

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

**FORM
2A
NPDES**



NPDES FORM 2A APPLICATION OVERVIEW

APPLICATION OVERVIEW

Form 2A has been developed in a modular format and consists of a “Basic Application Information” packet and a “Supplemental Application Information” packet. The Basic Application Information packet is divided into two parts. All applicants must complete Parts A and C. Applicants with a design flow greater than or equal to 0.1 mgd must also complete Part B. Some applicants must also complete the Supplemental Application Information packet. The following items explain which parts of Form 2A you must complete.

BASIC APPLICATION INFORMATION:

- A. Basic Application Information for all Applicants.** All applicants must complete questions A.1 through A.8. A treatment works that discharges effluent to surface waters of the United States must also answer questions A.9 through A.12.
- B. Additional Application Information for Applicants with a Design Flow ≥ 0.1 mgd.** All treatment works that have design flows greater than or equal to 0.1 million gallons per day must complete questions B.1 through B.6.
- C. Certification.** All applicants must complete Part C (Certification).

SUPPLEMENTAL APPLICATION INFORMATION:

- D. Expanded Effluent Testing Data.** A treatment works that discharges effluent to surface waters of the United States and meets one or more of the following criteria must complete Part D (Expanded Effluent Testing Data):
 1. Has a design flow rate greater than or equal to 1mgd,
 2. Is required to have a pretreatment program (or has one in place), or
 3. Is otherwise required by the permitting authority to provide the information.
- E. Toxicity Testing Data.** A treatment works that meets one or more of the following criteria must complete Part E (Toxicity Testing Data):
 1. Has a design flow rate greater than or equal to 1 mgd,
 2. Is required to have a pretreatment program (or has one in place), or
 3. Is otherwise required by the permitting authority to submit results of toxicity testing.
- F. Industrial User Discharges and RCRA/CERCLA Wastes.** A treatment works that accepts process wastewater from any significant industrial users (SIUs) or receives RCRA or CERCLA wastes must complete Part F (Industrial User Discharges and RCRA/CERCLA Wastes). SIUs are defined as:
 1. All industrial users subject to Categorical Pretreatment Standards under 40 Code of Federal Regulations (CFR) 403.6 and 40 CFR Chapter I, Subchapter N (see instructions); and
 2. Any other industrial user that:
 - a. Discharges an average of 25,000 gallons per day or more of process wastewater to the treatment works (with certain exclusions); or
 - b. Contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the treatment plant; or
 - c. Is designated as an SIU by the control authority.
- G. Combined Sewer Systems.** A treatment works that has a combined sewer system must complete Part G (Combined Sewer Systems).

ALL APPLICANTS MUST COMPLETE PART C (CERTIFICATION)

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

BASIC APPLICATION INFORMATION**PART A. BASIC APPLICATION INFORMATION FOR ALL APPLICANTS:**

All treatment works must complete questions A.1 through A.8 of this Basic Application Information Packet.

A.1. Facility Information.

Facility Name City of Snoqualmie Wastewater Treatment and Water Reclamation Facility

Mailing Address PO Box 987 Snoqualmie, WA 98065

Facility Address (not P.O. Box) 38190 SE Stearns Road Snoqualmie, WA 98065

Location 47.54091, -121.83140
(Latitude/Longitude as decimal degrees (NAD83/WGS84)

Telephone Number (425) 888-4153

E-mail address THolmes@ci.snoqualmie.wa.us

Contact Person Thomas Holmes

Title Wastewater Superintendent

UBI Number N/A

A.2. Applicant Information. If the applicant is different from the above, provide the following:

Applicant Name _____

Mailing Address _____

Telephone Number () _____

E-mail address _____

Contact Person _____

Title _____

Is the applicant the owner or operator (or both) of the treatment works? ☒ owner ☒ operator

Indicate whether correspondence regarding this permit should be directed to the facility or the applicant.

☒ facility ☐ applicant

Can the facility obtain broadband internet access for WQWebDMR (<http://www.ecy.wa.gov/programs/wq/permits/paris/webdmr.html>)?

☒ yes ☐ no

A.3. Existing Environmental Permits. Provide the permit number of any existing environmental permits that have been issued to the treatment works (include state-issued permits).

NPDES	<u>WA0022403</u>	PSD	_____
UIC	_____	Other	_____
RCRA	_____	Other	_____

A.4. Collection System Information. Provide information on municipalities and areas served by the facility. Provide the name and population of each entity and, if known, provide information on the type of collection system (combined vs. separate) and its ownership (municipal, private, etc.).

Name	Population Served	Type of Collection System	Ownership
<u>City of Snoqualmi</u>	<u>12,995</u>	<u>Separate</u>	<u>Municipal</u>
_____	_____	_____	_____
_____	_____	_____	_____
Total population served		<u>12,995</u>	

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

A.5. Indian Country.

- a. Is the treatment works located in Indian Country?
☐ Yes ☒ No
- b. Does the treatment works discharge to a receiving water that is either in Indian Country or that is upstream from (and eventually flows through) Indian Country?
☐ Yes ☒ No

A.6. Flow. Indicate the design flow rate of the treatment plant (i.e., the wastewater flow rate that the plant was built to handle). Also provide the average daily flow rate and maximum daily flow rate for each of the last three years. Each year's data must be based on a 12-month time period with the 12th month of "this year" occurring no more than three months prior to this application submittal.

- a. Design flow rate 2.15 mgd
- | | <u>Two Years Ago</u> | <u>Last Year</u> | <u>This Year</u> |
|-----------------------------------|----------------------|------------------|------------------|
| b. Annual average daily flow rate | <u>1.17</u> | <u>1.22</u> | <u>1.16</u> |
| c. Maximum daily flow rate | <u>4.32</u> | <u>3.00</u> | <u>2.40</u> |

A.7. Collection System. Indicate the type(s) of collection system(s) used by the treatment plant. Check all that apply. Also estimate the percent contribution (by miles) of each.

- ☒ Separate sanitary sewer 100 %
- ☐ Combined storm and sanitary sewer _____ %

A.8. Discharges and Other Disposal Methods.

- a. Does the treatment works discharge effluent to waters of the U.S.? ☒ Yes ☐ No
If yes, list how many of each of the following types of discharge points the treatment works uses:
- i. Discharges of treated effluent 1
- ii. Discharges of untreated or partially treated effluent _____
- iii. Combined sewer overflow points _____
- iv. Constructed emergency overflows (prior to the headworks) _____
- v. Other _____
- b. Does the treatment works discharge effluent to basins, ponds, or other surface impoundments that do not have outlets for discharge to waters of the U.S.? ☐ Yes ☒ No
If yes, provide the following for each surface impoundment:
Location : _____
(Latitude/Longitude as decimal degrees (NAD83/WGS84))
Annual average daily volume discharge to surface impoundment(s) _____ mgd
Is discharge ☐ continuous or ☒ intermittent?
- c. Does the treatment works land-apply treated wastewater? ☐ Yes ☒ No
If yes, provide the following for each land application site:
Location : _____
(Latitude/Longitude as decimal degrees (NAD83/WGS84))
Number of acres: _____
Annual average daily volume applied to site: _____ mgd
Is land application ☐ continuous or ☐ intermittent?
- d. Does the treatment works discharge or transport treated or untreated wastewater to another treatment works? ☐ Yes ☒ No

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

If yes, describe the mean(s) by which the wastewater from the treatment works is discharged or transported to the other treatment works (e.g., tank truck, pipe).

If transport is by a party other than the applicant, provide:

Transporter Name _____

Mailing Address _____

Contact Person _____

Title _____

Telephone Number (____) _____

For each treatment works that receives this discharge, provide the following:

Name _____

Mailing Address _____

Contact Person _____

Title _____

Telephone Number (____) _____

If known, provide the NPDES permit number of the treatment works that receives this discharge _____

Provide the average daily flow rate from the treatment works into the receiving facility. _____ mgd

- e. Does the treatment works discharge or dispose of its wastewater in a manner not included in A.8. through A.8.d above (e.g., underground percolation, well injection): ☐ Yes ☒ No

If yes, provide the following for each disposal method:

Description of method (including location and size of site(s) if applicable):

Annual daily volume disposed by this method: _____

Is disposal through this method ☐ continuous or ☐ intermittent?

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

WASTEWATER DISCHARGES:

If you answered "yes" to question A.8.a, complete questions A.9 through A.12 **once for each outfall** (including bypass points) through which effluent is discharged. Do not include information on combined sewer overflows in this section. If you answered "no" to question A.8.a, go to Part B, "Additional Application Information for Applicants with a Design Flow Greater than or Equal to 0.1 mgd."

A.9. Description of Outfall.

- a. Outfall number 001
- b. Location City of Snoqualmie 98065
(City or town, if applicable) (Zip Code)
King WA
(County) (State)
47.53916 -121.83222
(Latitude) Provide these as decimal degrees (NAD83/WGS84) (Longitude)
- c. Distance from shore (if applicable) 30 ft.
- d. Depth below surface (if applicable) 10.5 (at 7Q10 flow) ft.
- e. Average daily flow rate 0.80 mgd
- f. Does this outfall have either an intermittent or a periodic discharge? ☒ Yes ☐ No (go to A.9.g.)
If yes, provide the following information:
Number of times per year discharge occurs: NA
Average duration of each discharge: Intermittent excess reclaimed water flow during summer months. Continuous during the remainder of the year.
Average flow per discharge: 0.045 mgd
Months in which discharge occurs: Intermittent from May to August
- g. Is outfall equipped with a diffuser? ☒ Yes ☐ No

A.10. Description of Receiving Waters.

- a. Name of receiving water Snoqualmie River
- b. Name of watershed (if known) Snoqualmie-Skykomish
United States Soil Conservation Service 14-digit watershed code (if known): Unknown
- c. Name of State Management/River Basin (if known): Unknown
United States Geological Survey 8-digit hydrologic cataloging unit code (if known): 17110010
- d. Critical low flow of receiving stream (if applicable)
acute Unknown cfs chronic 346 cfs
- e. Total hardness of receiving stream at critical low flow (if applicable): 24.4 mg/l of CaCO₃

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

A.11. Description of Treatment

- a. What level(s) of treatment are provided? Check all that apply.

☐ Primary

☒ Secondary

☐ Advanced

☐ Other. Describe: _____

- b. Indicate the following removal rates (as applicable):

Design BOD5 removal or Design CBOD5 removal 85 %

Design SS removal 85 %

Design P removal N/A %

Design N removal N/A %

Other _____ %

- c. What type of disinfection is used for the effluent from this outfall? If disinfection varies by season, please describe:

Ultraviolet light year-round. Meets reclaimed standards in summer; otherwise, secondary standards.

If disinfection is by chlorination is dechlorination used for this outfall?

☐ Yes

☐ No

- d. Does the treatment plant have post aeration?

☐ Yes

☒ No

A.12. Effluent Testing Information. All Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum, effluent testing data must be based on at least three samples and must be no more than one and one-half years apart.

Outfall number: 001

PARAMETER	MAXIMUM DAILY VALUE		AVERAGE DAILY VALUE		
	Value	Units	Value	Units	Number of Samples
pH (Minimum)	<u>6.34</u>	S.U.			
pH (Maximum)	<u>7.23</u>	S.U.			
Flow Rate	<u>2.1</u>	<u>MGD</u>	<u>0.80</u>	<u>MGD</u>	<u>365</u>
Temperature (Winter)	<u>14.8</u>	<u>deg. C</u>	<u>13.0</u>	<u>deg. C</u>	<u>93</u>
Temperature (Summer)	<u>23.0</u>	<u>deg. C</u>	<u>21.8</u>	<u>deg. C</u>	<u>93</u>

* For pH please report a minimum and a maximum daily value

POLLUTANT	MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Conc.	Units	Number of Samples		

CONVENTIONAL AND NON CONVENTIONAL COMPOUNDS

BIOCHEMICAL OXYGEN DEMAND (Report one)	BOD5						
	CBOD5	<u>4.0</u>	<u>mg/L</u>	<u>2.0</u>	<u>mg/L</u>	<u>156</u>	<u>SM 5210 B-2011</u>
FECAL COLIFORM		<u>12</u>	<u>#/100 mL</u>	<u>1.4</u>	<u>#/100 mL</u>	<u>155</u>	<u>SM 9222 D (mFC)-06</u>

TOTAL SUSPENDED SOLIDS (TSS)	16	mg/L	3.5	mg/L	156	SM 2540 D-2011	
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**END OF PART A.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM
2A YOU MUST COMPLETE**

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

BASIC APPLICATION INFORMATION

**PART B. ADDITIONAL APPLICATION INFORMATION FOR APPLICANTS WITH A DESIGN FLOW GREATER
THAN OR EQUAL TO 0.1 MGD (100,000 gallons per day).**

All applicants with a design flow rate ≥ 0.1 mgd must answer questions B.1 through B.6. All others go to Part C (Certification).

B.1. Inflow and Infiltration. Estimate the average number of gallons per day that flow into the treatment works from inflow and/or infiltration.

290,000 gpd

Briefly explain any steps underway or planned to minimize inflow and infiltration.

The City repairs and rehabilitates leaky manholes in the system on a routine basis.

B.2. Topographic Map. Attach to this application a topographic map of the area extending at least one mile beyond facility property boundaries. This map must show the outline of the facility and the following information. (You may submit more than one map if one map does not show the entire area.)

- The area surrounding the treatment plant, including all unit processes.
- The major pipes or other structures through which wastewater enters the treatment works and the pipes or other structures through which treated wastewater is discharged from the treatment plant. Include outfalls from bypass piping, if applicable.
- Each well where wastewater from the treatment plant is injected underground.
- Wells, springs, other surface water bodies, and drinking water wells that are: 1) within ¼ mile of the property boundaries of the treatment works, and 2) listed in public record or otherwise known to the applicant.
- Any areas where the sewage sludge produced by the treatment works is stored, treated, or disposed.
- If the treatment works receives waste that is classified as hazardous under the Resource Conservation and Recovery Act (RCRA) by truck, rail, or special pipe, show on the map where the hazardous waste enters the treatment works and where it is treated, stored, and/or disposed.

B.3. Process Flow Diagram or Schematic. Provide a diagram showing the processes of the treatment plant, including all bypass piping and all backup power sources or redundancy in the system. Also provide a water balance showing all treatment units, including disinfection (e.g., chlorination and dechlorination). The water balance must show daily average flow rates at influent and discharge points and approximate daily flow rates between treatment units. Include a brief narrative description of the diagram.

B.4. Operation/Maintenance Performed by Contractor(s).

Are any operational or maintenance aspects (related to wastewater treatment and effluent quality) of the treatment works the responsibility of a contractor? ☐ Yes ☒ No

If yes, list the name, address, telephone number, and status of each contractor and describe the contractor's responsibilities (attach additional pages if necessary).

Name: _____

Mailing Address: _____

Telephone Number: () _____

Responsibilities of Contractor: _____

B.5. Scheduled improvements and Schedules of Implementation. Provide information on any uncompleted implementation schedule or uncompleted plans for improvements that will affect the wastewater treatment, effluent quality, or design capacity of the treatment works. If the treatment works has several different implementation schedules or is planning several improvements, submit separate responses to question B.5 for each. (If none, go to question B.6.)

- a. List the outfall number (assigned in question A.9) for each outfall that is covered by this implementation schedule.

001 - Per the Snoqualmie Water Reclamation Facility Improvements Engineering Report (RH2, December 2015), improvements to the anaerobic mixers, solids treatment, baffles for the existing clarifiers, grit removal system, and scum pump station are in progress but incomplete at this time. Improvements to the oxidation ditch aerators and third secondary clarifier are planned, but currently on hold. These improvements will not affect the effluent quality or design capacity of the treatment works. The City is currently underway with their General Sewer Plan and General Facilities Plan and determining phasing of future improvements.

- b. Indicate whether the planned improvements or implementation schedule are required by local, State, or Federal agencies.

☐ Yes ☐ No

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

- c. If the answer to B.5.b is "Yes," briefly describe, including new maximum daily inflow rate (if applicable).

- d. Provide dates imposed by any compliance schedule or any actual dates of completion for the implementation steps listed below, as applicable. For improvements planned independently of local, State, or Federal agencies, indicate planned or actual completion dates, as applicable. Indicate dates as accurately as possible.

