasons (WY 1995-2007)						
01A050	1994-07	154	-29.9	-0.5758	0.565	skc
01A120	1994-07	152	-55	-0.9507	0.342	skc
03A060	1994-07	154	-300.8	-1.365	0.172	skc
03B050	1994-07	154	-2.7	-1.4232	0.155	skc
04A100	1994-07	155	-29	-0.2942	0.769	skc
05A070	1994-07	150	-47.7	-1.3038	0.192	skc
05A090	1994-07	54	-33.3	-1.2167	0.224	sk
05A110	2001-07	46	7.5	0.3201	0.749	skc
05B070	1994-07	151	-6	-0.4315	0.666	skc
05B110	1994-07	150	-9.9	-1.3009	0.193	skc
07A090	1994-07	153	-92	-0.8269	0.408	skc
07C070	1994-07	148	13.3	0.1986	0.843	skc
07D050	1994-07	133	-25.6	-0.8536	0.393	skc
07D130	1994-07	155	-28.3	-1.1396	0.254	skc
08C070	1994-07	151	-0.3	-0.0634	0.949	skc
08C110	1994-07	150	-1.5	-0.4535	0.650	skc
09A080	1994-07	154	-5.8	-0.6789	0.497	skc
09A190	1994-07	155	-2	-0.4766	0.634	skc
10A070	1994-07	156	-17.5	-0.3982	0.691	skc
11A070	1994-07	152	-16.5	-1.1868	0.235	skc
13A060	1994-07	153	-3	-0.9877	0.323	skc
16A070	1994-07	153	18.1	2.074	**0.038**	skc
16C090	1994-07	141	-0.8	-0.1624	0.871	sk
18B070	1994-07	156	-2.8	-0.1915	0.848	skc
Flow July - September (WY 1995-2007)						
01A050	1994-07	39	-30.5	-0.9474	0.343	skc
01A120	1994-07	36	-36.6	-0.8091	0.418	skc
03A060	1994-07	39	-293.7	-1.4792	0.139	skc
03B050	1994-07	39	-0.4	-0.3497	0.727	skc
04A100	1994-07	39	-8.7	-0.2334	0.815	skc
05A070	1994-07	36	-12.6	-0.726	0.468	skc
05A090	1994-07	12	-4.9	-0.4282	0.668	mkc
05A110	2001-07	12	7.2	0.1961	0.845	sk
05B070	1994-07	39	-6.2	-0.8221	0.411	skc
05B110	1994-07	37	-0.9	-0.2009	0.841	skc
07A090	1994-07	38	-104.7	-1.3328	0.183	skc
07C070	1994-07	38	1	0	1.000	skc
07D050	1994-07	33	-23.6	-1.1743	0.240	skc
07D130	1994-07	39	-19.1	-1.3898	0.165	skc

08C070	1994-07	35	1	0.563	0.573	skc
08C110	1994-07	38	-0.8	-0.3457	0.730	skc
09A080	1994-07	39	0	0.0562	0.955	skc
09A190	1994-07	39	0.6	0.1687	0.866	skc
10A070	1994-07	39	20	0.7687	0.442	skc
11A070	1994-07	35	-11.3	-1.0787	0.281	skc
13A060	1994-07	39	-2	-0.9838	0.325	skc
16A070	1994-07	39	9.7	2.008	**0.045**	skc
16C090	1994-07	35	-1.6	-0.2458	0.806	skc
18B070	1994-07	39	0.6	0.0702	0.944	skc
TN All Seasons (WY 1995-2008)						
01A050	1994-08	164	-0.00429	-1.857	**0.063**	skc
01A120	1994-08	166	-0.00348	-3.4909	**0.000**	sk
03A060	1994-08	166	-0.002	-2.1561	**0.031**	skc
03B050	1994-08	165	-0.00974	-2.3274	**0.020**	skc
04A100	1994-08	165	-0.00076	-1.6861	**0.092**	sk
05A070	1994-08	165	-0.00602	-2.626	**0.009**	skc
05A090	1994-08	166	-0.00255	-1.4557	0.145	skc
05A110	1994-08	167	-0.00184	-1.4601	0.144	skc
05B070	1994-08	165	-0.00234	-2.3351	**0.020**	sk
05B110	1994-08	166	-0.00219	-1.9152	**0.055**	skc
07A090	1994-08	167	-0.00199	-1.64	0.101	skc
07C070	1994-08	163	-0.00022	-0.2883	0.773	skc
07D050	1994-08	166	-0.0035	-1.9788	**0.048**	skc
07D130	1994-08	167	-0.00113	-1.552	0.121	skc
08C070	1994-08	166	-0.0068	-2.85	**0.004**	skc
08C110	1994-08	153	-0.0014	-2.2011	**0.028**	sk
09A080	1994-08	164	-0.00402	-1.2597	0.208	skc
09A190	1994-08	166	-0.00004	-0.1931	0.847	sk
10A070	1994-08	166	-0.00449	-2.0166	**0.044**	skc
11A070	1994-08	168	-0.00501	-2.0195	**0.043**	skc
13A060	1994-08	168	0.00552	0.8772	0.380	skc
16A070	1994-08	165	-0.00133	-1.7902	**0.073**	skc
16C090	1994-08	163	0.0005	1.4991	0.134	sk
18B070	1994-08	168	0.00042	1.6015	0.109	skc
TN July - September (WY 1995-2008)						
01A050	1994-08	41	-0.00254	-1.0942	0.274	skc
01A120	1994-08	42	-0.00124	-0.8148	0.415	skc
03A060	1994-08	42	-0.00016	0.0749	0.940	skc
03B050	1994-08	42	-0.00565	-1.9181	**0.055**	mkc
04A100	1994-08	42	0.001	1.0677	0.286	skc
05A070	1994-08	42	-0.00638	-2.6208	**0.009**	skc
05A090	1994-08	42	-0.00389	-1.6575	**0.097**	skc
05A110	1994-08	42	-0.00086	-1.1006	0.271	skc
05B070	1994-08	42	-0.00234	-1.9221	**0.055**	skc
05B110	1994-08	42	-0.0025	-1.5365	0.124	skc
07A090	1994-08	42	0.00108	0.334	0.738	skc
07C070	1994-08	42	0.0005	0.3271	0.744	skc
07D050	1994-08	42	-0.001	-0.3352	0.737	skc
07D130	1994-08	42	0.00003	0.0955	0.924	skc

