



## Data Summary: Stillaguamish River Watershed Fecal Coliform, Dissolved Oxygen, pH, Mercury, and Arsenic Total Maximum Daily Load Study

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### Abstract

This report provides a summary of the field measurements and laboratory data collected by the Washington State Department of Ecology between August 2000 and November 2001 for the *Stillaguamish River Watershed Fecal Coliform, Dissolved Oxygen, pH, Mercury, and Arsenic Total Maximum Daily Load Study*. The data included in this report were used to recommend total maximum daily load (TMDL) pollutant limitations for the Stillaguamish River basin (Joy, 2004).

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## Table of Contents

Abstract.....	1
Acronyms.....	4
Introduction.....	5
Study Design.....	8
Methods.....	14
Data Quality.....	16
Results.....	19
References.....	20
Appendix A. Class AA and Class A Designation and Water Quality Standards.....	21
Appendix B. Data Qualifiers used by Manchester Environmental Laboratory.....	25
Appendix C. Field and Laboratory Data for the Stillaguamish River Watershed Fecal Coliform, Dissolved Oxygen, pH, Mercury, and Arsenic TMDL.....	27
Appendix D. Diel Survey Data for the Stillaguamish River Watershed Fecal Coliform, Dissolved Oxygen, pH, Mercury, and Arsenic TMDL.....	67

## List of Figures

Figure 1. A map of the Stillaguamish River basin including Port Susan.....	6
Figure 2. Stillaguamish River TMDL monitoring sites in the lower river basin including the Old Channel and mainstem of the Stillaguamish River.....	11
Figure 3. Stillaguamish River TMDL monitoring sites along the mainstem of the Stillaguamish River.....	12
Figure 4. Stillaguamish River TMDL monitoring sites along the North and South forks of the Stillaguamish River.....	13
Figure 5. A comparison of dissolved oxygen field meter readings and associated Winkler titration results.....	16

## List of Tables

Table 1. Waterbodies and parameters on the 1998 Section 303(d) list included in the Stillaguamish River TMDL field studies.....	7
Table 2: Surveys conducted by Ecology between August 2000 and November 2001 for the Stillaguamish River TMDL study.....	9
Table 4. Streamflow gages used to estimate flows at selected sites included in the Stillaguamish River TMDL study.....	14
Table 5. Methods and data quality objectives used in the Stillaguamish River TMDL study...	15
Table 6. A summary of the field sampling and laboratory precision data for the Stillaguamish River TMDL.....	17

## Acronyms

BOD	biochemical oxygen demand
°C	degrees centigrade
cfs	cubic feet per second
cfu	colony forming units
DO	dissolved oxygen
DOC	dissolved organic carbon
FC	fecal coliform
LCS	laboratory control sample
MEL	Manchester Environmental Laboratory
MF	membrane filter technique
mg/L	milligrams per liter
mL	milliliter
MPN	most probable number
NH <sub>3</sub>	ammonia nitrogen
N-N	nitrite-nitrate nitrogen
OP	orthophosphate phosphorus
ppt	parts per thousand
QA	quality assurance
RSD	relative standard deviation
TMDL	Total Maximum Daily Load
TNVSS	total non-volatile suspended solids
TOC	total organic carbon
TP	total phosphorus
TPN	total persulfate nitrogen
TSS	total suspended solids
umhos/cm	micromhos per centimeter
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
VOM	volatile organic matter
WAC	Washington State Administrative Code
WBID	Waterbody Identification
WDFW	Washington Department of Fish and Wildlife
WRIA	Water Resource Inventory Area
WWTP	wastewater treatment plant
#/100mL	number of colonies per 100 milliliters
ug/L	micrograms per liter

## Introduction

The Stillaguamish basin of western Washington State drains approximately 684 square miles from the Cascade Range to Port Susan of central Puget Sound (Figure 1). Two major forks, the North and South forks, come together at river mile 17.8 near the city of Arlington. At river mile 2.75, the Stillaguamish River splits into the Old Stillaguamish River Channel and Hatt Slough. Over 70 years ago, flow was redirected from the Old Channel to Hatt Slough following a series of floods and the release of several logjams. Hatt Slough is now the primary channel to Port Susan, and the Old Channel seasonally oscillates between functioning as a tidal slough during the dry season and a conduit for river discharge during the wet season.

Granite Falls (population est. 1,737) and Darrington (population est. 1,245) are located in the upper basin. Arlington (population est. 7,275) and Stanwood (population est. 3,345) are located in the lower basin, as is Interstate 5. Land use ranges from managed forest land in the upper basin to residential, business, and agricultural properties in the lower basin.

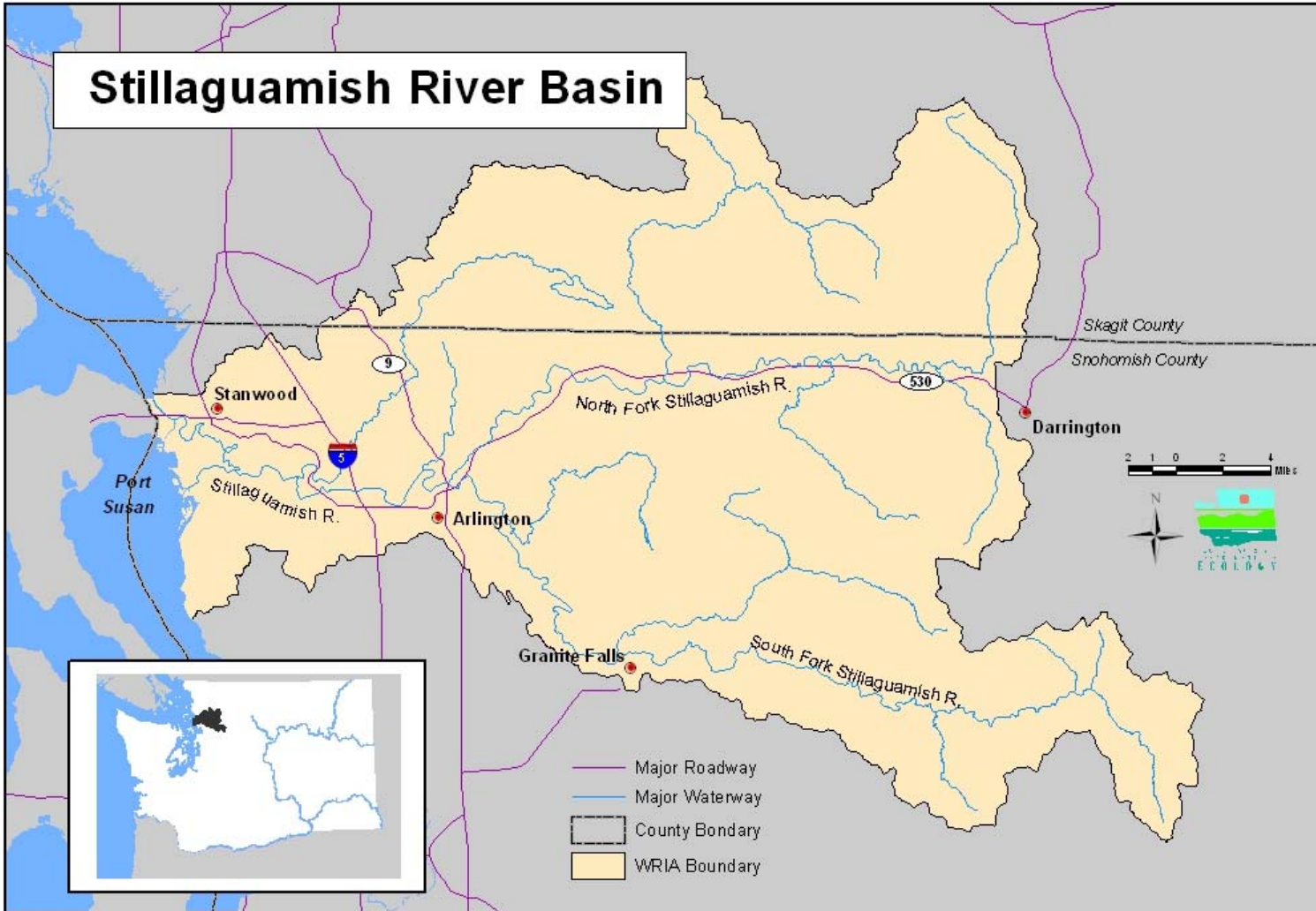


Figure 1. A map of the Stillaguamish River basin including Port Susan.

## Water Quality Issues

Chapter 173-201A of the Washington State Administrative Code (WAC) establishes water quality standards for surface waters in the state. Classifications are assigned based on general characteristics, characteristic uses, and water quality criteria. The mainstem of the Stillaguamish River, Old Stillaguamish Channel, and associated tributaries are designated as Class A waters. The North Fork Stillaguamish River and associated tributaries to Squire Creek at river mile 31.2 are also designated as Class A waters. Above Squire Creek, the North Fork and associated tributaries are designated as Class AA. The South Fork Stillaguamish River and associated tributaries to Canyon Creek at river mile 33.7 are designated as Class A waters. Above Canyon Creek, the South Fork and associated tributaries are designated as Class AA waters. Port Susan is designated as a Class A marine waterbody.

In 1996 and 1998 the Washington State Department of Ecology (Ecology) listed several rivers and streams in the Stillaguamish River basin under Section 303(d) of the federal Clean Water Act as not meeting water quality standards for fecal coliform bacteria, dissolved oxygen, pH, arsenic, ammonia, lead, copper, and nickel (Table 1). Water quality criteria associated with Class AA and A waters are outlined in Appendix A.

Table 1. Waterbodies and parameters on the 1998 Section 303(d) list included in the Stillaguamish River TMDL field studies.

Old WBID	New WBID	Name	Parameters
	HD76OJ	Harvey Ck.	Fecal Coliform
	JU33JU	Jim Ck.	Fecal Coliform
WA-05-1012	GH05SX	Jorgenson Slough (Church Ck.)	Fecal Coliform
	IJ55EP	Martha Lake Ck.	Fecal Coliform
	QE93BW	Old Stillaguamish R.	Fecal Coliform, Ammonia, Lead, Copper, Nickel
WA-05-1018	VJ74AO	Pilchuck Ck.	Dissolved Oxygen
WA-PS-0020	390KRD	Port Susan	Fecal Coliform
WA-05-1015	OT80TY	Portage Ck.	Fecal Coliform, Dissolved Oxygen, Turbidity
WA-05-1015	YF03BC	Portage Ck.	Fecal Coliform, Dissolved Oxygen
WA-05-1015	QJ28UC	Portage Ck.	Fecal Coliform, Dissolved Oxygen
WA-05-1010	QE93BW	Stillaguamish R.	Fecal Coliform, Dissolved Oxygen, Arsenic
WA-05-1010	ZO73WL	Stillaguamish R. (Hatt Slough)	Fecal Coliform, Dissolved Oxygen
WA-05-1020	WO38N V	North Fork Stillaguamish R.	Fecal Coliform
WA-05-1050	SN06ZT	South Fork Stillaguamish R.	Fecal Coliform, pH, Dissolved Oxygen
	LU17DC	Unnamed Ck. #0456	Fecal Coliform

From 2000 to 2001 the Washington State Department of Ecology conducted a total maximum daily load (TMDL) study in the basin to determine if the Stillaguamish River, its tributaries, and Port Susan were in compliance with water quality standards. Ecology completed surveys in the study area between August 2000 and November 2001. The surveys were coordinated with

existing monitoring programs when possible. Data generated by Ecology and credible outside sources were incorporated into the TMDL study. This report will focus on the data from the Ecology TMDL surveys. Information about data from other sources can be found in the following publications or websites:

- Continuous stream discharge data collected by Ecology for the TMDL surveys were reported by C. Springer in: *Flow Summary for Gaging Stations on the Stillaguamish River and Selected Tributaries, May through October 2001*. Publication No. 03-03-019. <http://www.ecy.wa.gov/biblio/0303019.html>.
- Continuous discharge data collected by the U.S. Geological Survey is available at their National Water Information System (NWIS) website <http://wa.water.usgs.gov/data/realtime/nwisweb.htm>.
- Ecology Freshwater Ambient Monitoring Program data for sites in the Stillaguamish River basin can be found at [http://www.ecy.wa.gov/programs/eap/fw\\_riv/rv\\_main.html](http://www.ecy.wa.gov/programs/eap/fw_riv/rv_main.html).
- Freshwater water quality monitoring data collected by the Stillaguamish Tribe can be viewed at <http://www.stillaguamish.nsn.us/Water%20Quality%20Data%20Summary.pdf>.
- Snohomish County Surface Water Management water quality monitoring data were reported by K. Thornburg and G. Williams in: *State of the Waters, 2000: Water Quality in Snohomish County Rivers, Streams and Lakes*. The publication is available online at: <http://www.co.snohomish.wa.us/publicwk/swm/wq/publications/stateofwater.htm>.
- Snohomish County Surface Water Management monitoring data are available online at: [http://198.238.192.103/spw\\_swhydro/index.asp](http://198.238.192.103/spw_swhydro/index.asp).
- Tulalip Tribes have produced several reports on Stillaguamish basin water quality since 1991. The reports are available from: Tulalip Natural Resources 7615 Totem Beach Rd. Marysville, WA 98271 or at [tulalip@tulalip.nsn.us](mailto:tulalip@tulalip.nsn.us).

## Study Design

Fifty-seven TMDL monitoring sites were distributed throughout the Stillaguamish River basin and along Port Susan (Figures 2-4). The primary geographic focus of the surveys was the lower basin along the mainstem Stillaguamish River and the east shore of Port Susan. Field surveys focused on the following subjects:

- Diel changes in dissolved oxygen and pH.
- The effects of nutrients on aquatic productivity.
- Verification of metals concentrations.
- Water quality response to storm events and low-flow conditions.
- Monthly variability in indicator bacteria at freshwater recreational areas.
- Bacteria loads in Port Susan tributaries.



The survey schedule is presented in Table 2 and referenced in the site descriptions in Table 3.

Table 2. Surveys conducted by Ecology between August 2000 and November 2001 for the Stillaguamish River TMDL study.

Survey	Description	Date
A	Old Stillaguamish Channel Reconnaissance Survey	August 2000
B	Basin Indicator Bacteria Recreational Area Survey	Weekly: August – September 2000
C	Lower Stillaguamish Diel D.O. Survey	September 2000; repeat October 2001
D	Lower Stillaguamish River Synoptic Survey	September 2000; repeat October 2001
E	Basin Bacteria Synoptic Survey	September 2000
F	Old Stillaguamish Channel Low-flow Period Survey	October 2000; repeat July 2001
G	Metals Monitoring	Quarterly: January 2001 – October 2001
H	Storm Event Surveys	June and November 2001
I	Periphyton collection	July and October 2001
J	Port Susan Bacteria Source Surveys	Monthly: February – November 2001

Table 3. Stillaguamish River TMDL study site descriptions.

Station ID	Station Name	Latitude	Longitude	River Mile	River Kilometer	Surveys
05TARLIN <sup>2</sup>	Arlington WWTP effluent	48.2031	122.1279	-	-	C, D, E, H
05TARMST	Armstrong Creek at the hatchery gaging station	48.2184	122.1362	1.0	1.6	E, H
05TCHUPK	Church Creek at the park off Lindstrom Road	48.2413	122.3257	2.1	3.4	B
05TCHURH	Church Creek/Jorgenson Slough at Marine Drive	48.2312	122.3466	0.5	0.8	A, F, G, H
05TCONFL <sup>1</sup>	Confluence of North and South forks of the Stillaguamish River at Hwy. 9	48.2037	122.1286	17.8	28.6	C, D, E, I
05TCOOK	Cook Slough at Hwy. 530 bridge near Silvana	48.1966	122.2438	7.8	12.6	C, D, E, H
05TDOUG <sup>4</sup>	Douglas Slough south of Hwy. 532	48.2399	122.3759	0.1	0.2	A, F, H
05TGLAD	Glade Bekken at Silvana Terrace Road	48.2045	122.2902	0.5	0.8	C, D, E, H
05THARAR	Mouth of Harvey Armstrong Creek	48.2105	122.1511	0.1	0.2	C, D, E
05TIRVIN	Irvine Slough at dike pump station	48.2406	122.3689	0.1	0.2	A, F, H
05TJIMCK	Jim Creek at Jordan Road	48.1988	122.0938	0.1	0.2	H
05TJUNIP	Juniper Beach off Juniper Beach Road on Camano Island	48.2279	122.4082	-	-	J
05TKACK	Kackman Creek at 252nd Street NE	48.2246	122.1616	0.9	1.4	E, H
05TMAR1	March Creek at Mouth	48.1929	122.1639	0.1	0.2	C, D, E
05TMARIN <sup>2</sup>	Mainstem Stillaguamish River at Hat Slough off Marine Drive	48.2109	122.3378	1.9	3.1	C, D, E, G, H, I
05TMARIN2	Mainstem Stillaguamish River at Hat Slough boat launch	48.2114	122.3391	1.7	2.7	B
05TMARSH	Mouth of March Creek at 220th Street NE	48.1927	122.1655	0.9	1.4	H
05TMARTH	Martha Lake Creek at Soundview Drive	48.1743	122.3609	0.1	0.2	I
05TMARTOL	Martha Lake Creek outlet to Warm Beach	48.1754	122.3622	0.0	0.0	I
05TMILLR <sup>4</sup>	Miller Creek at Miller Road	48.2216	122.3179	0.2	0.2	A, F, H
05TMIXZO	Mainstem Stillaguamish River below Arlington WWTP outfall	48.2030	122.1316	17.6	28.3	C, D, I
05TMS3	Mainstem Stillaguamish River at Old Channel diversion	48.2087	122.3225	2.8	4.4	C, D, E
05TMS6	Mainstem Stillaguamish River below Silvana	48.2034	122.2765	5.7	9.2	C, D, E
05TMS11 <sup>1, 2</sup>	Mainstem Stillaguamish River at Interstate 5 bridge	48.1970	122.2107	11.2	17.9	C, D, E, G, H
05TMS12	Mainstem Stillaguamish River at WDFW access	48.1991	122.1931	12.1	19.5	I
05TMS13 <sup>1</sup>	Mainstem Stillaguamish River below March Creek	48.1916	122.1823	12.9	20.8	C, D, E
05TMS15 <sup>1</sup>	Mainstem Stillaguamish River below Armstrong Creek	48.2072	122.1544	14.9	24.0	C, D, E
05TMS17	Mainstem Stillaguamish River at Dike Road	48.1999	122.1481	17.0	27.4	C, D, E, H
05TNFCIC <sup>2, 3</sup>	North Fork Stillaguamish River at Cicero bridge	48.2679	122.0135	9.5	15.3	E, G, H
05TNFCPO <sup>2</sup>	North Fork Stillaguamish River at C-Post Bridge	48.2829	121.8304	21.0	33.8	E, H
05TNFTWI <sup>2</sup>	Mouth of the North Fork Stillaguamish River at Twin Rivers Park	48.2038	122.1274	0.1	0.2	B, C, D, E, H
05TNFWHI <sup>2</sup>	North Fork Stillaguamish River at Whitman Road bridge	48.2722	121.8879	17.6	28.3	B, E, H
05TNORTH	North branch of the mainstem Stillaguamish River at Hwy. 530 bridge	48.2103	122.2470	7.5	12.1	C, D, E, H
05TOC1	Old Stillaguamish River Channel near Irvine Slough	48.2394	122.3684	1.4	2.3	A, F, H
05TOC2	Old Stillaguamish River Channel above the Stanwood WWTP outfall	48.2361	122.3564	3.4	5.5	A, F, H
05TOC3	Old Stillaguamish River Channel at the Marine Drive bridge	48.2257	122.3382	5.1	8.2	A, F, G, H
05TOC4	Old Stillaguamish River Channel at the Norman Road bridge	48.2132	122.3268	7.4	11.9	A, F, H
05TPILCH <sup>2</sup>	Pilchuck Creek at Jackson Gulch Road	48.2101	122.2255	0.1	0.2	C, D, E, H
05TPILDOWN	Downstream of the mouth of Pilchuck Creek in North Stillaguamish Slough	48.2049	122.2281	9.3	15.0	D
05TPILUP	Upstream of the mouth of Pilchuck Creek in North Stillaguamish Slough	48.2085	122.2195	9.5	15.3	D
05TPORT <sup>2</sup>	Portage Creek at the 212th Street bridge	48.1885	122.2335	1.1	1.8	C, D, E, H
05TSFGRA <sup>2</sup>	South Fork Stillaguamish below Granite Falls	48.0959	121.9739	33.5	53.9	E, H
05TSFJOR <sup>2</sup>	South Fork Stillaguamish at Jordan walkway bridge	48.1475	122.0386	26.1	42.0	B, E, H
05TSFTWI <sup>2</sup>	Mouth of the South Fork Stillaguamish River at Twin Rivers Park	48.2036	122.1273	0.1	0.2	B, C, D, E, G, H
05TSILVA	Mainstem Stillaguamish River below Silvana off Norman Road	48.2083	122.2835	4.6	7.4	H
05TSOUTH	South Pass at the end of Eide Road	48.2261	122.3857	0.5	0.8	A, F, H, I
05TSTAN <sup>4</sup>	Stanwood WWTP effluent	48.2362	122.3577	-	-	A, F, H
05TTCF1	Twin City Foods Drain # 1 at dike	48.2382	122.3761	0.1	0.2	A, F, H, I
05TTCF2	Twin City Foods Drain # 2 on Thomle Road	48.2261	122.3670	0.1	0.2	A, F, H
05TTCF3 <sup>4</sup>	Twin City Foods Drain # 3 on Thomle Road	48.2264	122.3627	0.1	0.2	A, F, H
05TTCF4	Twin City Foods Drain # 4 to Hat Slough	48.1983	122.3626	0.1	0.2	C, D, I
05TTCF5	Twin City Foods Drain # 5 at footbridge above Thomle Road	48.2289	122.3524	0.2	0.3	A, F, H
05TUNIDE	Unnamed Creek #0456 at the end of Soundview Drive	48.1647	122.3691	0.1	0.2	I
05TWAREF	Warm Beach WWTP effluent at Warm Beach	48.1885	122.3501	-	-	I
05TWARSL	Pump pond slough at Warm Beach	48.1886	122.3527	0.0	0.0	I
05TWARTG	Field ditch to pump pond at Warm Beach	48.1889	122.3520	0.1	0.2	I
05TWARUP	Warm Beach Creek upstream of WWTP outfall	48.1887	122.3496	0.2	0.3	I
05TWARUS	Warm Beach Creek above camp stables	48.1901	122.3446	0.5	0.8	I
05TWEST	West pass of Old Stillaguamish River Channel at Hwy. 532 bridge in Stanwood	48.2399	122.3854	1.0	1.6	A, F, H

<sup>1</sup>Continuously recording probe deployed at these sites for Survey C.

<sup>2</sup>E. coli sampled at these sites in addition to fecal coliform and enterococcus.

<sup>3</sup>Samples taken at 05TNFTWI on 6/12/2001 and 10/3/2001.

<sup>4</sup>Sampled during June 2001 storm event only.

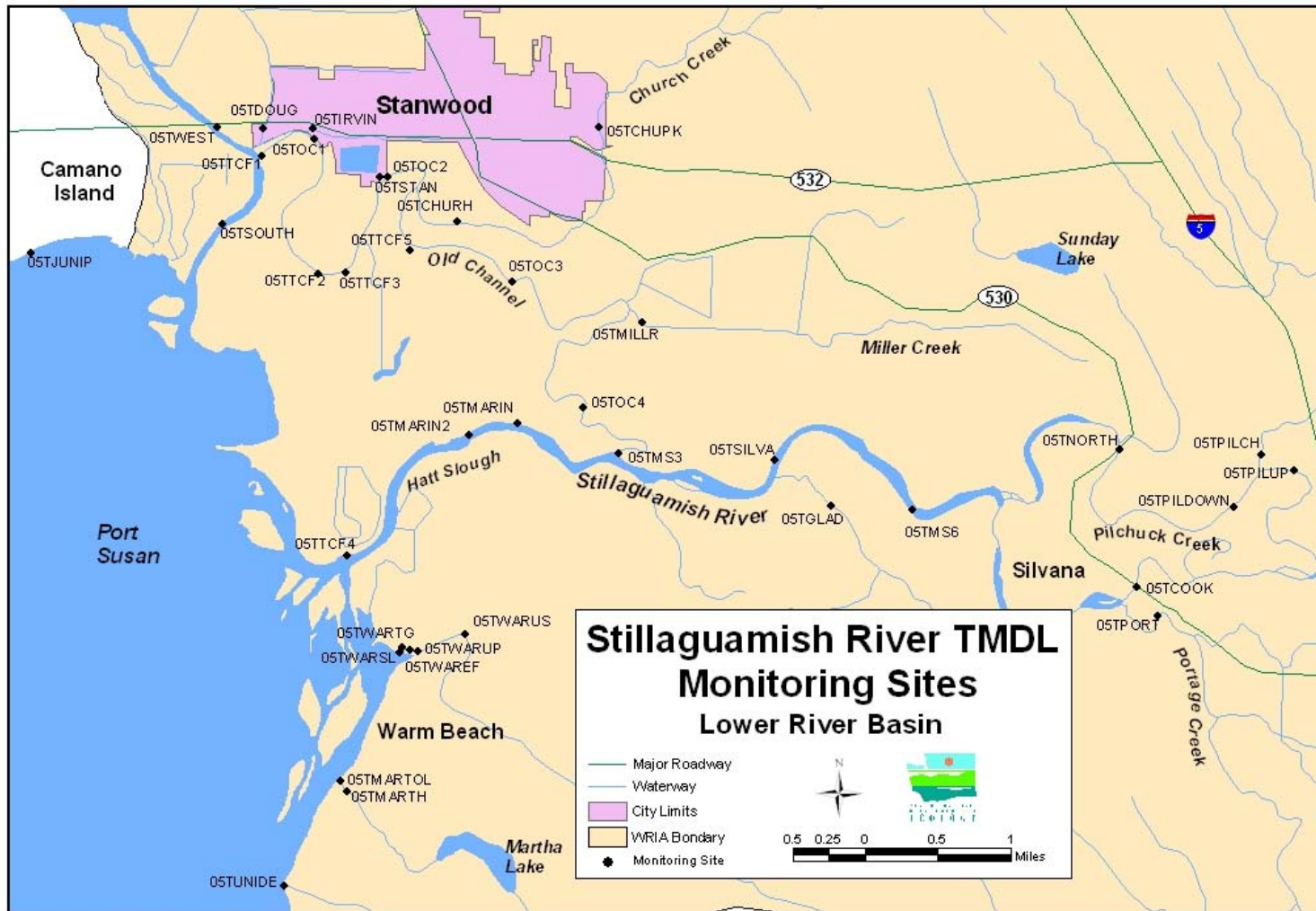


Figure 2. Stillaguamish River TMDL monitoring sites in the lower river basin including the Old Channel and mainstem of the Stillaguamish River.