Implementation Stage	Schedule MM/DD/YYYY	Actual Completion MM/DD/YYYY
- Begin Construction	<u> / / </u>	<u> / / </u>
- End Construction	<u> / / </u>	<u> / / </u>
- Begin Discharge	<u> / / </u>	<u> / / </u>
- Attain Operational Level	<u> / / </u>	<u> / / </u>

- e. Have appropriate permits/clearances concerning other Federal/State requirements been obtained? ☐ Yes ☐ No

Describe briefly: _____

B.6. EFFLUENT TESTING DATA (GREATER THAN OR EQUAL TO 0.1 MGD ONLY).

Applicants that discharge to waters of the US must provide effluent testing data for the following parameters. Provide the indicated effluent testing required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods (See attachment A). In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. At a minimum effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old.

Outfall Number: 001

POLLUTANT	MAXIMUM DAILY DISCHARGE		AVERAGE DAILY DISCHARGE			ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Conc.	Units	Number of Samples		
CONVENTIONAL AND NON CONVENTIONAL COMPOUNDS							
AMMONIA (as N)	0.89	mg/L	0.17	mg/L	52	EPA 350.1_2_1993	
CHLORINE (TOTAL RESIDUAL, TRC)	0.1	mg/L	0	mg/L	4	SM 4500-CI G	
DISSOLVED OXYGEN	8.2	mg/L	7.1	mg/L	4	SM 4500OC	
TOTAL KJELDAHL NITROGEN (TKN)	3.0	mg/L	1.4	mg/L	12	EPA 351.2	
NITRATE PLUS NITRITE NITROGEN	6.7	mg/L	3.8	mg/L	12	EPA 353.2	
OIL and GREASE	3.8	mg/L	3.1	mg/L	4	EPA 1664	
PHOSPHORUS (Total)	2.3	mg/L	0.45	mg/L	12	SM 4500PF	
TOTAL DISSOLVED SOLIDS (TDS)	360	mg/L	270	mg/L	4	SM 2540C	
OTHER							

END OF PART B.

REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

FACILITY NAME AND PERMIT NUMBER:

City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403

BASIC APPLICATION INFORMATION

PART C. CERTIFICATION

All applicants must complete the Certification Section. Refer to instructions to determine who is an officer for the purposes of this certification. All applicants must complete all applicable sections of Form 2A, as explained in the Application Overview. Indicate below which parts of Form 2A you have completed and are submitting. By signing this certification statement, applicants confirm that they have reviewed Form 2A and have completed all sections that apply to the facility for which this application is submitted.

Indicate which parts of Form 2A you have completed and are submitting:

☒ Basic Application Information packet

Supplemental Application Information packet:

☒ Part D (Expanded Effluent Testing Data)

☒ Part E (Toxicity Testing: Biomonitoring Data)

☐ Part F (Industrial User Discharges and RCRA/CERCLA Wastes)

☐ Part G (Combined Sewer Systems)

ALL APPLICANTS MUST COMPLETE THE FOLLOWING CERTIFICATION.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Permittee

Name and Title of
Responsible Official

Thomas Holmes Wastewater Superintendent

Signature

Tom Holmes

Telephone number

425 1888-4153

E-mail address

tholmes@ci.snoqualmie.wa.us

Date signed

9/26/2018

Co-Permittee (if applicable)

Name and official title

Signature

Telephone number

()

E-mail address

Date signed

Upon request of the permitting authority, you must submit any other information necessary to assure wastewater treatment practices at the treatment works or identify appropriate permitting requirements.

SEND COMPLETED FORMS TO¹:

Water Quality Permit Coordinator

Northwest Regional Office

Department of Ecology

3190 - 160th Avenue SE

Bellevue, WA 98008-5452

¹If unknown, contact an Ecology regional wastewater permit coordinator at: http://www.ecy.wa.gov/programs/wq/permits/permit_coord.html

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

SUPPLEMENTAL APPLICATION INFORMATION

PART D. EXPANDED EFFLUENT TESTING DATA

Refer to the directions on the cover page to determine whether this section applies to the treatment works.

Effluent Testing: 1.0 mgd and Pretreatment Works. If the treatment works has a design flow greater than or equal to 1.0 mgd or it has (or is required to have) a pretreatment program, or is otherwise required by the permitting authority to provide the data, then provide effluent testing data for the following pollutants. Provide the indicated effluent testing information and any other information required by the permitting authority for each outfall through which effluent is discharged. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analyses conducted using 40 CFR Part 136 methods. In addition, these data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136. Indicate in the blank rows provided below any data you may have on pollutants not specifically listed in this form. At a minimum, effluent testing data must be based on at least three pollutant scans and must be no more than four and one-half years old. The applicant should also review Attachment A.

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
METALS (TOTAL RECOVERABLE), CYANIDE, PHENOLS, AND HARDNESS.											
ANTIMONY	2.55	ug/L	0.03	lbs	1.17	ug/L	0.012	lbs	4	EPA 200.8	0.2
ARSENIC	7.61	ug/L	0.08	lbs	3.46	ug/L	0.036	lbs	4	EPA 200.8	0.02
BERYLLIUM	0.03	ug/L	0.0003	lbs	N.D.	ug/L	NA	NA	4	EPA 200.8	0.03
CADMIUM	0.06	ug/L	0.0006	lbs	0.03	ug/L	0.0003	lbs	4	EPA 200.8	0.025
CHROMIUM	0.63	ug/L	0.007	lbs	0.26	ug/L	0.003	lbs	4	EPA 200.8	0.05
COPPER	12.4	ug/L	0.13	lbs	7.44	ug/L	0.078	lbs	4	EPA 200.8	0.1
LEAD	4.26	ug/L	0.045	lbs	1.17	ug/L	0.012	lbs	4	EPA 200.8	0.05
MERCURY	3.26	ng/L	0.0000 3	lbs	1.76	ng/L	0.0000 2	lbs	4	EPA 1631e	0.5
NICKEL	12.5	ug/L	0.13	lbs	3.54	ug/L	0.037	lbs	4	EPA 200.8	0.05
SELENIUM	3.15	ug/L	0.033	lbs	1.11	ug/L	0.012	lbs	4	EPA 200.8	0.25
SILVER	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 200.8	0.05
THALLIUM	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 200.8	0.01
ZINC	305	ug/L	3.2	lbs	101	ug/L	1.1	lbs	4	EPA 200.8	0.5
CYANIDE	17	ug/L	0.18	lbs	N.D.	NA	NA	NA	4	EPA 335.4	5
TOTAL PHENOLIC COMPOUNDS	0.04	mg/L	0.42	lbs	0.02	mg/L	0.21	lbs	4	EPA 420.4	0.01
HARDNESS (AS CaCO3)	120	mg/L	1260	lbs	86	mg/L	903	lbs	3	EPA 200.7 calc	0.05
Use this space (or a separate sheet) to provide information on other metals requested by the permit writer											

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
VOLATILE ORGANIC COMPOUNDS											
ACROLEIN	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	2	EPA 624	1.0
ACRYLONITRILE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
BENZENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
BROMOFORM	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
CARBON TETRACHLORIDE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
CHLORBENZENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
CHLOROBIDBROMO-METHANE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
CHLOROETHANE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
2-CHLORO-ETHYLVINYL ETHER	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	3	EPA 624	1.0
CHOLOROFORM	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
DICHLOROBROMO-METHANE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
1,1-DICHLOROETHANE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
1,2-DICHLOROETHANE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
1,2-DICHLOROETHYLE NE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
TRANS-1,2-DICHLORO-ETHYLENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,1-DICHLOROETHYLE NE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
1,2-DICHLOROPROPANE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	1.0
1,3-DICHLOROPROPYLEN E	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
ETHYLBENZENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NAv	NA
METHYL BROMIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHYL CHLORIDE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
METHYLENE CHLORIDE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 624	2.0

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
1,1,2,2-TETRACHLOROETHANE	<1	ug/L	NA	NA	<1	ug/L	NA	NA	4	EPA 624	1.0
TETRACHLOROETHYLENE	<1	ug/L	NA	NA	<1	ug/L	NA	NA	4	EPA 624	1.0
TOLUENE	2.9	ug/L	0.03	lbs	<1	ug/L	NA	NA	4	EPA 624	1.0
1,1,1-TRICHLOROETHANE	<1	ug/L	NA	NA	<1	ug/L	NA	NA	4	EPA 624	1.0
1,1,2-TRICHLOROETHANE	<1	ug/L	NA	NA	<1	ug/L	NA	NA	4	EPA 624	1.0
TRICHLOROETHYLENE	<1	ug/L	NA	NA	<1	ug/L	NA	NA	4	EPA 624	1.0
VINYL CHLORIDE	<1	ug/L	NA	NA	<1	ug/L	NA	NA	4	EPA 624	1.0

Use this space (or a separate sheet) to provide information on other metals requested by the permit writer

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ACID-EXTRACTABLE COMPOUNDS

P-CHLORO-M-CRESOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2-CHLOROPHENOL	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.5
2,4-DICHLOROPHENOL	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.5
2,4-DIMETHYLPHENOL	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.5
4,6-DINITRO-O-CRESOL	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2,4-DINITROPHENOL	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	1
2-NITROPHENOL	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.5
4-NITROPHENOL	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.5
PENTA-CHLOROPHENOL	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.5
PHENOL	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.5
2,4,6-TRICHLORO PHENOL	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.5

Use this space (or a separate sheet) to provide information on other metals requested by the permit writer

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BASE-NEUTRAL COMPOUNDS

ACENAPHTHENE	N.D.	ug/L	NA	NA	N.D.	NA	NA	NA	4	EPA 625-SIM	0.2
ACENAPHTYLENE	N.D.	ug/L	NA	NA	N.D.	NA	NA	NA	4	EPA 625-SIM	0.2

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
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Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
ANTHRACENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BENZIDINE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.4
BENZO(A) ANTHRACENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BENZO(J)FLUORANTHENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BENZO(r,s,t)PENTAPHENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BENZO(A)PYRENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
3,4 BENZO-FLUORANTHENE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
BENZO(GHI)PERYLENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BENZO(K)FLUORANTHENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BIS (2-CHLOROETHOXY) METHANE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BIS (2-CHLOROETHYL)-ETHER	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BIS (2-CHLOROISOPROPYL) ETHER	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BIS (2-ETHYLHEXYL) PHTHALATE	0.3	ug/L	0.003	lbs	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
4-BROMOPHENYL PHENYL ETHER	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
BUTYL BENZYL PHTHALATE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
2-CHLORO NAPHTHALENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
4-CHLOROPHENYL PHENYL ETHER	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
CHRYSENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
DIBENZO(a,j)ACRIDINE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
DIBENZO(a,h)ACRIDINE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
DIBENZO(a,e)PYRENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
DIBENZO(a,h)PYRENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
DI-N-BUTYL PHTHALATE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
DI-N-OCTYL PHTHALATE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
DIBENZO(A,H) ANTHRACENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
1,2-DICHLORO BENZENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 624	1
1,3-DICHLORO BENZENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 624	1
1,4-DICHLORO BENZENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 624	1
3,3-DICHLORO BENZIDINE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
DIETHYL PHTHALATE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
DIMETHYL PHTHALATE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
2,4-DINITROTOLUENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
2,6-DINITROTOLUENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
1,2-DIPHENYLHYDRAZINE	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FLUORANTHENE	N.D.	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
FLUORENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
HEXACHLORO BENZENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
HEXACHLOROBUT ADIENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
HEXACHLOROCYCLO-PENTADIENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.4
HEXA CHLOROETHANE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
INDENO(1,2,3-CD) PYRENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
ISOPHORONE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
3-METHYL CHOLANTHRENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
NAPHTHALENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
NITROBENZENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
N-NITROSODI-N-PROPYLAMINE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
N-NITROSODI-METHYLAMINE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
N-NITROSODI-PHENYLAMINE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2
PERYLENE	N.D	ug/L	NA	NA	N.D	ug/L	NA	NA	4	EPA 625-SIM	0.2

FACILITY NAME AND PERMIT NUMBER:

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Water Reclamation Facility WA0022403**

Outfall number: 001 (Complete once for each outfall discharging effluent to waters of the United States.)

POLLUTANT	MAXIMUM DAILY DISCHARGE				AVERAGE DAILY DISCHARGE					ANALYTICAL METHOD	ML/MDL
	Conc.	Units	Mass	Units	Conc.	Units	Mass	Units	Number of Samples		
PHENANTHRENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
PYRENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2
1,2,4-TRICHLOROBENZENE	N.D.	ug/L	NA	NA	N.D.	ug/L	NA	NA	4	EPA 625-SIM	0.2

Use this space (or a separate sheet) to provide information on other metals requested by the permit writer

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**END OF PART D.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM
2A YOU MUST COMPLETE**

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

SUPPLEMENTAL APPLICATION INFORMATION

PART E. TOXICITY TESTING DATA

POTWs meeting one or more of the following criteria must provide the results of whole effluent toxicity tests for acute or chronic toxicity for each of the facility's discharge points: 1) POTWs with a design flow rate greater than or equal to 1.0 mgd; 2) POTWs with a pretreatment program (or those that are required to have one under 40 CFR Part 403); or 3) POTWs required by the permitting authority to submit data for these parameters.

- At a minimum, these results must include quarterly testing for a 12-month period within the past 1 year using multiple species (minimum of two species), or the results from four tests performed at least annually in the four and one-half years prior to the application, provided the results show no appreciable toxicity, and testing for acute and/or chronic toxicity, depending on the range of receiving water dilution. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136.
- In addition, submit the results of any other whole effluent toxicity tests from the past four and one-half years. If a whole effluent toxicity test conducted during the past four and one-half years revealed toxicity, provide any information on the cause of the toxicity or any results of a toxicity reduction evaluation, if one was conducted.
- If you have already submitted any of the information requested in Part E, you need not submit it again. Rather, provide the information requested in question E.4 for previously submitted information. If EPA methods were not used, report the reasons for using alternate methods. If test summaries are available that contain all of the information requested below, they may be submitted in place of Part E.

If no biomonitoring data is required, do not complete Part E. Refer to the Application Overview for directions on which other sections of the form to complete.

E.1. Required Tests.

Indicate the number of whole effluent toxicity tests conducted in the past four and one-half years.

☒ chronic ☒ acute

E.2. Individual Test Data. Complete the following chart for each whole effluent toxicity test conducted in the last four and one-half years. Allow one column per test (where each species constitutes a test). Copy this page if more than three tests are being reported.

Test number: **1**

Test number: **2**

Test number: **3**

a. Test information.

Test Species & test method number	Ceriodaphnia dubia; EPA-821-R-02-012	Pimephales promelas; EPA-821-R-02-012	Ceriodaphnia dubia; EPA/821/R-02-013
Age at initiation of test	<24 hours	9 days	<24 hours
Outfall number	001	001	001
Dates sample collected	1/17/2017	1/17/2017	4/24/2017
Date test started	1/18/2017	1/18/2017	4/25/2017
Duration	2 days	4 days	7 days

b. Give toxicity test methods followed.

Manual title	Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms	Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms	Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms
Edition number and year of publication	4th; 2002	4th; 2002	4th; 2002
Page number(s)	Unknown	Unknown	Unknown

c. Give the sample collection method(s) used. For multiple grab samples, indicate the number of grab samples used.

24-Hour composite	X	X	X
Grab			

d. Indicate where the sample was taken in relation to disinfection. (Check all that apply for each.)

Before disinfection			
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After disinfection	X	X	X
After dechlorination			

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

Test number: **1**Test number: **2**Test number: **3**

e. Describe the point in the treatment process at which the sample was collected.

Sample was collected:	Effluent	Effluent	Effluent
-----------------------	-----------------	-----------------	-----------------

f. For each test, include whether the test was intended to assess chronic toxicity, acute toxicity, or both

Chronic toxicity			X
Acute toxicity	X	X	

g. Provide the type of test performed.

Static			
Static-renewal	X	X	
Flow-through			

h. Source of dilution water. If laboratory water, specify type; if receiving water, specify source.