08C070	1994-08	42	-0.00461	-2.1826	**0.029**	mkc
08C110	1994-08	41	-0.0008	-1.0529	0.292	sk
09A080	1994-08	42	-0.00514	-1.4084	0.159	mkc
09A190	1994-08	42	0.00067	0.6022	0.547	sk
10A070	1994-08	41	-0.00104	-0.5383	0.590	skc
11A070	1994-08	42	-0.0035	-1.353	0.176	mkc
13A060	1994-08	42	0.01063	1.305	0.192	mkc
16A070	1994-08	42	-0.00202	-1.736	**0.083**	skc
16C090	1994-08	42	-0.00008	-0.3239	0.746	sk
18B070	1994-08	42	-0.00071	-0.7769	0.437	skc
NO23 All Seasons (WY 1995-2008)						
01A050	1994-08	164	-0.00008	-0.0346	0.972	skc
01A120	1994-08	166	-0.00033	-0.515	0.607	sk
03A060	1994-08	167	-0.00012	-0.1907	0.849	skc
03B050	1994-08	165	-0.00422	-1.1247	0.261	skc
04A100	1994-08	166	-0.0002	-0.492	0.623	skc
05A070	1994-08	166	-0.0019	-0.9153	0.360	skc
05A090	1994-08	167	-0.00117	-0.9054	0.365	skc
05A110	1994-08	166	0.00058	0.7885	0.430	skc
05B070	1994-08	166	0.00015	0.1994	0.842	skc
05B110	1994-08	167	-0.00112	-1.0372	0.300	skc
07A090	1994-08	167	0.00025	0.2911	0.771	skc
07C070	1994-08	163	0.00067	0.7196	0.472	skc
07D050	1994-08	166	-0.00076	-0.5765	0.564	skc
07D130	1994-08	167	-0.00062	-0.5164	0.606	skc
08C070	1994-08	167	-0.0048	-2.5026	**0.012**	skc
08C110	1994-08	153	-0.0015	-2.7156	**0.007**	sk
09A080	1994-08	165	-0.00062	-0.2404	0.810	skc
09A190	1994-08	166	0.00071	1.0454	0.296	sk
10A070	1994-08	168	0.00186	1.2757	0.202	skc
11A070	1994-08	168	-0.00085	-0.3502	0.726	skc
13A060	1994-08	168	0.01143	2.0519	**0.040**	skc
16A070	1994-08	164	-0.001	-1.5607	0.119	skc
16C090	1994-08	163	0.00032	1.163	0.245	skc
18B070	1994-08	168	0.00037	2.0469	**0.041**	skc
NO23 July - September (WY 1995-2008)						
01A050	1994-08	41	-0.00093	-0.438	0.661	skc
01A120	1994-08	42	-0.00017	-0.1622	0.871	skc
03A060	1994-08	42	0.00078	1.118	0.264	skc
03B050	1994-08	42	-0.00509	-1.0702	0.285	skc
04A100	1994-08	42	0.00002	-0.024	0.981	skc
05A070	1994-08	42	-0.00328	-1.5762	0.115	skc
05A090	1994-08	42	-0.00399	-2.3171	**0.020**	skc
05A110	1994-08	42	0.00038	-0.1858	0.853	skc
05B070	1994-08	42	-0.0025	-1.9428	**0.052**	skc
05B110	1994-08	42	-0.00301	-2.257	**0.024**	skc
07A090	1994-08	42	0.00133	0.6369	0.524	skc
07C070	1994-08	42	0.00067	0.8116	0.417	skc
07D050	1994-08	42	-0.00057	-0.2083	0.835	skc
07D130	1994-08	42	-0.0005	-0.256	0.798	skc

08C070	1994-08	42	-0.00364	-2.6222	**0.009**	mkc
08C110	1994-08	41	-0.0021	-2.4227	**0.015**	sk
09A080	1994-08	42	-0.003	-0.9378	0.348	mkc
09A190	1994-08	42	-0.00019	-0.074	0.941	skc
10A070	1994-08	42	0.00254	1.2788	0.201	skc
11A070	1994-08	42	-0.00079	-0.4582	0.647	mkc
13A060	1994-08	42	0.01126	1.7777	**0.075**	mkc
16A070	1994-08	42	-0.0011	-1.3151	0.188	skc
16C090	1994-08	42	-0.00019	-0.2216	0.825	skc
18B070	1994-08	42	-0.0000	-1.2727	0.203	skc
Flow-Adjusted TN All Seasons (WY 1995-2007)						
01A050	1994-07	152	-0.00328	-0.9361	0.349	skc
01A120	1994-07	151	-0.00317	-2.4881	**0.013**	sk
03A060	1994-07	153	-0.0013	-1.048	0.295	skc
03B050	1994-07	153	-0.005	-1.2172	0.224	skc
04A100	1994-07	153	-0.00111	-1.6258	0.104	sk
05A070	1994-07	149	-0.00547	-2.4164	**0.016**	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1994-07	150	-0.00285	-1.5585	0.119	skc
05B110	1994-07	149	-0.00115	-0.6424	0.521	skc
07A090	1994-07	153	-0.0018	-0.9403	0.347	skc
07C070	1994-07	146	-0.00045	-0.6473	0.517	skc
07D050	1994-07	133	-0.00326	-1.575	0.115	skc
07D130	1994-07	155	-0.00131	-1.6146	0.106	skc
08C070	1994-07	150	-0.00629	-1.9132	**0.056**	skc
08C110	1994-07	141	-0.00101	-1.2028	0.229	sk
09A080	1994-07	152	-0.00354	-0.938	0.348	skc
09A190	1994-07	154	-0.00061	-0.6991	0.484	sk
10A070	1994-07	154	-0.00387	-1.4604	0.144	skc
11A070	1994-07	152	-0.0038	-1.0834	0.279	skc
13A060	1994-07	153	0.00257	0.37	0.711	skc
16A070	1994-07	152	-0.00161	-1.9276	**0.054**	skc
16C090	1994-07	141	0.00051	1.0138	0.311	sk
18B070	1994-07	156	0.00034	0.908	0.364	skc
Flow-Adjusted TN July - September (WY 1995-2007)						
01A050	1994-07	38	0.00171	0.2254	0.822	skc
01A120	1994-07	36	0	0	1.000	skc
03A060	1994-07	39	0.00192	1.0993	0.272	skc
03B050	1994-07	39	-0.00463	-1.4413	0.149	skc
04A100	1994-07	39	0.0007	0.4903	0.624	skc
05A070	1994-07	36	-0.00676	-1.786	**0.074**	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1994-07	39	-0.00096	-0.4281	0.669	skc
05B110	1994-07	37	-0.00194	-1.0864	0.277	skc
07A090	1994-07	38	0.00282	1.332	0.183	skc
07C070	1994-07	38	0.00094	0.395	0.693	skc
07D050	1994-07	33	0.00184	0.9582	0.338	skc
07D130	1994-07	39	0.00095	0.8907	0.373	skc