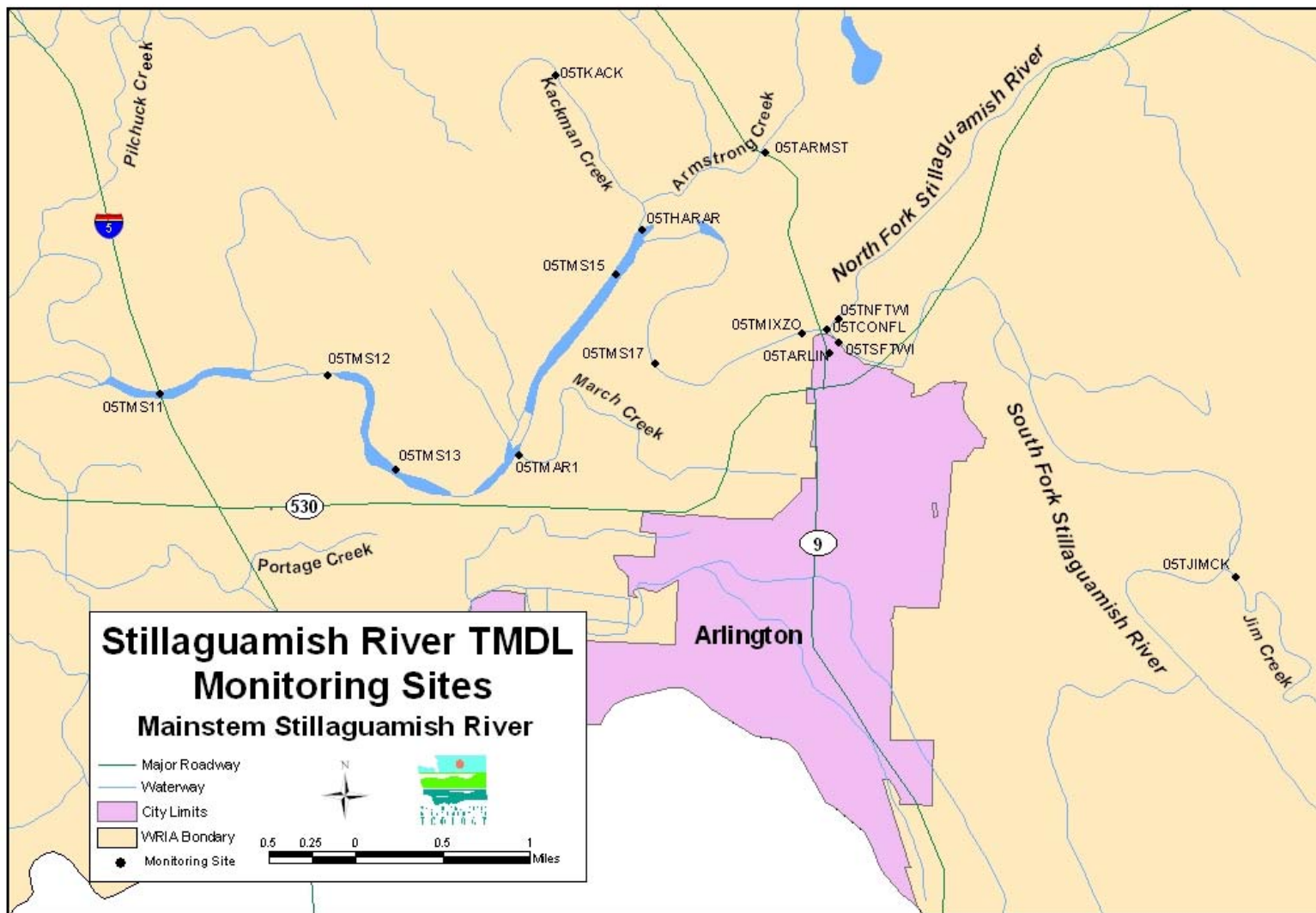


Figure 3. Stillaguamish River TMDL monitoring sites along the mainstem of the Stillaguamish River.

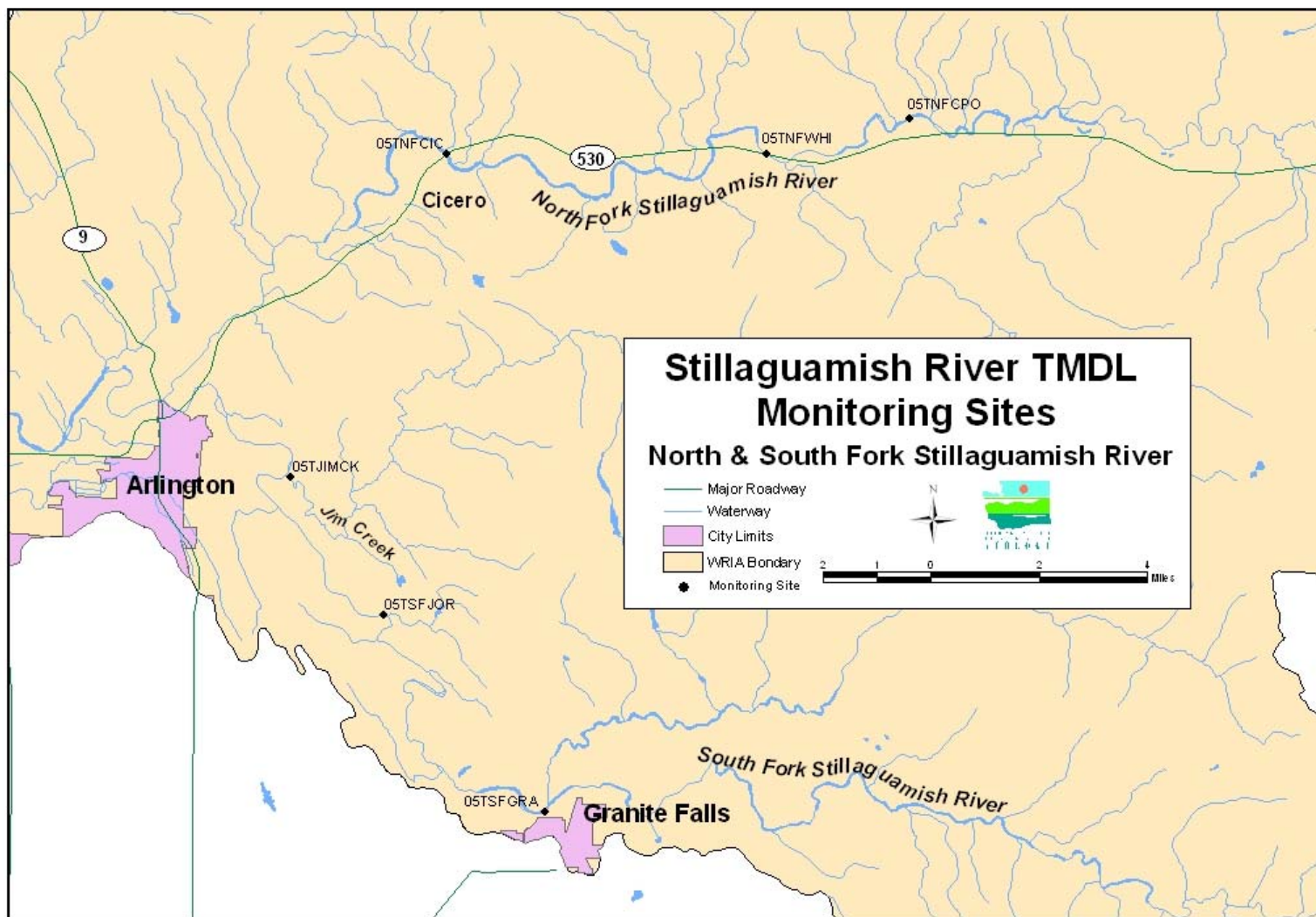


Figure 4. Stillaguamish River TMDL monitoring sites along the North and South forks of the Stillaguamish River.



## Methods

### Field

Streamflow gages were used to estimate flows at four sites. The location and operator of each gage are listed in Table 4.

Table 4. Streamflow gages used to estimate flows at selected sites included in the Stillaguamish River TMDL study.

Location	Operator
South Fork Stillaguamish at River Bend Park	Ecology
North Fork Stillaguamish at Cicero bridge (05TNFCIC)	USGS
Mainstem Stillaguamish at Interstate 5 (05TMS11)	USGS & Snohomish County
Armstrong Creek at hatchery gaging station (05TARMST)	Ecology

Field measurements, methods, and associated data quality objectives are outlined in Table 5. Further description of the field methods employed in the TMDL can be found in the Quality Assurance (QA) Project Plan (Joy, 2001).

Four diel surveys were conducted using multi-probe data loggers. Loggers were anchored in place at three to four sites to monitor temperature, dissolved oxygen, pH, and conductivity every 15 minutes for approximately 48 hours. Two surveys were conducted in the Lower Stillaguamish River in September 2000 and October 2001 to examine the daily ranges of the monitored parameters, with a focus on minimum dissolved oxygen concentrations. Two other surveys were conducted in the Old Channel of the Stillaguamish River in August 2000 and July 2001 to monitor changes in water quality over tidal and daily periods. The results of the surveys are depicted in Appendix D.

### Laboratory

Laboratory analyses, methods, and associated data quality objectives are outlined in Table 5. Manchester Environmental Laboratory (MEL) standard protocols were used for sample collection, preservation, and handling (MEL, 1994). USEPA protocols for sampling ambient water trace metals using two people were followed for metals sample collection and handling (USEPA, 1995). Containers and filters were pre-cleaned and supplied by MEL. All samples were stored in the dark, on ice, and transported to MEL within 24 hours of collection. Chain-of-custody signatures were not required during transport because samples were always within the possession of Ecology personnel or Greyhound Line employees.

Table 5. Methods and data quality objectives used in the Stillaguamish River TMDL study.

Analysis	Method	Accuracy	Precision	Bias	Required
		% deviation from true value	Relative Standard Deviation	% deviation from true value	Reporting Limits Concentration units
<b>Field Measurements</b>					
Dissolved Oxygen	Field meter or 360.2/	15	< 5% RSD	5	0.1 mg/L to 15 mg/L
pH	Field meter or 150.1/	0.15 s.u.	0.05 s.u.	0.10 s.u.	1 to 14 s.u.
Salinity	Salinometer or /2520B	25	<10% RSD	5	0.1 ppt
Specific Conductivity	Field meter or 120.1/	25	<10% RSD	5	1 umhos/cm
Temperature	Field meter or alcohol thermometer	0.1 °C	0.025 °C	0.05 °C	1°C to 40°C
Velocity	Current meter	0.1 f/s	0.1 f/s	N/A	0.05 f/s
<b>Laboratory Analyses (D = dissolved, TR = total recoverable)</b>					
Alkalinity <sup>4</sup>	/2320	-	-	-	5 mg/L
Ammonia Nitrogen	350.1/4500-NH3H	25	<10% RSD	5	0.1 mg/L
BOD	405.1/	N/A	<15% RSD	N/A	3 mg/L
Chloride	300.0/	30	<10% RSD	10	0.1 mg/L
Chlorophyll a	/10200H3	30	<10% RSD	10	0.05 ug/L
DOC <sup>3</sup>	415.1/	20	<10% RSD	N/A	1 mg/L
Enterococcus (MF)	1600/17-9230C	N/A	<25% RSD <sup>2</sup>	N/A	1 cfu/100 mL
E. coli (MF) <sup>3</sup>	1103.1/ or 1105/	N/A	<25% RSD <sup>2</sup>	N/A	1 cfu/100 mL
FC (MPN)	/9221E2	N/A	<25% RSD <sup>2</sup>	N/A	3 MPN/100 mL
FC (MF)	/9222D	N/A	<25% RSD <sup>2</sup>	N/A	1 cfu/100 mL
Nitrite-Nitrate	353.2/4500-NO3I	25	<10% RSD	5	0.1 mg/L
Orthophosphate	365.3M/4500PG	25	<10% RSD	5	0.003 mg/L
TNVSS <sup>3</sup>	160.4/	20	<10% RSD	N/A	1 mg/L
TOC	415.1/	N/A	<10% RSD	N/A	1 mg/L
TPN	/4500NB	25	<10% RSD	5	0.025 mg/L
Total Phosphorus	/4500PH or /4500PI	25	<10% RSD	5	0.01 mg/L
TSS	160.2/	20	<10% RSD	N/A	1 mg/L
VOM <sup>4</sup>	/10300C	-	-	-	1 mg/L
Hardness <sup>3</sup>	/2340B	25	<10% RSD	5	1 mg/L
Arsenic <sup>3</sup>	200.8/ or 206.2/	25	<10% RSD	5	0.2 ug/L (D and TR)
Copper <sup>3</sup>	200.8/	25	<10% RSD	5	0.1 ug/L (D and TR)
Lead <sup>3</sup>	200.8/	25	<10% RSD	5	0.1 ug/L (D and TR)
Mercury <sup>3</sup>	245.7/	25	<10% RSD	5	0.002 ug/L (TR)
Nickel <sup>3</sup>	200.8/	25	<10% RSD	5	0.02 ug/L (D) 0.1 ug/L (TR)

<sup>1</sup> USEPA, 1983 /APHA et al., 1998 (Standard Methods)

<sup>2</sup> Log-transformed data

<sup>3</sup> Precision standards were set after the Quality Assurance Project Plan was written

<sup>4</sup> Not anticipated in Quality Assurance Project Plan; sampled infrequently and no precision standards were set.

## Data Quality

### Field

Multi-probe meters, data loggers, and flow meters were calibrated according to Ecology's Environmental Assessment Program protocols and manufacturer instructions (WAS, 1993).

Calibration checks were conducted during and after sampling events to monitor multi-probe meter performance. Known pH and conductivity standards, and an alcohol thermometer, were used to assess the accuracy of the pH, conductivity, and temperature probes, respectively. Azide-modified Winkler titrations of randomly collected dissolved oxygen samples were used to assess the accuracy of the dissolved oxygen probe (Figure 5). Field meter data compared favorably to Winkler titration results (Figure 5).

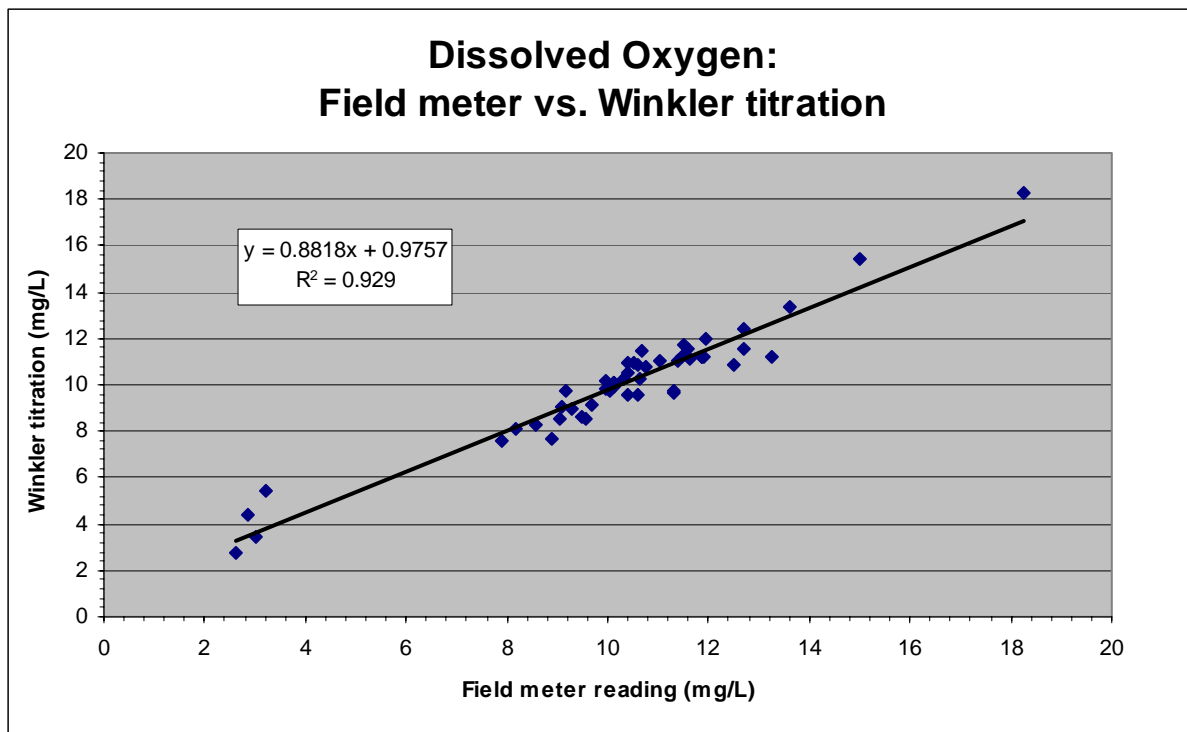


Figure 5. A comparison of dissolved oxygen field meter readings and associated Winkler titration results. Linear regression indicates a coefficient of determination of 0.929.

Field meters were used to evaluate the performance of data loggers. Checks were performed at the beginning, midpoint, and end of logging periods. No pH data were retrieved from the data logger placed near river mile 11 on the mainstem Stillaguamish River (05TMS11) during the October 2-4, 2001 Lower Stillaguamish River diel survey because the pH probe failed.



No data were retrieved from the data logger placed upstream of the Marine Drive Bridge (05TOC3) during the August 7-9, 2000 Old Stillaguamish Channel diel survey because the logger was stolen. No salinity data were retrieved from the data logger placed upstream of Irvine Slough (05TOC1) during the August 7-9, 2000 Old Stillaguamish Channel diel survey because the conductivity probe used to calculate salinity failed.

## Laboratory

Laboratory samples were analyzed according to quality assurance and quality control procedures followed by MEL (MEL, 2000). Some samples were qualified by the lab and should be used with caution. Descriptions of the qualifiers used by MEL can be found in Appendix B. Qualifiers are noted in the main data tables presented in Appendix C.

Field replicates and duplicate laboratory analyses were used to estimate precision. Field replicates are two samples collected from the same site at the same time. Duplicate laboratory analyses are performed using multiple aliquots from one sample container.

Field replicates were collected for at least 10% of all microbiology and metals samples, and at least 7% of all general chemistry samples analyzed by MEL (Table 6). Replicates were also collected for over 5% of the dissolved oxygen samples to evaluate field sampling precision for Winkler analysis (Table 6). Field replicate samples were collected to estimate total sampling precision, expressed as the median percent relative standard deviation (%RSD). Percent RSD is calculated by dividing the standard deviation by the mean of the duplicate pairs, and multiplying the result by 100. Precision standards for field replicates set in the QA Project Plan were met for all parameters sampled (Table 6).

Duplicate laboratory analyses were performed at a frequency of at least 10% (MEL, 2000). Duplicate analyses were used to evaluate laboratory precision, in %RSD, for general chemistry and microbiology parameters. Precision standards for duplicate laboratory analyses set in the QA Project Plan were met for all parameters in the aforementioned categories (Table 6).

Laboratory precision for metals was measured through matrix spike analyses and duplicate spike analyses. Matrix spike analysis is performed by adding a known amount of analyte to a sample aliquot. The aliquot is analyzed along with an unmodified aliquot from the same sample, and the percent recovery of the analyte from the representative sample matrix is calculated. All matrix spikes performed for this project were within the 75-125% control limits except two associated with the January 31, 2001 sampling event. Percent recovery for total recoverable copper (72 and 73%) and arsenic (62 and 63%) were outside control limits. Arsenic results were qualified as estimates, but the copper results were not because the percent recoveries were so close to control limits.

Duplicate spike analysis uses duplicate matrix spike samples to determine the repeatability of matrix spike results. Precision estimates based on duplicate spike analyses performed for this study were all within the acceptance criteria of  $\pm 20\%$ .

Table 6. A summary of the field sampling and laboratory precision data for the Stillaguamish River TMDL.

Parameter	n Pairs field	% of Total Field	Median RSD% field	n Pairs lab	Median RSD% lab	Precision Standard (RSD%)
Alkalinity <sup>3</sup>	1	9.1	1.13	4	.39	-
Ammonia Nitrogen	26	9.6	1.91	18	.17	<10
BOD	9	10.5	0.00	-	-	<15
Chloride	12	7.1	1.17	19	.56	<10
Chlorophyll a	5	7.7	9.43	11	5.55	<10
Conductivity	1	12.5	0.98	1	0	<10
DO (Winkler titration) <sup>2</sup>	12	5.7	0.46	-	-	-
DOC <sup>2</sup>	2	8.0	3.60	3	3.82	<10
Enterococci (MF) <sup>1</sup>	47	12.3	4.09	31	2.89	<25
E. coli (MF) <sup>1,2</sup>	15	40.5	3.95	6	1.76	<25
FC (MPN) <sup>1</sup>	15	10.8	11.09	0	-	<25
FC (MF) <sup>1</sup>	47	16.4	2.72	26	3.07	<25
Nitrite-Nitrate	26	9.5	0.71	28	.44	<10
Orthophosphate	25	9.6	2.18	29	0	<10
Salinity	1	9.1	0.00	1	0	<10
TNVSS <sup>2</sup>	3	9.4	6.43	4	3.21	<10
TOC	13	10.3	1.99	18	3.11	<10
TPN	26	9.5	1.97	30	1.59	<10
Total Phosphorus	26	9.5	4.60	33	2.01	<10
TSS	37	9.4	5.89	39	1.31	<10
VOM <sup>3</sup>	10	58.8	37.8	2	7.35	-
Hardness <sup>2</sup>	9	12.7	1.78	11	.66	<10
Arsenic (Tot. Rec.)	9	15.5	1.02	-	-	<10
Arsenic (Dissolved)	9	15.5	0.00	-	-	<10
Copper (Tot. Rec.)	8	13.8	4.70	-	-	<10
Copper (Dissolved)	8	13.8	1.97	-	-	<10
Lead (Tot. Rec.)	8	13.8	0.63	-	-	<10
Lead (Dissolved)	8	13.8	3.71	-	-	<10
Mercury (Tot. Rec.)	8	13.8	5.92	8	3.87	<10
Nickel (Tot. Rec.)	8	13.8	4.40	-	-	<10
Nickel (Dissolved)	8	13.8	3.09	-	-	<10

<sup>1</sup> Log-transformed data

<sup>2</sup> Not anticipated in Quality Assurance (QA) Project Plan; precision standards were set after QA Project Plan written.

<sup>3</sup> Not anticipated in QA Project Plan; sampled infrequently and no precision standards were set.

Metals samples associated with the October 5 and October 17, 2000 sampling events were analyzed during the same time period. MEL used samples from the October 17 sampling event as spikes for the October 5 sampling event. No explanation for the substitution was given.

Certified river water reference material for trace metals (SLRS-4, Natural Resource Council of Canada) with values of 0.68 ug/L arsenic, 1.81 ug/L copper, 0.67 ug/L nickel, and 0.086 ug/L lead was used for laboratory control sample (LCS) analyses. One reference material sample was analyzed with each set of metals samples. All LCS recoveries performed for each metal analyzed in this study were within acceptance criteria.

Transfer blanks were submitted for each sampling event and analyzed to detect metals contamination arising from sample containers or the filtration process. Bottle blanks were prepared at MEL by filling 500 mL Teflon sample bottles with deionized water. Filter blanks were prepared by filtering half the contents of a bottle blank into a separate sample bottle supplied by the laboratory. Blanks were handled, transported, and analyzed in the same manner as the samples collected during the associated sampling event.

No analytically significant levels of the requested metals were detected in the transfer blanks except on two occasions when copper was found in the blanks for total recoverable metals. Blanks associated with the January 31, 2001 sampling event showed detectable levels of copper (0.10 ug/L). All samples associated with the blank had copper levels >10 times the level found in the blank, so no qualification was necessary. Blanks associated with the October 16, 2001 sampling event also indicated copper contamination. Samples were prepared a second time, and copper was still found at 0.10 and 0.15 ug/L. There was insufficient sample for further analyses, so copper results were qualified as estimates.

## Results

Field measurements and laboratory data collected by Ecology for the Stillaguamish River TMDL study are presented in Appendix D under four categories: field data, general chemistry analyses, microbiology analyses, and metals analyses.

Graphs depicting the results of the Lower Stillaguamish River diel surveys and the Old Stillaguamish Channel low-flow period diel surveys are found in Appendix D.

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## Appendix A.

### Class AA and Class A Designation and Water Quality Standards

Table A-1. Characteristics and characteristic uses used to define Class AA and Class A waters in Washington State.

Class AA (extraordinary)	Class A (excellent)
<b>General Characteristics</b>	
Shall markedly and uniformly exceed the requirements for all, or substantially all uses.	Shall meet or exceed the requirements for all, or substantially all, uses.
<b>Characteristic Uses</b>	
Shall include, but not be limited to, the following: domestic, industrial, and agricultural water supply; stock watering; salmonid and other fish migration, rearing, spawning, and harvesting; wildlife habitat; primary contact recreation, sport fishing, boating, and aesthetic enjoyment; and commerce and navigation.	Same as AA.

Table A-2. Water quality criteria for Class AA freshwater, Class A freshwater, and Class A marine water in Washington State.

<p><b>Dissolved Oxygen</b></p> <p><i>Class AA Freshwater</i> Minimum 9.5 mg/L</p> <p><i>Class A Freshwater</i> Minimum 8.0 mg/L</p> <p><i>Class A Marine</i> 6.0 mg/L with 95% vertically avg. daily max. salinity &gt; 1 ppt</p>
<p><b>Fecal Coliform</b></p> <p><i>Class AA Freshwater</i> Geometric mean 50 cfu/100 mL 90<sup>th</sup> percentile value 100 cfu/100 mL*</p> <p><i>Class A Freshwater</i> Geometric mean 100 cfu/100 mL 90<sup>th</sup> percentile value 200 cfu/100 mL*</p> <p><i>Class A Marine</i> Geometric mean 14 cfu/100 mL 90<sup>th</sup> percentile value 43 cfu/100 mL* Vertically averaged salinity ≥ 10 ppt</p> <p><i>In Food and Drug Administration (FDA) shellfish harvesting areas</i> Geometric mean 14 MPN/100 mL 90<sup>th</sup> percentile value 43 MPN/100 mL*</p>
<p><b>pH</b></p> <p><i>Freshwater</i> Maximum 8.5 standard units Minimum 6.5 standard units</p> <p><i>Marine</i> Maximum 7.0 standard units Minimum 8.5 standard units</p>
<p><b>Ammonia **</b></p> <p><i>Freshwater</i> 4-day average over 3 years 1.35 mg/L as Nitrogen 1-hour average over 3 years 17.9 mg/L as Nitrogen</p> <p><i>Marine</i> 4-day average over 3 years 0.035 mg/L as Nitrogen 1-hour average over 3 years 0.233 mg/L</p>

Table A-2 (cont.)

<p><b>Dissolved Arsenic</b></p> <p><i>Freshwater Aquatic Toxicity</i>  4-day average over 3 years 190 ug/L  1-hour average over 3 years 360 ug/L</p> <p><i>Marine Aquatic Toxicity</i>  4-day average over 3 years 36 ug/L; 21 ug/L to prevent non-lethal effects to diatoms  1-hour average over 3 years 69 ug/L; 95% vertically averaged daily maximum salinity &gt;1 ppt</p> <p><i>Human Health</i>  Maximum 0.018 ug/L; consumption of water and organisms  Maximum 0.14 ug/L; consumption of organisms only</p>
<p><b>Dissolved Copper</b></p> <p><i>Freshwater Aquatic Toxicity</i>  4-day average over 3 years 2.2 ug/L; at hardness of 15 mg/L as Ca CO<sub>3</sub>  1-hour average over 3 years 2.8 ug/L; at hardness of 15 mg/L as CaCO<sub>3</sub></p> <p><i>Marine Aquatic Toxicity</i>  4-day average over 3 years 3.1 ug/L; 95% vertically averaged daily maximum salinity &gt;1 ppt  1-hour average over 3 years 4.8 ug/L; 95% vertically averaged daily maximum salinity &gt;1 ppt</p>
<p><b>Dissolved Lead</b></p> <p><i>Freshwater Aquatic Toxicity</i>  4-day average over 3 years 7.7 ug/L  1-hour average over 3 years 0.3 ug/L</p> <p><i>Marine Aquatic Toxicity</i>  4-day average over 3 years 8.1 ug/L; 95% vertically averaged daily maximum salinity &gt;1 ppt  1-hour average over 3 years 210 ug/L; 95% vertically averaged daily maximum salinity &gt;1 ppt</p>
<p><b>Mercury</b></p> <p><i>Freshwater Aquatic Toxicity</i>  4-day average over 3 years 0.012 ug/L  1-hour average over 3 years 2.1 ug/L</p> <p><i>Marine Aquatic Toxicity</i>  4-day average over 3 years 0.025 ug/L; 95% vertically averaged daily maximum salinity &gt; 1 ppt  1-hour average over 3 years 1.8 ug/L; 95% vertically averaged daily maximum salinity &gt; 1 ppt</p> <p><i>Human Health</i>  Maximum 0.14 ug/L; consumption of water and organisms  Maximum 0.15 ug/L; consumption of organisms only</p>

Table A-2 (cont.)

<b>Dissolved Nickel</b>
<i>Freshwater Aquatic Toxicity</i> 4-day average over 3 years 31.6 ug/L 1-hour average over 3 years 2.84 ug/L
<i>Marine Aquatic Toxicity</i> 4-day average over 3 years 8.2 ug/L; 95% vertically averaged daily maximum salinity > 1 ppt 1-hour average over 3 years 74 ug/L; 95% vertically averaged daily maximum salinity > 1 ppt
<i>Human Health</i> Maximum 610 ug/L; consumption of water and organisms Maximum 4600 ug/L; consumption of organisms only

\* Criteria wording states that not more than 10% of the samples were used to calculate the geometric mean.