Laboratory water	Moderately hard synthetic water	Moderately hard synthetic water	Diluted mineral water
Receiving water			

i. Type of dilution water. If salt water, specify "natural" or type of artificial sea salts or brine used.

Fresh water	X	X	X
Salt water			

j. Give the percentage effluent used for all concentrations in the test series.

	0; 6.25	0; 6.25	0; 2.4
	12.5; 33.3	12.5; 33.3	12.5; 33.3
	50; 100	50; 100	50; 100

k. Parameters measured during the test. (State whether parameter meets test method specifications)

pH	X	X	X
Salinity			
Temperature	X	X	X
Ammonia			
Dissolved oxygen	X	X	X

l. Test Results.

Acute:

Percent survival in 100% effluent	100 %	95 %	%
LC ₅₀			
95% C.I.	%	%	%
Control percent survival	100 %	100 %	%
Other (describe)			

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

Chronic:

NOEC	%	%	100 %
IC ₂₅	%	%	%
Control percent survival	%	%	100 %
Other (describe)			
m. Quality Control/Quality Assurance.			
Is reference toxicant data available?	Yes	Yes	Yes
Was reference toxicant test within acceptable bounds?	Yes	Yes	Yes
What date was reference toxicant test run (MM/DD/YYYY)?	01/21/2017	01/17/2017	04/18/2017
Other (describe)			

E.3. Toxicity Reduction Evaluation. Is the treatment works involved in a Toxicity Reduction Evaluation?☐ Yes ☒ No

If yes, describe: _____

_____**E.4. Summary of Submitted Biomonitoring Test Information.** If you have submitted biomonitoring test information, or information regarding the cause of toxicity, within the past four and one-half years, provide the dates the information was submitted to the permitting authority and a summary of the results.

Date submitted: ____/____/____ (MM/DD/YYYY)

Summary of results: (see instructions)

END OF PART E.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM
2A YOU MUST COMPLETE.

FACILITY NAME AND PERMIT NUMBER:

City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete part F.

GENERAL INFORMATION:

F.1. Pretreatment Program. Does the treatment works have, or is subject to, an approved pretreatment program?

☒ Yes ☐ No

F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. _____

b. Number of CIUs. 2

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: MicroConnex, Inc.

Mailing Address: 34935 SE Douglas St. Suite 110
Snoqualmie, WA 98065

F.4. Industrial Processes. Describe all the industrial processes that affect or contribute to the SIU's discharge.

Manufacturing flexible printed circuit boards

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): Shearing of raw supplied laminate, pre-cleaning and etching by plasma process, cleaning and preparation of laminate boards, drilling of circuit through holes and board mounting holes, laser machining, application, photo developing and stripping photo resistant film, copper etching, surface preparation and direct matellization of polyimide surfaces and subsequent copper plating, nickel and gold immersion plating, multi-layer board lamination, electroless tin, tin and gold connector pads, pre-clean and other process preparation baths, printing on finished circuit boards, physical vapor deposition of metals and semiconductors, and laboratory scale R&D projects.

Raw material(s): Circuit board substrates

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharge into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

2326 gpd (X continuous or _____ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

NA gpd (_____ continuous or _____ intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits ☐ Yes ☒ No

b. Categorical pretreatment standards ☒ Yes ☐ No

If subject to categorical pretreatment standards, which category and subcategory?

New sources - metal finishing wastewaters

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

F.8. Problems at the Treatment Works Attributed to Waste Discharge by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

☐ Yes ☒ No

If yes, describe each episode.

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail or dedicated pipe?

☐ Yes ☐ No (go to F.12)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

☐ Truck ☐ Rail ☐ Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number

Amount

Units

**CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION
WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:**

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

☐ Yes (complete F.13 through F.15.) ☐ No

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary.)

F.15. Waste Treatment.

a. Is this waste treated (or will be treated) prior to entering the treatment works?

☐ Yes ☐ No

If yes, describe the treatment (provide information about the removal efficiency):

b. Is the discharge (or will the discharge be) continuous or intermittent?

☐ Continuous ☐ Intermittent

If intermittent, describe discharge schedule.

END OF PART F.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

SUPPLEMENTAL APPLICATION INFORMATION

PART G. COMBINED SEWER SYSTEMS

If the treatment works has a combined sewer system, complete Part G.

G.1. System Map. Provide a map indicating the following: (may be included with Basic Application Information)

- a. All CSO discharge points.
- b. Sensitive use areas potentially affected by CSOs (e.g., beaches, drinking water supplies, shellfish beds, sensitive aquatic ecosystems, and outstanding natural resource waters).
- c. Waters that support threatened and endangered species potentially affected by CSOs.

G.2. System Diagram. Provide a diagram, either in the map provided in G.1 or on a separate drawing, of the combined sewer collection system that includes the following information.

- a. Location of major sewer trunk lines, both combined and separate sanitary.
- b. Locations of points where separate sanitary sewers feed into the combined sewer system.
- c. Locations of in-line and off-line storage structures.
- d. Locations of flow-regulating devices.
- e. Locations of pump stations.

CSO OUTFALLS:

Complete questions G.3 through G.6 once for each CSO discharge point.

G.3. Description of Outfall.

- a. Outfall number _____
- b. Location _____
(city or town, if applicable) (Zip Code) _____
(County) (State) _____
(Latitude) (Longitude) _____
- c. Distance from shore (if applicable) _____ ft.
- d. Depth below surface (if applicable) _____ ft.
- e. Which of the following were monitored during the last year for this CSO?
☐ Rainfall ☐ CSO pollutant concentrations ☐ CSO frequency
☐ CSO flow volume ☐ Receiving water quality
- f. How many storm events were monitored during the last year? _____

G.4. CSO Events.

- a. Give the number of CSO events in the last year.
_____ events (☐ actual or ☐ approx.)
- b. Give the average duration per CSO event.
_____ hours (☐ actual or ☐ approx.)

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

- c. Give the average volume per CSO event.
_____ million gallons (☐ actual or ☐ approx.)
- d. Give the minimum rainfall that caused a CSO event in the last year
_____ Inches of rainfall

G.5. Description of Receiving Waters.

- a. Name of receiving water: _____
- b. Name of watershed/river/stream system: _____
United State Soil Conservation Service 14-digit watershed code (if known): _____
- c. Name of State Management/River Basin: _____
United States Geological Survey 8-digit hydrologic cataloging unit code (if known): _____

G.6. CSO Operations.

Describe any known water quality impacts on the receiving water caused by this CSO (e.g., permanent or intermittent beach closings, permanent or intermittent shell fish bed closings, fish kills, fish advisories, other recreational loss, or violation of any applicable State water quality standard).

**END OF PART G.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM
2A YOU MUST COMPLETE.**

Additional information, if provided, will appear on the following pages.

ATTACHMENT A

EFFLUENT CHARACTERIZATION FOR PERMIT APPLICATION

This attachment is used in conjunction with Section V, Parts A, B, and C of EPA Application Form 2C, and Parts A.12, B.6, and D of EPA application Form 2A. It specifies effluent characterization requirements of the Department of Ecology and analytical procedure and detection and quantitation levels for some parameters. For new permit applications, analyze your wastewater for all parameters required by the application and any additional pollutants or groups of pollutants with an X in the left column. Existing Permittees should compile the data from the last year's data for parameters routinely measured. If you are a primary industry category with effluent guidelines you may have some mandatory testing requirements (see Table 2C-2 Form 2C). If you are a municipal POTW, EPA has identified mandatory testing requirements, which depend upon the design flow (see EPA Form 2A).

Ecology added this attachment to the application in order to reduce the number of analytical "non-detects" in required monitoring and to measure effluent concentrations near or below criteria values where possible at a reasonable cost. The applicant must use the specified analytical methods, detection limits (DLs) and quantitation levels (QLs) in the following table for application required monitoring unless:

- Another permit condition specifies other methods, detection levels, or quantitation levels.
- The method used produces measurable results in the sample and EPA has listed it as an EPA-approved method in 40 CFR Part 136.

If the applicant uses an alternative method, as allowed above, it must report the test method, DL, and QL in the application. If the applicant is unable to obtain the required DL and QL in its effluent due to matrix effects, the applicant must submit a matrix-specific detection limit (MDL) and a quantitation limit (QL) to Ecology with appropriate laboratory documentation.

	Form 2C Ref. #	Pollutant & CAS No. (if available)	Recommended Analytical Protocol	Detection (DL)¹ µg/L unless specified	Quantitation Level (QL)² µg/L unless specified
10		Conventional (Part A)			
	a.	Biochemical Oxygen Demand	SM5210-B		2 mg/L
		Soluble Biochemical Oxygen Demand	SM5210-B ³		2 mg/L
	b.	Chemical Oxygen Demand	SM5220-D		10 mg/L
	c.	Total Organic Carbon	SM5310-B/C/D		1 mg/L
	d.	Total Suspended Solids	SM2540-D		5 mg/L
	e.	Total Ammonia (as N)	SM4500-NH3-B and C/D/E/G/H		20
	f.	Flow	Calibrated device		
		Dissolved oxygen	SM4500-OC/OG		0.2 mg/L
		Temperature (max. 7-day avg.)	Analog recorder or Use micro-recording devices known as thermistors		0.2° C
	i.	pH	SM4500-H ⁺ B	N/A	N/A
10		Nonconventional (Part B)			
		Total Alkalinity	SM2320-B		5 mg/L as CaCO ₃
	b.	Chlorine, Total Residual	SM4500 Cl G		50.0
	c.	Color	SM2120 B/C/E		10 color units

	Form 2C Ref. #	Pollutant & CAS No. (if available)	Recommended Analytical Protocol	Detection (DL)¹ µg/L unless specified	Quantitation Level (QL)² µg/L unless specified
	d.	Fecal Coliform	SM 9221E,9222	N/A	Specified in method - sample aliquot dependent
	e.	Fluoride (16984-48-8)	SM4500-F E	25	100
	f.	Nitrate + Nitrite Nitrogen (as N)	SM4500-NO3- E/F/H		100
	g.	Nitrogen, Total Kjeldahl (as N)	SM4500-N _{org} B/C and SM4500NH ₃ - B/C/D/EF/G/H		300
		Soluble Reactive Phosphorus (as P)	SM4500-P E/F/G	3	10
	i.	Phosphorus, Total (as P)	SM 4500 PB followed by SM4500-PE/PF	3	10
	h.	Oil and Grease (HEM) (Hexane Extractable Material)	1664 A or B	1,400	5,000
		Salinity	SM2520-B		3 practical salinity units or scale (PSU or PSS)
		Settleable Solids	SM2540 -F		500 (or 1.0 mL/L)
	k.	Sulfate (as mg/L SO ₄)	SM4110-B		0.2 mg/L
	l.	Sulfide (as mg/L S)	SM4500- S ² F/D/E/G		0.2 mg/L
	m.	Sulfite (as mg/L SO ₃)	SM4500-SO3B		2 mg/L
		Total Coliform	SM 9221B, 9222B, 9223B	N/A	Specified in method - sample aliquot dependent
		Total dissolved solids	SM2540 C		20 mg/L
		Total Hardness	SM2340B		200 as CaCO ₃
	o.	Aluminum, Total (7429-90-5)	200.8	2.0	10
	p.	Barium Total (7440-39-3)	200.8	0.5	2.0
		BTEX (benzene +toluene + ethylbenzene + m,o,p xylenes)	EPA SW 846 8021/8260	1	2
	q.	Boron Total (7440-42-8)	200.8	2.0	10.0
	r.	Cobalt, Total (7440-48-4)	200.8	0.05	0.25
	s.	Iron, Total (7439-89-6)	200.7	12.5	50
	t.	Magnesium, Total (7439-95-4)	200.7	10	50
	u.	Molybdenum, Total (7439-98-7)	200.8	0.1	0.5
	v.	Manganese, Total (7439-96-5)	200.8	0.1	0.5
		NWTPH Dx ⁴	Ecology NWTPH Dx	250	250
		NWTPH Gx ⁵	Ecology NWTPH Gx	250	250
	w.	Tin, Total (7440-31-5)	200.8	0.3	1.5
	x.	Titanium, Total (7440-32-6)	200.8	0.5	2.5

	Form 2C Ref. #	Pollutant & CAS No. (if available)	Recommended Analytical Protocol	Detection (DL)¹ µg/L unless specified	Quantitation Level (QL)² µg/L unless specified
10		Metals, Cyanide and Total Phenols (Part C)			
	1M.	Antimony, Total (7440-36-0)	200.8	0.3	1.0
	2M.	Arsenic, Total (7440-38-2)	200.8	0.1	0.5
	3M.	Beryllium, Total (7440-41-7)	200.8	0.1	0.5
	4M.	Cadmium, Total (7440-43-9)	200.8	0.05	0.25
		Chromium (hex) dissolved (18540-29-9)	SM3500-Cr EC	0.3	1.2
	5M.	Chromium, Total (7440-47-3)	200.8	0.2	1.0
	6M.	Copper, Total (7440-50-8)	200.8	0.4	2.0
	7M.	Lead, Total (7439-92-1)	200.8	0.1	0.5
	8M.	Mercury, Total (7439-97-6)	1631E	0.0002	0.0005
	9M.	Nickel, Total (7440-02-0)	200.8	0.1	0.5
	10M.	Selenium, Total (7782-49-2)	200.8	1.0	1.0
	11M.	Silver, Total (7440-22-4)	200.8	0.04	0.2
	12M.	Thallium, Total (7440-28-0)	200.8	0.09	0.36
	13M.	Zinc, Total (7440-66-6)	200.8	0.5	2.5
	14M.	Cyanide, Total (57-12-5)	335.4	5	10
		Cyanide, Weak Acid Dissociable	SM4500-CN I	5	10
		Cyanide, Free Amenable to Chlorination (Available Cyanide)	SM4500-CN G	5	10
	15M.	Phenols, Total	EPA 420.1		50
10		Acid Compounds			
	1A.	2-Chlorophenol (95-57-8)	625	1.0	2.0
	2A.	2,4-Dichlorophenol (120-83-2)	625	0.5	1.0
	3A.	2,4-Dimethylphenol (105-67-9)	625	0.5	1.0
	4A.	4,6-dinitro-o-cresol (534-52-1) (2-methyl-4,6,-dinitrophenol)	625/1625B	1.0	2.0
	5A.	2,4 dinitrophenol (51-28-5)	625	1.0	2.0
	6A.	2-Nitrophenol (88-75-5)	625	0.5	1.0
	7A.	4-nitrophenol (100-02-7)	625	0.5	1.0
	8A.	Parachlorometa cresol (59-50-7) (4-chloro-3-methylphenol)	625	1.0	2.0
	9A.	Pentachlorophenol (87-86-5)	625	0.5	1.0
	10A.	Phenol (108-95-2)	625	2.0	4.0
	11A.	2,4,6-Trichlorophenol (88-06-2)	625	2.0	4.0
10		Volatile Compounds			
	1V.	Acrolein (107-02-8)	624	5	10
	2V.	Acrylonitrile (107-13-1)	624	1.0	2.0
	3V.	Benzene (71-43-2)	624	1.0	2.0
	5V.	Bromoform (75-25-2)	624	1.0	2.0
	6V.	Carbon tetrachloride (56-23-5)	624/601 or SM6230B	1.0	2.0