08C070	1994-07	35	-0.00597	-1.9688	**0.049**	mkc
08C110	1994-07	38	-0.00045	-0.3286	0.742	sk
09A080	1994-07	39	-0.00724	-1.7095	**0.087**	mkc
09A190	1994-07	39	0.00069	0.5284	0.597	sk
10A070	1994-07	38	-0.00216	-0.6995	0.484	skc
11A070	1994-07	35	0.00077	0.1605	0.873	skc
13A060	1994-07	39	0.00534	0.6521	0.514	mkc
16A070	1994-07	39	-0.00263	-1.7796	**0.075**	skc
16C090	1994-07	35	-0.00026	-0.9313	0.352	skc
18B070	1994-07	39	-0.00023	-0.8793	0.379	skc
Flow-Adjusted NO23 All Seasons (WY 1995-2007)						
01A050	1994-07	152	0.00105	0.35	0.726	skc
01A120	1994-07	151	-0.00021	-0.2944	0.768	skc
03A060	1994-07	154	0.00038	0.3921	0.695	skc
03B050	1994-07	153	0.00045	0.1142	0.909	skc
04A100	1994-07	154	-0.00011	-0.169	0.866	skc
05A070	1994-07	150	-0.00176	-0.6033	0.546	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1994-07	151	-0.00056	-0.3067	0.759	skc
05B110	1994-07	150	-0.00028	-0.1213	0.903	skc
07A090	1994-07	153	0.00061	0.3081	0.758	skc
07C070	1994-07	146	-0.0003	-0.4021	0.688	skc
07D050	1994-07	133	-0.00087	-0.3072	0.759	skc
07D130	1994-07	155	-0.0007	-0.6592	0.510	skc
08C070	1994-07	151	-0.00361	-1.6837	**0.092**	skc
08C110	1994-07	141	-0.00132	-2.0849	**0.037**	sk
09A080	1994-07	153	-0.00075	-0.1141	0.909	skc
09A190	1994-07	154	0.00085	0.902	0.367	skc
10A070	1994-07	156	0.00235	1.0857	0.278	skc
11A070	1994-07	152	0.00151	0.3735	0.709	skc
13A060	1994-07	153	0.00942	1.286	0.198	skc
16A070	1994-07	151	-0.00138	-1.5591	0.119	skc
16C090	1994-07	141	0.00014	0.4506	0.652	skc
18B070	1994-07	156	0.00031	2.1396	**0.032**	skc
Flow-Adjusted NO23 July - September (WY 1995-2007)						
01A050	1994-07	38	0.00214	0.5547	0.579	skc
01A120	1994-07	36	0.0004	0.3923	0.695	skc
03A060	1994-07	39	0.00186	1.8066	**0.071**	skc
03B050	1994-07	39	-0.00266	-0.4976	0.619	skc
04A100	1994-07	39	-0.00034	-0.3121	0.755	skc
05A070	1994-07	36	-0.00457	-0.8521	0.394	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1994-07	39	-0.00142	-0.9692	0.332	skc
05B110	1994-07	37	-0.00323	-1.7886	**0.074**	skc
07A090	1994-07	38	0.0029	1.0938	0.274	skc
07C070	1994-07	38	-0.00003	-0.076	0.939	skc
07D050	1994-07	33	0.00236	0.5484	0.583	skc
07D130	1994-07	39	0.00097	0.3495	0.727	skc

08C070	1994-07	35	-0.00354	-1.7546	**0.079**	skc
08C110	1994-07	38	-0.00158	-1.6432	0.100	sk
09A080	1994-07	39	-0.00303	-0.9145	0.360	mkc
09A190	1994-07	39	0.00028	0.4991	0.618	skc
10A070	1994-07	39	0.00224	0.6663	0.505	skc
11A070	1994-07	35	0.00183	0.3574	0.721	skc
13A060	1994-07	39	0.00872	0.8209	0.412	skc
16A070	1994-07	39	-0.00196	-1.8749	**0.061**	skc
16C090	1994-07	35	-0.00016	-0.8418	0.400	skc
18B070	1994-07	39	-0.00001	-0.1172	0.907	skc
TN Yield All Seasons (WY 1995-2007)						
01A050	1993-07	152	-0.778	-2.2243	**0.026**	sk
01A120	1994-07	151	-0.807	-3.0041	**0.003**	sk
03A060	1993-07	153	-0.43	-1.8894	**0.059**	skc
03B050	1994-07	153	-0.78	-2.8762	**0.004**	sk
04A100	1993-07	153	-0.125	-1.3368	0.181	sk
05A070	1993-07	149	-1.238	-2.473	**0.013**	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1994-07	150	-0.426	-1.5994	0.110	skc
05B110	1994-07	149	-0.528	-1.9325	**0.053**	skc
07A090	1993-07	153	-0.523	-1.439	0.150	skc
07C070	1994-07	146	0.032	0.0621	0.950	skc
07D050	1994-07	133	-0.732	-1.4212	0.155	skc
07D130	1994-07	155	-0.643	-1.7076	**0.088**	skc
08C070	1993-07	150	-0.387	-1.674	**0.094**	skc
08C110	1993-07	141	-0.341	-1.3962	0.163	skc
09A080	1993-07	152	-0.160	-0.7091	0.478	skc
09A190	1993-07	154	-0.073	-0.8777	0.380	skc
10A070	1993-07	154	-0.315	-1.3948	0.163	skc
11A070	1993-07	152	-0.441	-2.1106	**0.035**	skc
13A060	1994-07	153	-0.241	-0.5988	0.549	skc
16A070	1993-07	152	0.045	0.5644	0.572	skc
16C090	1993-07	141	0.02	0.4259	0.670	sk
18B070	1993-07	156	0.012	0.2042	0.838	skc
TN Yield July-Sep (WY 1995-2007)						
01A050	1993-07	38	-0.176	-0.8507	0.395	skc
01A120	1994-07	36	-0.076	-0.5939	0.553	sk
03A060	1993-07	39	-0.214	-1.2	0.230	skc
03B050	1994-07	39	-0.102	-0.5906	0.555	skc
04A100	1993-07	39	0.064	0.3047	0.761	skc
05A070	1993-07	36	-0.404	-1.8453	**0.065**	mkc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1994-07	39	-0.174	-1.4442	0.149	sk
05B110	1994-07	37	-0.076	-0.669	0.504	skc
07A090	1993-07	38	-0.183	-1.3404	0.180	skc
07C070	1994-07	38	0.129	0.7436	0.457	skc
07D050	1994-07	33	-0.302	-0.8349	0.404	skc
07D130	1994-07	39	-0.262	-1.4486	0.147	skc