\*\* New ammonia criteria are proposed but are not presenting here.



## Appendix B.

### Data Qualifiers used by Manchester Environmental Laboratory

(adapted from Manchester Environmental Laboratory's Lab Users Manual, 7<sup>th</sup> Edition)

Code	Definition
E	Reported result is an estimate because it exceeds the calibration.
G	Value is greater than result reported; result is a minimum value.
J	Analyte was positively identified. The associated numerical result is an estimate.
N	For organic analytes there is evidence the analyte is present in this sample. For metals analytes the spike sample recovery is not within control limits.
NJ	There is evidence that the analyte is present. The associated numerical result is an estimate.
NAF	Not analyzed for.
QNS	Quantity not sufficient.
REJ	Data are unusable for all purposes.
U	Analyte was not detected at or above the reported result.
UJ	Analyte was not detected at or above the reported estimated result.
<b>Bold Type</b>	Analyte was present in the sample. Used as a visual aid to locate detected compounds on the report sheet.

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## **Appendix C.**

### **Field and Laboratory Data for the Stillaguamish River Watershed Fecal Coliform, Dissolved Oxygen, pH, Mercury, and Arsenic TMDL**

Significant figures presented here may vary from recorded values found in Ecology's Environmental Information Management (EIM) database system.

Table C-1. Field data collected for the Stillaguamish River TMDL.

Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O.		Conductivity µmhos/cm	Salinity ppt	Flow cfs
						Meter	Winkler			

**Arlington WWTP effluent**

05TARLIN	9/12/2000	13:20		21.70	6.79			898		
05TARLIN	9/13/2000	11:17		20.10	6.92	4.40				
05TARLIN	6/12/2001	15:40		16.97	6.79	3.49		267.7		
05TARLIN	6/13/2001	14:05		17.86	6.58	3.54		292.7		
05TARLIN	10/16/2001	14:00		17.32	6.91	5.85		457.5	0.23	
05TARLIN	11/14/2001	12:40		16.60	6.90	3.13		490.3		
05TARLIN	11/15/2001	11:25		16.43	6.81	3.45		464		

**Armstrong Creek at the hatchery gaging station**

05TARMST	9/11/2000	12:10		10.80	7.30		10.35	125		4.98*
05TARMST	9/11/2000	12:10	R	10.80	7.34		10.30	125		
05TARMST	9/13/2000	13:20		11.00	7.73		10.30	135		4.52*
05TARMST	6/12/2001	15:00		9.71	7.07	9.31		27.7		
05TARMST	6/13/2001	13:15		10.52	6.82	11.61		38.2		
05TARMST	11/14/2001	11:36		9.31	7.16	10.61	10.85	63.4		23.94
05TARMST	11/15/2001	10:35		10.01	6.95	10.50	10.95	54.5		38.59

\*Flows were calculated using a flow-discharge rating curve.

**Church Creek at the park off Lindstrom Road**

05TCHUPK	8/7/2000	14:25		15.30	7.43		9.60	180		
05TCHUPK	8/14/2000	13:37		14.30	7.94		10.20	185		
05TCHUPK	8/14/2000	14:00	R	14.30	7.92		10.05	185		
05TCHUPK	8/21/2000	15:15		15.00	7.71		9.61	191		
05TCHUPK	8/28/2000	15:30		13.30	7.32		1.85	190		
05TCHUPK	9/5/2000	13:30		12.50	7.24		10.40	185		
05TCHUPK	6/12/2001	11:45								81.10

**Church Creek/Jorgenson Slough at Marine Drive**

05TCHURH	8/8/2000	10:30		18.60	7.90		8.35	> 1000		2.55
05TCHURH	10/5/2000	8:45		10.60	6.75			420		
05TCHURH	10/17/2000	13:20		11.40	7.77	8.95		10900	6.20	
05TCHURH	10/18/2000	14:00		12.90	8.05	10.40	9.60	5236	2.80	Reverse*
05TCHURH	1/31/2001	14:30		6.00				120		
05TCHURH	5/8/2001	13:23		11.00	6.67		11.00	110		6.70
05TCHURH	6/12/2001	11:20		10.31	7.63	10.41		100		81.43
05TCHURH	6/13/2001	18:45		13.30	7.57	9.70		134		32.74
05TCHURH	7/12/2001	13:50		22.35	8.76	18.25	18.28	3668	1.91	4.87
05TCHURH	7/17/2001	14:45		17.84	9.26	17.57		1033	0.54	1.21
05TCHURH	7/18/2001	11:21		17.10	7.57	7.95		1379	0.74	1.56
05TCHURH	10/16/2001	11:20		10.49	7.33		8.53	219.5	0.10	1.90
05TCHURH	11/14/2001	12:50		10.01	7.23	9.48	8.60	133.7		
05TCHURH	11/15/2001	11:30		10.93	7.03	9.58		102.5		

\*Flow was running in reverse due to influence of incoming tide.

**Confluence of the North and South Forks of the Stillaguamish River at Hwy. 9**

05TCONFL	9/11/2000	11:05		11.56	7.64	10.78		36.7		
05TCONFL	9/13/2000	9:25		12.19	7.60	10.35		52		
05TCONFL	7/11/2001	11:33		17.60	7.30		9.90	62		
05TCONFL	7/11/2001	15:55		20.50	7.59		10.05	69		
05TCONFL	10/2/2001	12:06		11.79	7.72	10.17		74.2		
05TCONFL	10/2/2001	19:10		13.41	7.47	10.05	9.78	73.8		
05TCONFL	10/4/2001	12:40		12.02	7.29	10.11	10.08	79.3		

**Cook Slough at the Hwy. 530 bridge near Silvana**

05TCOOK	9/11/2000	13:45		12.50	7.40		10.45	43		
05TCOOK	9/13/2000	14:20		14.50	7.95			64		
05TCOOK	6/12/2001	11:30		8.22	7.73	12.75		27.2		
05TCOOK	6/13/2001	9:35		9.22	7.11	11.85	11.22	29.2		
05TCOOK	10/3/2001	13:48		12.76	7.36	10.47		82		
05TCOOK	11/14/2001	8:50		8.32	7.25	11.45		25.3		
05TCOOK	11/15/2001	8:37		8.68	6.82	11.20		20.4		

Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O.		Conductivity µmhos/cm	Salinity ppt	Flow cfs
						mg/L	Meter Winkler			

**Douglas Slough south of Hwy. 532**

05TDOUG	10/17/2000	12:55		12.40	7.46	4.85		34084	21.30	
05TDOUG	10/18/2000	12:05		12.80	7.80	3.20	5.40	24220	14.60	
05TDOUG	6/12/2001	14:20		13.68	7.11	7.90	7.60	7300		0.75
05TDOUG	6/12/2001	14:25	R	13.70	7.05	7.85		7280		
05TDOUG	6/13/2001	17:35		19.50	6.79	8.20		10900	6.00	0.19
05TDOUG	7/18/2001	10:45		17.85	7.20	6.73		22350	13.40	0.16

**Glade Bekken at Silvana Terrace Road**

05TGLAD	9/11/2000	14:53		13.30	7.59		9.55	171		
05TGLAD	9/13/2000	14:45		14.30	7.68		9.25	175		
05TGLAD	6/12/2001	9:30		10.23	7.86	10.70		102		15.22
05TGLAD	6/13/2001	11:08		10.93	7.65	10.64	10.25	113		7.37
05TGLAD	10/3/2001	15:15		11.77	7.50	9.78		142.1		
05TGLAD	10/4/2001	11:30								0.35
05TGLAD	11/14/2001	14:25		9.91	7.29	11.29	9.65	108.2		4.22
05TGLAD	11/15/2001	8:20		10.34	7.22	11.30	9.70	101.1		5.13

**Mouth of Harvey Armstrong Creek**

05THARAR	9/11/2000	11:55		11.24	7.49	9.67		122		
05THARAR	9/13/2000	10:25		10.65	7.44	9.51		129.7		
05THARAR	10/2/2001	13:21		10.04	7.45	10.27		115.8		5.11

**Irvine Slough at dike pump station**

05TIRVIN	8/8/2000	9:55		17.70	6.97		1.60	1000		
05TIRVIN	8/9/2000	14:50		19.72	7.29	3.71		6300		
05TIRVIN	10/17/2000	11:30		11.83	7.86	4.01		1597	0.80	
05TIRVIN	10/18/2000	10:22		12.70	7.80	2.87	4.40	2800	1.50	
05TIRVIN	6/12/2001	13:45		11.18	7.31	8.35		242		16.80
05TIRVIN	6/13/2001	17:08		16.40	6.60	9.90		783		
05TIRVIN	7/17/2001	14:20		18.88	6.69	2.10		14100	8.45	
05TIRVIN	7/18/2001	11:00		18.08	6.77	2.63	2.76	17066	10.00	1.98
05TIRVIN	11/14/2001	11:05		10.38	6.73	4.26		1630		
05TIRVIN	11/15/2001	10:20		11.42	6.53	4.79		871		

**Jim Creek at Jordan Road**

05TJIMCK	6/12/2001	15:45		10.02	7.38	12.50	10.86	32		
05TJIMCK	6/13/2001	17:30		11.52	7.20	11.54		38.3		
05TJIMCK	11/14/2001	15:00		8.93	6.94	11.20		26.6		
05TJIMCK	11/15/2001	15:05		9.60	7.08	10.45		39		

**Juniper Beach off Juniper Beach Road on Camano Island**

05TJUNIP	3/29/2001	8:40		7.80			10.55	14000	12.50	
05TJUNIP	4/19/2001	7:15		10.80			8.80	15900	13.20	
05TJUNIP	5/9/2001	7:45		8.80			9.81	22300	24.90	
05TJUNIP	6/6/2001	8:50		16.00			8.38	18000	13.80	
05TJUNIP	6/6/2001	8:55	R				8.40			
05TJUNIP	7/11/2001	9:40		18.50			8.59	36900	9.10	
05TJUNIP	8/22/2001	12:00		16.90			8.22	32500	25.00	
05TJUNIP	9/19/2001	9:00		13.80			6.80	30900	25.10	
05TJUNIP	10/17/2001	8:50		8.50			8.80	22500	17.20	
05TJUNIP	11/19/2001	14:15		9.00			10.85	11500	10.00	

**Kackman Creek on 252nd Street NE**

05TKACK	9/11/2000	12:43		11.70	6.68		8.90	152		
05TKACK	9/13/2000	13:35		12.30	7.64		9.00	158		
05TKACK	6/12/2001	15:15		10.76	6.68	8.23		43		
05TKACK	6/13/2001	13:25		11.85	6.28	8.08		56.5		4.98
05TKACK	11/14/2001	12:10		9.67	6.35	7.54		78.2		2.46
05TKACK	11/15/2001	11:00		10.29	6.24	6.55		75.9		3.01

**March Creek at mouth**

05TMAR1	9/11/2000	12:36		13.40	7.21	7.58		187		
05TMAR1	9/13/2000	11:00		13.57	7.22	7.37		190		

Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O. mg/L		Conductivity µmhos/cm	Salinity ppt	Flow cfs
						Meter	Winkler			

**Mainstem Stillaguamish River at Hatt Slough off Marine Drive**

05TMARIN	9/11/2000	15:27		12.96	7.76	9.98		37.2		
05TMARIN	9/11/2000	15:40		12.90	7.28		10.20	45		
05TMARIN	9/11/2000	15:40	R	12.90	7.18		10.20	44		
05TMARIN	9/12/2000	15:40		14.20	7.24			59		
05TMARIN	9/13/2000	15:15		15.42	7.29	9.47		60.8		
05TMARIN	10/5/2000	10:20		10.10	6.77			65		
05TMARIN	1/31/2001	13:55		4.50				54		
05TMARIN	2/27/2001	11:55		5.20			12.75	49	0.00	
05TMARIN	3/29/2001	11:00		5.90			12.20	31		
05TMARIN	3/29/2001	11:05	R				12.10			
05TMARIN	4/19/2001	9:40		7.50			11.60	73	0.00	
05TMARIN	5/8/2001	13:00		9.80	7.03		11.00	39		
05TMARIN	5/9/2001	9:25		9.00	7.44		11.11	38		
05TMARIN	6/6/2001	11:30		11.30				49		
05TMARIN	6/12/2001	17:20		9.06	7.12	11.39		49		
05TMARIN	6/13/2001	12:15		9.90	7.64	11.03		54		
05TMARIN	7/11/2001	11:55		18.70			9.32	63	0.00	
05TMARIN	7/12/2001	13:25		20.12		9.40		70	0.00	
05TMARIN	8/22/2001	13:55		16.00	7.31		8.61	200	0.00	
05TMARIN	8/22/2001	13:55	R				8.98			
05TMARIN	9/19/2001	8:15		14.50	7.18		8.66	520	0.02	
05TMARIN	10/3/2001	14:47		13.44		9.87		85.5		
05TMARIN	10/16/2001	10:50		9.18	7.39	11.60		41.3	0.01	
05TMARIN	10/17/2001	10:25		8.60	6.91		10.95	49	0.00	
05TMARIN	11/14/2001	8:30		8.57		11.61	11.10	35.6		
05TMARIN	11/15/2001	9:17		8.81		10.81		21.8		
05TMARIN	11/19/2001	12:55		7.10		11.55		150	0.00	

**Mainstem Stillaguamish River at Hat Slough boat launch**

05TMARIN2	8/7/2000	14:05		18.20	7.15		8.60	81		
05TMARIN2	8/14/2000	14:17		18.20	7.16		9.70	95		
05TMARIN2	8/21/2000	14:37		19.80	7.85		10.70	80		
05TMARIN2	8/28/2000	13:58		17.40	7.47		9.75	103		
05TMARIN2	8/28/2000	13:58	R	17.40	7.35		9.75	103		
05TMARIN2	9/5/2000	14:00		15.80	7.02		9.00	105		
05TMARIN2	9/5/2000	14:05	R		7.02		8.95	105		

**Mouth of March Creek at 220th Street NE**

05TMARSH	6/12/2001	14:25		10.97	6.74	7.95		82.4		
05TMARSH	6/13/2001	12:20		14.40	6.59	4.86		169		4.73
05TMARSH	11/14/2001	10:30		10.27	6.63	5.88		165.3		4.33
05TMARSH	11/15/2001	10:05		10.84	6.46	4.80		170.2		4.23

**Martha Lake Creek at Soundview Drive**

05TMARTH	2/27/2001	10:35		3.20			12.10	143	0.00	
05TMARTH	3/29/2001	13:25		8.10			11.15	85		0.33
05TMARTH	4/19/2001	11:50		10.50			10.50	115	0.00	0.76
05TMARTH	5/9/2001	12:05		10.00			10.54	105		0.15
05TMARTH	6/6/2001	13:15		11.90			10.10	162		1 U
05TMARTH	7/11/2001	12:15		13.10			9.45	159	0.00	1 U
05TMARTH	8/22/2001	10:10		14.00			8.84	185	0.00	0.1
05TMARTH	9/19/2001	10:20		12.60			10.00	202	0.00	1 U
05TMARTH	10/17/2001	12:10		10.90			10.56	190	0.00	
05TMARTH	11/19/2001	11:11		8.90			9.65	174	0.00	0.05

**Martha Lake Creek outlet to Warm Beach**

05TMARTOL	7/11/2001	12:25		14.80			8.90	690	0.40	
05TMARTOL	8/22/2001	14:10		15.00			7.40	1250	1.00	
05TMARTOL	9/19/2001	10:30		13.10			9.16	680	0.02	

**Miller Creek at Miller Road**

05TMILLR	8/8/2000	8:55		17.70 E	7.55 E		5.25 E	261 E		2.30 E
05TMILLR	10/18/2000	9:00		12.02	7.48	6.87		256	0.10	
05TMILLR	6/12/2001	10:30		11.60	7.35	5.50		271		
05TMILLR	6/13/2001	12:39		12.81	6.77	5.54		346		22.86
05TMILLR	7/17/2001	15:15		16.70	7.80	10.10		239	0.11	0.82
05TMILLR	7/18/2001	11:55		16.27	7.44	7.48		254	0.12	1.56

Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O.		Conductivity µmhos/cm	Salinity ppt	Flow cfs
						mg/L	Winkler			

**Mainstem Stillaguamish River below Arlington WWTP outfall**

05TMIXZO	9/11/2000	11:23		11.91	7.66	10.58		34.2		
05TMIXZO	9/13/2000	9:50		12.54	7.49	9.81		58.14		
05TMIXZO	7/11/2001	11:22		17.40	7.15		9.95	70		
05TMIXZO	7/11/2001	15:20		20.20	7.72		10.25	68		
05TMIXZO	10/2/2001	12:20		11.85	7.56	9.87		74.1		

**Mainstem Stillaguamish River at Old Channel diversion**

05TMS3	9/11/2000	15:05		13.26	7.51	10.08		37.6		
05TMS3	9/13/2000	14:55		16.85	6.96	5.72		92.4		

**Mainstem Stillaguamish River below Silvana**

05TMS6	9/11/2000	14:40		12.63	7.77	10.33		38		
05TMS6	9/13/2000	14:15		14.90	7.60	9.79		60.7		

**Mainstem Stillaguamish River at Interstate 5 bridge**

05TMS11	9/11/2000	13:25		12.30	7.51	10.41		37.8		
05TMS11	9/12/2000	14:50		13.50	7.08			56		
05TMS11	9/12/2000	14:55	R	13.50	7.12			56		
05TMS11	9/13/2000	11:50		13.27	7.45	9.92		58.5		
05TMS11	1/31/2001	13:20		4.40				56		
05TMS11	5/8/2001	15:04		10.00	7.71		11.40	38		
05TMS11	6/12/2001	12:05		8.28	7.46	11.58	11.56	26.4		
05TMS11	6/13/2001	11:15		9.51	6.96	11.14		29		5150* J
05TMS11	7/12/2001	11:20		18.04	7.58	9.43		63.8	0.02	1168* J
05TMS11	10/2/2001	16:50		13.29	7.38	9.91		77.5		
05TMS11	10/3/2001	12:59		12.14	7.31	9.85		81.4		
05TMS11	10/4/2001	15:35		13.27	7.27	10.10	10.05	82.6		
05TMS11	10/16/2001	12:15		9.16	7.20	10.95		41.1	0.01	2393* J
05TMS11	11/14/2001	9:30		8.33	7.11	11.15		21.8		26108* J
05TMS11	11/15/2001	9:10		8.67	6.88	11.26		20.9		20507* J

\*Flows were calculated using a flow-discharge rating curve.

**Mainstem Stillaguamish River at WDFWS access point**

05TMS12	7/11/2001	12:30		18.40	7.51		10.35	71		
05TMS12	7/11/2001	17:25		20.30	7.99		10.80	74		
05TMS12	10/2/2001	18:25		13.43	7.42	10.10	9.95	77.2		

**Mainstem Stillaguamish River below March Creek**

05TMS13	9/11/2000	12:56		12.05	7.47	10.41		38.2		
05TMS13	9/13/2000	11:20		12.71	7.47	9.71		58.6		
05TMS13	10/2/2001	15:20		13.74	7.34	10.21		78.5		
05TMS13	10/4/2001	14:45		13.80	7.23	10.40	10.55	83.6		

**Mainstem Stillaguamish River below Armstrong Creek**

05TMS15	9/11/2000	12:20		12.01	7.47	10.44		38.1		
05TMS15	9/13/2000	10:40		12.55	7.52	9.88		57.6		
05TMS15	10/2/2001	14:10		12.50	7.40	9.81		76		
05TMS15	10/4/2001	13:38		12.28	7.20	9.98	9.85	80.6		

**Mainstem Stillaguamish River at Dike Road**

05TMS17	9/11/2000	11:40		11.81	7.40	10.55		37.5		
05TMS17	9/13/2000	10:05		12.42	7.61	9.91		56.6		
05TMS17	6/12/2001	14:45		8.56	7.35	12.17		26.1		
05TMS17	6/13/2001	12:50		10.35	6.94	12.00		25.7		
05TMS17	10/2/2001	12:10		12.12	7.55	9.81		74.6		
05TMS17	11/14/2001	11:20		8.41	7.22	11.50		17.8		
05TMS17	11/15/2001	10:25		8.66	7.00	11.25		21.4		

**North Fork Stillaguamish River at Cicero bridge**

05TNFCIC	9/12/2000	11:15		11.60	7.02			64		
05TNFCIC	1/31/2001	12:00		4.40				54		
05TNFCIC	5/8/2001	16:49		9.50	7.27		11.50	38		
05TNFCIC	6/12/2001	18:15		9.60	7.60	11.40		49		
05TNFCIC	6/13/2001	16:10		10.33	6.99	12.60		33.6		
05TNFCIC	7/12/2001	9:45		14.78	8.21	10.77	10.74	64.1	0.02	
05TNFCIC	10/16/2001	15:20		8.98	7.35		10.90	48.1	0.00	
05TNFCIC	11/14/2001	13:55		8.06	7.01	11.40		17.9		
05TNFCIC	11/15/2001	13:02		8.61	6.97	11.06		25.3		

Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O.		Conductivity µmhos/cm	Salinity ppt	Flow cfs
						mg/L	Meter Winkler			

**North Fork Stillaguamish River at C-post bridge**

05TNFCPO	9/12/2000	10:35		10.25	6.95			47		
05TNFCPO	6/12/2001	18:50		9.34	7.60	11.36		55		
05TNFCPO	6/13/2001	16:50		9.66	7.19	13.02		34.7		
05TNFCPO	11/14/2001	14:25		7.86	6.90	11.10		17.1		
05TNFCPO	11/15/2001	13:35		8.44	6.93	10.70		24.1		

**Mouth of the North Fork Stillaguamish River at Twin Rivers Park**

05TNFTWI	8/7/2000	13:05		17.45	7.87		9.85	76		
05TNFTWI	8/14/2000	11:45		16.00	7.34			88		
05TNFTWI	8/21/2000	11:06		14.60	8.17		10.30	80		
05TNFTWI	8/28/2000	11:05		14.30	7.85		10.35	95		
05TNFTWI	9/5/2000	11:45		13.70	7.46		10.50	96		
05TNFTWI	9/11/2000	11:19		12.40	7.21			57		
05TNFTWI	9/12/2000	12:55		13.50	7.24			65		
05TNFTWI	9/13/2000	10:10		12.80	7.75			78		
05TNFTWI	6/12/2001	16:40		9.56	7.44	11.66		27.4		
05TNFTWI	6/13/2001	15:45		10.50	6.94	11.42		34.2		
05TNFTWI	7/11/2001	13:40		18.40	7.86		11.15	77		
05TNFTWI	10/2/2001	10:21		11.44	7.61	10.60	9.55	84.1		
05TNFTWI	11/15/2001	12:10		8.73	6.91	10.54		25.2		

**North Fork Stillaguamish River at the Whitman Road bridge**

05TNFWHI	8/7/2000	11:45		14.50	8.33		11.20	66		
05TNFWHI	8/14/2000	12:27		13.80	8.23		11.60	74		
05TNFWHI	8/21/2000	12:00		13.30	8.25		11.65	75		
05TNFWHI	8/28/2000	12:37		13.50	7.56		11.10	78		
05TNFWHI	9/5/2000	10:20		10.70	6.93		11.20	86		
05TNFWHI	9/12/2000	10:55		11.00	6.94			58		
05TNFWHI	6/12/2001	18:35		9.72	7.84	11.36		55		
05TNFWHI	6/13/2001	16:30		10.18	7.19	16.30	11.18	35.4		
05TNFWHI	11/14/2001	14:10		7.95	6.91	11.09		18.2		
05TNFWHI	11/15/2001	13:20		8.55	6.88	10.76		26.3		

**North branch of the mainstem Stillaguamish River at Hwy. 530 bridge**

05TNORTH	9/11/2000	14:12		12.48	7.56	10.15		37.1		
05TNORTH	9/13/2000	13:45		14.46	7.65	9.68		58.4		
05TNORTH	6/12/2001	11:00		8.44	7.77	12.86		24.1		
05TNORTH	6/13/2001	10:40		9.60	6.92	11.37		26.2		
05TNORTH	10/3/2001	14:05		12.94	7.32	9.42		78		
05TNORTH	11/14/2001	8:35		8.44	7.17	11.40		28.9		
05TNORTH	11/15/2001	8:20		8.88	6.75	11.05	11.05	21.2		

**Old Stillaguamish River channel near Irvine Slough**

05TOC1	8/8/2000	13:33		18.62	7.45		9.23	13900		
05TOC1	8/8/2000	13:33						14600*	8.0*	
05TOC1	8/8/2000	13:45	R					14400*	8.0*	
05TOC1	8/8/2000	15:52		19.52	7.53	9.50		12544		
05TOC1	8/9/2000	13:25		19.90	7.61	10.40		14630	9.5*	
05TOC1	10/17/2000	11:55		11.48	7.75	9.10		26604	16.20	
05TOC1	10/18/2000	10:15		12.30	7.90	8.57		31547	19.60	
05TOC1	6/12/2001	14:00		10.00	7.57	10.25		254		
05TOC1	6/13/2001	16:55		14.00	7.58	9.76		449		
05TOC1 (0.5' depth)	7/17/2001	12:40		19.21	7.65	8.10		12641	7.25	
05TOC1 (2.5' depth)	7/17/2001	12:41		19.17	7.61	7.60		12750	7.31	
05TOC1 (5.0' depth)	7/17/2001	12:43		19.03	7.52	6.85		13165	7.55	
05TOC1 (0.5' depth)	7/18/2001	15:05		22.58	7.65	9.50		21964	12.95	
05TOC1 (3.5' depth)	7/18/2001	15:06		22.31	7.64	9.52		22500	13.60	
05TOC1	11/14/2001	10:45		9.64	7.23	9.04	8.50	3354		
05TOC1	11/15/2001	10:33		9.04	7.35	10.68		57.8		

\*Analyzed by MEL, salinity was reported in g/Kg ww and conductivity was reported in umhos/cm



Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O.		Conductivity µmhos/cm	Salinity ppt	Flow cfs
						Meter	Winkler			

**Old Stillaguamish River channel above the Stanwood WWTP outfall**

05TOC2	8/8/2000	13:55		22.12	7.69		9.41	12100		
05TOC2	8/8/2000	13:55						14400*	7.5*	
05TOC2	8/8/2000	15:35		23.04	7.81	10.53		12160		
05TOC2	8/9/2000	12:52		21.23	7.91	12.15		5879	3.0*	
05TOC2	10/17/2000	10:40		11.48	7.80	9.02		24624	14.90	
05TOC2	10/18/2000	9:50		12.20	7.80	8.57	8.30	24176	14.60	
05TOC2	6/12/2001	13:08		9.49	7.74	10.35		95		
05TOC2	6/13/2001	14:00		12.50	7.46	9.90		141		
05TOC2 (0.5' depth)	7/17/2001	11:25		18.45	7.58	9.28	8.93	8076	4.50	
05TOC2 (2.5' depth)	7/17/2001	11:27		18.43	7.53	8.72		8100	4.52	
05TOC2 (0.5' depth)	7/18/2001	15:35		21.23	7.64	10.50		12635	7.26	
05TOC2 (3.5' depth)	7/18/2001	15:37		21.23	7.64	10.50		12635	7.26	
05TOC2	11/14/2001	10:20		8.98	7.10	10.39		131		
05TOC2	11/15/2001	10:05		9.04	7.03	11.13		36.1		

\*Analyzed by MEL, salinity was reported in g/Kg ww and conductivity was reported in umhos/cm