	Form 2C Ref. #	Pollutant & CAS No. (if available)	Recommended Analytical Protocol	Detection (DL) ¹ µg/L unless specified	Quantitation Level (QL) ² µg/L unless specified
	7V.	Chlorobenzene (108-90-7)	624	1.0	2.0
	9V.	Chloroethane (75-00-3)	624/601	1.0	2.0
	10V.	2-Chloroethylvinyl Ether (110-75-8)	624	1.0	2.0
	11V.	Chloroform (67-66-3)	624 or SM6210B	1.0	2.0
	8V.	Dibromochloromethane (124-48-1)	624	1.0	2.0
	20B.	1,2-Dichlorobenzene (95-50-1)	624	1.9	7.6
	21B.	1,3-Dichlorobenzene (541-73-1)	624	1.9	7.6
	22B.	1,4-Dichlorobenzene (106-46-7)	624	4.4	17.6
	12V.	Dichlorobromomethane (75-27-4)	624	1.0	2.0
	14V.	1,1-Dichloroethane (75-34-3)	624	1.0	2.0
	15V.	1,2-Dichloroethane (107-06-2)	624	1.0	2.0
	16V.	1,1-Dichloroethylene (75-35-4)	624	1.0	2.0
	17V.	1,2-Dichloropropane (78-87-5)	624	1.0	2.0
	18V.	1,3-dichloropropene (mixed isomers) (1,2- dichloropropylene) (542-75-6) ⁶	624	1.0	2.0
	19V.	Ethylbenzene (100-41-4)	624	1.0	2.0
	20V.	Methyl bromide (74-83-9) (Bromomethane)	624/601	5.0	10.0
	21V.	Methyl chloride (74-87-3) (Chloromethane)	624	1.0	2.0
	22V.	Methylene chloride (75-09-2)	624	5.0	10.0
	23V.	1,1,2,2-Tetrachloroethane (79-34-5)	624	1.9	2.0
	24V.	Tetrachloroethylene (127-18-4)	624	1.0	2.0
	25V.	Toluene (108-88-3)	624	1.0	2.0
	26V.	1,2-Trans-Dichloroethylene (156-60-5) (Ethylene dichloride)	624	1.0	2.0
	27V.	1,1,1-Trichloroethane (71-55-6)	624	1.0	2.0
	28V.	1,1,2-Trichloroethane (79-00-5)	624	1.0	2.0
	29V.	Trichloroethylene (79-01-6)	624	1.0	2.0
	31V.	Vinyl chloride (75-01-4)	624/SM6200B	1.0	2.0
10		Base/Neutral Compounds (compounds in bold are Ecology PBTs)			
	1B.	Acenaphthene (83-32-9)	625	0.2	0.4
	2B.	Acenaphthylene (208-96-8)	625	0.3	0.6
	3B.	Anthracene (120-12-7)	625	0.3	0.6
	4B.	Benzidine (92-87-5)	625	12	24
	15B.	Benzyl butyl phthalate (85-68-7)	625	0.3	0.6
	5B.	Benzo(a)anthracene (56-55-3)	625	0.3	0.6
	7B.	Benzo(b)fluoranthene (3,4-benzofluoranthene) (205-99-2) ⁷	610/625	0.8	1.6
		Benzo(j)fluoranthene (205-82-3) ⁷	625	0.5	1.0

Form 2C Ref. #	Pollutant & CAS No. (if available)	Recommended Analytical Protocol	Detection (DL) ¹ µg/L unless specified	Quantitation Level (QL) ² µg/L unless specified
9B.	Benzo(k)fluoranthene (11,12-benzofluoranthene) (207-08-9) ⁷	610/625	0.8	1.6
	Benzo(r,s,t)pentaphene (189-55-9)	625	0.5	1.0
6B.	Benzo(a)pyrene (50-32-8)	610/625	0.5	1.0
8B.	Benzo(ghi)Perylene (191-24-2)	610/625	0.5	1.0
10B.	Bis(2-chloroethoxy)methane (111-91-1)	625	5.3	21.2
11B.	Bis(2-chloroethyl)ether (111-44-4)	611/625	0.3	1.0
12B.	Bis(2-chloroisopropyl)ether (39638-32-9)	625	0.3	0.6
13B.	Bis(2-ethylhexyl)phthalate (117-81-7)	625	0.1	0.5
14B.	4-Bromophenyl phenyl ether (101-55-3)	625	0.2	0.4
16B.	2-Chloronaphthalene (91-58-7)	625	0.3	0.6
17B.	4-Chlorophenyl phenyl ether (7005-72-3)	625	0.3	0.5
18B.	Chrysene (218-01-9)	610/625	0.3	0.6
	Dibenzo (a,h)acridine (226-36-8)	610M/625M	2.5	10.0
	Dibenzo (a,j)acridine (224-42-0)	610M/625M	2.5	10.0
19B.	Dibenzo(a-h)anthracene (53-70-3)(1,2,5,6-dibenzanthracene)	625	0.8	1.6
	Dibenzo(a,e)pyrene (192-65-4)	610M/625M	2.5	10.0
	Dibenzo(a,h)pyrene (189-64-0)	625M	2.5	10.0
23B.	3,3-Dichlorobenzidine (91-94-1)	605/625	0.5	1.0
24B.	Diethyl phthalate (84-66-2)	625	1.9	7.6
25B.	Dimethyl phthalate (131-11-3)	625	1.6	6.4
26B.	Di-n-butyl phthalate (84-74-2)	625	0.5	1.0
27B.	2,4-dinitrotoluene (121-14-2)	609/625	0.2	0.4
28B.	2,6-dinitrotoluene (606-20-2)	609/625	0.2	0.4
29B.	Di-n-octyl phthalate (117-84-0)	625	0.3	0.6
30B.	1,2-Diphenylhydrazine (as Azobenzene) (122-66-7)	1625B	5.0	20
31B.	Fluoranthene (206-44-0)	625	0.3	0.6
32B.	Fluorene (86-73-7)	625	0.3	0.6
33B.	Hexachlorobenzene (118-74-1)	612/625	0.3	0.6
34B.	Hexachlorobutadiene (87-68-3)	625	0.5	1.0
35B.	Hexachlorocyclopentadiene (77-47-4)	1625B/625	0.5	1.0
36B.	Hexachloroethane (67-72-1)	625	0.5	1.0
37B.	Indeno(1,2,3-cd)Pyrene (193-39-5)	610/625	0.5	1.0
38B.	Isophorone (78-59-1)	625	0.5	1.0
	3-Methyl cholanthrene (56-49-5)	625	2.0	8.0

	Form 2C Ref. #	Pollutant & CAS No. (if available)	Recommended Analytical Protocol	Detection (DL)¹ µg/L unless specified	Quantitation Level (QL)² µg/L unless specified
	39B.	Naphthalene (91-20-3)	625	0.3	0.6
	40B.	Nitrobenzene (98-95-3)	625	0.5	1.0
	41B.	N-Nitrosodimethylamine (62-75-9)	607/625	2.0	4.0
	42B.	N-Nitrosodi-n-propylamine (621-64-7)	607/625	0.5	1.0
	43B.	N-Nitrosodiphenylamine (86-30-6)	625	0.5	1.0
		Perylene (198-55-0)	625	1.9	7.6
	44B.	Phenanthrene (85-01-8)	625	0.3	0.6
	45B.	Pyrene (129-00-0)	625	0.3	0.6
	46B.	1,2,4-Trichlorobenzene (120-82-1)	625	0.3	0.6
10		Dioxin			
		2,3,7,8-Tetra-Chlorodibenzo-P-Dioxin (176-40-16) (2,3,7,8 TCDD)	1613B	1.3 pg/L	5 pg/L
10		Pesticides/PCBs			
	1P.	Aldrin (309-00-2)	608	0.025	0.05
	2P.	alpha-BHC (319-84-6)	608	0.025	0.05
	3P.	beta-BHC (319-85-7)	608	0.025	0.05
	4P.	gamma-BHC (58-89-9)	608	0.025	0.05
	5P.	delta-BHC (319-86-8)	608	0.025	0.05
	6P.	Chlordane (57-74-9) ⁸	608	0.025	0.05
	7P.	4,4'-DDT (50-29-3)	608	0.025	0.05
	8P.	4,4'-DDE (72-55-9)	608	0.025	0.0510
	9P.	4,4' DDD (72-54-8)	608	0.025	0.05
	10P.	Dieldrin (60-57-1)	608	0.025	0.05
	11P.	alpha-Endosulfan (959-98-8)	608	0.025	0.05
	12P.	beta-Endosulfan (33213-65-9)	608	0.025	0.05
	13P.	Endosulfan Sulfate (1031-07-8)	608	0.025	0.05
	14P.	Endrin (72-20-8)	608	0.025	0.05
	15P.	Endrin Aldehyde (7421-93-4)	608	0.025	0.05
	16P.	Heptachlor (76-44-8)	608	0.025	0.05
	17P.	Heptachlor Epoxide (1024-57-3)	608	0.025	0.05
	18P.	PCB-1242 (53469-21-9) ⁹	608	0.25	0.5
	19P.	PCB-1254 (11097-69-1)	608	0.25	0.5
	20P.	PCB-1221 (11104-28-2)	608	0.25	0.5
	21P.	PCB-1232 (11141-16-5)	608	0.25	0.5
	22P.	PCB-1248 (12672-29-6)	608	0.25	0.5
	23P.	PCB-1260 (11096-82-5)	608	0.13	0.5
	24P.	PCB-1016 (12674-11-2) ⁹	608	0.13	0.5
	25P.	Toxaphene (8001-35-2)	608	0.24	0.5

1. Detection level (DL) or detection limit means the minimum concentration of an analyte (substance) that can be measured and reported with a 99% confidence that the analyte concentration is greater than zero as determined by the procedure given in 40 CFR part 136, Appendix B.
2. Quantitation Level (QL) also known as Minimum Level of Quantitation (ML) – The lowest level at which the entire analytical system must give a recognizable signal and acceptable calibration point for the analyte. It is equivalent to the concentration of the lowest calibration standard, assuming that the lab has used all method-specified sample weights, volumes, and cleanup procedures. The QL is calculated by multiplying the MDL by 3.18 and rounding the result to the number nearest to $(1, 2, \text{ or } 5) \times 10^n$, where n is an integer. (64 FR 30417).
ALSO GIVEN AS:
The smallest detectable concentration of analyte greater than the Detection Limit (DL) where the accuracy (precision & bias) achieves the objectives of the intended purpose. (Report of the Federal Advisory Committee on Detection and Quantitation Approaches and Uses in Clean Water Act Programs Submitted to the US Environmental Protection Agency December 2007).
3. Soluble Biochemical Oxygen Demand method note: First, filter the sample through a Millipore Nylon filter (or equivalent) - pore size of 0.45-0.50 um (prep all filters by filtering 250 ml of laboratory grade deionized water through the filter and discard). Then, analyze sample as per method 5210-B.
4. NWTPH Dx - Northwest Total Petroleum Hydrocarbons Diesel Extended Range – see <http://www.ecy.wa.gov/biblio/97602.html>
5. NWTPH Gx - Northwest Total Petroleum Hydrocarbons Gasoline Extended Range – see <http://www.ecy.wa.gov/biblio/97602.html>
6. 1, 3-dichloropropylene (mixed isomers) You may report this parameter as two separate parameters: cis-1, 3-dichloropropene (10061-01-5) and trans-1, 3-dichloropropene (10061-02-6).
7. Total Benzo(a)fluoranthenes - Because Benzo(b)fluoranthene, Benzo(j)fluoranthene and Benzo(k)fluoranthene co-elute you may report these three isomers as total benzo(a)fluoranthenes.
8. Chlordane – You may report alpha-chlordane (5103-71-9) and gamma-chlordane (5103-74-2) in place of chlordane (57-74-9). If you report alpha and gamma-chlordane, the DL/PQLs that apply are 0.025/0.050.
9. PCB 1016 & PCB 1242 – You may report these two PCB compounds as one parameter called PCB 1016/1242.
10. An X placed in this box means you must analyze for all pollutants in the group. This may be in addition to NPDES application requirements.

To request ADA accommodation including materials in a format for the visually impaired, call the Water Quality Program at Ecology, 360-407-6600. Persons with impaired hearing may use the Washington Relay Service at 711. Persons with a speech disability may call TTY at 877-833-6341.

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

SUPPLEMENTAL APPLICATION INFORMATION

PART E. TOXICITY TESTING DATA

POTWs meeting one or more of the following criteria must provide the results of whole effluent toxicity tests for acute or chronic toxicity for each of the facility's discharge points: 1) POTWs with a design flow rate greater than or equal to 1.0 mgd; 2) POTWs with a pretreatment program (or those that are required to have one under 40 CFR Part 403); or 3) POTWs required by the permitting authority to submit data for these parameters.

- At a minimum, these results must include quarterly testing for a 12-month period within the past 1 year using multiple species (minimum of two species), or the results from four tests performed at least annually in the four and one-half years prior to the application, provided the results show no appreciable toxicity, and testing for acute and/or chronic toxicity, depending on the range of receiving water dilution. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136.
- In addition, submit the results of any other whole effluent toxicity tests from the past four and one-half years. If a whole effluent toxicity test conducted during the past four and one-half years revealed toxicity, provide any information on the cause of the toxicity or any results of a toxicity reduction evaluation, if one was conducted.
- If you have already submitted any of the information requested in Part E, you need not submit it again. Rather, provide the information requested in question E.4 for previously submitted information. If EPA methods were not used, report the reasons for using alternate methods. If test summaries are available that contain all of the information requested below, they may be submitted in place of Part E.

If no biomonitoring data is required, do not complete Part E. Refer to the Application Overview for directions on which other sections of the form to complete.

E.1. Required Tests.

Indicate the number of whole effluent toxicity tests conducted in the past four and one-half years.

☒ chronic ☒ acute

E.2. Individual Test Data.

Complete the following chart for each whole effluent toxicity test conducted in the last four and one-half years. Allow one column per test (where each species constitutes a test). Copy this page if more than three tests are being reported.

Test number: **4**

Test number: **5**

Test number: **6**

a. Test information.

Test Species & test method number	Pimephales promelas; EPA-821-R-02-013	Ceriodaphnia dubia; EPA- 821-R-02-012	Pimephales promelas; EPA-821-R-02-012
Age at initiation of test	1 day	<24 hours	7 days
Outfall number	001	001	001
Dates sample collected	4/24/2017	7/10/2017	7/10/2017
Date test started	4/25/2017	7/11/2017	7/11/2017
Duration	7 days	2 days	4 days

b. Give toxicity test methods followed.

Manual title	Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms	Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms	Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms
Edition number and year of publication	4th; 2002	4th; 2002	4th; 2002
Page number(s)	Unknown	Unknown	Unknown

c. Give the sample collection method(s) used. For multiple grab samples, indicate the number of grab samples used.

24-Hour composite	X	X	X
Grab			

d. Indicate where the sample was taken in relation to disinfection. (Check all that apply for each.)

Before disinfection			
---------------------	--	--	--

After disinfection	X	X	X
After dechlorination			

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

Test number: **4**Test number: **5**Test number: **6**

e. Describe the point in the treatment process at which the sample was collected.

Sample was collected:	Effluent	Effluent	Effluent
-----------------------	-----------------	-----------------	-----------------

f. For each test, include whether the test was intended to assess chronic toxicity, acute toxicity, or both

Chronic toxicity	X		
Acute toxicity		X	X

g. Provide the type of test performed.

Static			
Static-renewal		X	X
Flow-through			

h. Source of dilution water. If laboratory water, specify type; if receiving water, specify source.

Laboratory water	Moderately hard synthetic water	Moderately hard synthetic water	Moderately hard synthetic water
Receiving water			

i. Type of dilution water. If salt water, specify "natural" or type of artificial sea salts or brine used.

Fresh water	X	X	X
Salt water			

j. Give the percentage effluent used for all concentrations in the test series.

	0; 2.4	0; 6.25	0; 6.25
	12.5; 33.3	12.5; 33.3	12.5; 33.3
	50; 100	50; 100	50; 100

k. Parameters measured during the test. (State whether parameter meets test method specifications)

pH	X	X	X
Salinity			
Temperature	X	X	X
Ammonia			
Dissolved oxygen	X	X	X

l. Test Results.

Acute:

Percent survival in 100% effluent	%	100 %	92.5 %
LC ₅₀			
95% C.I.	%	%	%
Control percent survival	%	100 %	95 %
Other (describe)			

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

Chronic:

NOEC	100 %	%	%
IC ₂₅	%	%	%
Control percent survival	100 %	%	%
Other (describe)			
m. Quality Control/Quality Assurance.			
Is reference toxicant data available?	Yes	Yes	Yes
Was reference toxicant test within acceptable bounds?	Yes	Yes	Yes
What date was reference toxicant test run (MM/DD/YYYY)?	04/13/2017	07/17/2017	07/18/2017
Other (describe)			

E.3. Toxicity Reduction Evaluation. Is the treatment works involved in a Toxicity Reduction Evaluation?☐ Yes ☒ No

If yes, describe: _____

_____**E.4. Summary of Submitted Biomonitoring Test Information.** If you have submitted biomonitoring test information, or information regarding the cause of toxicity, within the past four and one-half years, provide the dates the information was submitted to the permitting authority and a summary of the results.