08C070	1993-07	35	-0.126	-0.9542	0.340	skc
08C110	1993-07	38	-0.102	-1.0476	0.295	skc
09A080	1993-07	39	0.009	0.0271	0.978	skc
09A190	1993-07	39	0.073	0.8358	0.403	skc
10A070	1993-07	38	0.039	0.198	0.843	skc
11A070	1993-07	35	-0.157	-1.7734	**0.076**	skc
13A060	1994-07	39	-0.048	-0.1659	0.868	skc
16A070	1993-07	39	0.02	0.4579	0.647	sk
16C090	1993-07	35	-0.029	-0.7421	0.458	sk
18B070	1993-07	39	-0.013	-0.2056	0.837	skc
NO23 Yield All Seasons (WY 1995-2007)						
01A050	1994-07	152	-0.27375	-1.0394	0.299	sk
01A120	1994-07	151	-0.22516	-1.5297	0.126	sk
03A060	1994-07	154	-0.22803	-2.0408	**0.041**	sk
03B050	1994-07	153	-0.57547	-1.7036	**0.088**	skc
04A100	1994-07	154	-0.06686	-0.5754	0.565	skc
05A070	1994-07	150	-0.71537	-3.0102	**0.003**	sk
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1994-07	151	-0.18655	-1.1035	0.270	skc
05B110	1994-07	150	-0.30198	-2.7872	**0.005**	sk
07A090	1994-07	153	-0.21723	-1.2482	0.212	sk
07C070	1994-07	146	0.09515	0.5233	0.601	skc
07D050	1994-07	133	-0.37418	-1.7501	**0.080**	sk
07D130	1994-07	155	-0.42775	-1.4956	0.135	skc
08C070	1994-07	151	-0.21913	-1.135	0.256	skc
08C110	1994-07	141	-0.25444	-1.3217	0.186	skc
09A080	1994-07	153	-0.0637	-0.3112	0.756	skc
09A190	1994-07	154	0.00364	0.0162	0.987	skc
10A070	1994-07	156	0.010413	0.0943	0.925	skc
11A070	1994-07	152	-0.15872	-1.3349	0.182	skc
13A060	1994-07	153	-0.09402	-0.2365	0.813	skc
16A070	1994-07	151	0.021	0.29	0.772	skc
16C090	1994-07	141	-0.0086	-0.2708	0.787	skc
18B070	1994-07	156	0.00293	0.1955	0.845	skc
NO23 Yield July-Sep (WY 1995-2007)						
01A050	1994-07	38	-0.11994	-0.3705	0.711	skc
01A120	1994-07	36	-0.0401	-0.2771	0.782	sk
03A060	1994-07	39	-0.07647	-0.8179	0.413	skc
03B050	1994-07	39	-0.08561	-0.3782	0.705	skc
04A100	1994-07	39	-0.00278	0	1.000	skc
05A070	1994-07	36	-0.27978	-1.8218	**0.068**	mkc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1994-07	39	-0.12159	-1.5146	0.130	sk
05B110	1994-07	37	-0.10321	-1.2748	0.202	skc
07A090	1994-07	38	-0.13726	-1.1893	0.234	skc
07C070	1994-07	38	0.09363	1.0042	0.315	skc
07D050	1994-07	33	-0.22629	-1.2401	0.215	skc
07D130	1994-07	39	-0.19472	-1.5971	0.110	skc

08C070	1994-07	35	-0.0685	-0.6232	0.533	skc
08C110	1994-07	38	-0.14522	-1.3887	0.165	skc
09A080	1994-07	39	0.050135	0.1252	0.900	skc
09A190	1994-07	39	0.00364	0.0365	0.971	skc
10A070	1994-07	39	0.266893	1.4194	0.156	skc
11A070	1994-07	35	-0.06761	-1.2166	0.224	skc
13A060	1994-07	39	-0.01556	-0.0234	0.981	skc
16A070	1994-07	39	0.01859	0.4355	0.663	mkc
16C090	1994-07	35	-0.0279	-1.6065	0.108	sk
18B070	1994-07	39	-0.00386	-0.1768	0.860	skc
Flow All Seasons (WY 1988-2007)						
01A050	1988-07	225	-10	-0.4668	0.641	skc
01A120	1988-07	200	-21.8	-0.7297	0.466	skc
03A060	1988-07	226	-126.4	-1.178	0.239	skc
03B050	1988-07	199	-1.3	-1.3029	0.193	skc
04A100	1988-07	227	-13.4	-0.3213	0.748	skc
05A070	1988-07	220	-6.4	-0.4874	0.626	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1988-07	199	-5	-0.5974	0.550	skc
05B110	1992-07	162	-6.1	-1.1081	0.268	skc
07A090	1988-07	223	-0.7	-0.0128	0.990	skc
07C070	1988-07	201	43	1.2498	0.211	skc
07D050	1994-07	133	-25.6	-0.8536	0.393	skc
07D130	1988-07	203	-15.2	-0.8775	0.380	skc
08C070	1988-07	223	2	1.0693	0.285	skc
08C110	1988-07	196	-3.7	-1.2727	0.203	skc
09A080	1991-07	190	1	0.2153	0.830	skc
09A190	1988-07	227	0.9	0.5693	0.569	sk
10A070	1988-07	227	-3.5	-0.2111	0.833	skc
11A070	1988-07	223	-22.6	-2.5178	**0.012**	skc
13A060	1988-07	213	-0.6	-0.9044	0.366	sk
16A070	1988-07	225	8.5	2.5828	**0.010**	skc
16C090	1993-07	153	1.7	0.6262	0.531	skc
18B070	1993-07	168	6.7	0.5697	0.569	skc
Flow July - September (WY 1988-2007)						
01A050	1988-07	57	-24.5	-1.4807	0.139	skc
01A120	1988-07	48	-20.4	-1.1296	0.259	skc
03A060	1988-07	57	-209.8	-2.0262	**0.043**	skc
03B050	1988-07	51	-0.4	-0.584	0.559	skc
04A100	1988-07	57	-81.9	-1.7257	**0.084**	skc
05A070	1988-07	54	-4	-0.4708	0.638	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1988-07	51	-4.1	-0.9045	0.366	sk
05B110	1992-07	40	-2.2	-0.5697	0.569	skc
07A090	1988-07	55	-20.9	-0.8013	0.423	skc
07C070	1988-07	53	17.7	0.7373	0.461	skc
07D050	1994-07	33	-23.6	-1.1743	0.240	skc
07D130	1988-07	51	-15.5	-1.6055	0.108	skc