**Old Stillaguamish River channel at the Marine Drive bridge**

05TOC3	8/8/2000	15:08		22.40	7.80	10.66		7970		
05TOC3	8/8/2000	15:08						9380*	5.0*	
05TOC3	8/8/2000	15:08	R	23.00	7.89		11.48	7840		
05TOC3	8/9/2000	11:28		20.43	7.38	10.90		2555	2* U	
05TOC3	10/5/2000	9:40		9.80	6.11			1000 G		
05TOC3	10/5/2000	9:40			7.1*					
05TOC3	10/17/2000	13:50		11.70	7.72	8.80		6800	3.80	
05TOC3	10/18/2000	9:15		12.20	7.70	8.38		8756	4.90	
05TOC3	10/18/2000	13:15		12.40	8.05	8.67		8264	4.60	
05TOC3	1/31/2001	15:10		5.65				104		
05TOC3	1/31/2001	15:15	R	5.65				104		
05TOC3	5/8/2001	11:50		10.20	7.31			74		
05TOC3	6/12/2001	10:53		8.88	7.65	10.77		62		
05TOC3	6/13/2001	13:05		11.20	7.23	10.05		86		
05TOC3	7/12/2001	12:40		22.14	8.00	11.23		4232	2.32	
05TOC3 (0.5' depth)	7/17/2001	10:05		17.42	7.18	5.80		3262	1.76	
05TOC3 (2.5' depth)	7/17/2001	10:07		17.42	7.18	5.55		3250		
05TOC3 (0.5' depth)	7/17/2001	10:15	R						1.76	
05TOC3	7/18/2001	15:55		21.73	7.71	13.60	13.38	5842	3.21	
05TOC3	10/16/2001	10:00		9.56	7.00	9.68	9.18	270	0.13	
05TOC3	11/14/2001	9:45		8.80	7.04	10.75		62.9		
05TOC3	11/15/2001	9:45		8.90	6.93	11.73		24.3		

\*Analyzed by MEL, salinity was reported in g/Kg ww and conductivity was reported in umhos/cm

**Old Stillaguamish River channel at the Norman Road bridge**

05TOC4	8/8/2000	14:40		22.36	7.96		16.33	3200	2* U	
05TOC4	8/8/2000	14:40						3530*		
05TOC4	10/17/2000	10:15		10.80	7.77	10.15		115	0.00	
05TOC4	10/18/2000	8:40		11.04	7.87	8.18		103	0.00	
05TOC4	6/12/2001	10:10		8.54	7.90	11.45	11.25	49		
05TOC4	6/13/2001	11:48		9.77	7.28	11.03		53		
05TOC4	7/17/2001	6:10		16.76	6.96	2.62		935.5	0.49	
05TOC4	7/18/2001	18:15		18.28	7.16	7.43		176	0.08	
05TOC4	11/14/2001	9:00		8.60	7.25	11.61		36.1		
05TOC4	11/15/2001	9:00		8.84	7.063	11.50		20.1		

\*Analyzed by MEL, salinity was reported in g/Kg ww and conductivity was reported in umhos/cm

**Pilchuck Creek at Jackson Gulch Road**

05TPILCH	8/7/2000	13:44		17.50	6.90			95		
05TPILCH	8/7/2000	13:46					7.90			
05TPILCH	8/14/2000	14:47		17.40	6.86		8.70	100		
05TPILCH	8/21/2000	13:09		17.20	8.10		9.30	94		
05TPILCH	8/28/2000	13:30		15.35	7.20		8.60	97		
05TPILCH	9/5/2000	14:25		14.40	7.00		9.00	100		
05TPILCH	9/11/2000	13:11		13.00	7.77		9.70	50		
05TPILCH	9/12/2000	16:10		14.80	7.17			59		
05TPILCH	9/13/2000	14:00		15.00	7.70		9.20	70		
05TPILCH	6/12/2001	10:15		8.52	7.99	11.85	11.20	22.1		
05TPILCH	6/13/2001	9:00		9.41	6.88	12.32		28.7		
05TPILCH	10/3/2001	15:45		12.58	7.13		9.08	54		
05TPILCH	10/3/2001	15:45	R				9.07			
05TPILCH	10/3/2001	15:47				9.07				
05TPILCH	11/14/2001	9:10		9.14	6.85	10.70		25.9		
05TPILCH	11/15/2001	9:35		9.56	6.54	10.31	10.30	28.4		

Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O. mg/L Meter Winkler		Conductivity µmhos/cm	Salinity ppt	Flow cfs
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**Downstream of the mouth of Pilchuck Creek in North Stillaguamish Slough**

05TPILDOWN	9/13/2000	13:15		14.12	7.41	9.82		58.6		
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**Upstream of the mouth of Pilchuck Creek in North Stillaguamish Slough**

05TPILUP	9/13/2000	13:10		13.95	7.46	9.93		58.5		
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**Portage Creek at the 212th Street bridge**

05TPORT	9/11/2000	14:12		12.70	6.75		6.15	222		
05TPORT	9/12/2000	15:05		12.40	7.21			221		
05TPORT	9/13/2000	16:25		12.50	7.64		6.10	230		
05TPORT	9/13/2000	16:29	R				5.45			
05TPORT	6/12/2001	13:30		10.55	6.94	8.56		87.6		
05TPORT	6/13/2001	11:45		11.30	6.70	8.90	7.64	89.5		
05TPORT	10/3/2001	13:25		10.18	7.08	5.81		782.6		
05TPORT	11/14/2001	10:10		8.51	7.09	10.40	10.95	35		
05TPORT	11/15/2001	8:50		9.82	6.62	7.30		87.7		

**South Fork Stillaguamish River below Granite Falls**

05TSFGRA	9/12/2000	11:55		11.20	6.93			35		
05TSFGRA	6/12/2001	18:35		8.53	7.56	12.71	11.54	19.1		
05TSFGRA	6/13/2001	18:15		9.60	7.27	12.16		25.2		
05TSFGRA	11/14/2001	15:38		8.45	6.44	11.95	11.95	13.7		
05TSFGRA	11/15/2001	14:25		8.95	7.05	11.76		18.2		

**South Fork Stillaguamish River at the Jordan walkway bridge**

05TSFJOR	8/7/2000	12:30		17.50	6.55			54		
05TSFJOR	8/14/2000	10:45		14.50	7.22		10.05	68		
05TSFJOR	8/21/2000	13:00		16.30	7.95			59		
05TSFJOR	8/21/2000	16:10		17.90	7.94		10.12	57		
05TSFJOR	8/21/2000	16:15	R	17.90	8.06			57		
05TSFJOR	8/28/2000	11:50		13.90	7.60		10.55	66		
05TSFJOR	9/5/2000	11:10		13.20	6.96		10.75	76		
05TSFJOR	9/12/2000	12:15		12.25	7.01			30		
05TSFJOR	6/12/2001	18:15		8.75	7.47	12.51		22.3		
05TSFJOR	6/13/2001	17:50		9.95	7.22	13.24	11.20	25.2		
05TSFJOR	11/14/2001	15:15		8.33	6.92	11.91		14.4		
05TSFJOR	11/15/2001	14:45		8.57	7.08	11.51	11.70	20		

**Mouth of the South Fork Stillaguamish River at Twin Rivers Park**

05TSFTWI	8/7/2000	13:00		17.00	7.87		9.75	60		
05TSFTWI	8/14/2000	11:50		16.80	7.30			65		
05TSFTWI	8/21/2000	11:08		14.60	8.22		9.60	64		
05TSFTWI	8/28/2000	11:05		14.50	8.06		10.05	75		
05TSFTWI	9/5/2000	11:50		14.20	7.49		10.10	78		
05TSFTWI	9/11/2000	11:24		11.70	7.41		10.70	37		
05TSFTWI	9/12/2000	12:57		14.40	7.05			42		
05TSFTWI	9/13/2000	10:20		12.40	7.50			54		
05TSFTWI	10/5/2000	11:22		9.00	6.46			55		
05TSFTWI	1/31/2001	11:00		4.10	7.11			50		
05TSFTWI	5/8/2001	15:53		9.90	8.43		11.30	30		
05TSFTWI	6/12/2001	16:20		8.98	7.49	11.73		26.4		
05TSFTWI	6/13/2001	15:25		10.60	6.96	12.06		27.5		
05TSFTWI	7/11/2001	13:45		18.90	7.30		10.10	59		
05TSFTWI	7/12/2001	10:25		17.09	7.74	9.69		49.7	0.01	
05TSFTWI	10/2/2001	10:27		10.86	7.57	10.50		62.5		
05TSFTWI	10/16/2001	14:30		7.13	9.1 *			33.17	0.00	
05TSFTWI	11/14/2001	13:30		8.44	6.98	11.68		156		
05TSFTWI	11/15/2001	11:55		8.71	7.07	10.90		20.6		

\* Questionable reading instrument battery was low.

**Mainstem Stillaguamish River below Silvana off Norman Road**

05TSILVA	6/12/2001	9:25		8.56	8.32	13.24		26.2		
05TSILVA	6/13/2001	10:20		9.58	7.07	10.77		28.4		
05TSILVA	10/3/2001	14:25		13.52	7.35	9.90		82.9		
05TSILVA	11/14/2001	8:05		8.53	7.25	11.40	11.05	32.8		
05TSILVA	11/15/2001	8:00		8.79	6.85	11.67		20.1		

Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O. mg/L		Conductivity µmhos/cm	Salinity ppt	Flow cfs
						Meter	Winkler			

**South Pass at the end of Eide Road**

05TSOUTH	8/8/2000	13:18		20.05	7.61		9.19	21800	16.0*	
05TSOUTH	8/8/2000	13:18						26300*		
05TSOUTH	10/17/2000	10:00		11.50	8.13	9.08		31379	19.50	
05TSOUTH	10/18/2000	10:40		12.30	7.81	8.70		30116	18.60	
05TSOUTH	2/27/2001	13:40		7.00			12.80	8250	7.50	
05TSOUTH	3/29/2001	9:10		7.80			9.93	14200	13.20	
05TSOUTH	4/19/2001	7:35		10.10			10.05	9800	8.00	
05TSOUTH	5/9/2001	8:50		11.90			9.72	16000	13.30	
05TSOUTH	6/6/2001	9:15		16.20			9.20	13500	8.50	
05TSOUTH	6/12/2001	15:00		10.54	7.74	10.17		431		
05TSOUTH	6/13/2001	18:05		14.15	7.90	9.50		654		
05TSOUTH	7/11/2001	10:15		18.20			7.20	26100	19.00	
05TSOUTH	7/17/2001	13:00		19.00	7.80	8.41		18700	10.99	
05TSOUTH	7/18/2001	14:45		22.13	7.59	8.90		24985	15.12	
05TSOUTH	8/22/2001	12:15		17.00			7.44	28100	21.20	
05TSOUTH	9/19/2001	8:40		13.50			6.79	27200	22.10	
05TSOUTH	9/19/2001	8:40	R				6.31			
05TSOUTH	10/17/2001	9:05		8.90			9.18	17900	24.90	
05TSOUTH	11/14/2001	11:48		9.94	7.50	9.93		13267		
05TSOUTH	11/15/2001	11:10		9.21	7.13	10.79		383.5		
05TSOUTH	11/19/2001	14:35		8.50			9.90	10000	8.50	

\*Analyzed by MEL, salinity was reported in g/Kg ww and conductivity was reported in umhos/cm

**Stanwood WWTP effluent**

05TSTAN	10/17/2000	10:30		11.80	8.14	3.88		1000		
05TSTAN	6/12/2001	12:55		15.21	7.69	4.06		745		1.55*
05TSTAN	6/13/2001	14:40		19.00	7.80	7.20		743		0.84*

\*Reported by Stanwood WWTP in millions of gallons per day (MGD).

**Twin City Foods drain #1 at dike**

05TTCF1	2/27/2001	12:25		6.50				7000	6.50	
05TTCF1	3/29/2001	9:45		7.50			11.20	9000	6.00	
05TTCF1	4/19/2001	8:10		10.50			12.80	9500	7.30	
05TTCF1	5/9/2001	9:50		12.00			12.55	9100	7.00	
05TTCF1	6/6/2001	10:15		16.00			8.97	10300	7.30	1.60
05TTCF1	6/12/2001	16:08		14.50	7.21	8.57		7900		3.42
05TTCF1	6/13/2001	15:49		18.20	7.12	7.60		6555		3.07
05TTCF1	7/11/2001	11:00		21.40			7.64	25500	17.20	0.00
05TTCF1	7/18/2001	9:17		17.31	7.23	3.00	3.45	22204	13.30	0.66
05TTCF1	8/22/2001	12:50		17.20			4.93	12100	8.70	0.6
05TTCF1	9/19/2001	9:30		15.60			3.51	13600	10.00	0
05TTCF1	10/17/2001	9:40		8.30			7.86	7500	6.50	
05TTCF1	11/14/2001	13:20		11.33	6.83	5.47		5300		
05TTCF1	11/15/2001	11:55		11.41	6.67	7.17		6176		

**Twin City Foods drain #2 on Thomle Road**

05TTCF2	6/12/2001	16:40		15.64	7.28	12.70	12.45	7500		
05TTCF2	6/13/2001	16:10		20.60	7.18	15.00	15.45	6950		0.41
05TTCF2	7/17/2001	12:05		17.13	7.33	5.80		18200	10.74	0.5
05TTCF2	7/18/2001	9:40		17.21	7.23	3.80		20170	12.01	
05TTCF2	11/15/2001	12:15		10.09	6.98	9.18	9.70	359.4		

**Twin City Foods drain #3 on Thomle Road**

05TTCF3	6/12/2001	16:35		15.70	6.93	8.50		3780		
05TTCF3	6/13/2001	16:29		19.40	6.90	10.97		4680		1.58
05TTCF3	7/17/2001	11:48		17.55	7.44	6.68		20724	12.35	0.50
05TTCF3	7/18/2001	10:00		17.76	7.44	5.50		20586	12.27	0.52

**Twin City Foods drain #4 to Hatt Slough\***

05TTCF4	2/27/2001	11:00		8.00			8.40	5700	5.00	
05TTCF4	3/29/2001	10:25		11.00			8.80	14000	11.90	
05TTCF4	4/19/2001	9:10		11.00				14000	11.80	
05TTCF4	5/9/2001	10:25		12.50			8.78	5500	4.30	
05TTCF4	6/6/2001	11:10		12.10			18.76	12900	5.20	
05TTCF4	7/11/2001	11:40		14.00			4.15	3600	2.80	
05TTCF4	8/22/2001	13:40		15.00			11.82	6500	5.00	
05TTCF4	9/19/2001	10:00		12.00			1.18	5300	4.20	
05TTCF4	10/17/2001	10:05		10.80			6.34	11100	9.00	

\*Drain was always plugged and never discharging to Hatt Slough during sampling events.

Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O.		Conductivity µmhos/cm	Salinity ppt	Flow cfs
						Meter	Winkler			

**Twin City Foods drain #5 at footbridge above Thomle Road**

05TTCF5	8/9/2000	12:25		18.76	7.53	7.89		8600		
05TTCF5	8/9/2000	12:25						10300*	5.5*	
05TTCF5	2/27/2001	12:55		6.50			13.20	4130	3.80	
05TTCF5	6/12/2001	15:35		14.07	6.92	6.92		6668	10.39	2.22
05TTCF5	6/13/2001	13:29		15.30	6.67	6.19		2900	8.78	4.23
05TTCF5	7/17/2001	10:50		17.77	7.38	4.25		17660		1
05TTCF5	7/18/2001	10:13		18.66	7.64	6.05		15100		2.07
05TTCF5	11/14/2001	13:47		9.73	7.15	7.23		3720		
05TTCF5	11/15/2001	12:25		10.38	7.09	8.38		1596		

\*Analyzed by MEL, salinity was reported in g/Kg ww and conductivity was reported in umhos/cm

**Unnamed Creek #0456 at the end of Soundview Drive**

05TUNIDE	3/29/2001	13:45		7.90			11.80	118	0.00	0.22
05TUNIDE	4/19/2001	12:05		9.80			11.50	142		0.24
05TUNIDE	5/9/2001	12:25		10.10			9.55	160		0.04
05TUNIDE	5/9/2001	12:30	R				9.62			
05TUNIDE	6/6/2001	13:30		12.90			8.72	189		
05TUNIDE	8/22/2001	9:45		15.50				195	0.00	
05TUNIDE	10/17/2001	11:50		10.40			8.62	179	0.00	
05TUNIDE	11/19/2001	11:30		9.30			9.50	163	0.00	0.09

**Warm Beach WWTP effluent at Warm Beach**

05TWAREF	2/27/2001	10:05		5.40				4	-0.10	
05TWAREF	3/29/2001	12:20		9.50		9.80		10		
05TWAREF	4/19/2001	10:45		12.70				510	0.30	
05TWAREF	5/9/2001	11:20		13.30				433		
05TWAREF	6/6/2001	12:15		14.90		6.95		458		
05TWAREF	7/11/2001	13:15		20.40		8.19		510	0.00	
05TWAREF	8/22/2001	10:50		14.00		4.50		245	0.00	
05TWAREF	10/17/2001	11:05		11.10		6.80		202	0.00	
05TWAREF	11/19/2001	12:00		9.00		7.25		179	0.00	

**Pump pond slough at Warm Beach**

05TWARSL	2/27/2001	9:42		5.60				4290	4.10	
05TWARSL	3/29/2001	12:45		9.00		9.10		3050	2.50	
05TWARSL	4/19/2001	10:55		11.90				2280	1.90	
05TWARSL	5/9/2001	11:50		11.00				3200	2.50	
05TWARSL	6/6/2001	12:30		13.10		5.87		950	0.50	
05TWARSL	7/11/2001	13:35		16.00		3.03		850	0.50	
05TWARSL	8/22/2001	11:15		14.00		4.60		580	0.50	
05TWARSL	9/19/2001	11:40		12.00		4.40		600	0.02	
05TWARSL	10/17/2001	11:15		10.20		5.61		2050	1.60	
05TWARSL	11/19/2001	12:17		9.90		6.95		2450	2.00	

**Field ditch to pump pond at Warm Beach**

05TWARDG	2/27/2001	9:25		5.40		8.90		1880	1.40	
05TWARDG	3/29/2001	12:35		9.70		11.10		2090	1.80	
05TWARDG	4/19/2001	11:05		11.80		11.95		1950	1.50	
05TWARDG	5/9/2001	11:35		11.80				2420	2.00	
05TWARDG	6/6/2001	12:35		14.00				2150	1.80	
05TWARDG	7/11/2001	13:45		18.10				4380	3.00	
05TWARDG	8/22/2001	11:25		16.00		6.06		3500	2.30	
05TWARDG	9/19/2001	11:50		13.10		4.13		1400	0.90	
05TWARDG	10/17/2001	11:25		10.00		5.22		1600	1.10	
05TWARDG	11/19/2001	12:30		10.00				3500	3.00	

**Warm Beach Creek upstream of WWTP outfall**

05TWARUP	2/27/2001	10:10		5.80				141	0.00	
05TWARUP	3/29/2001	12:15		9.10				158		0.63
05TWARUP	4/19/2001	10:35		10.50		8.35		198	0.00	0.43
05TWARUP	5/9/2001	11:05		9.00		7.90		155	0.10	0.57
05TWARUP	6/6/2001	11:50		11.00		6.38		171	0.10	0.35
05TWARUP	7/11/2001	13:10		12.70		4.69		163	0.00	0
05TWARUP	8/22/2001	10:45		11.50		3.82		170	0.00	0
05TWARUP	9/19/2001	10:55		11.00		5.05		176	0.00	
05TWARUP	10/17/2001	10:55		11.00		3.90		170	0.00	
05TWARUP	10/17/2001	10:55	R			3.85				
05TWARUP	11/19/2001	11:55		8.20				160	0.00	

Station	Date	Time	Field Replicate	Temp. °C	pH std. units	D.O.		Conductivity µmhos/cm	Salinity ppt	Flow cfs
						Meter	Winkler			

**Warm Beach Creek above camp stables**

05TWARUS	9/19/2001	11:15		11.00			10.62	120	0.00	0.1
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**West pass of Old Stillaguamish River Channel at Hwy. 532 bridge in Stanwood**

05TWEST	8/8/2000	13:00		17.93	7.21		9.12	11600		
05TWEST	8/8/2000	13:00						13700*	7.5*	
05TWEST	8/9/2000	13:40		18.10	7.44	9.23		11500		
05TWEST	10/17/2000	9:30		11.43	7.84	8.22		42862	27.60	
05TWEST	10/18/2000	10:55		12.20	8.00	7.83		41076	26.30	
05TWEST	6/12/2001	14:48		10.79	7.50	9.84		695		
05TWEST	6/13/2001	18:26		14.70	7.07	9.30		1080		
05TWEST	7/17/2001	13:20		18.78	7.81	9.10		18100	10.65	
05TWEST	7/18/2001	14:45		17.55	7.35	8.65		16112	9.40	
05TWEST	11/14/2001	11:32		9.48	7.28	9.51		4753		
05TWEST	11/15/2001	10:48		9.11	7.05	10.75		177.5		

\*Analyzed by MEL, salinity was reported in g/Kg ww and conductivity was reported in umhos/cm

Table C-2. General chemistry analyses data for the Stillaguamish River TMDL.

**Arlington WWTP effluent**

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TARLIN	9/12/2000	13:20			221					
05TARLIN	9/13/2000	11:17			152*	3*			3*	
05TARLIN	6/12/2001	15:40			29.8	7 J			11	
05TARLIN	6/13/2001	14:05			38.2				8	
05TARLIN	10/2/2001	11:10			93.5	3 U			2	
05TARLIN	10/16/2001	14:00							7	
05TARLIN	11/14/2001	12:40			87.5	2 U			3	
05TARLIN	11/15/2001	11:25			82.7				3	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TARLIN	9/12/2000	13:20		0.634	0.980	2.79		4.36		
05TARLIN	9/13/2000	11:17		0.223	2.100	3.47		4.40	7.2	7.0
05TARLIN	6/12/2001	15:40		0.087	0.631	1.99	2.32	2.47		
05TARLIN	6/13/2001	14:05		0.101	0.934	1.54	2.41	2.59		
05TARLIN	10/2/2001	11:10		0.121 J	2.370	3.27 J	3.17	3.36 J	7.1	
05TARLIN	11/14/2001	12:40		0.082	1.510	2.38	2.51	2.71		
05TARLIN	11/15/2001	11:25		0.074	1.610	2.31	2.66	2.88		

\*24 hour composite sample

**Armstrong Creek at the hatchery gaging station**

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TARMST	9/11/2000	12:10			3.75					
05TARMST	9/11/2000	12:15	R		3.77					
05TARMST	9/13/2000	13:20			3.76					
05TARMST	6/12/2001	15:00			1.83	4 UJ			112 J	
05TARMST	6/13/2001	13:15			2.4				36 J	
05TARMST	11/14/2001	11:36			3.99	3 U			13	
05TARMST	11/15/2001	10:35			3.81				10	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TARMST	9/11/2000	12:10		0.01 U	0.680	0.863	0.018	0.045	3.8	
05TARMST	9/11/2000	12:15	R	0.01 U	0.676	0.881	0.017	0.045	3.8	
05TARMST	9/13/2000	13:20		0.01 U	0.788	0.913	0.018	0.046	2.5	
05TARMST	6/12/2001	15:00		0.011	0.985	1.25	0.009	0.092		
05TARMST	6/13/2001	13:15		0.01 U	1.19	1.33	0.008	0.038		
05TARMST	11/14/2001	11:36		0.017	0.456	0.687	0.011	0.046		
05TARMST	11/15/2001	10:35		0.017	0.845	1.11	0.0091	0.039		

Church Creek/Jorgenson Slough at Marine Drive

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TCHURH	8/8/2000	10:30	R			3			4	
05TCHURH	10/5/2000	8:45								
05TCHURH	10/17/2000	13:20								
05TCHURH	10/18/2000	14:00								
05TCHURH	10/18/2000	14:10								
05TCHURH	1/31/2001	14:30								
05TCHURH	5/8/2001	13:23								
05TCHURH	6/12/2001	11:20								
05TCHURH	6/13/2001	18:45								
05TCHURH	7/12/2001	13:50								
05TCHURH	7/17/2001	14:45								
05TCHURH	7/18/2001	11:21								
05TCHURH	10/16/2001	11:20								
05TCHURH	11/14/2001	12:50								
05TCHURH	11/15/2001	11:30								
05TCHURH	11/15/2001	11:30								
05TCHURH	8/8/2000	10:30	R	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TCHURH	10/17/2000	13:20		0.01 U	0.01 U	0.342	0.027	0.101	7.8	
05TCHURH	10/18/2000	14:00		0.198	0.325	0.662	0.027	0.082 J	6.0	6.0
05TCHURH	10/18/2000	14:00		0.092	0.331	0.585		0.060	6.2	
05TCHURH	10/18/2000	14:00		0.084	0.332	0.614		0.059	6.1	
05TCHURH	6/12/2001	11:20		0.060	0.818	1.31	0.048	0.224		
05TCHURH	6/13/2001	18:45		0.040	0.879	1.32	0.034	0.107		
05TCHURH	7/17/2001	14:45		0.01 U	0.128	0.602	0.016	0.094	8.6	
05TCHURH	7/18/2001	11:21		0.024	0.294	0.697	0.018	0.060	7.6	
05TCHURH	11/14/2001	12:50		0.053	0.298	0.801	0.031	0.078		
05TCHURH	11/15/2001	11:30		0.085	0.784	1.34	0.0424	0.092		

Confluence of the North and South Forks of the Stillaguamish River at Hwy. 9

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		VOM mg/L	TSS mg/L	TNVSS mg/L							
							water	tissue										
05TCONFL	9/11/2000	11:05	R		24.8	3 U	2.4		57	8	7							
05TCONFL	9/13/2000	9:25																
05TCONFL	7/11/2001	15:55																
05TCONFL	7/11/2001	16:00																
05TCONFL	7/11/2001	16:05																
05TCONFL	10/2/2001	12:06																
05TCONFL	10/2/2001	19:10																
05TCONFL	10/2/2001	19:15																
05TCONFL	10/2/2001	19:20																
05TCONFL	9/11/2000	11:05															4.5	4.4
05TCONFL	9/13/2000	9:25															2.4	2.3
05TCONFL	7/11/2001	15:55													0.005 U	0.012		
05TCONFL	10/2/2001	12:06															1.6	
05TCONFL	10/2/2001	19:10													0.0071	0.013 J		

Cook Slough at the Hwy. 530 bridge near Silvana

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L							
							water	tissue									
05Tcook	9/11/2000	13:45	R		1.09				117								
05Tcook	9/13/2000	14:20															
05Tcook	9/13/2000	14:24															
05Tcook	6/12/2001	11:30															
05Tcook	6/12/2001	11:40															
05Tcook	6/13/2001	9:35															
05Tcook	10/3/2001	13:48															
05Tcook	11/14/2001	8:50															
05Tcook	11/15/2001	8:37															
05Tcook	9/11/2000	13:45															
05Tcook	9/13/2000	14:20															
05Tcook	9/13/2000	14:24															
05Tcook	6/12/2001	11:30															
05Tcook	6/13/2001	9:35															
05Tcook	10/3/2001	13:48															
05Tcook	11/14/2001	8:50															
05Tcook	11/15/2001	8:37															

Douglas Slough south of Hwy. 532

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TDOUG	10/17/2000	12:55	R		2160	4 UJ 2			14	
05TDOUG	10/18/2000	12:05							14	
05TDOUG	6/12/2001	14:20							12	
05TDOUG	6/12/2001	14:25							17	
05TDOUG	6/13/2001	17:35							9	
05TDOUG	7/18/2001	10:45							2 U 18	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TDOUG	10/17/2000	12:55	R	0.623	0.124	0.896	0.199	0.531 J	4.4	2
05TDOUG	10/18/2000	12:05		0.638	0.299	0.927	0.206	0.392	4.2	
05TDOUG	6/12/2001	14:20		0.209	0.941	1.38	0.141	0.233		
05TDOUG	6/12/2001	14:25		0.211	0.926	1.4	0.143	0.231		
05TDOUG	6/13/2001	17:35		0.567	0.567	1.45	0.031	0.291		
05TDOUG	6/13/2001	17:40		0.58	0.566	1.48	0.058	0.273		
05TDOUG	7/18/2001	10:45	0.181	0.049	0.42	0.043	0.168	4.8		

Glade Bekken at Silvana Terrace Road

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TGLAD	9/11/2000	14:53			6.76	3 U 8			786	37 J
05TGLAD	9/13/2000	14:45			6.87					
05TGLAD	6/12/2001	9:30			4.65					
05TGLAD	6/13/2001	11:08			4.62					
05TGLAD	10/3/2001	15:15			7.77					
05TGLAD	11/14/2001	14:25			7.97					
05TGLAD	11/15/2001	8:20	7.88	4 U	41					
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TGLAD	9/11/2000	14:53		0.01 U	0.399	0.675	0.044	0.087	6.3	6.1
05TGLAD	9/13/2000	14:45		0.01 U	0.394	0.629	0.046	0.094	5.9	
05TGLAD	6/12/2001	9:30		0.070	0.671	1.31	0.024	0.539		
05TGLAD	6/13/2001	11:08		0.024	0.853	1.19	0.021	0.071		
05TGLAD	10/3/2001	15:15		0.013 J	0.331	0.501 J	0.0435	0.0555 J	6.5	
05TGLAD	11/14/2001	14:25		0.017	0.688	1.13	0.024	0.093		
05TGLAD	11/15/2001	8:20	0.023	1.2	1.71	0.024	0.092			