Date submitted: ____/____/____ (MM/DD/YYYY)

Summary of results: (see instructions)

END OF PART E.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM 2A YOU MUST COMPLETE.

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

SUPPLEMENTAL APPLICATION INFORMATION

PART F. INDUSTRIAL USER DISCHARGES AND RCRA/CERCLA WASTES

All treatment works receiving discharges from significant industrial users or which receive RCRA, CERCLA, or other remedial wastes must complete part F.

GENERAL INFORMATION:

F.1. Pretreatment Program. Does the treatment works have, or is subject to, an approved pretreatment program?

☐ Yes ☐ No

F.2. Number of Significant Industrial Users (SIUs) and Categorical Industrial Users (CIUs). Provide the number of each of the following types of industrial users that discharge to the treatment works.

a. Number of non-categorical SIUs. _____

b. Number of CIUs. _____

SIGNIFICANT INDUSTRIAL USER INFORMATION:

Supply the following information for each SIU. If more than one SIU discharges to the treatment works, copy questions F.3 through F.8 and provide the information requested for each SIU.

F.3. Significant Industrial User Information. Provide the name and address of each SIU discharging to the treatment works. Submit additional pages as necessary.

Name: JR Four Ltd, -dba Technical Glass Products

Mailing Address: 8107 Bracken Place SE

Snoqualmie, WA 98065

F.4. Industrial Processes. Describe all the industrial processes that affect or contribute to the SIU's discharge.

Glass cleaning with film application, glass neoceram cut to size, and metal finishing line to prepare surface for powder coating

F.5. Principal Product(s) and Raw Material(s). Describe all of the principal processes and raw materials that affect or contribute to the SIU's discharge.

Principal product(s): Alkaline cleaning, alkaline cleaning rinse, etching/sealing, etching/sealing rinse, and final sealer application

Raw material(s): Galaxy FGClean1052 (3%), Duratec 400 (3%), Spectralink (2%) by volume

F.6. Flow Rate.

a. Process wastewater flow rate. Indicate the average daily volume of process wastewater discharge into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

4000 gpd (☒ continuous or ☒ intermittent)

b. Non-process wastewater flow rate. Indicate the average daily volume of non-process wastewater flow discharged into the collection system in gallons per day (gpd) and whether the discharge is continuous or intermittent.

NA gpd (____ continuous or ____ intermittent)

F.7. Pretreatment Standards. Indicate whether the SIU is subject to the following:

a. Local limits ☒ Yes ☐ No

b. Categorical pretreatment standards ☒ Yes ☐ No

If subject to categorical pretreatment standards, which category and subcategory?

New sources - metal finishing

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

F.8. Problems at the Treatment Works Attributed to Waste Discharge by the SIU. Has the SIU caused or contributed to any problems (e.g., upsets, interference) at the treatment works in the past three years?

☐ Yes ☒ No

If yes, describe each episode.

RCRA HAZARDOUS WASTE RECEIVED BY TRUCK, RAIL, OR DEDICATED PIPELINE:

F.9. RCRA Waste. Does the treatment works receive or has it in the past three years received RCRA hazardous waste by truck, rail or dedicated pipe?

☐ Yes ☐ No (go to F.12)

F.10. Waste Transport. Method by which RCRA waste is received (check all that apply):

☐ Truck ☐ Rail ☐ Dedicated Pipe

F.11. Waste Description. Give EPA hazardous waste number and amount (volume or mass, specify units).

EPA Hazardous Waste Number

Amount

Units

**CERCLA (SUPERFUND) WASTEWATER, RCRA REMEDIATION/CORRECTIVE ACTION
WASTEWATER, AND OTHER REMEDIAL ACTIVITY WASTEWATER:**

F.12. Remediation Waste. Does the treatment works currently (or has it been notified that it will) receive waste from remedial activities?

☐ Yes (complete F.13 through F.15.) ☐ No

F.13. Waste Origin. Describe the site and type of facility at which the CERCLA/RCRA/or other remedial waste originates (or is expected to originate in the next five years).

F.14. Pollutants. List the hazardous constituents that are received (or are expected to be received). Include data on volume and concentration, if known. (Attach additional sheets if necessary.)

F.15. Waste Treatment.

a. Is this waste treated (or will be treated) prior to entering the treatment works?

☐ Yes ☐ No

If yes, describe the treatment (provide information about the removal efficiency):

b. Is the discharge (or will the discharge be) continuous or intermittent?

☐ Continuous ☐ Intermittent

If intermittent, describe discharge schedule.

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

SUPPLEMENTAL APPLICATION INFORMATION

PART E. TOXICITY TESTING DATA

POTWs meeting one or more of the following criteria must provide the results of whole effluent toxicity tests for acute or chronic toxicity for each of the facility's discharge points: 1) POTWs with a design flow rate greater than or equal to 1.0 mgd; 2) POTWs with a pretreatment program (or those that are required to have one under 40 CFR Part 403); or 3) POTWs required by the permitting authority to submit data for these parameters.

- At a minimum, these results must include quarterly testing for a 12-month period within the past 1 year using multiple species (minimum of two species), or the results from four tests performed at least annually in the four and one-half years prior to the application, provided the results show no appreciable toxicity, and testing for acute and/or chronic toxicity, depending on the range of receiving water dilution. Do not include information on combined sewer overflows in this section. All information reported must be based on data collected through analysis conducted using 40 CFR Part 136 methods. In addition, this data must comply with QA/QC requirements of 40 CFR Part 136 and other appropriate QA/QC requirements for standard methods for analytes not addressed by 40 CFR Part 136.
- In addition, submit the results of any other whole effluent toxicity tests from the past four and one-half years. If a whole effluent toxicity test conducted during the past four and one-half years revealed toxicity, provide any information on the cause of the toxicity or any results of a toxicity reduction evaluation, if one was conducted.
- If you have already submitted any of the information requested in Part E, you need not submit it again. Rather, provide the information requested in question E.4 for previously submitted information. If EPA methods were not used, report the reasons for using alternate methods. If test summaries are available that contain all of the information requested below, they may be submitted in place of Part E.

If no biomonitoring data is required, do not complete Part E. Refer to the Application Overview for directions on which other sections of the form to complete.

E.1. Required Tests.

Indicate the number of whole effluent toxicity tests conducted in the past four and one-half years.

☒ chronic ☒ acute

E.2. Individual Test Data.

Complete the following chart for each whole effluent toxicity test conducted in the last four and one-half years. Allow one column per test (where each species constitutes a test). Copy this page if more than three tests are being reported.

Test number: 7

Test number: 8

Test number: _____

a. Test information.

Test Species & test method number	Ceriodaphnia dubia; EPA/821/R-02-013	Pimephales promelas; EPA/821/R-02-013	
Age at initiation of test	<24 hours	1 day	
Outfall number	001	001	
Dates sample collected	10/02/2017; 10/04/2017; 10/06/2017	10/02/2017; 10/04/2017; 10/06/2017	
Date test started	10/03/2017	10/03/2017	
Duration	7 days	7 days	

b. Give toxicity test methods followed.

Manual title	Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms	Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms	
Edition number and year of publication	4th; 2002	4th; 2002	
Page number(s)	Unknown	Unknown	

c. Give the sample collection method(s) used. For multiple grab samples, indicate the number of grab samples used.

24-Hour composite	X	X	
Grab			

d. Indicate where the sample was taken in relation to disinfection. (Check all that apply for each.)

Before disinfection			
---------------------	--	--	--

After disinfection	X	X	
After dechlorination			

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

Test number: **7**

Test number: **8**

Test number: _____

e. Describe the point in the treatment process at which the sample was collected.

Sample was collected:

Effluent

Effluent

f. For each test, include whether the test was intended to assess chronic toxicity, acute toxicity, or both

Chronic toxicity

X

X

Acute toxicity

g. Provide the type of test performed.

Static

Static-renewal

Flow-through

h. Source of dilution water. If laboratory water, specify type; if receiving water, specify source.

Laboratory water

EPA diluted mineral water

**Moderately hard synthetic
water**

Receiving water

i. Type of dilution water. If salt water, specify "natural" or type of artificial sea salts or brine used.

Fresh water

X

X

Salt water

j. Give the percentage effluent used for all concentrations in the test series.

0; 2.4

0; 2.4

12.5; 33.3

12.5; 33.3

50; 100

50; 100

k. Parameters measured during the test. (State whether parameter meets test method specifications)

pH

X

X

Salinity

Temperature

X

X

Ammonia

Dissolved oxygen

X

X

l. Test Results.

Acute:

Percent survival in 100%
effluent

%

%

%

LC₅₀

95% C.I.

%

%

%

Control percent survival

%

%

%

Other (describe)

FACILITY NAME AND PERMIT NUMBER:

**City of Snoqualmie Wastewater Treatment and
Water Reclamation Facility WA0022403**

Chronic:

NOEC	100 %	100 %	%
IC ₂₅	%	%	%
Control percent survival	90 %	92.5 %	%
Other (describe)			
m. Quality Control/Quality Assurance.			
Is reference toxicant data available?	Yes	Yes	
Was reference toxicant test within acceptable bounds?	Yes	Yes	
What date was reference toxicant test run (MM/DD/YYYY)?	10/05/2017	10/03/2017	/ /
Other (describe)			

E.3. Toxicity Reduction Evaluation. Is the treatment works involved in a Toxicity Reduction Evaluation?☐ Yes ☒ No

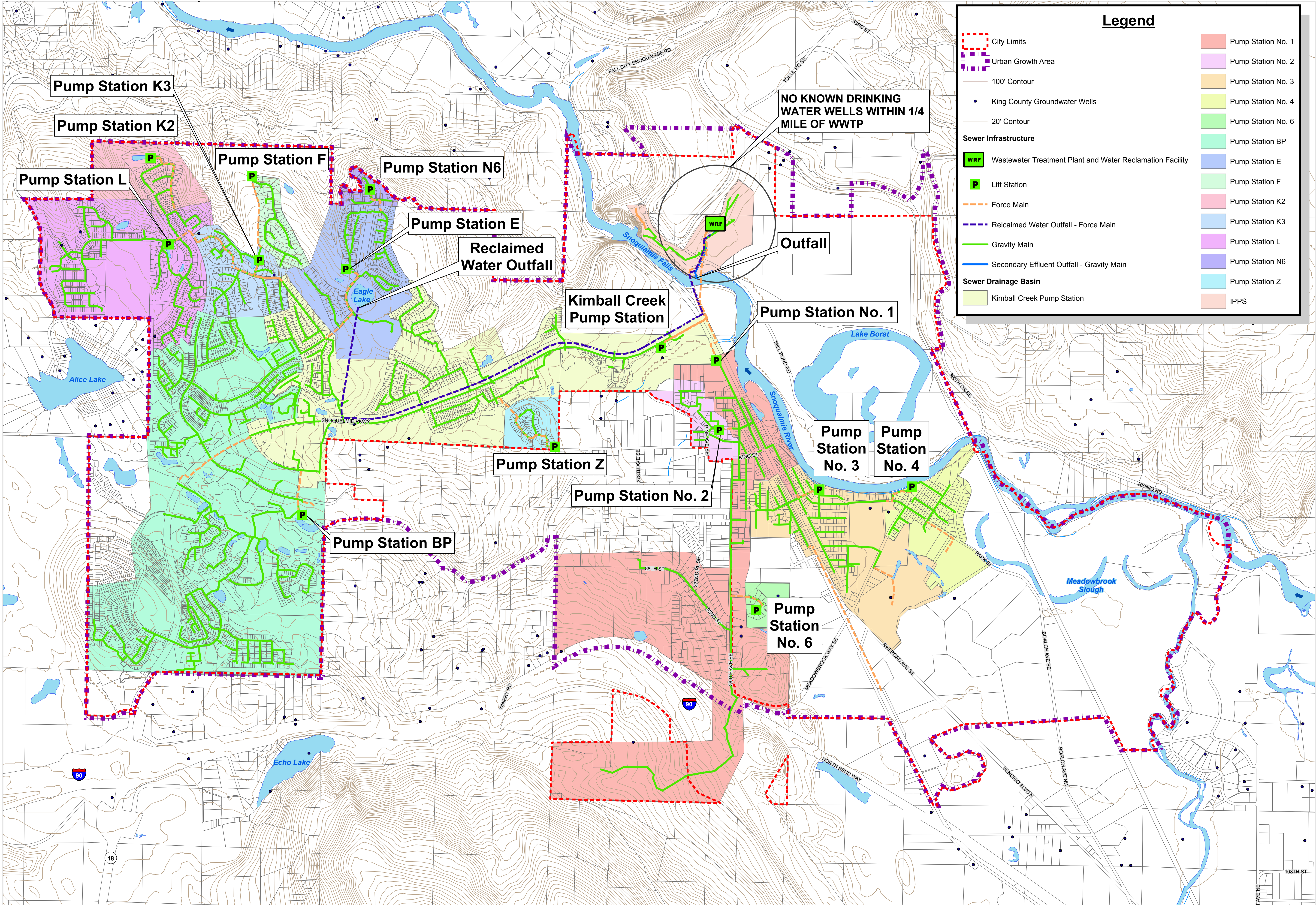
If yes, describe: _____

_____**E.4. Summary of Submitted Biomonitoring Test Information.** If you have submitted biomonitoring test information, or information regarding the cause of toxicity, within the past four and one-half years, provide the dates the information was submitted to the permitting authority and a summary of the results.

Date submitted: ____/____/____ (MM/DD/YYYY)

Summary of results: (see instructions)

END OF PART E.
REFER TO THE APPLICATION OVERVIEW TO DETERMINE WHICH OTHER PARTS OF FORM
2A YOU MUST COMPLETE.



Legend

- City Limits
- Urban Growth Area
- 100' Contour
- King County Groundwater Wells
- 20' Contour
- Sewer Infrastructure**
 - WRF Wastewater Treatment Plant and Water Reclamation Facility
 - P Lift Station
 - Force Main
 - Relcamed Water Outfall - Force Main
 - Gravity Main
 - Secondary Effluent Outfall - Gravity Main
- Sewer Drainage Basin**
 - Kimball Creek Pump Station

Pump Station No. 1
Pump Station No. 2
Pump Station No. 3
Pump Station No. 4
Pump Station No. 6
Pump Station BP
Pump Station E
Pump Station F
Pump Station K2
Pump Station K3
Pump Station L
Pump Station N6
Pump Station Z
IPPS

This map is a graphic representation derived from the City of Snoqualmie Geographic Information System. It was designed and intended for City of Snoqualmie staff use only; it is not guaranteed to survey accuracy. This map is based on the best information available on the date shown on this map.

Any reproduction or sale of this map, or portions thereof, is prohibited without express written authorization by the City of Snoqualmie.

This material is owned and copyrighted by the City of Snoqualmie.