08C070	1988-07	53	2.6	1.5956	0.111	skc
08C110	1988-07	50	-1.7	-1.1306	0.258	skc
09A080	1991-07	48	0.2	0.1643	0.869	skc
09A190	1988-07	57	1.1	1.1432	0.253	skc
10A070	1988-07	57	5.3	0.2351	0.814	skc
11A070	1988-07	53	-10.5	-1.5651	0.118	skc
13A060	1988-07	54	-0.3	-0.6346	0.526	skc
16A070	1988-07	57	6.3	2.9799	**0.003**	skc
16C090	1993-07	38	1	0.2912	0.771	skc
18B070	1993-07	42	5.9	0.6262	0.531	skc
NO23 All Seasons (WY 1988-2008)						
01A050	1988-08	233	0.00017	0.1005	0.920	skc
01A120	1988-08	213	-0.0006	-0.8256	0.409	skc
03A060	1988-08	238	-0.00036	-0.9315	0.352	skc
03B050	1988-08	212	-0.00456	-1.6453	**0.100**	skc
04A100	1988-08	237	-0.00007	-0.0189	0.985	skc
05A070	1988-08	237	-0.00167	-1.7921	**0.073**	skc
05A090	1988-08	214	-0.00047	-0.5756	0.565	skc
05A110	1992-08	177	0.00022	0.3539	0.723	skc
05B070	1988-08	213	-0.0004	-0.7758	0.438	skc
05B110	1992-08	178	-0.00092	-1.0239	0.306	skc
07A090	1988-08	238	0.0005	0.8462	0.397	skc
07C070	1988-08	215	0.00071	1.5169	0.129	skc
07D050	1991-08	189	-0.00029	-0.0676	0.946	skc
07D130	1988-08	215	0.00075	1.3116	0.190	skc
08C070	1988-08	237	-0.00363	-4.7518	**0.000**	sk
08C110	1988-08	199	-0.00033	-0.6196	0.536	skc
09A080	1990-08	210	0.00067	0.4102	0.682	skc
09A190	1988-08	237	0.00067	1.5341	0.125	skc
10A070	1988-08	239	0.00107	1.4965	0.135	skc
11A070	1988-08	239	-0.00234	-1.849	**0.064**	skc
13A060	1988-08	228	0.01033	3.1801	**0.001**	skc
16A070	1988-08	236	-0.0026	-3.5443	**0.000**	skc
16C090	1993-08	175	0.00019	0.9386	0.348	skc
18B070	1993-08	180	0.00029	1.4454	0.148	skc
NO23 July - September (WY 1988-2007)						
01A050	1988-08	57	-0.00008	-0.0574	0.954	skc
01A120	1988-08	53	-0.00075	-1.0718	0.284	skc
03A060	1988-08	59	0	0.0157	0.987	skc
03B050	1988-08	53	-0.00279	-1.0818	0.279	skc
04A100	1988-08	59	0.00014	0.6001	0.548	skc
05A070	1988-08	59	-0.0017	-1.9008	**0.057**	skc
05A090	1988-08	53	-0.00133	-1.2874	0.198	skc
05A110	1992-08	44	-0.00071	-0.9973	0.319	skc
05B070	1988-08	53	-0.00138	-2.2682	**0.023**	skc
05B110	1992-08	44	-0.00249	-2.1042	**0.035**	skc
07A090	1988-08	59	0.0025	2.0702	**0.038**	skc
07C070	1988-08	56	0.00108	1.5764	0.115	skc
07D050	1991-08	47	0.00077	0.5355	0.592	skc
07D130	1988-08	54	0.0015	1.2349	0.217	skc

08C070	1988-08	59	-0.00192	-2.4681	**0.014**	skc
08C110	1988-08	53	-0.00003	0	1.000	skc
09A080	1990-08	53	-0.00013	0	1.000	skc
09A190	1988-08	59	0.00113	2.4221	**0.015**	skc
10A070	1988-08	60	0.00241	2.1374	**0.033**	skc
11A070	1988-08	60	-0.002	-1.7045	**0.088**	skc
13A060	1988-08	57	0.0119	2.7641	**0.006**	mkc
16A070	1988-08	60	-0.0027	-3.2634	**0.001**	skc
16C090	1993-08	45	-0.00015	-0.151	0.880	skc
18B070	1994-08	45	0.0000	-1.0154	0.310	skc
Flow-Adjusted NO23 All Seasons (WY 1988-2007)						
01A050	1987-07	232	0.00088	0.5326	0.594	skc
01A120	1987-07	210	-0.00065	-0.7984	0.425	skc
03A060	1987-07	237	-0.00019	-0.2742	0.784	skc
03B050	1987-07	209	-0.00549	-1.3662	0.172	skc
04A100	1987-07	237	0.00016	0.5343	0.593	skc
05A070	1987-07	231	-0.00098	-1.0371	0.300	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1987-07	210	-0.00089	-0.9398	0.347	skc
05B110	1992-07	161	-0.00008	-0.0112	0.991	skc
07A090	1987-07	234	0.00076	0.9393	0.348	skc
07C070	1987-07	210	0	0	1.000	skc
07D050	1994-07	133	-0.00087	-0.3072	0.759	skc
07D130	1987-07	215	0.00088	1.5177	0.129	skc
08C070	1987-07	233	-0.00408	-3.2879	**0.001**	skc
08C110	1987-07	199	0.00044	0.6152	0.538	skc
09A080	1991-07	188	0.00121	0.5007	0.617	skc
09A190	1987-07	237	0.00056	1.4584	0.145	skc
10A070	1987-07	238	0.00055	0.653	0.514	skc
11A070	1987-07	234	0.00058	0.5503	0.582	skc
13A060	1987-07	224	0.01147	3.1076	**0.002**	skc
16A070	1987-07	234	-0.00292	-3.6697	**0.000**	skc
16C090	1993-07	153	0.00001	0.0932	0.926	skc
18B070	1993-07	168	0.00011	0.7334	0.463	skc
Flow-Adjusted NO23 July - September (WY 1995-2008)						
01A050	1987-07	57	0.0018	0.8507	0.395	skc
01A120	1987-07	50	-0.00006	-0.0548	0.956	skc
03A060	1987-07	59	0.00091	1.3322	0.183	skc
03B050	1987-07	53	-0.00521	-1.5778	0.115	mkc
04A100	1987-07	59	0.00025	0.5867	0.557	skc
05A070	1987-07	56	-0.00061	-0.4942	0.621	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1987-07	53	-0.00109	-1.1186	0.263	skc
05B110	1992-07	39	-0.00226	-1.4472	0.148	skc
07A090	1987-07	57	0.00373	2.8686	**0.004**	skc
07C070	1987-07	55	0.00031	0.4853	0.627	skc
07D050	1994-07	33	0.00236	0.5484	0.583	skc
07D130	1987-07	54	0.00205	2.1102	**0.035**	skc