Mouth of Harvey Armstrong Creek

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05THARAR	9/11/2000	11:55			3.99	3 U 4 U			4	
05THARAR	9/13/2000	10:25			4.04					
05THARAR	10/2/2001	13:21			4.33					
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05THARAR	9/11/2000	11:55		0.01 U	0.661	0.789	0.017	0.047	4.6	
05THARAR	9/13/2000	10:25		0.01 U	0.776	0.917	0.017	0.049	3.1	
05THARAR	10/2/2001	13:21		0.01 UJ	0.837	1.01 J	0.018	0.024 J	3.5	



Irvine Slough at dike pump station

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TIRVIN	8/8/2000	9:55				3 U				
05TIRVIN	8/9/2000	14:50				3 U			8	
05TIRVIN	10/17/2000	11:30							8	
05TIRVIN	10/18/2000	10:22							7	
05TIRVIN	6/12/2001	13:45				4 J			26	
05TIRVIN	6/13/2001	17:08							5	
05TIRVIN	7/17/2001	14:20				6			8	
05TIRVIN	7/18/2001	11:00				3			13	
05TIRVIN	11/14/2001	11:05				3 U			14	
05TIRVIN	11/14/2001	11:10	R			3 U			13	
05TIRVIN	11/15/2001	10:20							54	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TIRVIN	8/8/2000	9:55		0.241	0.085	0.751	0.005	0.082	11.5	
05TIRVIN	8/9/2000	14:50		0.161	0.115	0.617		0.065	10.0	
05TIRVIN	10/17/2000	11:30		0.267	0.657	1.31	0.014	0.133 J	6.7	6.2
05TIRVIN	10/18/2000	10:22		0.163	0.336	0.731		0.071	8.7	
05TIRVIN	6/12/2001	13:45		0.106	0.972	1.55	0.018	0.164		
05TIRVIN	6/13/2001	17:08		0.187	1.78	2.68	0.011	0.090		
05TIRVIN	7/17/2001	14:20		0.585	0.031	0.937	0.011 J	0.086	13.5	
05TIRVIN	7/18/2001	11:00		0.533	0.03	0.810	0.013 J	0.054	10.2	
05TIRVIN	11/14/2001	11:05		0.276	0.436	1.09	0.012	0.099		
05TIRVIN	11/14/2001	11:10	R	0.304	0.414	1.10	0.013	0.099		
05TIRVIN	11/15/2001	10:20		0.366	1.68	2.76	0.016	0.248		

Jim Creek at Jordan Road

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TJIMCK	6/12/2001	15:45			1.39				46 J	
05TJIMCK	6/13/2001	17:30			1.40				7 J	
05TJIMCK	11/14/2001	15:00			1.54				168	
05TJIMCK	11/15/2001	15:05			1.74				69	

Juniper Beach off Juniper Beach Road on Camano Island

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TJUNIP	3/29/2001	8:40							18	
05TJUNIP	4/19/2001	7:15							24	
05TJUNIP	5/9/2001	7:45							8	
05TJUNIP	6/6/2001	8:50							356	
05TJUNIP	6/6/2001	8:55	R						400	
05TJUNIP	7/11/2001	9:40							13	
05TJUNIP	8/22/2001	12:00							199	
05TJUNIP	9/19/2001	9:00							17	
05TJUNIP	10/17/2001	8:50							60	
05TJUNIP	11/19/2001	14:15							1800	

Kackman Creek on 252nd Street NE

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TKACK	9/11/2000	12:43			3.35					
05TKACK	9/13/2000	13:35			3.31					
05TKACK	6/12/2001	15:15			1.80	4 UJ			9 J	
05TKACK	6/13/2001	13:25			2.66				5	
05TKACK	11/14/2001	12:10			4.64	4 U			5	
05TKACK	11/15/2001	11:00			4.60				5	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TKACK	9/11/2000	12:43		0.01 U	0.149	0.275	0.011	0.044	2.5	
05TKACK	9/13/2000	13:35		0.01 U	0.143	0.268	0.011	0.043	2.6	
05TKACK	6/12/2001	15:15		0.014	0.288	0.679	0.038	0.071		
05TKACK	6/13/2001	13:25		0.016	0.361	0.710	0.019	0.042		
05TKACK	11/14/2001	12:10		0.046	0.272	0.989	0.015	0.049		
05TKACK	11/15/2001	11:00		0.037	0.353	1.02	0.017	0.053		

March Creek at mouth

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMAR1	9/11/2000	12:36			6.15					
05TMAR1	9/13/2000	11:00			6.17	3 U				
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMAR1	9/11/2000	12:36		0.01 U	0.113	0.241	0.009	0.051	3.7	
05TMAR1	9/13/2000	11:00		0.01 U	0.072	0.249	0.009	0.050	3.6	3.4

Mainstem Stillaguamish at Hatt Slough off Marine Drive

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMARIN	9/11/2000	15:40			1.14	3 U	1.7		15	
05TMARIN	9/11/2000	15:40	R		1.12	3 U	1.4		15	
05TMARIN	9/12/2000	15:40			1.50					
05TMARIN	9/13/2000	15:15			1.75		1.5		11	
05TMARIN	10/5/2000	10:20							4	
05TMARIN	1/31/2001	13:55							164	
05TMARIN	2/27/2001	11:55							5	
05TMARIN	3/29/2001	11:00							43	
05TMARIN	3/29/2001	11:05	R						43	
05TMARIN	4/19/2001	9:40							21	
05TMARIN	5/8/2001	13:00							9	
05TMARIN	5/9/2001	9:25							8	
05TMARIN	6/6/2001	11:30							5	
05TMARIN	6/12/2001	17:20			1.32				177	
05TMARIN	6/13/2001	12:15			1.32				40	
05TMARIN	7/11/2001	11:55							2	
05TMARIN	7/12/2001	13:25							2	
05TMARIN	8/22/2001	13:55							44	
05TMARIN	8/22/2001	13:56	R						45	
05TMARIN	9/19/2001	8:15							6	
05TMARIN	10/3/2001	14:47		40.8			1.3		5	5
05TMARIN	10/16/2001	10:50							11	
05TMARIN	10/17/2001	10:25							15	
05TMARIN	11/14/2001	8:30			1.44				533	
05TMARIN	11/15/2001	9:17			1.11				291	
05TMARIN	11/15/2001	9:20	R						279	
05TMARIN	11/19/2001	12:55							67	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMARIN	9/11/2000	15:40		0.012	0.238	0.376	0.006	0.040	5.4	4.7
05TMARIN	9/11/2000	15:45	R	0.018	0.238	0.348	0.005	0.038	5.4	4.8
05TMARIN	9/13/2000	15:15		0.01 U	0.179	0.285	0.007	0.038	2.5	
05TMARIN	6/12/2001	17:20		0.01 U	0.287	0.446	0.009	0.144		
05TMARIN	6/13/2001	12:15		0.024	0.319	0.427	0.009	0.051		
05TMARIN	10/3/2001	14:47		0.058 J	0.212	0.363 J	0.0071	0.016 J	1.8	
05TMARIN	11/14/2001	8:30		0.047	0.193	0.312	0.010	0.390		
05TMARIN	11/15/2001	9:17		0.014	0.245	0.331	0.0089	0.276		
05TMARIN	11/15/2001	9:20	R	0.010	0.243	0.345	0.0082	0.314		

March Creek at 220th Street NE

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMARSH	6/12/2001	14:25			4.95				25	
05TMARSH	6/13/2001	12:20			11.00				15	
05TMARSH	6/13/2001	12:20	R						122 J	
05TMARSH	11/14/2001	10:30			9.59				14	
05TMARSH	11/15/2001	10:05			10.60				8	
05TMARSH	11/15/2001	10:10	R		10.40				8	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMARSH	6/12/2001	14:25		0.125	0.401	1.12	0.396	0.511		
05TMARSH	6/13/2001	12:20		0.968	0.659	2.72	0.318	0.653		
05TMARSH	11/14/2001	10:30		0.058	0.959	1.78	0.0469	0.148		
05TMARSH	11/15/2001	10:05		0.122	1.01	2.18	0.314	0.444		
05TMARSH	11/15/2001	10:05	R	0.122	1.01	2.26	0.325	0.428		

Martha Lake Creek at Soundview Drive

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMARTH	2/27/2001	10:35							1 U	
05TMARTH	3/29/2001	13:25							8	
05TMARTH	4/19/2001	11:50							8	
05TMARTH	5/9/2001	12:05							4	
05TMARTH	6/6/2001	13:15							6	
05TMARTH	7/11/2001	12:15							5	
05TMARTH	8/22/2001	10:10							13 J	
05TMARTH	9/19/2001	10:20							10	
05TMARTH	10/17/2001	12:10							2	
05TMARTH	11/19/2001	11:11							7	

Martha Lake Creek outlet to Warm Beach

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMARTOL	7/11/2001	12:25							2	
05TMARTOL	8/22/2001	14:10							6	
05TMARTOL	9/19/2001	10:30							1	

Miller Creek at Miller Road

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMILLR	8/8/2000	8:55				3 U				
05TMILLR	10/18/2000	9:00							14	
05TMILLR	6/12/2001	10:30				4 U			12	
05TMILLR	6/13/2001	12:39							7	
05TMILLR	7/17/2001	15:15				2 U				
05TMILLR	7/18/2001	11:55				2 U				
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMILLR	8/8/2000	8:55		0.077	0.048	0.479	0.073	0.278	5.9	
05TMILLR	10/18/2000	9:00		0.059	0.517	1.07		0.208	7.9	
05TMILLR	6/12/2001	10:30		0.151	2.53	3.22	0.080	0.244		
05TMILLR	6/13/2001	12:39		0.198	6.22	7.17	0.151	0.280		
05TMILLR	7/17/2001	15:15		0.027	0.014	0.483	0.062	0.177	8.4	
05TMILLR	7/18/2001	11:55		0.023	0.012	0.472	0.050	0.163	8.1	

Mainstem Stillaguamish River below Arlington WWTP outfall

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll	VOM	TSS mg/L	TNVSS mg/L
							mg/L tissue	mg/L tissue		
05TMIXZO	9/11/2000	11:23			1.08					
05TMIXZO	9/13/2000	9:50			1.86					
05TMIXZO	7/11/2001	15:20		27.3			1440	300	6	5
05TMIXZO	7/11/2001	15:25	R				1050	170		
05TMIXZO	7/11/2001	15:30	R				700	157		
05TMIXZO	10/2/2001	12:20			2.49					
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMIXZO	9/11/2000	11:23		0.015	0.204	0.303	0.007	0.045	4.7	
05TMIXZO	9/13/2000	9:50		0.01 U	0.162	0.207	0.019	0.040	2.1	
05TMIXZO	7/11/2001	15:20		0.01 U	0.063	0.095	0.011	0.020		
05TMIXZO	10/2/2001	12:20		0.059 J	0.172	0.326 J	0.0081	0.017 J	1.9	

Mainstem Stillaguamish River at the Old Channel diversion

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMS3	9/11/2000	15:05			1.11				43	
05TMS3	9/13/2000	14:55			4.39				4	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMS3	9/11/2000	15:05		0.01 U	0.231	0.317	0.005	0.049	5.1	
05TMS3	9/13/2000	14:55		0.032	0.099	0.197	0.005 U	0.033	2.1	

Mainstem Stillaguamish River below Silvana

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMS6	9/11/2000	14:40			1.09		3.0		31	
05TMS6	9/13/2000	14:15			1.71		1.2		10	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMS6	9/11/2000	14:40		0.01 U	0.233	0.356	0.006	0.046	4.9	4.5
05TMS6	9/13/2000	14:15		0.012	0.177	0.239	0.008	0.031	2.1	

Mainstem Stillaguamish River at Interstate 5 bridge

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMS11	9/11/2000	13:25			1.09	3 U	1.9		31	
05TMS11	9/12/2000	14:50			1.39					
05TMS11	9/12/2000	14:55	R		1.41					
05TMS11	9/13/2000	11:50			1.60	2 U	1.3		8	
05TMS11	1/31/2001	13:20							187	
05TMS11	5/8/2001	15:04							9	
05TMS11	6/12/2001	12:05			1.06	4 U			203	
05TMS11	6/12/2001	12:10	R		1.04	4 U			160	
05TMS11	6/13/2001	11:15			1.36				40	
05TMS11	7/12/2001	11:20							4	
05TMS11	10/2/2001	16:50		38.0	2.74	3 U	1.6		7	6
05TMS11	10/2/2001	16:55	R	37.4	2.69	3 U	1.4		6	5
05TMS11	10/3/2001	12:59		39.2	3.00		2.1		6	6
05TMS11	10/16/2001	12:15							15	
05TMS11	11/14/2001	9:30			0.985	4 UJ			1090	
05TMS11	11/15/2001	9:10			1.02				285	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMS11	9/11/2000	13:25		0.011	0.212	0.320	0.005	0.048	4.5	3.9
05TMS11	9/13/2000	11:50		0.01 U	0.167	0.212	0.007	0.027	2.0	1.9
05TMS11	6/12/2001	12:05		0.01 U	0.234	0.348	0.006	0.101		
05TMS11	6/12/2001	12:10	R	0.01 U	0.235	0.348	0.006	0.094		
05TMS11	6/13/2001	11:15		0.01 U	0.280	0.318	0.005	0.036		
05TMS11	10/2/2001	16:50		0.06 J	0.201	0.346 J	0.0096	0.021 J	1.9	
05TMS11	10/2/2001	16:55	R	0.059 J	0.196	0.356 J	0.0099	0.019 J	1.9	
05TMS11	10/3/2001	12:59		0.065 J	0.204	0.369 J	0.013	0.021 J	1.7	
05TMS11	11/14/2001	9:30		0.046	0.130	0.247	0.012	0.973		
05TMS11	11/15/2001	9:10		0.01 U	0.247	0.350	0.0065	0.239		

Mainstem Stillaguamish River at the WDFWS access point

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMS12	7/11/2001	17:10		28.6			1260	315	5	4
05TMS12	7/11/2001	17:15	R				2320	210		
05TMS12	7/11/2001	17:20	R				1830	294		
05TMS12	7/11/2001	17:25	R	28.5			2650	169	4	2
05TMS12	10/2/2001	18:25					1980	229	5	5
05TMS12	10/2/2001	18:30					5600	655		
05TMS12	10/2/2001	18:40					2990	380		
05TMS12	10/2/2001	18:55	R				5260	630		
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMS12	7/11/2001	17:10		0.013	0.069	0.175	0.005 U	0.017		
05TMS12	7/11/2001	17:25	R	0.01 U	0.078	0.109	0.005 U	0.012		
05TMS12	10/2/2001	18:25		0.055	0.199	0.343 J	0.010	0.016 J		

Mainstem Stillaguamish River below March Creek

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMS13	9/11/2000	12:56			1.08					
05TMS13	9/13/2000	11:20			1.60					
05TMS13	10/2/2001	15:20			2.79					
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMS13	9/11/2000	12:56		0.01 U	0.211	0.312	0.006	0.053	4.7	
05TMS13	9/13/2000	11:20		0.01 U	0.171	0.217	0.007	0.026	1.9	
05TMS13	10/2/2001	15:20		0.055 J	0.192	0.339 J	0.010	0.017 J		

Mainstem Stillaguamish River below Armstrong Creek

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMS15	9/11/2000	12:20			1.12	3 U	2.2		28	
05TMS15	9/13/2000	10:40			1.53				8	
05TMS15	10/2/2001	14:10		36.8	2.55	3 U	0.96		5	5
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMS15	9/11/2000	12:20		0.016	0.212	0.289	0.006	0.041	4.3	3.6
05TMS15	9/13/2000	10:40		0.01 U	0.166	0.231	0.007	0.028	1.9	
05TMS15	10/2/2001	14:10		0.062 J	0.195	0.375 J	0.012	0.019 J	2.0	

Mainstem Stillaguamish River at Dike Road

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TMS17	9/11/2000	11:40			1.08					
05TMS17	9/13/2000	10:05			1.56					
05TMS17	6/12/2001	14:45			1.01				293	
05TMS17	6/13/2001	12:50			1.19				43	
05TMS17	10/2/2001	12:10			2.64				7	
05TMS17	11/14/2001	11:20			0.90				941	
05TMS17	11/15/2001	10:25			1.02				208	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TMS17	9/11/2000	11:40		0.011	0.205	0.358	0.007	0.039	4.7	
05TMS17	9/13/2000	10:05		0.01 U	0.155	0.230	0.008	0.031	2.1	
05TMS17	6/12/2001	14:45		0.01 U	0.168	0.307	0.007	0.258		
05TMS17	6/13/2001	12:50		0.027	0.214	0.281	0.005 U	0.037		
05TMS17	10/2/2001	12:10		0.061 J	0.177	0.328 J	0.014	0.022 J		
05TMS17	11/14/2001	11:20		0.030	0.148	0.289	0.010	0.619		
05TMS17	11/15/2001	10:25		0.01 U	0.244	0.332	0.0064	0.202		

North Fork Stillaguamish River at Cicero bridge

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TNFCIC	9/12/2000	11:15			1.35					
05TNFCIC	1/31/2001	12:00							31	
05TNFCIC	5/8/2001	16:49							5	
05TNFCIC	6/12/2001	18:15			0.987				37 J	
05TNFCIC	6/13/2001	16:10			1.26				12	
05TNFCIC	7/12/2001	9:45							2	
05TNFCIC	10/16/2001	15:20							5	
05TNFCIC	10/16/2001	15:30	R						5	
05TNFCIC	11/14/2001	13:55			0.952				417	
05TNFCIC	11/15/2001	13:02			1.09				128	

North Fork Stillaguamish River at C-post bridge

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TNFCPO	9/12/2000	10:35			0.758					
05TNFCPO	6/12/2001	18:50			0.987				4 J	
05TNFCPO	6/13/2001	16:50			0.929				2	
05TNFCPO	11/14/2001	14:25			0.789				259	
05TNFCPO	11/15/2001	13:35			1.05				89	

Mouth of the North Fork Stillaguamish River at Twin Rivers Park

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TNFTWI	9/11/2000	11:19			1.22				9	
05TNFTWI	9/12/2000	12:55			1.52					
05TNFTWI	9/13/2000	10:10			1.72					
05TNFTWI	6/12/2001	16:40			1.17				78 J	
05TNFTWI	6/13/2001	15:45			1.33				13	
05TNFTWI	6/13/2001	15:50	R		1.32					
05TNFTWI	10/2/2001	10:21			2.80				5	
05TNFTWI	11/15/2001	12:10			1.11				177	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TNFTWI	9/11/2000	11:19		0.01 U	0.216	0.279	0.005	0.025	4.3	
05TNFTWI	9/13/2000	10:10		0.01 U	0.128	0.199	0.005	0.022	2.0	
05TNFTWI	6/12/2001	16:40		0.01 U	0.321	0.444	0.014	0.069		
05TNFTWI	6/13/2001	15:45		0.012	0.264	0.324	0.005	0.018		
05TNFTWI	6/13/2001	15:50	R	0.013	0.263	0.327	0.006	0.019		
05TNFTWI	10/2/2001	10:21		0.067 J	0.145	0.304 J	0.0087	0.016 J		
05TNFTWI	11/15/2001	12:10		0.014	0.310	0.419	0.0071	0.161		

North Fork Stillaguamish River at the Whitman Road bridge

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TNFWHI	9/12/2000	10:55			0.796					
05TNFWHI	6/12/2001	18:35			0.851				20 J	
05TNFWHI	6/13/2001	16:30			0.867				13	
05TNFWHI	6/13/2001	16:40	R						14	
05TNFWHI	11/14/2001	14:10			0.842				336	
05TNFWHI	11/15/2001	13:20			0.955				153	

North branch of the mainstem Stillaguamish River at Hwy. 530 bridge

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TNORTH	9/11/2000	14:12			1.16					
05TNORTH	9/13/2000	13:45			1.64					
05TNORTH	6/12/2001	11:00			1.50				195	
05TNORTH	6/13/2001	10:40			1.61				480	
05TNORTH	6/13/2001	10:50	R		1.36					
05TNORTH	10/3/2001	14:05			2.75				7	
05TNORTH	11/14/2001	8:35			1.27				541	
05TNORTH	11/15/2001	8:20			1.20				208	
05TNORTH	11/15/2001	8:30	R		1.16				195	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TNORTH	9/11/2000	14:12		0.01 U	0.250	0.318	0.005	0.047	5.6	
05TNORTH	9/13/2000	13:45		0.016	0.180	0.245	0.008	0.028	2.5	
05TNORTH	6/12/2001	11:00		0.01 U	0.279	0.441	0.007	0.108		
05TNORTH	6/13/2001	10:40		0.012	0.335	0.514	0.006	0.215		
05TNORTH	10/3/2001	14:05		0.078 J	0.209	0.394 J	0.0098	0.019 J	2.1	
05TNORTH	11/14/2001	8:35		0.051	0.165	0.314	0.0097	0.590		
05TNORTH	11/15/2001	8:20		0.012	0.273	0.364	0.0075	0.199		
05TNORTH	11/15/2001	8:20	R	0.027	0.272	0.388	0.0078	0.180		

Old Stillaguamish River channel near Irvine Slough

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L	
							water	tissue			
05TOC1	8/8/2000	13:33	R			3 U	5.4		13	30	
05TOC1	8/8/2000	13:45		3 U					13		
05TOC1	8/9/2000	13:25		15.2 J					41		
05TOC1	10/17/2000	11:55		3.4					32		
05TOC1	10/18/2000	10:15							27		
05TOC1	6/12/2001	14:00		2					136		
05TOC1	6/13/2001	16:55							51		
05TOC1 (0.5' depth)	7/17/2001	12:40		3			34.9		15		12
05TOC1 (0.5' depth)	7/18/2001	15:05		3 U			12.8		84		77
05TOC1 (0.5' depth)	7/18/2001	15:10		R			3 U	11.2	69		
05TOC1	11/14/2001	10:45				3 U		114			
05TOC1	11/15/2001	10:33						387			
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L	
05TOC1	8/8/2000	13:33	R	0.039	0.017	0.112	0.028	0.066	1.7	1.4	
05TOC1	8/8/2000	13:45		0.043	0.018	0.109	0.028	0.068	1.7		
05TOC1	8/9/2000	13:25		0.043	0.014	0.183		0.129	2.7		
05TOC1	10/17/2000	11:55		0.152	0.138	0.212	0.047	0.093 J	1.9		
05TOC1	10/18/2000	10:15		0.108	0.123	0.121	0.051	0.085	2.2		
05TOC1	6/12/2001	14:00		0.116	0.340	0.669	0.040	0.204			
05TOC1	6/13/2001	16:55		0.161	1.01	1.42	0.058	0.154			
05TOC1 (0.5' depth)	7/17/2001	12:40		0.01 U	0.01 U	0.338	0.015	0.105	5.8		
05TOC1	7/17/2001	12:45		R	0.011	0.01 U	0.364	0.015	0.103		5.9
05TOC1 (0.5' depth)	7/18/2001	15:05		0.074	0.029	0.294	0.053	0.180	3.1		
05TOC1 (0.5' depth)	7/18/2001	15:10	R	0.077	0.031	0.296	0.053	0.184	3.2		
05TOC1	11/14/2001	10:45	0.466 J	0.346	0.479	0.028	0.266				
05TOC1	11/15/2001	10:33	0.072	0.226	0.387	0.029	0.399				

Old Stillaguamish River channel above the Stanwood WWTP outfall

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L	
							water	tissue			
05TOC2	8/8/2000	13:55	R				32.4		39	23 21	
05TOC2	8/9/2000	12:52		45.5					71		
05TOC2	10/17/2000	10:40		4.9					25		
05TOC2	10/17/2000	10:45		5.3					23		
05TOC2	10/18/2000	9:50							119		
05TOC2	6/12/2001	13:08							251		
05TOC2	6/12/2001	13:15		R					395		
05TOC2	6/13/2001	14:00		R					95		
05TOC2	6/13/2001	14:10		R					87		
05TOC2 (0.5' depth)	7/17/2001	11:25					93.9		45		36
05TOC2 (0.5' depth)	7/18/2001	15:35				47.9		203	187		
05TOC2	11/14/2001	10:20						1440			
05TOC2	11/15/2001	10:05						602			
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L	
05TOC2	8/8/2000	13:55	R	0.031	0.01 U	0.248	0.043	0.168		1.9 1.9	
05TOC2	8/9/2000	12:52		0.044	0.01 U	0.331		0.329	6.8		
05TOC2	10/17/2000	10:40		0.259	0.232	0.204	0.054	0.097 J	2.2		
05TOC2	10/17/2000	10:45		0.270	0.237	0.378	0.053	0.104 J	2.3		
05TOC2	10/18/2000	9:50		0.343	0.247	0.608	0.065	0.207	2.4		
05TOC2	6/12/2001	13:08		0.051	0.354	0.682	0.019	0.378			
05TOC2	6/12/2001	13:15		R	0.051	0.345	0.680	0.019	0.415		
05TOC2	6/13/2001	14:00		0.050	0.871	1.17	0.020	0.135			
05TOC2 (0.5' depth)	7/17/2001	11:25		0.029	0.011	0.727	0.029	0.286	7.0		
05TOC2 (0.5' depth)	7/18/2001	15:35		0.056	0.017	0.529	0.023	0.402	6.4		
05TOC2	11/14/2001	10:20	0.132	0.176	1.02	0.025	1.48				
05TOC2	11/15/2001	10:05	0.083	0.237	0.416	0.011	0.615				

Old Stillaguamish River channel at the Marine Drive bridge

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TOC3	8/8/2000	15:08					37.6			
05TOC3	8/8/2000	15:10	R			4			27	
05TOC3	8/9/2000	11:28				10	297		99	
05TOC3	10/5/2000	9:40							16	
05TOC3	10/17/2000	13:50					82.1		137	125
05TOC3	10/18/2000	9:15							441	
05TOC3	1/31/2001	15:10							718	
05TOC3	1/31/2001	15:15	R						498	
05TOC3	5/8/2001	11:50							91	
05TOC3	5/8/2001	11:55	R						108	
05TOC3	6/12/2001	10:53							448	
05TOC3	6/13/2001	13:05							140	
05TOC3	7/12/2001	12:40							112	
05TOC3	7/12/2001	12:40	R						116	
05TOC3	7/17/2001	10:05					259 J		146	119
05TOC3	7/17/2001	10:15	R			7	241 J		136	113
05TOC3	7/18/2001	15:55					256		1330	1240
05TOC3	10/16/2001	10:00							293	
05TOC3	11/14/2001	9:45							4000	
05TOC3	11/14/2001	9:50	R						3550	
05TOC3	11/15/2001	9:45							733	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TOC3	8/8/2000	15:10	R	0.029	0.01 U	0.302	0.052	0.190	5.6	
05TOC3	8/9/2000	11:28		0.048	0.01 U	0.404		0.411	10.7	
05TOC3	10/17/2000	13:50		0.378	0.352	0.904	0.027	0.317	5.7	4.0
05TOC3	10/18/2000	9:15		0.342	0.284	0.915	0.033	0.789	6.2	
05TOC3	6/12/2001	10:53		0.033	0.244	0.463	0.012	0.382		
05TOC3	6/13/2001	13:05		0.041	0.795	1.05	0.019	0.150		
05TOC3	7/17/2001	10:05		0.083	0.021	1.05	0.008	0.641	7.9	
05TOC3	7/17/2001	10:15	R	0.085	0.022	1.09	0.008	0.645	7.9	
05TOC3	7/18/2001	15:55		0.012	0.041	0.348	0.024	2.39	11.9	
05TOC3	7/18/2001	16:00	R	0.01 U	0.032	0.297	0.024	1.99	9.9	
05TOC3	11/14/2001	9:45		0.192	0.114	0.480	0.017	3.52		
05TOC3	11/14/2001	9:50	R	0.190	0.109	0.530	0.015	3.58		
05TOC3	11/15/2001	9:45		0.081	0.217	0.369	0.011	0.722		