Vicinity Map



Figure 2-3
Sewer Drainage Basins
City of Snoqualmie
General Sewer Plan



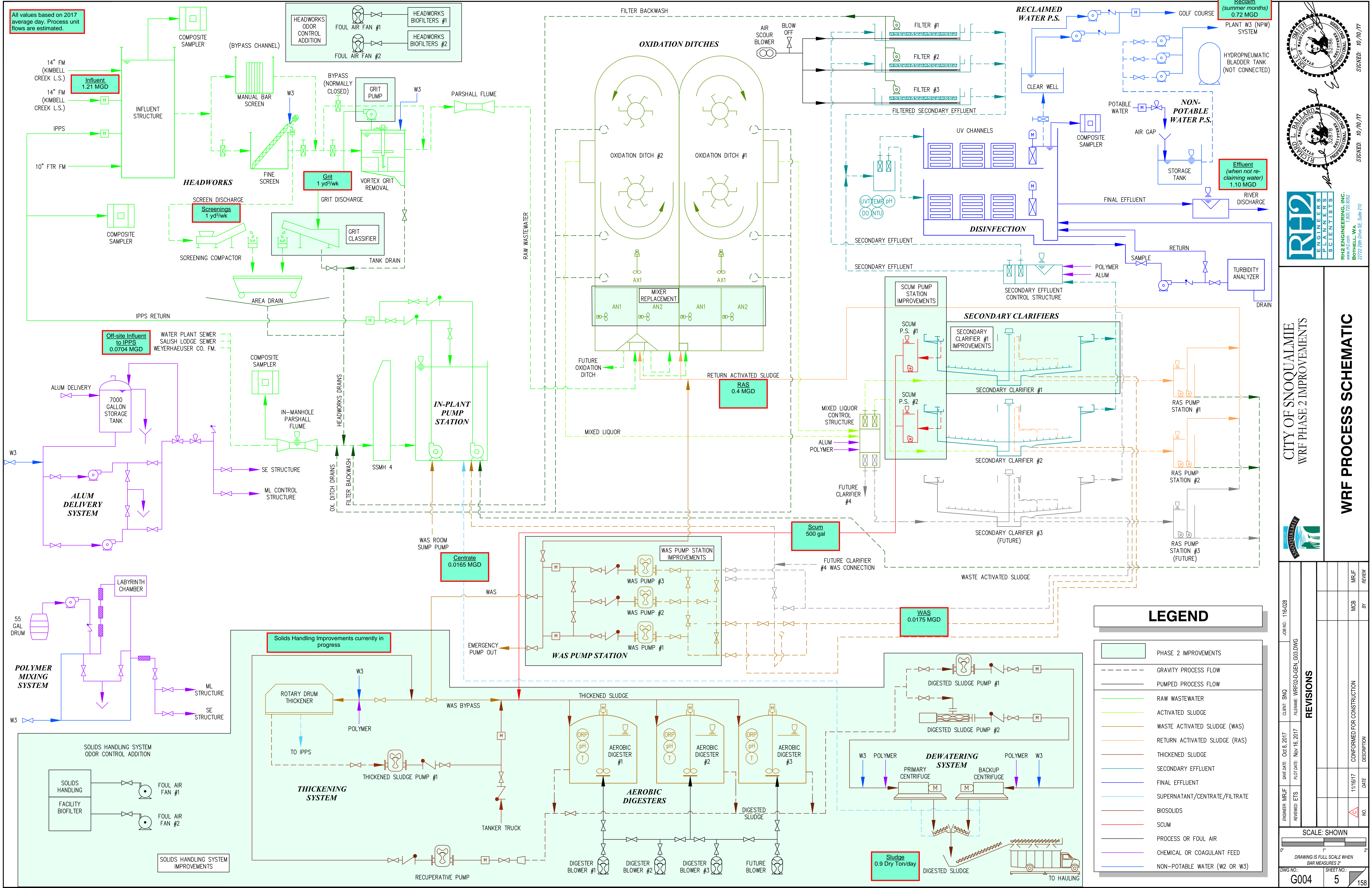
1 inch = 1,000 feet

0 500 1,000 2,000 Feet

DRAWING IS FULL SCALE WHEN BAR MEASURES 2"



Z:\BOTH\ELL\DATA\SNQ\116-028\GIS\MAPS\SNQ_VICINITY_MAP.MXD BY: ECOBA PLOT DATE: SEP 24, 2018 COORDINATE SYSTEM: NAD 1983 HARN STATEPLANE WASHINGTON NORTH FIPS 4601 FEET



All values based on 2017 average day. Process unit flows are estimated.

<

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



Professional
Analytical
Services

ANALYSIS REPORT

City of Snoqualmie
PO Box 987
Snoqualmie, WA 98065
Attention: Lyle Beach
All results reported on an as received basis.

Date Received: 02/22/17
Date Reported: 3/15/17

AMTEST Identification Number 17-A002418
Client Identification OUTFALL GRAB 1-9
Sampling Date 02/22/17, 10:40

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chlorine Residual- Total	< 0.05	mg/l		0.05	SM 4500-Cl G	SW	02/22/17
Total Cyanide	< 0.005	mg/l		0.005	EPA 335.4	SW	02/27/17
Dissolved Oxygen	6.9	mg/l		1	SM 4500OC	SW	02/22/17
Total Oil and Grease	3.1	mg/l		1	EPA 1664	DM	03/06/17
Total Phenol	0.030	mg/L		0.01	EPA 420.4	JC	03/03/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Hardness (CaCO ₃)	61.	mg/l		0.05	EPA 200.7 calc	AY	03/09/17
Calcium	19.	mg/l		0.05	EPA 200.7	AY	03/09/17
Magnesium	3.4	mg/l		0.01	EPA 200.7	AY	03/09/17

Total Metals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Mercury - Trace	0.00326	ug/L		0.0005	EPA 1631e	Anatek	03/01/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A002418

Volatile Organic Analysis (VOA's)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
1,1,1,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,1,1-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,1,2,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,1,2-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,1-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,1-Dichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,2,3-Trichloropropane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,2-Dibromo3Chloropropane	< 5	ug/l		5.0	EPA 624	NNL	02/24/17
1,2-Dibromoethane (EDB)	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,2-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,2-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,2-Dichloropropane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,3-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
1,4-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
2-Butanone (MEK)	< 5	ug/l		5.0	EPA 624	NNL	02/24/17
2-Chloroethyl Vinyl Ether	< 1	ug/l		1.0	EPA 624	NNL	03/15/17
2-Hexanone	< 5	ug/l		5.0	EPA 624	NNL	02/24/17
4-Methyl-2-Pentanone MIBK	< 5	ug/l		5.0	EPA 624	NNL	02/24/17
Acetone	14.6	ug/l		5.0	EPA 624	NNL	02/24/17
Acrylonitrile	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Benzene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Bromochloromethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Bromodichloromethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Bromoform	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Bromomethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Carbon Disulfide	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Carbon Tetrachloride	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Chlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Chlorodibromomethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Chloroethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Chloroform	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Chloromethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Cis-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Cis-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Dibromomethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A002418

Volatile Organic Analysis (VOA's) continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Ethyl Benzene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
m,p Xylene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Methyl Iodide	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Methylene Chloride	< 2	ug/l		2.0	EPA 624	NNL	02/24/17
o-Xylene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Styrene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Tetrachloroethylene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Toluene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Trans-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Trans-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
trans-1,4-Dichloro2butene	< 5	ug/l		5.0	EPA 624	NNL	02/24/17
Trichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Trichlorofluoromethane	< 1	ug/l		1.0	EPA 624	NNL	02/24/17
Vinyl Acetate	< 5	ug/l		5.0	EPA 624	NNL	02/24/17
Vinyl Chloride	< 1	ug/l		1.0	EPA 624	NNL	02/24/17

VOA Surrogates

ANALYTE	% RECOVERY	LIMITS
D4-1,2,-Dichloroethane	117. %	70.9 - 129.
D8-Toluene	97.1 %	60.1 - 140.
4-Bromofluorobenzene	105. %	68.0 - 120.

City of Snoqualmie
Project Name:
AmTest ID: 17-A002419

AMTEST Identification Number 17-A002419
Client Identification TRIP BLANK
Sampling Date

Total Metals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Mercury - Trace	< 0.0005	ug/L		0.0005	EPA 1631e	Anatek	03/01/17

AMTEST Identification Number 17-A002420
Client Identification OUTFALL COMP
Sampling Date 02/22/17, 10:30

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Dissolved Solids	190	mg/l		1	SM 2540C	SW	03/01/17

ICP/MS Metals 200.8

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Antimony	2.55	ug/L		0.2	EPA 200.8	AY	03/09/17
Arsenic	0.853	ug/L		0.02	EPA 200.8	AY	03/09/17
Beryllium	0.03	ug/L		0.03	EPA 200.8	AY	03/09/17
Cadmium	< 0.025	ug/L		0.025	EPA 200.8	AY	03/09/17
Chromium	0.63	ug/L		0.05	EPA 200.8	AY	03/09/17
Copper	8.48	ug/L		0.1	EPA 200.8	AY	03/09/17
Lead	0.224	ug/L		0.05	EPA 200.8	AY	03/09/17
Nickel	0.60	ug/L		0.05	EPA 200.8	AY	03/09/17
Selenium	< 0.25	ug/L		0.25	EPA 200.8	AY	03/09/17
Silver	< 0.05	ug/L		0.05	EPA 200.8	AY	03/09/17
Thallium	< 0.01	ug/L		0.01	EPA 200.8	AY	03/09/17
Zinc	34.8	ug/L		0.5	EPA 200.8	AY	03/09/17

Semi-Volatile Surrogates

ANALYTE	% RECOVERY	LIMITS
D5-Nitrobenzene	140. %	22.0 - 114.
2-Fluorobiphenyl	134. %	17.4 - 113.
D14-Terphenyl	145. %	26.9 - 142.

Miscellaneous

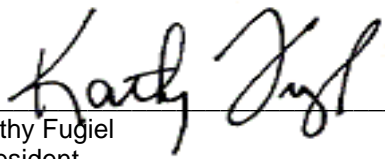
PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANLST	DATE
bis(2-Chloroethyl)ether	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
2-Chlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
Hexachloroethane	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Nitrobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Isophorone	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
2-Nitrophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
bis(2Chloroethoxy)methane	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
2,4-Dichlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
1,2,4-Trichlorobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Naphthalene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Hexachlorobutadiene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
4-Chloro-3-methylphenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
Hexachlorocyclopentadiene	< 0.4	ug/l		0.4	EPA 625-SIM	NNL	03/07/17
2,4,6-Trichlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
2-Chloronaphthalene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Dimethylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Acenaphthylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
2,6-Dinitrotoluene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Acenaphthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
2,4-Dinitrophenol	< 1	ug/l		1	EPA 625-SIM	NNL	03/08/17
2,4-Dinitrotoluene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
4-Nitrophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
4-Chlorophenyl-phenyl eth	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Diethylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
4,6-Dinitro-2-methylpheno	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
4-Bromophenyl-phenyl ethe	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Hexachlorobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Pentachlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
Phenanthrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Di-n-butylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Butylbenzylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Benzo(a)anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A002420

Miscellaneous continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chrysene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
3,3-Dichlorobenzidine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
bis(2-Ethylhexyl)phthalat	0.3	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Di-n-octylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Benzo(b)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Benzo(k)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Benzo(a)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
3-Methylcholanthrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/08/17
Indeno(1,2,3-cd)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Dibenzo(ah)anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Benzo(g,h,i)perylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
N-Nitrosodimethylamine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
bis(2-Chloroisopropyl)eth	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
N-Nitroso-di-n-propylamin	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Fluorene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
N-nitrosodiphenylamine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Benzidine	< 0.4	ug/l		0.4	EPA 625-SIM	NNL	03/07/17
Azobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/07/17
Benzo(j)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/08/17
Dibenzo(a,h)acridine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/08/17
Dibenzo(a,j)acridine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/08/17
Dibenzo(a,e)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/08/17
Benzo(rst)pentaphene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/08/17
Dibenzo(a,h)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/08/17
Phenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
2,4-Dimethylphenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	03/08/17
Perylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	03/08/17
Chlorpyrifos	< 0.2	ug/L		0.2	EPA 8270D	NNL	03/08/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A002420



Kathy Fugiel
President

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13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
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**Professional
Analytical
Services**

ANALYSIS REPORT

City of Snoqualmie
PO Box 987
Snoqualmie, WA 98065
Attention: Lyle Beach
All results reported on an as received basis.

Date Received: 05/01/17
Date Reported: 6/ 6/17

AMTEST Identification Number 17-A006257
Client Identification GRAB
Sampling Date 05/01/17, 08:00

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chlorine Residual- Total	< 0.05	mg/l		0.05	SM 4500-Cl G	SW	05/01/17
Total Cyanide	< 0.005	mg/l		0.005	EPA 335.4	SW	05/04/17
Dissolved Oxygen	8.2	mg/l		1	SM 4500OC	SW	05/01/17
Total Oil and Grease	3.8	mg/l		1	EPA 1664	KF	05/04/17
Total Phenol	< 0.01	mg/L		0.01	EPA 420.4	JC	05/10/17

ICP/MS Metals 200.8

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Antimony	0.56	ug/L		0.2	EPA 200.8	KQ	05/24/17
Arsenic	4.99	ug/L		0.02	EPA 200.8	KQ	05/24/17
Beryllium	< 0.03	ug/L		0.03	EPA 200.8	KQ	05/24/17
Cadmium	0.034	ug/L		0.025	EPA 200.8	KQ	05/24/17
Chromium	0.32	ug/L		0.05	EPA 200.8	KQ	05/24/17
Copper	6.10	ug/L		0.1	EPA 200.8	KQ	05/24/17
Lead	0.136	ug/L		0.05	EPA 200.8	KQ	05/24/17
Nickel	0.59	ug/L		0.05	EPA 200.8	KQ	05/24/17
Selenium	3.15	ug/L		0.25	EPA 200.8	KQ	05/24/17
Silver	< 0.05	ug/L		0.05	EPA 200.8	KQ	05/24/17
Thallium	< 0.01	ug/L		0.01	EPA 200.8	KQ	05/24/17
Zinc	37.9	ug/L		0.5	EPA 200.8	KQ	05/24/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A006257

Total Metals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Hexavalent Chromium	< 0.003	mg/l		0.003	SM 3500-Cr B	SW	05/08/17
Mercury - Trace	0.00166	ug/L		0.0005	EPA 1631e	Anatek	05/09/17

Volatile Organic Analysis (VOA's)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
1,1,1,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1,1-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1,2,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1,2-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1-Dichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2,3-Trichloropropane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2-Dibromo3Chloropropane	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
1,2-Dibromoethane (EDB)	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2-Dichloropropane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,3-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,4-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
2-Butanone (MEK)	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
2-Chloroethyl Vinyl Ether	< 1	ug/l		1.0	EPA 624	NNL	05/08/17
2-Hexanone	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
4-Methyl-2-Pentanone MIBK	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
Acetone	13.4	ug/l		5.0	EPA 624	NNL	05/07/17
Acrolein	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Acrylonitrile	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Benzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Bromochloromethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Bromodichloromethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Bromoform	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Bromomethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Carbon Disulfide	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Carbon Tetrachloride	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Chlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Chlorodibromomethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A006257

Volatile Organic Analysis (VOA's) continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Chloroform	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Chloromethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Cis-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Cis-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Dibromomethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Ethyl Benzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
m,p Xylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Methyl Iodide	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Methylene Chloride	< 2	ug/l		2.0	EPA 624	NNL	05/07/17
o-Xylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Styrene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Tetrachloroethylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Toluene	2.9	ug/l		1.0	EPA 624	NNL	05/07/17
Trans-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Trans-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
trans-1,4-Dichloro2butene	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
Trichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Trichlorofluoromethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Vinyl Acetate	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
Vinyl Chloride	< 1	ug/l		1.0	EPA 624	NNL	05/07/17

VOA Surrogates

ANALYTE	% RECOVERY	LIMITS
D4-1,2,-Dichloroethane	92.6 %	70.9 - 129.
D8-Toluene	106. %	60.1 - 140.
4-Bromofluorobenzene	94.2 %	68.0 - 120.

City of Snoqualmie
Project Name:
AmTest ID: 17-A006258

AMTEST Identification Number 17-A006258
Client Identification TRIP BLANK
Sampling Date 05/01/17, 08:00

Volatile Organic Analysis (VOA's)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
1,1,1,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1,1-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1,2,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1,2-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,1-Dichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2,3-Trichloropropane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2-Dibromo3Chloropropane	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
1,2-Dibromoethane (EDB)	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,2-Dichloropropane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,3-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
1,4-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
2-Butanone (MEK)	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
2-Hexanone	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
4-Methyl-2-Pentanone MIBK	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
Acetone	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
Acrylonitrile	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Benzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Bromochloromethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Bromodichloromethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Bromoform	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Bromomethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Carbon Disulfide	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Carbon Tetrachloride	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Chlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Chlorodibromomethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Chloroethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Chloroform	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Chloromethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A006258

Volatile Organic Analysis (VOA's) continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Cis-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Cis-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Dibromomethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Ethyl Benzene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
m,p Xylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Methyl Iodide	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Methylene Chloride	< 2	ug/l		2.0	EPA 624	NNL	05/07/17
o-Xylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Styrene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Tetrachloroethylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Toluene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Trans-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Trans-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
trans-1,4-Dichloro2butene	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
Trichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Trichlorofluoromethane	< 1	ug/l		1.0	EPA 624	NNL	05/07/17
Vinyl Acetate	< 5	ug/l		5.0	EPA 624	NNL	05/07/17
Vinyl Chloride	< 1	ug/l		1.0	EPA 624	NNL	05/07/17

VOA Surrogates

ANALYTE	% RECOVERY	LIMITS
D4-1,2,-Dichloroethane	105. %	70.9 - 129.
D8-Toluene	105. %	60.1 - 140.
4-Bromofluorobenzene	102. %	68.0 - 120.