08C070	1987-07	55	-0.00349	-3.0179	**0.003**	mkc
08C110	1987-07	53	0.00094	1.3248	0.185	sk
09A080	1991-07	47	0.00014	0.0177	0.986	mkc
09A190	1987-07	59	0.00122	2.7783	**0.005**	skc
10A070	1987-07	60	0.00184	1.2062	0.228	skc
11A070	1987-07	56	0.00064	0.472	0.637	skc
13A060	1987-07	57	0.01463	2.8272	**0.005**	mkc
16A070	1987-07	60	-0.00292	-3.5191	**0.000**	skc
16C090	1993-07	38	-0.00012	-0.7775	0.437	skc
18B070	1993-07	42	-0.00006	-0.6689	0.504	skc
NO23 Yield All Seasons (WY 1988-2007)						
01A050	1988-07	221	-0.02947	-0.124	0.901	skc
01A120	1988-07	198	-0.15383	-1.6364	0.102	sk
03A060	1988-07	225	-0.16486	-1.8599	**0.063**	skc
03B050	1988-07	197	-0.39819	-1.7726	**0.076**	skc
04A100	1988-07	225	-0.02692	-0.3718	0.710	skc
05A070	1988-07	219	-0.16216	-1.1234	0.261	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1988-07	198	-0.14601	-1.5112	0.131	skc
05B110	1992-07	161	-0.20042	-2.2968	**0.022**	sk
07A090	1988-07	222	0.02052	0.1637	0.870	skc
07C070	1988-07	198	0.17175	1.6123	0.107	skc
07D050	1994-07	133	-0.37418	-1.7501	**0.080**	sk
07D130	1988-07	203	-0.13782	-0.9464	0.344	skc
08C070	1988-07	221	-0.04768	-0.4931	0.622	skc
08C110	1988-07	187	-0.11196	-0.9173	0.359	skc
09A080	1991-07	188	0.154425	0.8938	0.371	skc
09A190	1988-07	225	0.03774	1.5127	0.130	sk
10A070	1988-07	227	0.05565	0.8846	0.376	skc
11A070	1988-07	223	-0.23777	-2.677	**0.007**	skc
13A060	1988-07	213	0.2535	0.9933	0.321	skc
16A070	1988-07	223	-0.08329	-4.4091	**0.000**	sk
16C090	1993-07	153	0.00523	0.1621	0.871	sk
18B070	1993-07	168	0.00952	0.5801	0.562	skc
NO23 Yield July-Sept (WY 1988-2007)						
01A050	1988-07	54	-0.07145	-0.5929	0.553	skc
01A120	1988-07	47	-0.11334	-1.6064	0.108	sk
03A060	1988-07	56	-0.11407	-1.9444	**0.052**	skc
03B050	1988-07	50	-0.10053	-0.7625	0.446	skc
04A100	1988-07	56	-0.05646	-1.0894	0.276	skc
05A070	1988-07	53	-0.07638	-0.8758	0.381	skc
05A090	Insufficient Flow data					
05A110	Insufficient Flow data					
05B070	1988-07	50	-0.08708	-1.8831	**0.060**	sk
05B110	1992-07	39	-0.10454	-1.4391	0.150	skc
07A090	1988-07	54	0.04393	0.7034	0.482	skc
07C070	1988-07	52	0.12021	1.7481	**0.080**	skc
07D050	1994-07	33	-0.22629	-1.2401	0.215	skc
07D130	1988-07	51	-0.08609	-0.9878	0.323	skc

08C070	1988-07	52	0.02603	0.4971	0.619	skc
08C110	1988-07	50	0.00382	0.0174	0.986	skc
09A080	1991-07	47	0.08573	0.5883	0.556	skc
09A190	1988-07	56	0.04808	2.4795	**0.013**	skc
10A070	1988-07	57	0.13836	1.901	**0.057**	skc
11A070	1988-07	53	-0.09304	-2.3493	**0.019**	skc
13A060	1988-07	54	0.22403	1.2509	0.211	skc
16A070	1988-07	57	-0.04394	-1.5354	0.125	skc
16C090	1993-07	38	-0.0086	-0.7308	0.465	sk
18B070	1993-07	42	0.00288	0.4434	0.658	skc

Table E-2. Tabulated monthly yields at long-term ambient monitoring stations in Puget Sound.