Old Stillaguamish River channel at the Norman Road bridge

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TOC4	8/8/2000	14:40					372		252	
05TOC4	10/17/2000	10:15					5.3 J		11	11
05TOC4	10/18/2000	8:40							67	
05TOC4	6/12/2001	10:10			1.48	4 U			129	
05TOC4	6/13/2001	11:48							48	
05TOC4	7/17/2001	6:10				5	105 J		62	50
05TOC4	7/18/2001	18:15				3	68.4		84	74
05TOC4	11/14/2001	9:00			1.39	4 UJ			474	
05TOC4	11/15/2001	9:00			1.04				248	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TOC4	8/8/2000	14:40		0.014	0.01 U	0.385	0.032	0.822		
05TOC4	10/17/2000	10:15		0.01 U	0.139	0.159	0.007	0.033 J	2.1	1.8
05TOC4	10/18/2000	8:40		0.115	0.115	0.193	0.013	0.069	2.5	
05TOC4	6/12/2001	10:10		0.01 U	0.236	0.395	0.006	0.117		
05TOC4	6/13/2001	11:48		0.031	0.339	0.428	0.007	0.047		
05TOC4	7/17/2001	6:10		0.068	0.018	0.546	0.007	0.327	5.3	
05TOC4	7/18/2001	18:15		0.179	0.055	0.480	0.008	0.276	3.2	
05TOC4	11/14/2001	9:00		0.044	0.197	0.356	0.0096	0.367		
05TOC4	11/15/2001	9:00		0.017	0.241	0.332	0.0074	0.242		



**Pilchuck Creek at Jackson Gulch Road**

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TPILCH	9/11/2000	13:11			1.81					
05TPILCH	9/12/2000	16:10			2.00					
05TPILCH	9/13/2000	14:00			2.13	3 U				
05TPILCH	6/12/2001	10:15			1.19	4 U			444	
05TPILCH	6/13/2001	9:00			1.64				285	
05TPILCH	10/3/2001	15:45			2.37	3 U			2	
05TPILCH	10/3/2001	15:50	R		2.38				3	
05TPILCH	11/14/2001	9:10			1.99	3 U			41	
05TPILCH	11/15/2001	9:35			2.11				25	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TPILCH	9/11/2000	13:11		0.01 U	0.550	0.679	0.005 U	0.023	10.5	
05TPILCH	9/12/2000	16:10								
05TPILCH	9/13/2000	14:00		0.01 U	0.399	0.558	0.005 U	0.016	7.0	6.7
05TPILCH	6/12/2001	10:15		0.011	0.325	0.509	0.008	0.103		
05TPILCH	6/13/2001	9:00		0.01 U	0.482	0.699	0.006	0.098		
05TPILCH	10/3/2001	15:45		0.14 J	0.219	0.524 J	0.0094	0.019 J	3.5	
05TPILCH	10/3/2001	15:50	R	0.14 J	0.219	0.519 J	0.0095	0.018 J	3.6	
05TPILCH	11/14/2001	9:10		0.058	0.257	0.444	0.063	0.039		
05TPILCH	11/15/2001	9:35		0.034	0.531	0.701	0.0069	0.037		

**Portage Creek at the 212th Street bridge**

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TPORT	9/11/2000	14:12			7.52					
05TPORT	9/12/2000	15:05			7.44					
05TPORT	9/13/2000	16:25			7.43	3 U				
05TPORT	9/13/2000	16:29	R		7.50	3 U				
05TPORT	6/12/2001	13:30			5.51	4 U			28	
05TPORT	6/13/2001	11:45			4.77				6	
05TPORT	10/3/2001	13:25			7.33	3 U			1 U	
05TPORT	11/14/2001	10:00	R		1.38	3 U			144	
05TPORT	11/14/2001	10:10			1.36	3 U			147	
05TPORT	11/15/2001	8:50			5.67				25	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TPORT	9/11/2000	14:12		0.01 U	0.655	0.844	0.029	0.071	3.2	
05TPORT	9/13/2000	16:25		0.01 U	0.661	0.874	0.030	0.078	2.9	2.8
05TPORT	9/13/2000	16:29	R	0.01 U	0.665	0.924	0.030	0.075	3.0	3.1
05TPORT	6/12/2001	13:30		0.039	1.03	1.50	0.049	0.146		
05TPORT	6/13/2001	11:45		0.023	1.18	1.57	0.042	0.103		
05TPORT	10/3/2001	13:25		0.017 J	0.638	0.898 J	0.0399	0.0682 J	3.8	
05TPORT	11/14/2001	10:00	R	0.149	0.198	0.308	0.012	0.148		
05TPORT	11/14/2001	10:10		0.160	0.198	0.315	0.013	0.15		
05TPORT	11/15/2001	8:50		0.031	0.684	1.08	0.0397	0.106		

**South Fork Stillaguamish River below Granite Falls**

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TSFGRA	9/12/2000	11:55			0.687					
05TSFGRA	6/12/2001	18:35			0.902				10	
05TSFGRA	6/13/2001	18:15			0.996				12	
05TSFGRA	11/14/2001	15:38			0.975				106	
05TSFGRA	11/15/2001	14:25			1.03				86	

**South Fork Stillaguamish River at the Jordan walkway bridge**

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TSJOR	9/12/2000	12:15			0.987					
05TSJOR	6/12/2001	18:15			0.805				285	
05TSJOR	6/13/2001	17:50			0.909				43	
05TSJOR	11/14/2001	15:15			0.848				714	
05TSJOR	11/15/2001	14:45			0.928				263	

Mouth of the South Fork Stillaguamish River at Twin Rivers Park

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TSFTWI	9/11/2000	11:24			0.911				41	
05TSFTWI	9/12/2000	12:57			0.978					
05TSFTWI	9/13/2000	10:20			1.14					
05TSFTWI	10/5/2000	11:22							14	
05TSFTWI	1/31/2001	11:00							335	
05TSFTWI	5/8/2001	15:53							10	
05TSFTWI	6/12/2001	16:20			1.02				524	
05TSFTWI	6/13/2001	15:25			1.13				53 J	
05TSFTWI	7/12/2001	10:25							9	
05TSFTWI	10/2/2001	10:27			2.02				12	
05TSFTWI	10/16/2001	14:30							18	
05TSFTWI	11/14/2001	13:30			0.895				910	
05TSFTWI	11/15/2001	11:55			0.977				310 J	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TSFTWI	9/11/2000	11:24		0.01 U	0.197	0.259	0.005 U	0.049	4.2	
05TSFTWI	9/13/2000	10:20		0.01 U	0.176	0.218	0.005 U	0.032	2.1	
05TSFTWI	6/12/2001	16:20		0.011	0.142	0.281	0.017	0.406		
05TSFTWI	6/13/2001	15:25		0.025	0.193	0.240	0.008	0.041		
05TSFTWI	10/2/2001	10:27		0.054 J	0.208	0.343 J	0.007	0.021 J		
05TSFTWI	11/14/2001	13:30		0.021	0.126	0.227	0.0088	0.911		
05TSFTWI	11/15/2001	11:55		0.01 U	0.220	0.274	0.005	0.220		

Mainstem Stillaguamish River below Silvana off Norman Road

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TSILVA	6/12/2001	9:25			1.69	4 U			127	
05TSILVA	6/13/2001	10:20			1.92				49	
05TSILVA	10/3/2001	14:25		40	3.09	3 U	1.7		6	6
05TSILVA	11/14/2001	8:05			1.35	3 U			562	
05TSILVA	11/14/2001	8:10	R		1.35				482	
05TSILVA	11/15/2001	8:00			1.10				300	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TSILVA	6/12/2001	9:25		0.01 U	0.244	0.38	0.007	0.096		
05TSILVA	6/13/2001	10:20		0.027	0.332	0.419	0.008	0.047		
05TSILVA	10/3/2001	14:25		0.066 J	0.216	0.386 J	0.0087	0.021 J	2.0	
05TSILVA	11/14/2001	8:05		0.167	0.189	0.306	0.011	0.419		
05TSILVA	11/15/2001	8:00		0.012	0.248	0.331	0.0075	0.247		

South Pass at the end of Eide Road

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TSOUTH	8/8/2000	13:18					3.3		18	
05TSOUTH	10/17/2000	10:00					2.1		45	
05TSOUTH	10/18/2000	10:40							32	
05TSOUTH	2/27/2001	13:46							16	
05TSOUTH	3/29/2001	9:10							16	
05TSOUTH	5/9/2001	8:50							17	
05TSOUTH	6/6/2001	9:15							23	
05TSOUTH	6/12/2001	15:00							149	
05TSOUTH	6/13/2001	18:05							70	
05TSOUTH	7/11/2001	10:15							12	
05TSOUTH	7/11/2001	10:15	R						13	
05TSOUTH	7/17/2001	13:00					15.0			
05TSOUTH	7/18/2001	14:45					15.8			
05TSOUTH	8/22/2001	12:15							38	
05TSOUTH	9/19/2001	8:40							30	
05TSOUTH	9/19/2001	8:40	R						30	
05TSOUTH	10/17/2001	9:05							18	
05TSOUTH	11/14/2001	11:48							91	
05TSOUTH	11/15/2001	11:10							190	
05TSOUTH	11/15/2001	11:13	R						176	
05TSOUTH	11/19/2001	14:35							47	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TSOUTH	8/8/2000	13:18		0.032	0.01 U	0.127	0.027	0.063		
05TSOUTH	10/17/2000	10:00		0.091	0.089	0.125	0.035	0.101 J	2.1	1.5
05TSOUTH	10/18/2000	10:40		0.093	0.128	0.047	0.039	0.082	2.1	
05TSOUTH	6/12/2001	15:00		0.121	0.322	0.662	0.042	0.221		
05TSOUTH	6/13/2001	18:05		0.189	1.05	1.48	0.061	0.168		
05TSOUTH	6/13/2001	18:10	R	0.191	1.07	1.48	0.062	0.175		
05TSOUTH	7/17/2001	13:00		0.057	0.026	0.307	0.056	0.142	4.3	
05TSOUTH	7/18/2001	14:45		0.067	0.033	0.310	0.050	0.194	3.4	
05TSOUTH	11/14/2001	11:48		0.220	0.347	0.638	0.039	0.182		
05TSOUTH	11/15/2001	11:10		0.098	0.221	0.404	0.014	0.188		
05TSOUTH	11/15/2001	11:13	R	0.101	0.222	0.389	0.012	0.245		

Stanwood WWTP effluent

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TRC* mg/L	TSS mg/L	TNVSS mg/L
							mg/L	tissue			
05TSTAN	10/17/2000	10:30								5	
05TSTAN	6/12/2001	12:55				6		0.08		5	
05TSTAN	6/13/2001	14:40						0.30		4	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L	
05TSTAN	10/17/2000	10:30		18.8	0.819	19.6		6.19 J	13.5	12.6	
05TSTAN	10/18/2000	14:30		18.2	0.812	19.6		5.71	15.9 J		
05TSTAN	6/12/2001	12:55		13.4	0.113	14.5	5.82	6.09			
05TSTAN	6/13/2001	14:40		12.9	0.178	15.0	5.88	6.81			

\*Sample collection and analyses performed by City of Stanwood.

**Twin City Foods drain #1 at dike**

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TTCF1	2/27/2001	12:25							11	
05TTCF1	2/27/2001	12:55							44	
05TTCF1	3/29/2001	9:45							18	
05TTCF1	4/19/2001	7:35							16	
05TTCF1	4/19/2001	8:10							10	
05TTCF1	5/9/2001	9:50							24	
05TTCF1	6/6/2001	10:15							37	
05TTCF1	6/12/2001	16:08				5			22	
05TTCF1	6/13/2001	15:49							18	
05TTCF1	7/11/2001	11:00							16	
05TTCF1	7/18/2001	9:17				4				
05TTCF1	8/22/2001	12:50							288	
05TTCF1	9/19/2001	9:30							32	
05TTCF1	10/17/2001	9:40							12	
05TTCF1	11/14/2001	13:20				4 U			30	
05TTCF1	11/15/2001	11:55							34	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TTCF1	6/12/2001	16:08		0.174	2.85	4.12	0.131			
05TTCF1	6/13/2001	15:49		0.329	3.16	5.04	0.275	0.627		
05TTCF1	7/18/2001	9:17		0.063	0.013	0.668	1.19	1.45	7.8	
05TTCF1	11/14/2001	13:20		0.828	2.30	4.32	0.024	0.244		
05TTCF1	11/15/2001	11:55		0.731	4.39	6.23	0.017	0.212		

**Twin City Foods drain #2 on Thomle Road**

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TTCF2	6/12/2001	16:40				4			20	
05TTCF2	6/13/2001	16:10							21	
05TTCF2	7/17/2001	12:05				3 U				
05TTCF2	7/18/2001	9:40				4				
05TTCF2	11/15/2001	12:15							95	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TTCF2	6/12/2001	16:40		0.090	0.342	0.695	0.154	0.389		
05TTCF2	6/13/2001	16:10		0.152	4.53	7.54	0.201	0.536		
05TTCF2	7/17/2001	12:05		0.082	0.018	0.401	0.136	0.204	5.6	
05TTCF2	7/18/2001	9:40		0.034	0.012	0.379	0.112	0.234	4.8	
05TTCF2	11/15/2001	12:15		0.122	0.431	0.666	0.014	0.149		

**Twin City Foods drain #3 on Thomle Road**

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TTCF3	6/12/2001	16:35				2			21	
05TTCF3	6/13/2001	16:29							16	
05TTCF3	7/17/2001	11:48				2 U				
05TTCF3	7/18/2001	10:00				2 U				
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TTCF3	6/12/2001	16:35		0.233	26.4	35.1	0.011	0.115		
05TTCF3	6/13/2001	16:29		0.154	12.3	17.4	0.029	0.277		
05TTCF3	7/17/2001	11:48		0.405	0.091	0.848	0.040	0.201	8.3	
05TTCF3	7/18/2001	10:00		0.349	0.066	0.830	0.034	0.173	9	

**Twin City Foods drain #4 to Hatt Slough\***

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TTCF4	2/27/2001	11:00							6 J	
05TTCF4	2/27/2001	11:02							6	
05TTCF4	3/29/2001	10:25	R						6	
05TTCF4	4/19/2001	9:10							6	
05TTCF4	5/9/2001	10:25							7	
05TTCF4	6/6/2001	11:10							143	
05TTCF4	7/11/2001	11:40							2	
05TTCF4	8/22/2001	13:40							29	
05TTCF4	9/19/2001	10:00							36	
05TTCF4	10/17/2001	10:05							33	

\* Drain was always plugged and never discharging to Hatt Slough during sampling events.

Twin City Foods drain #5 at footbridge above Thomle Road

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TTCF5	8/9/2000	12:25				7			27	6
05TTCF5	6/12/2001	15:35				3			10	
05TTCF5	6/13/2001	13:29							7	
05TTCF5	7/17/2001	10:50				3 U			10	
05TTCF5	7/18/2001	10:13				5			24	
05TTCF5	11/14/2001	13:47				3 U			126	
05TTCF5	11/15/2001	12:25							56	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TTCF5	8/9/2000	12:25		0.032	0.01 U	0.530		3.77	9.9	
05TTCF5	6/12/2001	15:35		0.113	7.47	8.24	0.429	0.696		
05TTCF5	6/13/2001	13:29		0.123	9.22	10.1	0.195	0.388		
05TTCF5	7/17/2001	10:50		0.256	0.052	0.833	2.06	3.02	9.8	
05TTCF5	7/18/2001	10:13		0.183	0.049	0.977	2.46	3.03	10.8	
05TTCF5	11/14/2001	13:47		0.473	0.497	1.11	0.0371	0.269		
05TTCF5	11/15/2001	12:25		0.211	1.46	1.95	0.0727	0.284		

Unnamed Creek #0456 at the end of Soundview Drive

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TUNIDE	3/29/2001	13:45							4	
05TUNIDE	4/19/2001	12:05							7	
05TUNIDE	5/9/2001	12:25							2	
05TUNIDE	5/9/2001	12:30	R						20	
05TUNIDE	6/6/2001	13:30							12	
05TUNIDE	8/22/2001	9:45							18	
05TUNIDE	10/17/2001	11:50							15	
05TUNIDE	11/19/2001	11:30							11	

Warm Beach WWTP effluent at Warm Beach

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TWAREF	2/27/2001	10:05							36	
05TWAREF	3/29/2001	12:20							33	
05TWAREF	4/19/2001	10:45							9	
05TWAREF	5/9/2001	11:20							16	
05TWAREF	6/6/2001	12:15							35	
05TWAREF	7/11/2001	13:15							69	
05TWAREF	8/22/2001	10:50							3	
05TWAREF	10/17/2001	11:05							8	
05TWAREF	11/19/2001	12:00							13	

Pump pond slough at Warm Beach

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TWARSL	2/27/2001	9:42							8	
05TWARSL	3/29/2001	12:45							9	
05TWARSL	4/19/2001	10:55							6	
05TWARSL	4/19/2001	11:00	R						9	
05TWARSL	5/9/2001	11:50							6	
05TWARSL	6/6/2001	12:30							4	
05TWARSL	7/11/2001	13:35							7	
05TWARSL	8/22/2001	11:15							4	
05TWARSL	9/19/2001	11:40							4	
05TWARSL	10/17/2001	11:15							6	
05TWARSL	11/19/2001	12:17							13	
05TWARSL	11/19/2001	12:20	R						13	

Field ditch to pump pond at Warm Beach

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TWARDG	2/27/2001	9:25							5	
05TWARDG	3/29/2001	12:35							6	
05TWARDG	4/19/2001	11:05							5	
05TWARDG	5/9/2001	11:35							20	
05TWARDG	6/6/2001	12:35							12	
05TWARDG	7/11/2001	13:45							4	
05TWARDG	8/22/2001	11:25							2	
05TWARDG	9/19/2001	11:50							4	
05TWARDG	10/17/2001	11:25							4	
05TWARDG	11/19/2001	12:30							14	

Warm Beach Creek upstream of WWTP outfall

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TWARUP	2/27/2001	10:10							7	
05TWARUP	3/29/2001	12:15							8	
05TWARUP	4/19/2001	10:35							18	
05TWARUP	5/9/2001	11:05							1	
05TWARUP	6/6/2001	11:50							1	
05TWARUP	7/11/2001	13:10							1	U
05TWARUP	8/22/2001	10:45							1	U
05TWARUP	9/19/2001	10:55							1	U
05TWARUP	10/17/2001	10:55							1	
05TWARUP	10/17/2001	10:55	R						2	
05TWARUP	11/19/2001	11:55							7	

Creek at Warm Beach above camp stables

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TWARUS	9/19/2001	11:15							8	

West pass of Old Stillaguamish River Channel at Hwy. 532 bridge in Stanwood

Station	Date	Time	Field Rep.	Alkalinity mg/L	Chloride mg/L	BOD mg/L	Chlorophyll mg/L		TSS mg/L	TNVSS mg/L
							water	tissue		
05TWEST	8/8/2000	13:00					4.8		15	
05TWEST	8/9/2000	13:40					4.7		25	
05TWEST	10/17/2000	9:30							22	
05TWEST	10/18/2000	10:55							20	
05TWEST	6/12/2001	14:48							132	
05TWEST	6/13/2001	18:26							67	
05TWEST	6/13/2001	18:30							70	
05TWEST	7/17/2001	13:20					9.9			
05TWEST	7/18/2001	14:45					8.0			
05TWEST	11/14/2001	11:32							85	
05TWEST	11/15/2001	10:48							756	
Station	Date	Time	Field Rep.	NH3 mg/L	N-N mg/L	TPN mg/L	OP mg/L	TP mg/L	TOC mg/L	DOC mg/L
05TWEST	8/8/2000	13:00		0.039	0.014	0.122	0.026	0.068		
05TWEST	8/9/2000	13:40		0.045	0.016	0.129		0.088		
05TWEST	10/17/2000	9:30		0.053	0.114	0.105	0.059	0.081	1.7	1.4
05TWEST	10/18/2000	10:55		0.035	0.112	0.051	0.061	0.076	1.5	
05TWEST	6/12/2001	14:48		0.130	0.349	0.689	0.041	0.204		
05TWEST	6/13/2001	18:26		0.210	1.03	1.50	0.063	0.179		
05TWEST	7/17/2001	13:20		0.031	0.017	0.247	0.039	0.077	4.2	
05TWEST	7/18/2001	14:45		0.055	0.048	0.266	0.055	0.161	2.0	
05TWEST	11/14/2001	11:32		0.419	0.421	1.04	0.0309	0.217		
05TWEST	11/15/2001	10:48		0.088	0.208	0.396	0.013	0.878		

Table C-3. Microbiological analyses data for the Stillaguamish River TMDL.

Station	Date	Time	Field Replicate	E. coli cfu/100mL	Enterococci cfu/100mL	F.C. cfu/100mL
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**Arlington WWTP effluent**

05TARLIN	9/12/2000	13:20		900 J	400	960 J
05TARLIN	9/13/2000	11:17			29	120
05TARLIN	6/12/2001	15:40			34	36
05TARLIN	6/13/2001	14:05			23	26
05TARLIN	11/14/2001	12:40		100		80
05TARLIN	11/15/2001	11:25		270 J		440 J

**Armstrong Creek at the hatchery gaging station**

05TARMST	9/13/2000	13:20			7	10
05TARMST	6/12/2001	15:00			4000 J	2800 J
05TARMST	6/13/2001	13:15			530 J	75 J
05TARMST	11/14/2001	11:36		150		170
05TARMST	11/15/2001	10:35		120		200

**Church Creek at the park off Lindstrom Road**

05TCHUPK	8/7/2000	14:25			47	190
05TCHUPK	8/14/2000	13:37			37	100
05TCHUPK	8/14/2000	14:00	R		41	59
05TCHUPK	8/21/2000	15:15			59	64
05TCHUPK	8/28/2000	15:30			96	150
05TCHUPK	9/5/2000	13:30			580 J	57

**Church Creek/Jorgenson Slough at Marine Drive**

05TCHURH	8/8/2000	10:30			11	370
05TCHURH	10/17/2000	13:20			23	220
05TCHURH	10/18/2000	14:00			160	140
05TCHURH	10/18/2000	14:00	R		180	140
05TCHURH	6/12/2001	11:20			12000 J	11000 J
05TCHURH	6/13/2001	18:45			620	700
05TCHURH	7/17/2001	14:45			80	260
05TCHURH	7/17/2001	14:50	R		140	280
05TCHURH	7/18/2001	11:21			48	740
05TCHURH	11/14/2001	12:50		280		170
05TCHURH	11/15/2001	11:30		950		740

**Confluence of North and South Forks of the Stillaguamish River at Hwy. 9**

05TCONFL	9/11/2000	11:05			74	63
05TCONFL	9/13/2000	9:25			45	32

**Cook Slough at Hwy. 530 bridge near Silvana**

05TCOOK	9/13/2000	14:20			37	33
05TCOOK	9/13/2000	14:24	R		36	32
05TCOOK	6/12/2001	11:30			230	320 J
05TCOOK	6/12/2001	11:40	R		380	330 J
05TCOOK	6/13/2001	9:35			51 J	23 J
05TCOOK	11/14/2001	8:50		300 J		390 J
05TCOOK	11/15/2001	8:37		69		43 J

**Douglas Slough south of Hwy. 532**

05TDOUG	10/17/2000	12:55			3 U	6
05TDOUG	10/18/2000	12:05			45	16
05TDOUG	6/12/2001	14:20			2900 J	7000 J
05TDOUG	6/12/2001	14:25	R		2700 J	2100 J
05TDOUG	6/13/2001	17:35			380	330
05TDOUG	6/13/2001	17:40	R		300	150
05TDOUG	7/18/2001	10:45			240	6100 J

Station	Date	Time	Field Replicate	E. coli cfu/100mL	Entero. cfu/100mL	F.C. cfu/100mL
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**Glade Bekken at Silvana Terrace Road**

05TGLAD	9/13/2000	14:45			28	21
05TGLAD	6/12/2001	9:30			220000 J	52000 J
05TGLAD	6/13/2001	11:08			14000	2500
05TGLAD	11/14/2001	14:25		480		360
05TGLAD	11/15/2001	8:20		260		310 J

**Mouth of Harvey Armstrong Creek**

05THARAR	9/13/2000	10:25			34	35
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**Irvine Slough at dike pump station**

05TIRVIN	8/8/2000	9:55			640	
05TIRVIN	8/9/2000	14:50				15000 J
05TIRVIN	10/17/2000	11:30			2000	6100
05TIRVIN	10/18/2000	10:22			28000 J	750
05TIRVIN	6/12/2001	13:45			15000 J	5000 G
05TIRVIN	6/13/2001	17:08			380	430
05TIRVIN	7/17/2001	14:20			5400 J	1200 J
05TIRVIN	7/18/2001	11:00			4200	20000
05TIRVIN	11/14/2001	11:05		460		360
05TIRVIN	11/14/2001	11:10	R	670		310
05TIRVIN	11/15/2001	10:20		450		320

**Jim Creek at Jordan Road**

05TJIMCK	6/12/2001	15:45			490	320 J
05TJIMCK	6/12/2001	15:45	R		540	380 J
05TJIMCK	6/13/2001	17:30			69	150
05TJIMCK	11/14/2001	15:00		85		160 J
05TJIMCK	11/15/2001	15:05		46		20

**Juniper Beach off Juniper Beach Road on Camano Island**

05TJUNIP	3/29/2001	8:40			26 J	13
05TJUNIP	4/19/2001	7:15			1	17
05TJUNIP	5/9/2001	7:45			1 U	2
05TJUNIP	6/6/2001	8:50			11	13
05TJUNIP	6/6/2001	8:55	R		6	4.5
05TJUNIP	7/11/2001	9:40			1 U	1.8 U
05TJUNIP	8/22/2001	12:00			22	49
05TJUNIP	9/19/2001	9:00			18	11
05TJUNIP	10/17/2001	8:50			49	49
05TJUNIP	11/19/2001	14:15			240	130

**Kackman Creek on 252nd Street NE**

05TKACK	9/11/2000	12:43				
05TKACK	9/13/2000	13:35			12	32
05TKACK	6/12/2001	15:15			2600	1600 J
05TKACK	6/13/2001	13:25			75 J	200 J
05TKACK	11/14/2001	12:10		130		150 J
05TKACK	11/15/2001	11:00		100		84

**March Creek at mouth**

05TMAR1	9/13/2000	11:00			18	48
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Station	Date	Time	Field Replicate	E. coli cfu/100mL	Entero. cfu/100mL	F.C. cfu/100mL
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**Mainstem Stillaguamish River at Hatt Slough off Marine Drive**

05TMARIN	9/11/2000	15:40			130	100
05TMARIN	9/11/2000	15:45	R		160	110
05TMARIN	9/12/2000	15:40		48	80	51
05TMARIN	9/13/2000	15:15			36	25
05TMARIN	10/5/2000	10:20				
05TMARIN	1/31/2001	13:55				
05TMARIN	2/27/2001	11:55			33 J	70 J
05TMARIN	3/29/2001	11:00			41	2
05TMARIN	3/29/2001	11:05	R		31	13
05TMARIN	4/19/2001	9:40			61	17
05TMARIN	5/8/2001	13:00				
05TMARIN	5/9/2001	9:25			59	7.8
05TMARIN	6/6/2001	11:30			20	23
05TMARIN	6/12/2001	17:20			910	680 J
05TMARIN	6/12/2001	17:30	R		1100	700 J
05TMARIN	6/13/2001	12:15			200 J	130 J
05TMARIN	7/11/2001	11:55			7	22
05TMARIN	7/12/2001	13:25				
05TMARIN	8/22/2001	13:55			760 J	540
05TMARIN	8/22/2001	13:56	R		860 J	540
05TMARIN	9/19/2001	8:15			62	49
05TMARIN	10/3/2001	14:47				
05TMARIN	10/16/2001	10:50				
05TMARIN	10/17/2001	10:25			77	49
05TMARIN	11/14/2001	8:30		320 J		380 J
05TMARIN	11/15/2001	9:17		170 J		110 J
05TMARIN	11/15/2001	9:20	R	140		88 J
05TMARIN	11/19/2001	12:55			150	49