City of Snoqualmie
Project Name:
AmTest ID: 17-A006259

AMTEST Identification Number 17-A006259
Client Identification COMP
Sampling Date 05/01/17, 08:00

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Dissolved Solids	280	mg/l		1	SM 2540C	SW	05/22/17

ICP/MS Metals 200.8

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Antimony	0.55	ug/L		0.2	EPA 200.8	KQ	05/24/17
Arsenic	5.06	ug/L		0.02	EPA 200.8	KQ	05/24/17
Beryllium	< 0.03	ug/L		0.03	EPA 200.8	KQ	05/24/17
Cadmium	0.026	ug/L		0.025	EPA 200.8	KQ	05/24/17
Chromium	0.30	ug/L		0.05	EPA 200.8	KQ	05/24/17
Copper	6.43	ug/L		0.1	EPA 200.8	KQ	05/24/17
Lead	0.127	ug/L		0.05	EPA 200.8	KQ	05/24/17
Nickel	0.54	ug/L		0.05	EPA 200.8	KQ	05/24/17
Selenium	3.72	ug/L		0.25	EPA 200.8	KQ	05/24/17
Silver	< 0.05	ug/L		0.05	EPA 200.8	KQ	05/24/17
Thallium	< 0.01	ug/L		0.01	EPA 200.8	KQ	05/24/17
Zinc	34.6	ug/L		0.5	EPA 200.8	KQ	05/24/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A006259

Polynuclear Aromatic Hydrocarbons (PAH)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Liq/Liq Ext.	y				EPA 3520	NNL	05/02/17

Semi-Volatile Surrogates

ANALYTE	% RECOVERY	LIMITS
D5-Nitrobenzene	86.6 %	22.0 - 114.
2-Fluorobiphenyl	69.4 %	17.4 - 113.
D14-Terphenyl	76.8 %	26.9 - 142.

Miscellaneous

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANLST	DATE
bis(2-Chloroethyl)ether	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
2-Chlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17
Hexachloroethane	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Nitrobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Isophorone	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
2-Nitrophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17
bis(2Chloroethoxy)methane	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
2,4-Dichlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17
1,2,4-Trichlorobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Naphthalene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Hexachlorobutadiene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
4-Chloro-3-methylphenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17
Hexachlorocyclopentadiene	< 0.4	ug/l		0.4	EPA 625-SIM	NNL	05/23/17
2,4,6-Trichlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17
2-Chloronaphthalene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Dimethylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Acenaphthylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
2,6-Dinitrotoluene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Acenaphthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
2,4-Dinitrophenol	< 1	ug/l		1	EPA 625-SIM	NNL	05/24/17
2,4-Dinitrotoluene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
4-Nitrophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17
4-Chlorophenyl-phenyl eth	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Diethylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
4,6-Dinitro-2-methylpheno	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17

Miscellaneous continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
4-Bromophenyl-phenyl ethe	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Hexachlorobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Pentachlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17
Phenanthrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Di-n-butylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Butylbenzylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Benzo(a)anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Chrysene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
3,3-Dichlorobenzidine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
bis(2-Ethylhexyl)phthalat	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Di-n-octylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Benzo(b)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Benzo(k)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Benzo(a)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
3-Methylcholanthrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/24/17
Indeno(1,2,3-cd)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Dibenzo(ah)anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Benzo(g,h,i)perylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
N-Nitrosodimethylamine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
bis(2-Chloroisopropyl)eth	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
N-Nitroso-di-n-propylamin	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Fluorene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
N-nitrosodiphenylamine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Benzidine	< 0.4	ug/l		0.4	EPA 625-SIM	NNL	05/23/17
Azobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/23/17
Benzo(j)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/24/17
Dibenzo(a,h)acridine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/24/17
Dibenzo(a,i)acridine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/24/17
Dibenzo(a,e)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/24/17
Benzo(rst)pentaphene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/24/17
Dibenzo(a,h)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/24/17
Phenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A006259

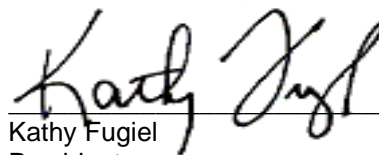
Miscellaneous continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
2,4-Dimethylphenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	05/24/17
Perylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	05/24/17
Chlorpyrifos	< 0.2	ug/L		0.2	EPA 8270D	NNL	05/24/17

AMTEST Identification Number **17-A006260**
Client Identification **MERCURY TRIP BLANK**
Sampling Date **05/01/17, 08:00**

Total Metals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Mercury - Trace	< 0.0005	ug/L		0.0005	EPA 1631e	Anatek	05/09/17



Kathy Fugiel
President

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ANALYSIS REPORT

City of Snoqualmie
PO Box 987
Snoqualmie, WA 98065
Attention: Lyle Beach
All results reported on an as received basis.

Date Received: 08/01/17
Date Reported: 9/11/17

AMTEST Identification Number 17-A012284
Client Identification COMP
Sampling Date 08/01/17, 08:00

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Dissolved Solids	360	mg/l		1	SM 2540C	SW	08/07/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Hardness (CaCO ₃)	120	mg/l		0.05	EPA 200.7 calc	KQ	08/07/17
Calcium	37.	mg/l		0.05	EPA 200.7	KQ	08/07/17
Magnesium	6.3	mg/l		0.01	EPA 200.7	KQ	08/07/17

ICP/MS Metals 200.8

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Antimony	1.37	ug/L		0.2	EPA 200.8	KQ	08/08/17
Arsenic	7.61	ug/L		0.02	EPA 200.8	KQ	08/08/17
Beryllium	< 0.03	ug/L		0.03	EPA 200.8	KQ	08/08/17
Cadmium	< 0.025	ug/L		0.025	EPA 200.8	KQ	08/08/17
Chromium	< 0.05	ug/L		0.05	EPA 200.8	KQ	08/08/17
Copper	2.79	ug/L		0.1	EPA 200.8	KQ	08/08/17
Lead	0.062	ug/L		0.05	EPA 200.8	KQ	08/08/17
Nickel	0.48	ug/L		0.05	EPA 200.8	KQ	08/08/17
Selenium	0.90	ug/L		0.25	EPA 200.8	KQ	08/08/17
Silver	< 0.05	ug/L		0.05	EPA 200.8	KQ	08/08/17
Thallium	< 0.01	ug/L		0.01	EPA 200.8	KQ	08/08/17
Zinc	28.1	ug/L		0.5	EPA 200.8	KQ	08/08/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A012284

Total Metals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Mercury	< 0.00005	mg/l		0.00005	EPA 245.1	SW	09/07/17

Polynuclear Aromatic Hydrocarbons (PAH)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Liq/Liq Ext.	Y				EPA 3520	DP	08/04/17

Semi-Volatile Surrogates

ANALYTE	% RECOVERY	LIMITS
D5-Nitrobenzene	87.5 %	22.0 - 114.
2-Fluorobiphenyl	80.8 %	17.4 - 113.
D14-Terphenyl	96.2 %	26.9 - 142.

Miscellaneous

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANLST	DATE
bis(2-Chloroethyl)ether	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
2-Chlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
Hexachloroethane	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Nitrobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Isophorone	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
2-Nitrophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
bis(2Chloroethoxy)methane	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
2,4-Dichlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
1,2,4-Trichlorobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Naphthalene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Hexachlorobutadiene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
4-Chloro-3-methylphenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
Hexachlorocyclopentadiene	< 0.4	ug/l		0.4	EPA 625-SIM	NNL	08/15/17
2,4,6-Trichlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
2-Chloronaphthalene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Dimethylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Acenaphthylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
2,6-Dinitrotoluene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Acenaphthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
2,4-Dinitrophenol	< 1	ug/l		1	EPA 625-SIM	NNL	08/14/17
2,4-Dinitrotoluene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A012284

Miscellaneous continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
4-Nitrophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
4-Chlorophenyl-phenyl eth	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Diethylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
4,6-Dinitro-2-methylpheno	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
4-Bromophenyl-phenyl ethe	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Hexachlorobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Pentachlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
Phenanthrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Di-n-butylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Butylbenzylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Benzo(a)anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Chrysene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
3,3-Dichlorobenzidine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
bis(2-Ethylhexyl)phthalat	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Di-n-octylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Benzo(b)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Benzo(k)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Benzo(a)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
3-Methylcholanthrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/14/17
Indeno(1,2,3-cd)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Dibenzo(ah)anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Benzo(g,h,i)perylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
N-Nitrosodimethylamine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
bis(2-Chloroisopropyl)eth	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
N-Nitroso-di-n-propylamin	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Fluorene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
N-nitrosodiphenylamine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Benzidine	< 0.4	ug/l		0.4	EPA 625-SIM	NNL	08/15/17
Azobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/15/17
Benzo(j)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/14/17
Dibenzo(a,h)acridine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/14/17
Dibenzo(a,j)acridine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/14/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A012284

Miscellaneous continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Dibenzo(a,e)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/14/17
Benzo(rst)pentaphene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/14/17
Dibenzo(a,h)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/14/17
Phenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
2,4-Dimethylphenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	08/14/17
Perylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	08/14/17
Chlorpyrifos	< 0.2	ug/L		0.2	EPA 8270D	NNL	08/14/17

AMTEST Identification Number 17-A012285
Client Identification GRAB
Sampling Date 08/01/17, 08:00

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Cyanide	0.017	mg/l		0.005	EPA 335.4	SW	08/02/17
Dissolved Oxygen	6.7	mg/l		1	SM 4500OC	SW	08/01/17
Total Oil and Grease	3.7	mg/l		1	EPA 1664	DP	08/09/17
Total Phenol	0.040	mg/L		0.01	EPA 420.4	JC	08/08/17

Total Metals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Hexavalent Chromium	< 0.003	mg/l		0.003	SM 3500-Cr B	SW	08/07/17
Mercury - Trace	0.00138	ug/L		0.0005	EPA 1631e	Anatek	08/30/17

Volatile Organic Analysis (VOA's)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
1,1,1,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1,1-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1,2,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1,2-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1-Dichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,2,3-Trichloropropane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,2-Dibromo3Chloropropane	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
1,2-Dibromoethane (EDB)	< 1	ug/l		1.0	EPA 624	NNL	08/09/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A012285

Volatile Organic Analysis (VOA's) continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
1,2-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,2-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,2-Dichloropropane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,3-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,4-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
2-Butanone (MEK)	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
2-Hexanone	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
4-Methyl-2-Pentanone MIBK	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
Acetone	37.5	ug/l		5.0	EPA 624	NNL	08/09/17
Acrylonitrile	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Benzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Bromochloromethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Bromodichloromethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Bromoform	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Bromomethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Carbon Disulfide	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Carbon Tetrachloride	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Chlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Chlorodibromomethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Chloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Chloroform	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Chloromethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Cis-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Cis-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Dibromomethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Ethyl Benzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
m,p Xylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Methyl Iodide	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Methylene Chloride	< 2	ug/l		2.0	EPA 624	NNL	08/09/17
o-Xylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Styrene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Tetrachloroethylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Toluene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Trans-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Trans-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A012285

Volatile Organic Analysis (VOA's) continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
trans-1,4-Dichloro2butene	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
Trichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Trichlorofluoromethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Vinyl Acetate	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
Vinyl Chloride	< 1	ug/l		1.0	EPA 624	NNL	08/09/17

VOA Surrogates

ANALYTE	% RECOVERY	LIMITS
D4-1,2,-Dichloroethane	107. %	70.9 - 129.
D8-Toluene	116. %	60.1 - 140.
4-Bromofluorobenzene	87.8 %	68.0 - 120.

City of Snoqualmie
Project Name:
AmTest ID: 17-A012286

AMTEST Identification Number 17-A012286
Client Identification GRAB TRIP BLANK
Sampling Date

Total Metals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Mercury - Trace	< 0.0005	ug/L		0.0005	EPA 1631e	Anatek	08/30/17

Volatile Organic Analysis (VOA's)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
1,1,1,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1,1-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1,2,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1,2-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,1-Dichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,2,3-Trichloropropane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,2-Dibromo3Chloropropane	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
1,2-Dibromoethane (EDB)	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,2-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,2-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,2-Dichloropropane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,3-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
1,4-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
2-Butanone (MEK)	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
2-Hexanone	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
4-Methyl-2-Pentanone MIBK	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
Acetone	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
Acrylonitrile	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Benzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Bromochloromethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Bromodichloromethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Bromoform	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Bromomethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Carbon Disulfide	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Carbon Tetrachloride	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Chlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17

City of Snoqualmie
Project Name:
AmTest ID: 17-A012286

Volatile Organic Analysis (VOA's) continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chlorodibromomethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Chloroethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Chloroform	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Chloromethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Cis-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Cis-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Dibromomethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Ethyl Benzene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
m,p Xylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Methyl Iodide	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Methylene Chloride	< 2	ug/l		2.0	EPA 624	NNL	08/09/17
o-Xylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Styrene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Tetrachloroethylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Toluene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Trans-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Trans-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
trans-1,4-Dichloro2butene	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
Trichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Trichlorofluoromethane	< 1	ug/l		1.0	EPA 624	NNL	08/09/17
Vinyl Acetate	< 5	ug/l		5.0	EPA 624	NNL	08/09/17
Vinyl Chloride	< 1	ug/l		1.0	EPA 624	NNL	08/09/17

VOA Surrogates

ANALYTE	% RECOVERY	LIMITS
D4-1,2,-Dichloroethane	103. %	70.9 - 129.
D8-Toluene	111. %	60.1 - 140.
4-Bromofluorobenzene	89.8 %	68.0 - 120.

City of Snoqualmie
Project Name:
AmTest ID: 17-A012286

A handwritten signature in black ink, reading "Kathy Fugiel", written over a horizontal line.

Kathy Fugiel
President

Am Test Inc.
13600 NE 126TH PL
Suite C
Kirkland, WA 98034
(425) 885-1664
www.amtestlab.com



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ANALYSIS REPORT

City of Snoqualmie
PO Box 987
Snoqualmie, WA 98065
Attention: Lyle Beach
All results reported on an as received basis.