Station	Number of Months	Minimum	Percentiles					Maximum	Monthly Average
			10	25	50 (median)	75	90		
Monthly TN Yield WY 1995-2007 All Months (kg/month)									
01A050	152	6.0	10.5	19.8	49.4	100.3	175.4	392.2	75.3
01A120	151	1.7	5.0	11.9	29.1	55.1	104.5	367.9	46.8
03A060	153	2.2	5.0	9.6	17.3	29.3	55.5	168.9	24.7
03B050	153	3.6	7.2	12.9	44.8	112.0	217.0	1188.9	88.7
04A100	153	3.0	4.6	6.7	11.0	17.1	26.2	74.6	14.4
05A070	149	1.4	5.8	15.4	39.9	90.4	165.8	1085.3	76.3
05B070	150	1.1	3.5	9.3	34.0	72.3	132.0	913.8	62.9
05B110	149	1.0	2.5	6.3	20.2	53.6	105.3	2507.0	65.8
07A090	153	3.9	8.1	15.0	36.8	80.0	127.9	359.2	56.9
07C070	146	2.5	5.6	11.6	26.7	48.8	86.2	293.0	39.0
07D050	133	1.9	6.8	15.1	38.5	89.6	156.3	703.2	66.9
07D130	155	5.9	8.4	15.9	35.0	58.1	106.4	356.3	47.1
08C070	150	3.5	7.0	11.0	20.9	49.5	88.6	248.8	37.4
08C110	141	9.8	12.7	15.9	21.4	36.2	63.6	146.1	30.0
09A080	152	5.8	8.0	12.4	26.5	58.3	113.2	271.7	47.5
09A190	154	0.9	2.4	4.1	9.0	23.5	55.3	280.1	22.6
10A070	154	2.7	7.8	11.0	19.8	43.7	76.0	346.1	34.9
11A070	152	3.6	6.3	8.1	16.4	40.7	66.4	547.5	33.7
13A060	153	8.3	12.6	17.3	29.6	76.1	126.6	280.9	50.5
16A070	152	0.7	1.7	2.4	5.5	15.9	31.0	255.4	14.7
16C090	141	0.5	1.1	2.0	5.0	10.3	17.4	98.8	9.7
18B070	156	0.3	0.9	1.4	3.2	8.7	14.3	634.8	10.8
Monthly TN Yield WY 1995-2007 July-September (kg/month)									
01A050	38	6.0	8.7	10.1	11.8	18.1	32.6	41.1	16.0
01A120	36	1.7	2.9	4.1	5.8	9.0	20.9	151.5	12.1
03A060	39	2.2	3.8	4.5	6.6	9.8	16.1	24.2	7.8
03B050	39	4.1	4.6	6.8	8.4	12.2	15.3	26.2	9.9
04A100	39	3.0	3.6	4.1	5.9	7.9	14.5	26.5	7.2
05A070	36	1.4	2.8	3.8	6.8	12.8	30.0	58.8	11.4
05B070	39	1.1	1.8	2.5	4.2	8.1	36.6	57.7	9.6
05B110	37	1.0	1.6	2.4	3.5	5.6	14.5	27.8	5.3
07A090	38	3.9	5.8	7.3	8.9	13.4	24.8	36.6	11.8
07C070	38	2.5	3.2	4.9	6.7	10.7	17.8	28.2	8.9
07D050	33	1.9	3.8	6.3	10.3	14.0	30.9	38.5	12.6
07D130	39	5.9	6.9	8.0	10.3	14.0	22.4	37.4	12.6
08C070	35	3.5	4.6	5.3	7.4	8.7	16.7	22.6	8.3
08C110	38	9.8	11.4	12.6	13.9	16.7	20.2	30.2	15.2
09A080	39	5.8	6.3	7.5	9.4	12.7	18.4	25.3	10.6
09A190	39	1.5	1.7	2.2	3.0	4.4	6.6	25.5	4.1
10A070	38	4.7	5.9	7.1	8.6	10.9	17.3	19.8	9.5
11A070	35	3.9	4.7	5.7	7.0	7.8	10.0	10.6	7.0
13A060	39	8.3	9.7	12.3	15.2	19.1	22.1	25.6	15.6
16A070	39	0.7	1.0	1.6	1.9	2.8	4.5	16.0	2.7
16C090	35	0.5	0.6	1.0	1.5	3.1	6.9	9.9	2.5

18B070	39	0.5	0.6	0.9	1.4	2.0	8.7	36.6	3.3
Monthly NO23 Yield WY 1995-2007 All Months (kg/month)									
01A050	152	2.2	8.4	15.0	39.1	83.9	138.9	284.8	59
01A120	151	0.7	3.9	7.5	23.4	47.8	78.9	196.5	35.6
03A060	154	0.8	2.6	5.7	13.2	23.5	35.4	88.1	16.9
03B050	153	3.0	6.3	11.1	34.3	92.8	202.4	981.3	73.5
04A100	154	1.2	3.5	5.0	8.6	11.6	18.1	34.0	9.6
05A070	150	0.3	2.9	9.7	34.7	75.5	126.1	686.9	57.2
05B070	151	0.2	1.3	6.2	26.5	58.1	102.9	602.5	48.8
05B110	150	0.7	1.7	4.1	17.0	43.7	88.1	914.4	48.9
07A090	153	2.2	5.5	10.7	29.6	63.4	101.2	279.0	43.9
07C070	146	1.5	3.3	6.2	21.4	39.0	66.4	228.1	30.1
07D050	133	1.7	5.4	10.9	29.1	75.2	118.7	350.9	50.7
07D130	155	4.8	6.7	12.6	27.2	50.4	87.1	212.0	38.7
08C070	151	2.5	5.0	8.2	16.0	42.7	82.3	209.8	32.2
08C110	141	9.7	11.7	13.7	18.6	30.0	51.2	105.3	25.6
09A080	153	3.6	5.3	8.9	20.2	49.0	86.5	221.2	36.6
09A190	154	0.7	1.3	2.1	5.4	17.6	48.1	161.0	17.1
10A070	156	1.4	5.1	6.5	12.9	34.7	59.1	232.5	24.6
11A070	152	0.9	3.9	5.5	11.0	29.3	45.9	159.3	21.1
13A060	153	7.0	11.3	15.4	25.2	65.8	99.0	165.8	42.1
16A070	151	0.4	0.9	1.4	4.3	11.4	21.3	126.3	9.6
16C090	141	0.4	0.6	1.2	3.2	6.3	13.6	66.1	6.1
18B070	156	0.2	0.4	0.8	1.6	4.0	9.3	159.7	4.3
Monthly NO23 Yield WY 1995-2007 July-September (kg/month)									
01A050	38	5.2	7.3	7.9	9.7	14.8	30.2	32.4	13.0
01A120	36	0.7	1.7	2.8	4.4	6.0	13.6	121.7	8.8
03A060	39	0.8	1.9	2.5	3.3	5.4	8.1	15.5	4.5
03B050	39	3.5	4.1	6.0	7.2	11.2	14.2	19.8	8.6
04A100	39	1.2	2.9	3.3	4.4	5.8	9.0	12.2	5.1
05A070	36	0.3	1.3	2.2	4.1	8.1	27.4	35.5	7.5
05B070	39	0.2	0.4	0.7	1.9	5.2	32.2	50.3	6.5
05B110	37	0.7	1.1	1.6	2.7	3.5	10.9	23.8	3.9
07A090	38	2.2	4.2	5.1	6.3	8.8	17.7	29.6	8.3
07C070	38	1.5	1.9	2.8	4.2	5.8	12.7	24.2	5.5
07D050	33	1.7	2.7	4.9	7.0	9.9	22.3	30.3	9.2
07D130	39	4.8	5.7	6.3	7.8	10.1	20.1	33.0	10.1
08C070	35	2.5	3.2	4.4	5.4	7.3	12.0	18.8	6.4
08C110	38	9.7	10.7	11.6	12.7	14.6	17.5	21.8	13.5
09A080	39	3.6	4.1	5.2	6.5	9.0	12.8	18.6	7.6
09A190	39	0.8	0.9	1.3	1.7	2.5	3.3	17.6	2.3
10A070	39	2.5	3.2	4.4	6.1	7.3	9.1	14.9	6.3
11A070	35	2.7	3.2	3.5	4.3	5.5	6.8	8.0	4.6
13A060	39	7.0	8.2	11.2	13.6	16.7	19.5	23.5	14.0
16A070	39	0.4	0.6	0.8	1.1	1.7	3.4	12.1	1.7
16C090	35	0.4	0.5	0.6	0.8	1.2	3.2	4.9	1.2
18B070	39	0.2	0.3	0.4	0.6	1.0	1.4	2.6	0.8
Monthly NO23 Yield WY 1988-2007 All Months (kg/month)									
01A050	221	2.2	9.1	14.9	37.8	81.2	130.9	284.9	57.0
01A120	198	0.7	4.3	7.9	23.3	45.0	74.3	196.5	34.0