**Mainstem Stillaguamish River at Hat Slough boat launch**

05TMARIN2	8/7/2000	14:05			11	37
05TMARIN2	8/14/2000	14:17			6	30
05TMARIN2	8/21/2000	14:37			20	74
05TMARIN2	8/28/2000	13:58			3	9
05TMARIN2	8/28/2000	13:59	R		6	6
05TMARIN2	9/5/2000	14:00			19	21
05TMARIN2	9/5/2000	14:05	R		10	27

**Mouth of March Creek at 220th Street NE**

05TMARSH	6/12/2001	14:25			15000 J	18000 J
05TMARSH	6/13/2001	12:20			1200 J	3300 J
05TMARSH	6/13/2001	12:30	R		1700 J	2000 J
05TMARSH	11/14/2001	10:30		620 J		550 J
05TMARSH	11/15/2001	10:05		870		900 J
05TMARSH	11/15/2001	10:10	R	800		730 J

**Martha Lake Creek at Soundview Drive**

05TMARTH	2/27/2001	10:35			61 J	7.8 J
05TMARTH	3/29/2001	13:25			870 J	21
05TMARTH	4/19/2001	11:50			26	49
05TMARTH	5/9/2001	12:05			49	23
05TMARTH	6/6/2001	13:15			17	79
05TMARTH	7/11/2001	12:15			31	23
05TMARTH	8/22/2001	10:10			1900 J	1100
05TMARTH	9/19/2001	10:20			16000 J	540
05TMARTH	10/17/2001	12:10			2200	540
05TMARTH	11/19/2001	11:11			2200	130

Station	Date	Time	Field Replicate	E. coli cfu/100mL	Entero. cfu/100mL	F.C. cfu/100mL
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**Martha Lake Creek outlet to Warm Beach**

05TMARTOL	7/11/2001	12:25			110	130
05TMARTOL	8/22/2001	14:10			1500 J	240
05TMARTOL	9/19/2001	10:30			7000 J	540

**Miller Creek at Miller Road**

05TMILLR	8/8/2000	8:55			100	310
05TMILLR	10/18/2000	9:00			140	49
05TMILLR	6/12/2001	10:30			3600 J	2400 J
05TMILLR	6/13/2001	12:39			3000 J	2100 J
05TMILLR	7/17/2001	15:15			120	440
05TMILLR	7/18/2001	11:55			420	1300
05TMILLR	7/18/2001	12:05	R		360	1200

**Mainstem Stillaguamish River below Silvana**

05TMS6	9/11/2000	14:40			120	96
05TMS6	9/13/2000	14:15			31	31

**Mainstem Stillaguamish River at Interstate 5 bridge**

05TMS11	9/11/2000	13:25			130	57
05TMS11	9/12/2000	14:50		32	43	39
05TMS11	9/12/2000	14:50	R	24	49	27
05TMS11	9/13/2000	11:50			57	27
05TMS11	6/12/2001	12:05			320 J	520 J
05TMS11	6/12/2001	12:10	R		380	300 J
05TMS11	6/13/2001	11:15			23 J	100 J
05TMS11	11/14/2001	9:30		260 J		380 J
05TMS11	11/15/2001	9:10		34		34 J

**Mainstem Stillaguamish River below March Creek**

05TMS13	9/13/2000	11:20			47	31
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**Mainstem Stillaguamish River below Armstrong Creek**

05TMS15	9/11/2000	12:20			120	63
05TMS15	9/13/2000	10:40			33	40

**Mainstem Stillaguamish River at Dike Road**

05TMS17	9/13/2000	10:05			45	31
05TMS17	6/12/2001	14:45			700	540
05TMS17	6/13/2001	12:50			31 J	38 J
05TMS17	11/14/2001	11:20		350		330
05TMS17	11/15/2001	10:25		31		37 J

**North Fork Stillaguamish River at Cicero bridge**

05TNFCIC	9/12/2000	11:15		15	43	17
05TNFCIC	6/12/2001	18:15			8	14
05TNFCIC	6/13/2001	16:10			8 U	8
05TNFCIC	11/14/2001	13:55		110		77
05TNFCIC	11/14/2001	14:00	R	80		80 J
05TNFCIC	11/15/2001	13:02		19		17
05TNFCIC	11/15/2001	13:10	R	19		19

**North Fork Stillaguamish River at C-post bridge**

05TNFCPO	9/12/2000	10:35		4	5	4
05TNFCPO	6/12/2001	18:50			71	67
05TNFCPO	6/13/2001	16:50			1	4
05TNFCPO	11/14/2001	14:25		51		37 J
05TNFCPO	11/15/2001	13:35		17		17

Station	Date	Time	Field Replicate	E. coli cfu/100mL	Enterococcus cfu/100mL	F.C. cfu/100mL
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**Mouth of the North Fork Stillaguamish River at Twin Rivers Park**

05TNFTWI	8/7/2000	13:05			3	24
05TNFTWI	8/14/2000	11:45			6	9
05TNFTWI	8/21/2000	11:06			14	61
05TNFTWI	8/28/2000	11:05			19	15
05TNFTWI	9/5/2000	11:45			7	13
05TNFTWI	9/12/2000	12:55		39	20	41
05TNFTWI	6/12/2001	16:40			240	240
05TNFTWI	6/13/2001	15:45			29	43
05TNFTWI	6/13/2001	15:50	R		43	34
05TNFTWI	11/15/2001	12:10		49		40

**North Fork Stillaguamish River at the Whitman Road bridge**

05TNFWHI	8/7/2000	11:45			1 U	6
05TNFWHI	8/14/2000	12:27			2	2
05TNFWHI	8/21/2000	12:00			8	10
05TNFWHI	8/28/2000	12:37			12	1
05TNFWHI	9/5/2000	10:20			20	4
05TNFWHI	9/12/2000	10:55		6	5	8
05TNFWHI	6/12/2001	18:35			56	25
05TNFWHI	6/13/2001	16:30			5	11
05TNFWHI	6/13/2001	16:40	R		7	17
05TNFWHI	11/14/2001	14:10		62		85
05TNFWHI	11/15/2001	13:20		23		17

**North branch of the mainstem Stillaguamish River at Hwy. 530 bridge**

05TNORTH	9/11/2000	14:12				
05TNORTH	9/13/2000	13:45			35	63
05TNORTH	6/12/2001	11:00			420	780 J
05TNORTH	6/13/2001	10:40			110	180
05TNORTH	6/13/2001	10:40	R		86	130
05TNORTH	10/3/2001	14:05				
05TNORTH	11/14/2001	8:35		260 J		210 J
05TNORTH	11/15/2001	8:20		71		74 J
05TNORTH	11/15/2001	8:30	R	60		66 J

**Old Stillaguamish River Channel near Irvine Slough**

05TOC1	8/8/2000	13:33				120
05TOC1	8/8/2000	13:45				130
05TOC1	10/17/2000	11:55			6	46
05TOC1	10/18/2000	10:15			4	41
05TOC1	6/12/2001	14:00			3100	2700 J
05TOC1	6/13/2001	16:55			380	450
05TOC1	7/17/2001	12:40			3	6
05TOC1	7/17/2001	12:45	R		3	20
05TOC1	7/18/2001	15:05			1 U	14
05TOC1	7/18/2001	15:10	R		3 U	34
05TOC1	11/14/2001	10:45		63 J		69 J
05TOC1	11/15/2001	10:33		100		63

**Old Stillaguamish River Channel above the Stanwood WWTP outfall**

05TOC2	8/8/2000	13:55				270
05TOC2	10/17/2000	10:40			6	23
05TOC2	10/17/2000	10:45	R		9	26
05TOC2	10/18/2000	9:50			33	29
05TOC2	6/12/2001	13:08			5300 J	2400 J
05TOC2	6/12/2001	13:15	R		2900	2800 J
05TOC2	6/13/2001	14:00			380	510
05TOC2	6/13/2001	14:10	R		380	530
05TOC2	7/17/2001	11:25			49	74
05TOC2	7/18/2001	15:35			11	74
05TOC2	11/14/2001	10:20		210 J		210 J
05TOC2	11/15/2001	10:05		140		160

Station	Date	Time	Field Replicate	E. coli cfu/100mL	Enter. cfu/100mL	F.C. cfu/100mL
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**Old Stillaguamish River Channel at the Marine Drive bridge**

05TOC3	8/8/2000	15:08				180
05TOC3	10/17/2000	13:50			6	29
05TOC3	10/18/2000	9:15			350 J	64
05TOC3	6/12/2001	10:53			600	790 J
05TOC3	6/13/2001	13:05			520 J	410 J
05TOC3	7/17/2001	10:05			60 J	200 J
05TOC3	7/17/2001	10:15	R		55	260
05TOC3	7/18/2001	15:55			32	200
05TOC3	7/18/2001	16:00	R		42	280
05TOC3	11/14/2001	9:45		360 J		310 J
05TOC3	11/14/2001	9:50	R	310 J		450 J
05TOC3	11/15/2001	9:45		63 J		130 J

**Old Stillaguamish River Channel at the Norman Road bridge**

05TOC4	8/8/2000	14:40				160
05TOC4	8/8/2000	14:40				
05TOC4	10/17/2000	10:15				
05TOC4	10/18/2000	8:40			11	84
05TOC4	10/18/2000	8:40				
05TOC4	6/12/2001	10:10			750	420
05TOC4	6/12/2001	10:10				
05TOC4	6/13/2001	11:48			75 J	100 J
05TOC4	7/17/2001	6:10			110 J	250 J
05TOC4	7/18/2001	18:15			29	390
05TOC4	11/14/2001	9:00		260 J		570 J
05TOC4	11/15/2001	9:00		57 J		51 J

**Pilchuck Creek at Jackson Gulch Road**

05TPILCH	8/7/2000	13:44			1 U	44
05TPILCH	8/7/2000	13:46	R		10	49
05TPILCH	8/14/2000	14:47			3	40
05TPILCH	8/21/2000	13:09			27	280
05TPILCH	8/28/2000	13:30			7	43
05TPILCH	9/5/2000	14:25			20	200
05TPILCH	9/11/2000	13:11				
05TPILCH	9/12/2000	16:10		64	60	73
05TPILCH	9/13/2000	14:00			48	76
05TPILCH	6/12/2001	10:15			730	950 J
05TPILCH	6/13/2001	9:00			250 J	75 J
05TPILCH	10/3/2001	15:45				
05TPILCH	10/3/2001	15:50				
05TPILCH	11/14/2001	9:10		170 J		140 J
05TPILCH	11/15/2001	9:35		47		43 J

**Portage Creek at the 212th Street bridge**

05TPORT	9/11/2000	14:12				
05TPORT	9/12/2000	15:05		180 J	76	190 J
05TPORT	9/13/2000	16:25			130	200
05TPORT	9/13/2000	16:29	R		88	240
05TPORT	6/12/2001	13:30			3400 J	6300 J
05TPORT	6/12/2001	13:40	R		8300 J	7000 J
05TPORT	6/13/2001	11:45			1300 J	770 J
05TPORT	10/3/2001	13:25				
05TPORT	11/14/2001	10:00	R	520 J		700 J
05TPORT	11/14/2001	10:10		270 J		350 J
05TPORT	11/15/2001	8:50		1900		1600 J

Station	Date	Time	Field Replicate	E. coli cfu/100mL	Entero. cfu/100mL	F.C. cfu/100mL
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**South Fork Stillaguamish River below Granite Falls**

05TSFGRA	9/12/2000	11:55		23	43	26
05TSFGRA	6/12/2001	18:35			180	92
05TSFGRA	6/12/2001	18:35				
05TSFGRA	6/13/2001	18:15			46	17
05TSFGRA	11/14/2001	15:38		31		37
05TSFGRA	11/14/2001	15:38	R	200		28
05TSFGRA	11/15/2001	14:25		32		22

**South Fork Stillaguamish River at the Jordan walkway bridge**

05TSFJOR	8/7/2000	12:30			9	40
05TSFJOR	8/14/2000	10:45			28	55
05TSFJOR	8/21/2000	16:10			29	48
05TSFJOR	8/21/2000	16:15	R		24	49
05TSFJOR	8/28/2000	11:50			14	18
05TSFJOR	9/5/2000	11:10			33	24
05TSFJOR	9/12/2000	12:15		18	45	21
05TSFJOR	6/12/2001	18:15			140	110
05TSFJOR	6/13/2001	17:50			14	14
05TSFJOR	11/14/2001	15:15		62		38
05TSFJOR	11/15/2001	14:45		23		9
05TSFJOR	11/15/2001	14:45	R	19		11

**Mouth of the South Fork Stillaguamish River at Twin Rivers Park**

05TSFTWI	8/7/2000	13:00			11	37
05TSFTWI	8/14/2000	11:50			4	10
05TSFTWI	8/21/2000	11:08			99	130
05TSFTWI	8/28/2000	11:05			32	40
05TSFTWI	9/5/2000	11:50			14	24
05TSFTWI	9/12/2000	12:57		27	45	31
05TSFTWI	6/12/2001	16:20			330	310
05TSFTWI	6/13/2001	15:25			69	31
05TSFTWI	11/14/2001	13:30		80		92 J
05TSFTWI	11/15/2001	11:55		26		26

**Mainstem Stillaguamish River below Silvana off Norman Road**

05TSILVA	6/12/2001	9:25			570	360
05TSILVA	6/13/2001	10:20			130 J	160 J
05TSILVA	10/3/2001	14:25				
05TSILVA	11/14/2001	8:05		270 J		190 J
05TSILVA	11/14/2001	8:10	R	240 J		200 J
05TSILVA	11/15/2001	8:00		49		60 J

Station	Date	Time	Field Replicate	E. coli cfu/100mL	Enterococcus cfu/100mL	F.C. cfu/100mL
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**South Pass at the end of Eide Road**

05TSOUTH	8/8/2000	13:18				29
05TSOUTH	10/17/2000	10:00			6	43
05TSOUTH	10/18/2000	10:40			11	35
05TSOUTH	2/27/2001	13:40			2	4.5
05TSOUTH	3/29/2001	9:10			60	33
05TSOUTH	4/19/2001	7:35			31	23
05TSOUTH	5/9/2001	8:50			3	13
05TSOUTH	6/6/2001	9:15			160	49
05TSOUTH	6/6/2001	9:15	R		110	95
05TSOUTH	6/12/2001	15:00			4700	1600 J
05TSOUTH	6/13/2001	18:05			850	800
05TSOUTH	6/13/2001	18:10	R		440	500
05TSOUTH	7/11/2001	10:15			6	23
05TSOUTH	7/11/2001	10:20	R		3	11
05TSOUTH	7/17/2001	13:00			3	20
05TSOUTH	7/18/2001	14:45			1 U	14
05TSOUTH	8/22/2001	12:15			88	49
05TSOUTH	9/19/2001	8:40			20	7.8
05TSOUTH	9/19/2001	8:40	R		6	17
05TSOUTH	10/17/2001	9:05			120	79
05TSOUTH	11/14/2001	11:48		27		37
05TSOUTH	11/15/2001	11:10		88		66
05TSOUTH	11/15/2001	11:13	R	69		46
05TSOUTH	11/19/2001	14:35			140	240
05TSOUTH	11/19/2001	14:35	R		190	79

**Stanwood WWTP effluent**

05TSTAN	10/17/2000	10:30			3 U	3 U
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**Twin City Foods drain #1 at dike**

05TTCF1	2/27/2001	12:25			1 U	13
05TTCF1	2/27/2001	12:55			190	49
05TTCF1	3/29/2001	9:45			14	240
05TTCF1	4/19/2001	7:35			31	23
05TTCF1	4/19/2001	8:10			38	540
05TTCF1	5/9/2001	9:50			7	700
05TTCF1	6/6/2001	10:15			80	920
05TTCF1	6/12/2001	16:08			1100	1700 J
05TTCF1	6/13/2001	15:49			6100	2800
05TTCF1	7/11/2001	11:00			87	920
05TTCF1	7/18/2001	9:17			260 J	550 J
05TTCF1	8/22/2001	12:50			3900 J	3500
05TTCF1	9/19/2001	9:30			230	540
05TTCF1	9/19/2001	9:30	R		230	540
05TTCF1	10/17/2001	9:40			5300 J	1300
05TTCF1	11/14/2001	13:20		2400		1800
05TTCF1	11/15/2001	11:55		770		400

**Twin City Foods drain #2 on Thomle Road**

05TTCF2	6/12/2001	16:40			2100 J	38000 J
05TTCF2	6/13/2001	16:10			2800	2700 J
05TTCF2	7/17/2001	12:05			290	14
05TTCF2	7/18/2001	9:40			350 J	23 J
05TTCF2	11/15/2001	12:15		36		57

**Twin City Foods drain #3 on Thomle Road**

05TTCF3	6/12/2001	16:35			3800 J	9000 J
05TTCF3	6/13/2001	16:29			870	2100 J
05TTCF3	7/17/2001	11:48			96	250
05TTCF3	7/18/2001	10:00			180 J	410 J

Station	Date	Time	Field Replicate	E. coli cfu/100mL	Entero. cfu/100mL	F.C. cfu/100mL
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**Twin City Foods drain #4 to Hatt Slough\***

05TTCF4	2/27/2001	11:00			6 J	7.8 J
05TTCF4	2/27/2001	11:02	R		7 J	2 J
05TTCF4	3/29/2001	10:25			62	49
05TTCF4	4/19/2001	9:10			13	49
05TTCF4	5/9/2001	10:25			6	46
05TTCF4	6/6/2001	11:10			80	79
05TTCF4	7/11/2001	11:40			140	1700
05TTCF4	8/22/2001	13:40			77	2400
05TTCF4	9/19/2001	10:00			47 J	540
05TTCF4	10/17/2001	10:05			19	240
05TTCF4	10/17/2001	10:10	R		17	240

\* Drain was always plugged and never discharging to Hatt Slough during sampling events.

**Twin City Foods drain #5 at footbridge above Thomle Road**

05TTCF5	8/9/2000	12:25				
05TTCF5	2/27/2001	12:55				
05TTCF5	6/12/2001	15:35			1800 J	8000 J
05TTCF5	6/13/2001	13:29			1100 J	2500 J
05TTCF5	7/17/2001	10:50			400	280
05TTCF5	7/18/2001	10:13			180 J	210 J
05TTCF5	11/14/2001	13:47		160		160
05TTCF5	11/14/2001	13:55	R	190		110
05TTCF5	11/15/2001	12:25		120		140 J
05TTCF5	11/15/2001	12:30	R	92		100 J

**Unnamed Creek #0456 at the end of Soundview Drive**

05TUNIDE	3/29/2001	13:45			1900 J	46
05TUNIDE	4/19/2001	12:05			860 J	540
05TUNIDE	5/9/2001	12:25			280	49
05TUNIDE	5/9/2001	12:30	R		150	79
05TUNIDE	6/6/2001	13:30			490	3500
05TUNIDE	8/22/2001	9:45			10000 J	2400
05TUNIDE	10/17/2001	11:50			340	79
05TUNIDE	11/19/2001	11:30			3000 J	790

**Warm Beach WWTP effluent at Warm Beach**

05TWAREF	2/27/2001	10:05			3 J	7.8 J
05TWAREF	3/29/2001	12:20			21	49
05TWAREF	4/19/2001	10:45			3 U	4.5
05TWAREF	5/9/2001	11:20			4000 J	20000 J
05TWAREF	6/6/2001	12:15			14	130
05TWAREF	7/11/2001	13:15			29	170
05TWAREF	8/22/2001	10:50			1800	540
05TWAREF	10/17/2001	11:05			76	11
05TWAREF	11/19/2001	12:00			190	7.8

**Pump pond slough at Warm Beach**

05TWARSL	2/27/2001	9:42			110 J	33 J
05TWARSL	3/29/2001	12:45			31	33
05TWARSL	4/19/2001	10:55			65	240
05TWARSL	4/19/2001	11:00	R		61	49
05TWARSL	5/9/2001	11:50			160	540
05TWARSL	6/6/2001	12:30			380	350
05TWARSL	7/11/2001	13:35			600	540
05TWARSL	8/22/2001	11:15			1900	1700
05TWARSL	9/19/2001	11:40			380 J	350
05TWARSL	10/17/2001	11:15			6700 J	240
05TWARSL	11/19/2001	12:17			2000	110
05TWARSL	11/19/2001	12:20	R		1600	130

Table C-4. Metals analyses data for the Stillaguamish River TMDL.

Station	Date	Time	Field Replicate	Hardness mg/L	Arsenic $\mu\text{g/L}$		Copper $\mu\text{g/L}$		Lead $\mu\text{g/L}$		Mercury $\mu\text{g/L}$	Nickel $\mu\text{g/L}$	
					Dissolved	Tot. Rec.	Dissolved	Tot. Rec.	Dissolved	Tot. Rec.	Tot. Rec.	Dissolved	Tot. Rec.

**Arlington WWTP effluent**

05TARLIN	9/13/2000	11:17		62.1*										
05TARLIN	6/12/2001	15:40		57.0	0.90	0.85	7.05	9.57	0.534	0.82 J	0.0034	2.77	2.98	
05TARLIN	10/3/2001	12:15		42.7	0.89	0.91	9.35	11.90	0.521	0.630	0.0084	8.92	10.50	
05TARLIN	10/16/2001	14:00		50.3	0.83	0.83	11.90	17.70	0.423	0.590	0.0096	1.69	2.04	

\*24-hour composite

**Church Creek/Jorgenson Slough at Marine Drive**

05TCHURH	10/5/2000	8:45		93.3	1.20	1.40	0.92	2.37	0.053	0.280	0.0029	2.14	3.32
05TCHURH	10/17/2000	13:20		703.0	0.82	0.62	1.50	30.10	0.500 U	1.000 U	0.0043	2.00 U	4.10
05TCHURH	1/31/2001	14:30		39.5	0.62	0.78 J	1.69	2.90	0.125	0.630	0.0140	2.52	4.87
05TCHURH	5/8/2001	13:23		58.0	1.09	1.11	1.23	1.42	0.091	0.200	0.0110	3.98	4.43
05TCHURH	6/13/2001	18:45		44.9	0.99	1.27	2.32	3.35	0.190	0.760 J	0.0170	5.55	7.39
05TCHURH	7/12/2001	13:50		252.0	2.00 U	2.54	2.11	3.89	0.200 U	0.930	0.0092	2.86	3.95
05TCHURH	10/16/2001	11:20		74.2	1.40	1.50	1.18	1.74	0.095	0.180	0.0200	2.04	2.61

**Douglas Slough south of Hwy. 532**

05TDOUG	10/17/2000	12:55		2560.0	0.50 U	0.50 U	8.00	40.90	0.500 U	1.000 U	0.0052	7.90	8.20
05TDOUG	6/13/2001	17:35		1120.0	19.50	22.50	4.26	6.87	0.472	0.970 J	0.0110	14.20	16.80

**Irvine Slough at dike pump station**

05TIRVIN	10/17/2000	11:30		179.0	0.50 U	1.10	1.87	3.72	0.160	1.270	0.0039	4.73	6.32
05TIRVIN	6/13/2001	17:08		188.0	1.64	2.21	5.27	7.00	0.069	0.510 J	0.0100	73.00	76.70

**Mainstem Stillaguamish River at Hatt Slough off Marine Drive**

05TMARIN	9/11/2000	15:40		19.3									
05TMARIN	9/11/2000	15:45		19.2									
05TMARIN	9/13/2000	15:15		28.8									
05TMARIN	10/5/2000	10:20		26.9	0.50 U	0.50 U	0.68	1.21	0.050 U	0.100	0.0020 U	1.53	2.66
05TMARIN	1/31/2001	13:55		26.7	0.41	1.66 J	1.46	10.50	0.056	2.380	0.0216 J	3.49	29.80
05TMARIN	5/8/2001	13:00		23.0	0.41	0.47	0.56	1.08	0.022	0.160	0.0046	1.70	3.05
05TMARIN	6/13/2001	12:15		18.9	0.45	0.82	1.14	3.19	0.066	0.600 J	0.0100	2.78	8.55
05TMARIN	7/12/2001	13:25		30.7	0.65	0.65	0.57	0.72	0.022	0.069	0.0036	1.02	1.23
05TMARIN	10/16/2001	10:50		22.4	0.55	0.66	0.882	1.40 J	0.041	0.120	0.0076	1.93	3.30



Station	Date	Time	Field Replicate	Hardness mg/L	Arsenic µg/L		Copper µg/L		Lead µg/L		Mercury µg/L Tot. Rec.	Nickel µg/L	
					Dissolved	Tot. Rec.	Dissolved	Tot. Rec.	Dissolved	Tot. Rec.		Dissolved	Tot. Rec.

**Mainstem Stillaguamish River below Silvana**

05TMS6	9/11/2000	14:40		20.2									
05TMS6	9/13/2000	14:15		28.8									

**Mainstem Stillaguamish River at Interstate 5 bridge**

05TMS11	9/11/2000	13:25		19.7									
05TMS11	9/13/2000	11:50		27.8									
05TMS11	1/31/2001	13:20		29.3	0.44	2.40 J	1.38	10.30	0.053	2.160	0.0217 J	2.42	24.60
05TMS11	5/8/2001	15:04		21.9	0.37	0.60	0.52	1.09	0.020 U	0.150	0.0030	1.45	2.94
05TMS11	6/12/2001	12:05		20.1	0.44	1.40	1.19	6.78	0.053	1.880	0.0190	2.16	16.80
05TMS11	6/12/2001	12:10	R	19.6	0.44	1.48	1.25	6.98	0.067	1.980	0.0190	2.20	16.90
05TMS11	7/12/2001	11:20		28.6	0.67	0.67	0.48	0.67	0.020 U	0.074	0.0026	0.93	1.19
05TMS11	10/3/2001	12:59		55.6	0.81	0.88	0.58	1.08 J	0.024	0.100 U	0.0043	1.67 J	0.95
05TMS11	10/3/2001	13:05	R	41.7	0.79	0.89	0.577	1.01 J	0.023	0.100 U	0.0033	1.74	2.50
05TMS11	10/16/2001	12:15		22.7	0.56	0.67	0.728	1.44 J	0.020 U	0.140	0.0064	1.42	2.87

**North Fork Stillaguamish River at Cicero bridge**

05TNFCIC	1/31/2001	12:00		22.3	0.38	0.66 J	0.85	2.99	0.042	0.490	0.0063	4.27	12.60
05TNFCIC	5/8/2001	16:49		22.2	0.40	0.43	0.47	0.83	0.020 U	0.090	0.0034	1.72	2.66
05TNFCIC	7/12/2001	9:45		29.4	0.78	0.75	0.34	0.50	0.020 U	0.054	0.0020 U	0.78	1.10
05TNFCIC	10/16/2001	15:20		26.5	0.65	0.70	0.516	0.88 J	0.071	0.100 U	0.0054	1.90	2.85
05TNFCIC	10/16/2001	15:25	R	26.5	0.65	0.69	0.584	0.94	0.024	0.100 U	0.0058	1.92	2.64

**Mouth of the North Fork Stillaguamish River at Twin Rivers Park**

05TNFTWI	9/11/2000	11:19		24.2									
05TNFTWI	9/13/2000	10:10		32.4									
05TNFTWI	6/12/2001	16:40		19.9	0.42	1.02	1.04	4.16	0.071	1.160 J	0.0160	3.61	15.50
05TNFTWI	10/3/2001	11:22		34.6	0.91	0.96	0.45	0.75 J	0.020 U	0.100 U	0.0032	2.28	2.80

**Old Stillaguamish River Channel above the Stanwood WWTP outfall**

05TOC2	10/17/2000	10:40		2750.0	0.50 U	0.50 U	5.44	8.90	0.500 U	1.000 U	0.0042	6.10	9.70
05TOC2	10/17/2000	10:45	R	2530.0	0.50 U	0.50 U	5.60	20.90	0.500 U	1.000 U	0.0040	6.60	11.50
05TOC2	6/13/2001	14:00		39.6	0.81	1.65	2.18	7.07	0.099	1.310 J	0.0170	5.49	17.10
05TOC2	6/13/2001	14:10	R	38.4	0.83	1.58	2.18	29.40	0.093	2.250	0.0180	5.41	16.30

Station	Date	Time	Field Replicate	Hardness mg/L	Arsenic µg/L		Copper µg/L		Lead µg/L		Mercury µg/L Tot. Rec.	Nickel µg/L	
					Dissolved	Tot. Rec.	Dissolved	Tot. Rec.	Dissolved	Tot. Rec.		Dissolved	Tot. Rec.