03A060	225	0.8	2.8	6.2	13.3	23.5	37.0	88.1	17.3
03B050	197	3.0	6.5	11.9	33.6	91.6	218.0	981.3	75.6
04A100	225	1.2	3.7	5.4	8.0	11.3	16.3	34.0	9.4
05A070	219	0.3	3.0	10.4	34.2	74.2	122.9	686.9	54.4
05B070	198	0.2	1.6	6.3	26.6	59.2	103.6	602.5	48.3
05B110	161	0.7	1.8	4.5	16.9	39.8	87.3	914.5	46.7
07A090	222	0.4	5.5	10.1	29.0	63.0	99.4	279.0	43.2
07C070	198	0.8	2.9	5.7	18.8	34.5	64.3	228.1	27.7
07D050	133	1.7	5.4	10.9	29.1	75.2	118.7	350.8	50.7
07D130	203	3.9	6.7	12.4	27.2	50.3	84.1	212.0	38.1
08C070	221	2.5	4.9	8.3	17.2	41.5	68.9	250.2	31.2
08C110	187	9.7	11.7	13.6	19.3	33.5	52.6	105.4	26.3
09A080	188	2.8	5.3	9.0	20.5	44.7	82.5	221.2	34.4
09A190	225	0.5	1.1	2.0	6.8	17.3	42.8	180.4	17.0
10A070	227	1.4	4.4	6.4	13.0	33.9	59.3	232.5	25.4
11A070	223	0.9	4.1	5.9	12.7	32.3	52.1	159.3	22.4
13A060	213	0.3	10.4	14.4	24.6	58.8	99.0	351.1	41.6
16A070	223	0.4	1.0	1.7	4.9	15.8	26.0	247.5	12.1
16C090	153	0.4	0.6	1.2	3.2	6.3	13.5	66.1	5.9
18B070	168	0.2	0.4	0.8	1.5	3.9	9.1	159.7	4.1
Monthly NO23 Yield WY 1988-2007 July-September (kg/month)									
01A050	54	5.0	7.3	8.2	10.0	13.8	26.2	43.2	12.9
01A120	47	0.7	2.3	3.4	5.4	6.9	13.2	121.7	8.5
03A060	56	0.8	2.0	2.6	3.7	6.2	10.6	15.5	4.9
03B050	50	3.4	4.3	6.0	8.1	11.6	15.6	26.3	9.1
04A100	56	1.2	2.8	3.5	4.6	6.0	9.0	12.2	5.2
05A070	53	0.3	1.5	2.2	3.7	6.8	29.8	45.6	7.8
05B070	50	0.2	0.4	1.0	2.2	3.8	30.6	63.4	6.8
05B110	39	0.7	1.1	1.6	2.7	3.7	10.8	23.9	3.9
07A090	54	0.4	3.4	4.7	6.0	8.2	12.3	29.6	7.4
07C070	52	0.8	1.5	2.3	3.7	5.4	8.4	24.2	4.9
07D050	33	1.7	2.7	4.9	7.0	9.9	22.3	30.4	9.2
07D130	51	4.4	5.4	6.3	7.8	10.1	16.7	33.0	9.7
08C070	52	2.5	3.1	4.4	5.2	6.5	11.4	18.8	6.1
08C110	50	9.7	10.4	11.5	12.6	14.0	16.2	21.8	13.1
09A080	47	2.8	3.7	5.1	6.4	9.3	13.1	24.7	7.6
09A190	56	0.5	0.8	1.0	1.4	2.2	2.9	17.6	1.9
10A070	57	2.5	3.1	4.2	5.6	7.1	9.2	14.9	6.0
11A070	53	2.7	3.3	3.9	4.8	6.2	7.1	11.3	5.1
13A060	54	0.3	7.2	9.5	12.8	16.0	19.2	23.5	13.0
16A070	57	0.4	0.7	0.9	1.4	2.0	2.7	12.1	1.7
16C090	38	0.4	0.5	0.6	0.7	1.1	2.9	4.9	1.1
18B070	42	0.2	0.3	0.4	0.6	1.0	1.4	2.6	0.7

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Appendix F. Glossary, Acronyms, and Abbreviations

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.

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.

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.

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

Following are acronyms and abbreviations used frequently in this report.

DQO	Data quality objective
Ecology	Washington State Department of Ecology
EIM	Environmental Information Management database
EPA	U.S. Environmental Protection Agency
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	Total Maximum Daily Load (water cleanup plan)
TN	Total nitrogen
TP	Total phosphorus
USGS	U.S. Geological Survey
WAC	Washington Administrative Code
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