**Old Stillaguamish River Channel at the Marine Drive bridge**

05TOC3	10/5/2000	9:40		152.0	0.70	1.10	0.84	2.40	0.100 U	0.250	0.0020 U	3.03	6.04
05TOC3	10/17/2000	13:50		767.0	0.50 U	3.00	2.40	13.80	0.500 U	1.800	0.0130	4.50	27.40
05TOC3	1/31/2001	15:10		43.7	0.77	3.02 J	1.89	18.00	0.056	4.950	0.0556	4.59	48.10
05TOC3	1/31/2001	15:15	R	46.7	0.87	3.05 J	1.84	18.10	0.045	4.990	0.0612	5.13	49.10
05TOC3	5/8/2001	11:50		38.0	0.60	1.32	0.83	4.83	0.038	1.030	0.0120	2.65	11.70
05TOC3	5/8/2001	11:55	R	38.2	0.60	1.10	0.81	4.07	0.038	1.020	0.0140	2.53	7.58
05TOC3	6/13/2001	13:05		31.5	0.68	1.55	1.96	7.39	0.082	1.320 J	0.0180	4.18	17.90
05TOC3	7/12/2001	12:40		392.0	2.00 U	5.18	1.70	6.07	0.200 U	1.670	0.0150	5.40	14.60
05TOC3	7/12/2001	12:40	R	393.0	2.00 U	5.04	1.65	6.13	0.200 U	1.640	0.0190	4.75	14.54
05TOC3	10/16/2001	10:00		56.1	1.20	2.78	0.968	10.40	0.100	2.390	0.0423	2.22	18.50

**Old Stillaguamish River Channel at the Norman Road bridge**

05TOC4	10/17/2000	10:15		37.4	0.65	0.60	0.61	1.72	0.050 U	0.210	0.0048	1.65	3.66
05TOC4	6/13/2001	11:48		19.0	0.45	0.82	1.17	3.39	0.063	0.620 J	0.0110	2.92	8.74

**Portage Creek at the 212th Street bridge**

05TPORT	6/12/2001	13:30		47.6	1.70	2.73	1.90	3.31	0.140	1.160 J	0.0180	2.91	5.51
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**Mouth of the South Fork Stillaguamish River at Twin Rivers Park**

05TSFTWI	9/11/2000	11:24		16.9									
05TSFTWI	9/13/2000	10:20		23.0									
05TSFTWI	10/5/2000	11:22		22.2	0.50 U	0.50 U	0.50	1.92	0.050 U	0.690	0.0021	0.29	3.43
05TSFTWI	1/31/2001	11:00		33.7	0.50	2.25 J	1.64	16.20	0.050	3.120	0.0261 J	1.04	31.10
05TSFTWI	5/8/2001	15:53		19.6	0.39	0.44	0.51	1.61	0.021	0.170	0.0029	0.64	2.00
05TSFTWI	6/12/2001	16:20		29.0	0.55	3.27	2.18	21.80	0.079	4.600	0.0497	1.11	39.60
05TSFTWI	7/12/2001	10:25		23.2	0.63	0.68	0.54	1.07	0.021	0.140	0.0025	0.23	1.19
05TSFTWI	10/3/2001	11:37		39.5	0.80	0.84	0.598	1.10 J	0.023	0.100 U	0.0029	0.60	1.50
05TSFTWI	10/16/2001	14:30		19.2	0.53	0.61	0.712	1.49 J	0.038	0.130	0.0059	0.45	1.59

**Stanwood WWTP effluent**

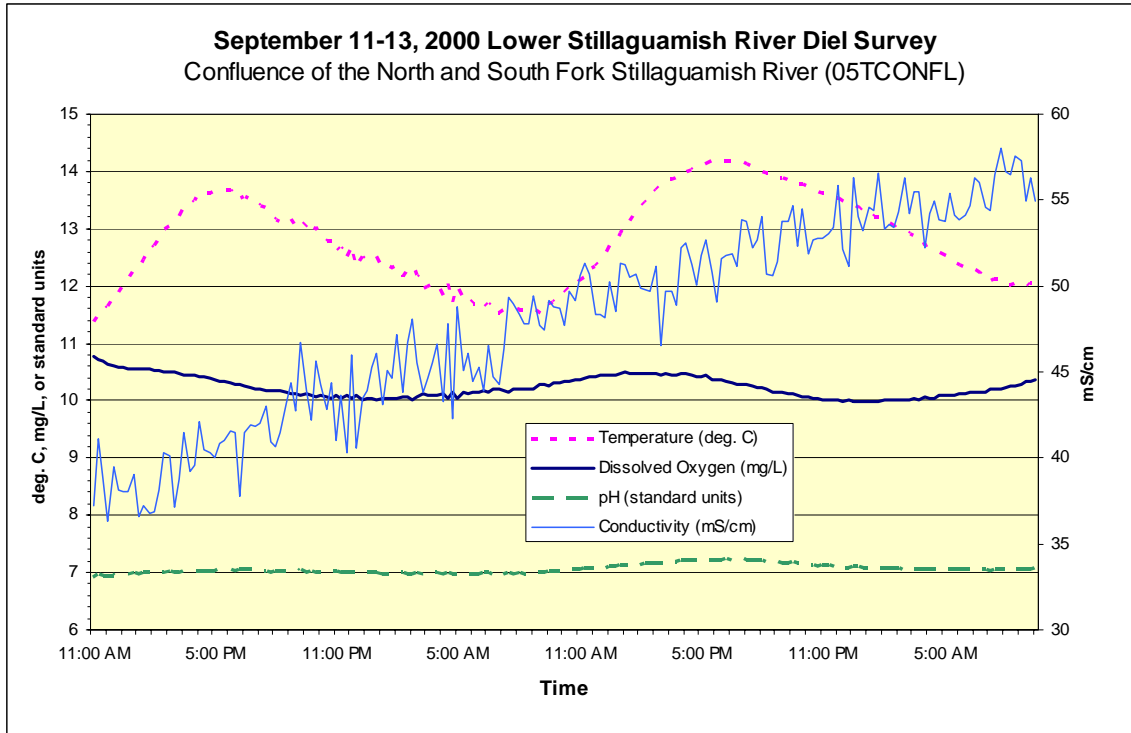
05TSTAN	6/13/2001	14:40		143.0	3.93	3.84	3.08	3.78	0.300	0.710 J	0.0097	8.02	8.59
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## **Appendix D.**

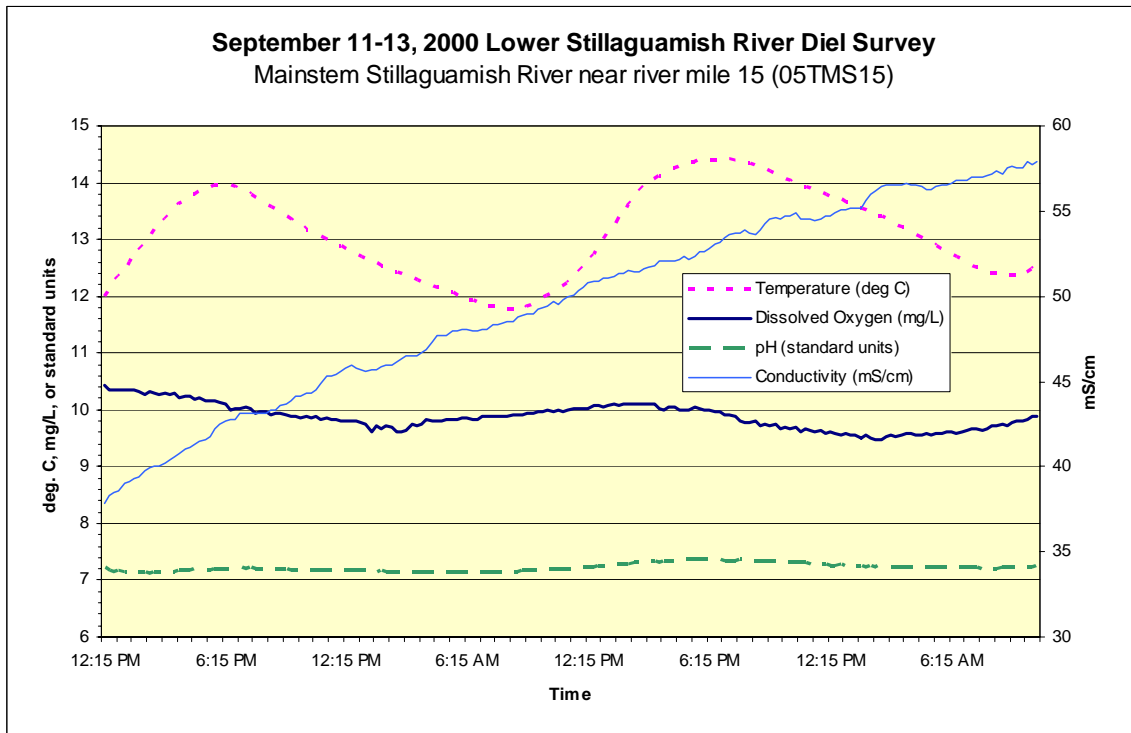
**Diel Survey Data for the Stillaguamish River Watershed  
Fecal Coliform, Dissolved Oxygen, pH, Mercury, and Arsenic TMDL**

Figure D-1. Results of the Lower Stillaguamish River diel surveys conducted on September 11-13, 2000 and October 2-4, 2001.

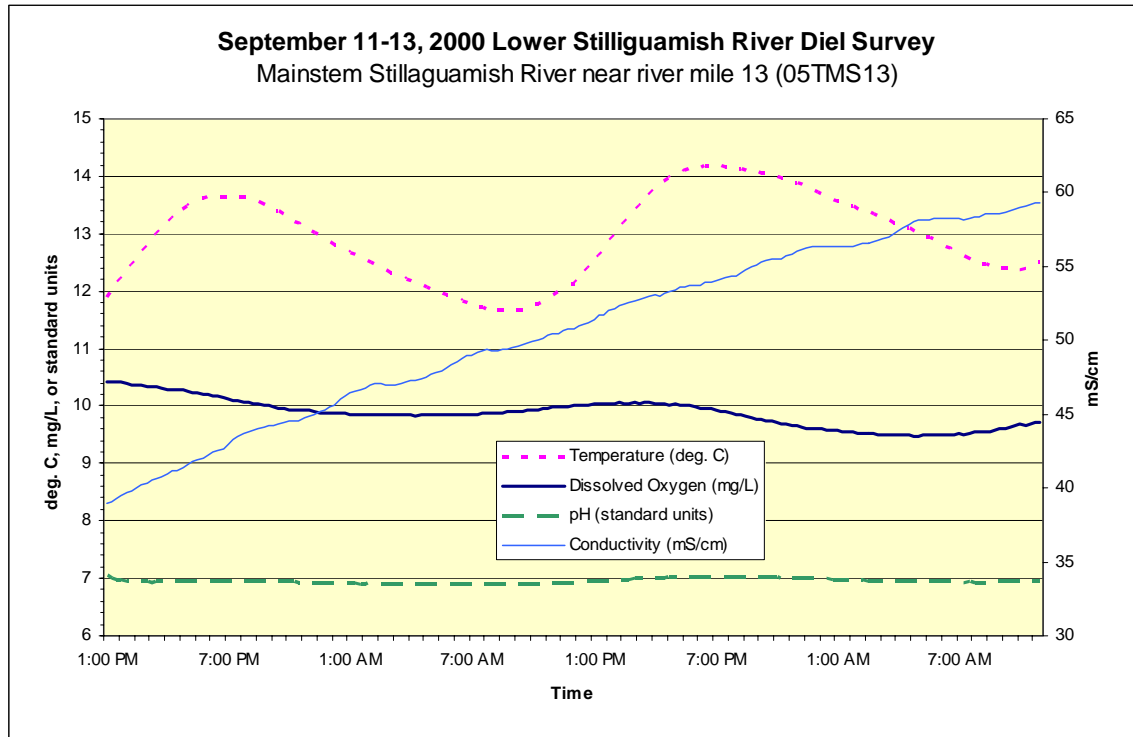
a)



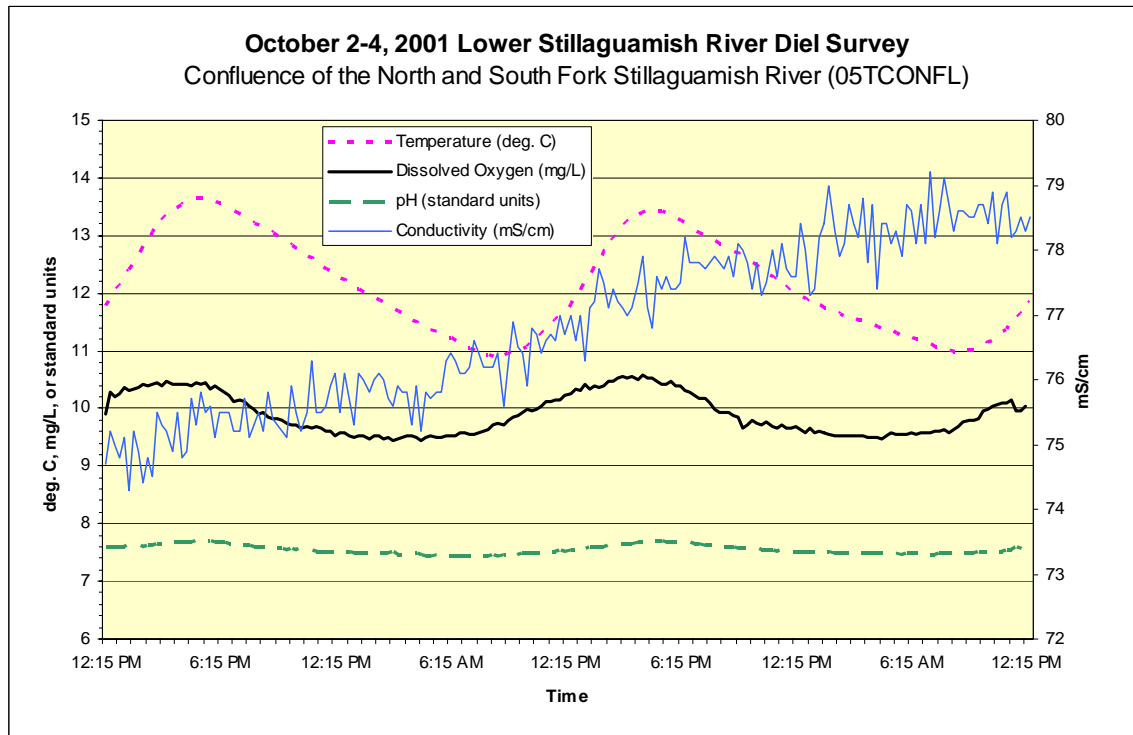
b)



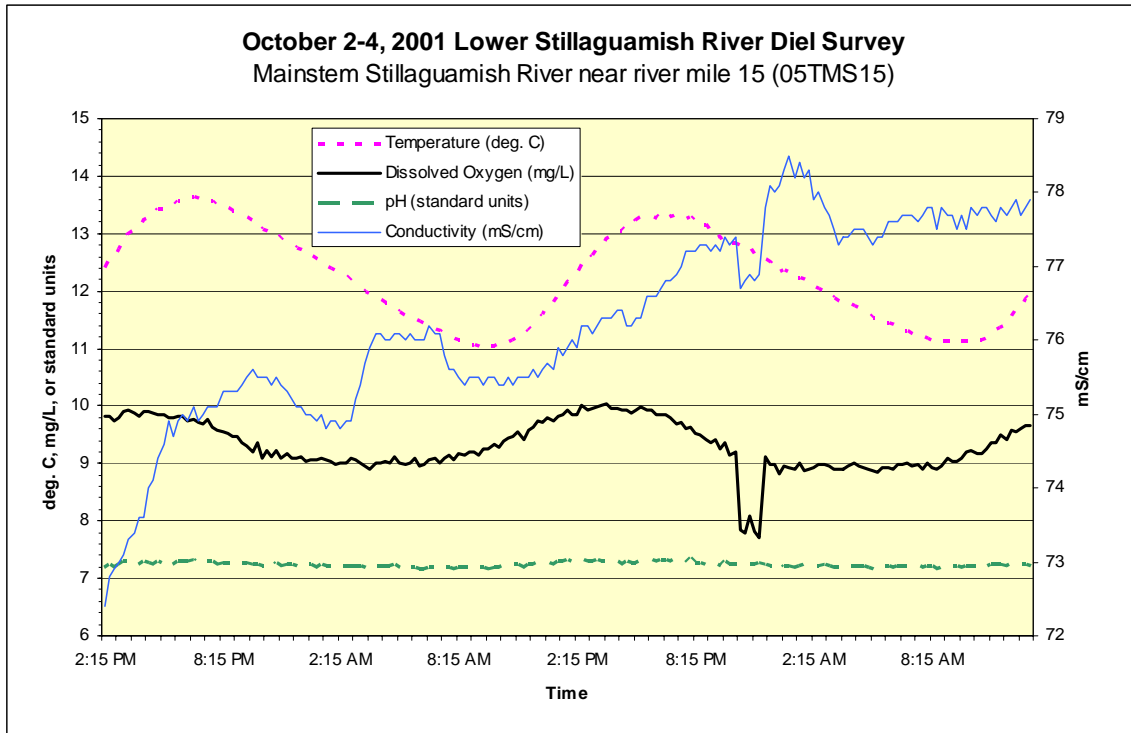
c)



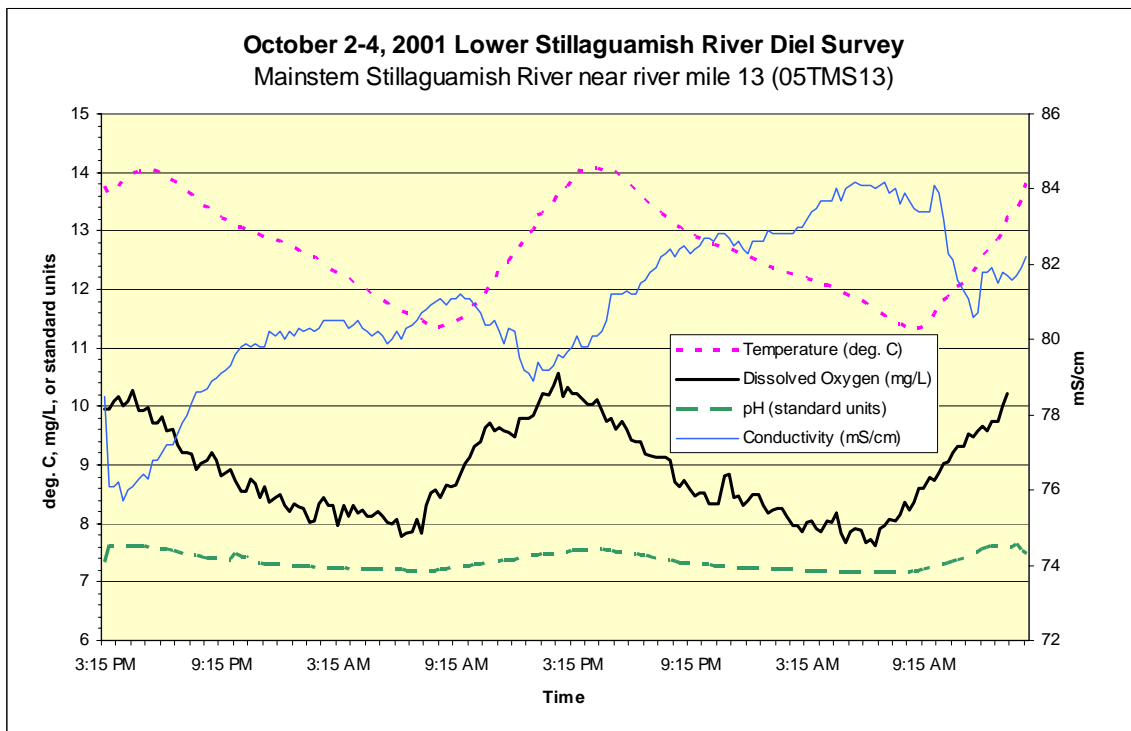
d)



e)



f)



g)

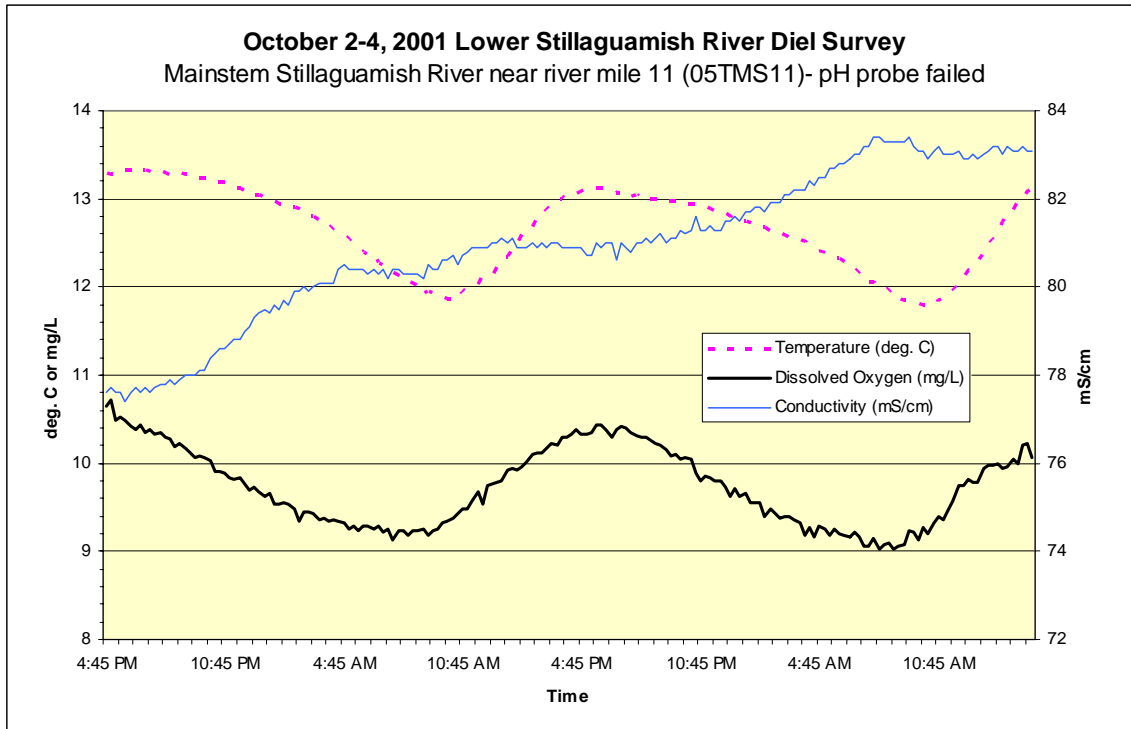
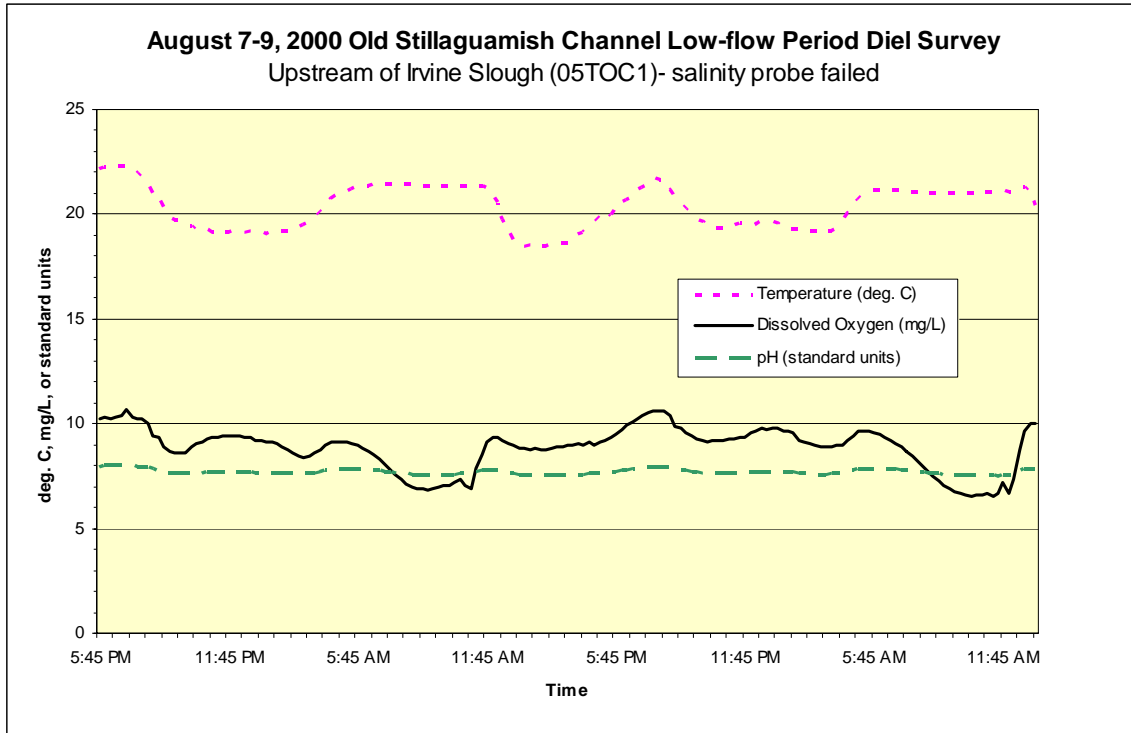
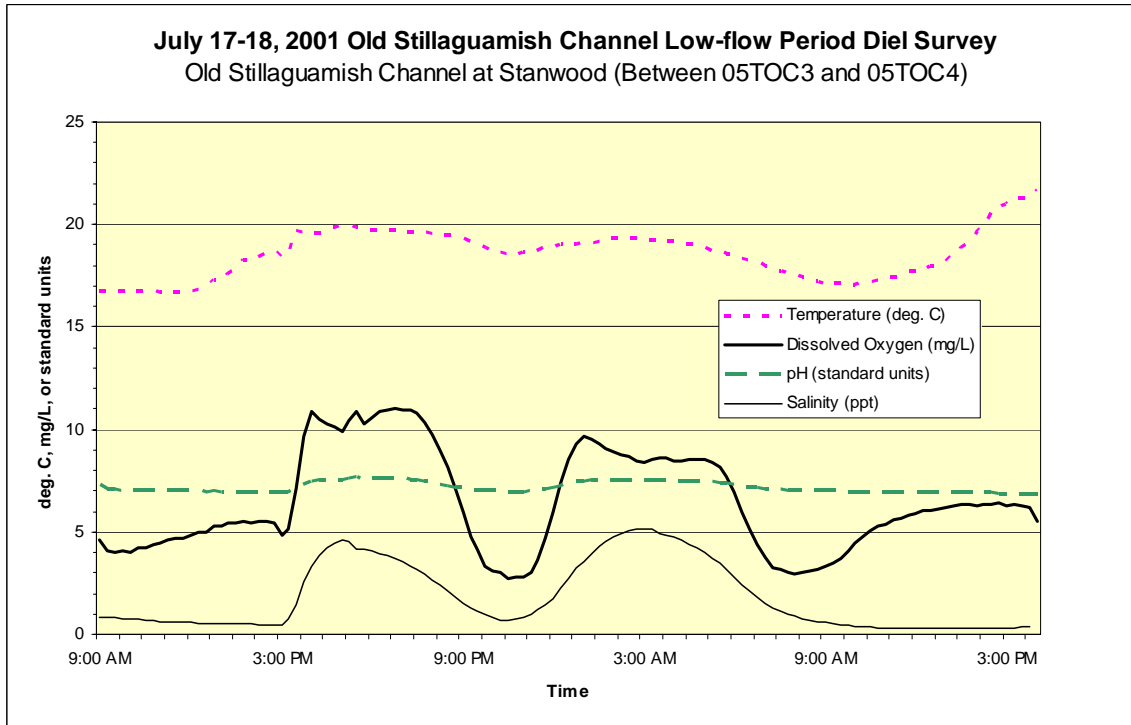


Figure D-2. Results of the Old Stillaguamish Channel low-flow period diel surveys conducted on August 7-9, 2000 and July 17-18, 2001.

a)



b)





c)