Date Received: 10/05/17
Date Reported: 11/ 1/17

AMTEST Identification Number 17-A017713
Client Identification 2017 OCTOBER NUTRIENTS
Sampling Date 10/04/17, 08:00

Nutrients

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Ammonia Nitrogen	0.022	mg/l		0.005	EPA 350.1	JC	10/09/17
Total Nitrogen (TKN)	1.20	mg/l		0.1	EPA 351.2	JC	10/13/17
Nitrate + Nitrite	3.8	mg/l		0.01	EPA 353.2	JC	10/10/17

AMTEST Identification Number 17-A017714
Client Identification OF1 G GRAB
Sampling Date 10/05/17, 08:00

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chlorine Residual- Total	0.11	mg/l		0.05	SM 4500-Cl G	SW	10/05/17
Dissolved Oxygen	6.4	mg/l		1	SM 4500OC	SW	10/05/17
Total Oil and Grease	1.7	mg/l		1	EPA 1664	DP	10/18/17
Total Phenol	0.024	mg/L		0.01	EPA 420.4	JC	10/12/17

Demand

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Organic Carbon	6.2	mg/l		0.2	SM 5310B	SW	10/09/17

Minerals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Hardness (CaCO3)	77.	mg/l		0.05	EPA 200.7 calc	KQ	10/27/17
Calcium	25.	mg/l		0.05	EPA 200.7	KQ	10/27/17
Magnesium	3.6	mg/l		0.01	EPA 200.7	KQ	10/27/17

ICP Metals by EPA Method 200.7

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Hexavalent Chromium	< 0.003	mg/l		0.003	SM 3500-Cr B	SW	10/10/17

Total Metals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Mercury - Trace	0.00072	ug/L		0.0005	EPA 1631e	Anatek	10/11/17

Volatile Organic Analysis (VOA's)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
1,1,1,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1,1-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1,2,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1,2-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1-Dichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2,3-Trichloropropane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2-Dibromo3Chloropropane	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
1,2-Dibromoethane (EDB)	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2-Dichloropropane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,3-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,4-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
2-Butanone (MEK)	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
2-Chloroethyl Vinyl Ether	< 1	ug/l		1.0	EPA 624	NNL	10/10/17
2-Hexanone	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
4-Methyl-2-Pentanone MIBK	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
Acetone	8.1	ug/l		5.0	EPA 624	NNL	10/09/17
Acrolein	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Acrylonitrile	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Benzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Bromochloromethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Bromodichloromethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Bromoform	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Bromomethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Carbon Disulfide	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Carbon Tetrachloride	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Chlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Chlorodibromomethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Chloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Chloroform	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Chloromethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Cis-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Cis-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17

City of Snoqualmie
Project Name: 4 QUARTER TESTING
AmTest ID: 17-A017714

Volatile Organic Analysis (VOA's) continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Dibromomethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Ethyl Benzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
m,p Xylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Methyl Iodide	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Methylene Chloride	< 2	ug/l		2.0	EPA 624	NNL	10/09/17
o-Xylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Styrene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Tetrachloroethylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Toluene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Trans-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Trans-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
trans-1,4-Dichloro2butene	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
Trichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Trichlorofluoromethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Vinyl Acetate	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
Vinyl Chloride	< 1	ug/l		1.0	EPA 624	NNL	10/09/17

VOA Surrogates

ANALYTE	% RECOVERY	LIMITS
D4-1,2,-Dichloroethane	95.3 %	70.9 - 129.
D8-Toluene	102. %	60.1 - 140.
4-Bromofluorobenzene	99.5 %	68.0 - 120.

Miscellaneous

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANLST	DATE
Cyanide, Total	< 0.005	mg/l		0.005	EPA 335.4	MJ	10/10/17

AMTEST Identification Number 17-A017715
Client Identification TRIP BLANK
Sampling Date

Total Metals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Mercury - Trace	< 0.0005	ug/L		0.0005	EPA 1631e	Anatek	10/11/17

Volatile Organic Analysis (VOA's)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
1,1,1,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1,1-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1,2,2-Tetrachloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1,2-Trichloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,1-Dichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2,3-Trichloropropane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2-Dibromo3Chloropropane	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
1,2-Dibromoethane (EDB)	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2-Dichloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,2-Dichloropropane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,3-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
1,4-Dichlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
2-Butanone (MEK)	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
2-Hexanone	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
4-Methyl-2-Pentanone MIBK	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
Acetone	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
Acrylonitrile	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Benzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Bromochloromethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Bromodichloromethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Bromoform	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Bromomethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Carbon Disulfide	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Carbon Tetrachloride	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Chlorobenzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17

Volatile Organic Analysis (VOA's) continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Chlorodibromomethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Chloroethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Chloroform	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Chloromethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Cis-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Cis-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Dibromomethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Ethyl Benzene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
m,p Xylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Methyl Iodide	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Methylene Chloride	< 2	ug/l		2.0	EPA 624	NNL	10/09/17
o-Xylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Styrene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Tetrachloroethylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Toluene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Trans-1,2-Dichloroethene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Trans-1,3-Dichloropropene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
trans-1,4-Dichloro2butene	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
Trichloroethylene	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Trichlorofluoromethane	< 1	ug/l		1.0	EPA 624	NNL	10/09/17
Vinyl Acetate	< 5	ug/l		5.0	EPA 624	NNL	10/09/17
Vinyl Chloride	< 1	ug/l		1.0	EPA 624	NNL	10/09/17

VOA Surrogates

ANALYTE	% RECOVERY	LIMITS
D4-1,2,-Dichloroethane	93.2 %	70.9 - 129.
D8-Toluene	106. %	60.1 - 140.
4-Bromofluorobenzene	98.6 %	68.0 - 120.

City of Snoqualmie
Project Name: 4 QUARTER TESTING
AmTest ID: 17-A017716

AMTEST Identification Number 17-A017716
Client Identification OF1 COMP
Sampling Date 10/05/17, 08:00

Conventionals

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Total Dissolved Solids	260	mg/l		1	SM 2540C	SW	10/09/17

ICP/MS Metals 200.8

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Antimony	< 0.2	ug/L		0.2	EPA 200.8	KQ	10/26/17
Arsenic	0.403	ug/L		0.02	EPA 200.8	KQ	10/26/17
Beryllium	< 0.03	ug/L		0.03	EPA 200.8	KQ	10/26/17
Cadmium	0.061	ug/L		0.025	EPA 200.8	KQ	10/26/17
Chromium	< 0.05	ug/L		0.05	EPA 200.8	KQ	10/26/17
Copper	12.4	ug/L		0.1	EPA 200.8	KQ	10/26/17
Lead	4.26	ug/L		0.05	EPA 200.8	KQ	10/26/17
Nickel	12.5	ug/L		0.05	EPA 200.8	KQ	10/26/17
Selenium	< 0.25	ug/L		0.25	EPA 200.8	KQ	10/26/17
Silver	< 0.05	ug/L		0.05	EPA 200.8	KQ	10/26/17
Thallium	< 0.01	ug/L		0.01	EPA 200.8	KQ	10/26/17
Zinc	305.	ug/L		0.5	EPA 200.8	KQ	10/26/17

Polynuclear Aromatic Hydrocarbons (PAH)

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
Liq/Liq Ext.	Y				EPA 3520	DP	10/11/17

Semi-Volatile Surrogates

ANALYTE	% RECOVERY	LIMITS
D5-Nitrobenzene	84.4 %	22.0 - 114.
2-Fluorobiphenyl	84.2 %	17.4 - 113.
D14-Terphenyl	101. %	26.9 - 142.

Miscellaneous

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANLST	DATE
bis(2-Chloroethyl)ether	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
2-Chlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17
Hexachloroethane	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Nitrobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Isophorone	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
2-Nitrophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17
bis(2Chloroethoxy)methane	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
2,4-Dichlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17
1,2,4-Trichlorobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Naphthalene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Hexachlorobutadiene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
4-Chloro-3-methylphenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17
Hexachlorocyclopentadiene	< 0.4	ug/l		0.4	EPA 625-SIM	NNL	10/23/17
2,4,6-Trichlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17
2-Chloronaphthalene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Dimethylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Acenaphthylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
2,6-Dinitrotoluene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Acenaphthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
2,4-Dinitrophenol	< 1	ug/l		1	EPA 625-SIM	NNL	10/12/17
2,4-Dinitrotoluene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
4-Nitrophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17
4-Chlorophenyl-phenyl eth	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Diethylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
4,6-Dinitro-2-methylpheno	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17

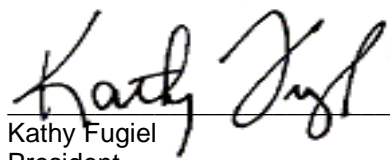
Miscellaneous continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
4-Bromophenyl-phenyl ethe	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Hexachlorobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Pentachlorophenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17
Phenanthrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Di-n-butylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Butylbenzylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Benzo(a)anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Chrysene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
3,3-Dichlorobenzidine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
bis(2-Ethylhexyl)phthalat	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Di-n-octylphthalate	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Benzo(b)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Benzo(k)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Benzo(a)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
3-Methylcholanthrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/12/17
Indeno(1,2,3-cd)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Dibenzo(ah)anthracene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Benzo(g,h,i)perylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
N-Nitrosodimethylamine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
bis(2-Chloroisopropyl)eth	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
N-Nitroso-di-n-propylamin	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Fluorene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
N-nitrosodiphenylamine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Benzidine	< 0.4	ug/l		0.4	EPA 625-SIM	NNL	10/23/17
Azobenzene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/23/17
Benzo(j)fluoranthene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/12/17
Dibenzo(a,h)acridine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/12/17
Dibenzo(a,i)acridine	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/12/17
Dibenzo(a,e)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/12/17
Benzo(rst)pentaphene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/12/17
Dibenzo(a,h)pyrene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/12/17
Phenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17

City of Snoqualmie
Project Name: 4 QUARTER TESTING
AmTest ID: 17-A017716

Miscellaneous continued...

PARAMETER	RESULT	UNITS	Q	D.L.	METHOD	ANALYST	DATE
2,4-Dimethylphenol	< 0.5	ug/l		0.5	EPA 625-SIM	NNL	10/12/17
Perylene	< 0.2	ug/l		0.2	EPA 625-SIM	NNL	10/12/17
Chlorpyrifos	< 0.2	ug/L		0.2	EPA 8270D	NNL	10/12/17



Kathy Fugiel
President



Whole Effluent Toxicity Test Report City of Snoqualmie Wastewater Treatment and Water Reclamation Facility

❖ January 2017 Sampling Event

Prepared for: City of Snoqualmie
Wastewater Treatment and
Water Reclamation Facility
38190 SE Sterns Road
Snoqualmie, WA 98065

Prepared by: Nautilus Environmental
4340 Vandever Ave
San Diego, California 92120

Submitted: March 1, 2017

Data Quality Assurance:

- Nautilus Environmental is accredited in accordance with NELAP by the State of Oregon Environmental Laboratory Accreditation Program (Certificate No. 4053-002). It is also certified by the State of California Department of Health Services Environmental Laboratory Accreditation Program (Certificate No. 1802) and the State of Washington Department of Ecology (Lab ID C552).
- All data have been reviewed and verified.
- All test results have met minimum test acceptability criteria under their respective EPA protocols, unless otherwise noted in this report.
- All test results have met internal Quality Assurance Program requirements.

Nautilus Environmental
4340 Vandever Avenue
San Diego, California 92120
858.587.7333
fax: 858.587.3961

Results verified by: _____

Mari Reddy

Introduction

Toxicity tests were conducted using an effluent sample collected from the City of Snoqualmie Wastewater Treatment and Water Reclamation Facility in January of 2017 to satisfy monitoring requirements. Acute bioassays were conducted using the water flea *Ceriodaphnia dubia* and fathead minnow *Pimephales promelas* in order to meet National Pollutant Discharge Elimination System (NPDES) permit biomonitoring requirements for permit number WA0022403. Testing was performed at Nautilus Environmental (Nautilus) located in San Diego, California between January 18 and 22, 2017.

Materials and Methods

An effluent sample was collected into two low-density polyethylene cubitainers. The cubitainers were packed in a cooler containing ice and shipped to Nautilus via overnight delivery service. Appropriate chain-of-custody (COC) procedures were employed during sample collection and transport. Upon arrival at Nautilus, the cooler was opened, the sample inspected, and the contents verified against information on the COC form. Receipt temperature was measured and recorded on the COC form. Standard water quality parameters were measured and recorded on a sample check-in sheet. The sample was stored at 4°C in the dark until used for testing. Standard water quality measurements conducted upon receipt of the sample are summarized in Table 1.

Table 1. Sample Information

Sample ID	Effluent
Nautilus Log-In No.	17-0063
Collection Date and Time	01/17/2017, 08:00
Receipt Date and Time	01/18/2017, 09:45
Receipt Temperature (°C)	3.0
Dissolved Oxygen (mg/L)	10.3
pH	7.53
Conductivity (µS/cm)	512
Hardness (mg/L CaCO ₃)	85
Alkalinity (mg/L CaCO ₃)	143
Total Chlorine (mg/L)	<0.02
Total Ammonia (mg/L)	15.3

Test Methods

Acute toxicity tests were conducted according to procedures presented by USEPA (2002) and the methods are summarized in Tables 2 and 3.

Table 2. Summary of Methods for the 48-hour Water Flea Acute Survival Test

Test Period	01/18/2017, 14:05 to 01/20/2017, 12:40
Test Organism	<i>Ceriodaphnia dubia</i> (water flea)
Test Organism Source; Age at Initiation	In-house culture; < 24 hours
Dilution/Control Water	Moderately Hard Synthetic Water
Test Concentrations (% Sample)	100, 50, 33.3, 12.5, 6.25, 0 (laboratory control)
Test Design	4 replicates; 5 organisms per replicate
Test Protocol	EPA-821-R-02-012
Test Acceptability Criterion	Mean control survival \geq 90%
Statistical Analysis Software	CETIS™ v.1.8.7.20

Table 3. Summary of Methods for the 96-hour Fathead Minnow Acute Survival Test

Test Period	01/18/2017, 14:00 to 01/22/2017, 14:45
Test Organism	<i>Pimephales promelas</i> (fathead minnow)
Test Organism Source; Age at Initiation	Aquatic Biosystems (Fort Collins, CO); 9 days old
Dilution/Control Water	Moderately Hard Synthetic Water
Test Concentrations (% Sample)	100, 50, 33.3, 12.5, 6.25, 0 (laboratory control)
Test Design	4 replicates; 10 organisms per replicate
Test Protocol	EPA-821-R-02-012
Test Acceptability Criterion	Mean control survival \geq 90%
Statistical Analysis Software	CETIS™ v.1.8.7.20

Results

There were no statistically significant effects detected in any effluent concentration tested for the acute water flea test. There was a statistically significant effect (5 percent effect) in the 100 percent undiluted effluent for the fathead minnow test. This resulted in a NOEC of 100 percent effluent for the water flea and 50 percent effluent for the fathead minnow. Additionally, no statistically significant effects were observed in the acute critical effluent concentration (ACEC) of 33.3 percent effluent for either species tested. Statistical results for the acute toxicity tests are summarized in Table 4 and detailed test results are summarized in Table 5. Individual statistical summaries for all tests including laboratory bench data sheets, and copies of the sample receipt information and COC forms are provided in Appendices A through C.

Table 4. Summary of Acute Toxicity Statistical Results

Species and Endpoint	NOEC (% effluent)	EC ₅₀ (% effluent)
Water Flea 48hr Survival	100	> 100
Fathead Minnow 96hr Survival	50	> 100

NOEC = No Observed Effect Concentration; the highest concentration at which no effect is observed.

EC₅₀ = Median effect concentration; the effluent concentration estimated to produce an adverse effect to 50 percent of the test organisms.

Table 5. Summary of Acute Toxicity Results

Test Concentration (% effluent)	Water Flea	Fathead Minnow
	Mean 48hr Survival (%)	Mean 96hr Survival (%)
Lab Control	100	100
6.25	100	100
12.5	100	100
33.3	100	100
50	100	100
100	100	95.0

Quality Assurance

The sample was received in good condition and within the recommended temperature range according to WDOE, 2016. Both tests were initiated within the required 36-hour holding time. Mean control responses for both tests met minimum test acceptability criteria. Statistical analyses followed standard USEPA flowchart selections and dose response relationships were reviewed to ensure the validity of the data. Based on the dose responses observed during testing, the statistical results are deemed reliable. Minor QA/QC issues that were not likely to have any bearing on results are noted on test data sheets. A list of laboratory qualifier codes used on bench data sheets is provided in Appendix D.

Reference Toxicant Test

The monthly reference toxicant tests for both species met minimum test acceptability requirements. The calculated median effect values for water flea and fathead minnow survival were within two standard deviations of the historical mean, indicating typical organism sensitivity to copper for our laboratory. Reference toxicant test results, including control chart coefficients of variation (CV), are summarized in Table 6.

Table 6. Reference Toxicant Test Results

Species and Endpoint	Date Initiated	EC ₅₀ (µg/L copper)	Historical Mean ± 2 SD (µg/L copper)	CV (%)
Water flea 48hr Survival	01/21/2017	15.3	17.8 ± 11.1	31.3
Fathead minnow 96hr Survival	01/17/2017	105	63.1 ± 47.3	37.5

EC₅₀ = Median effect concentration; the effluent concentration estimated to produce an adverse effect to 50 percent of the test organisms.

Historical Mean ± 2 SD = the mean EC₅₀ value from 20 previous reference toxicant tests conducted at Nautilus, ± two standard deviations (SD).

CV = coefficient of variation.

References

- Tidepool Scientific Software. 2000-2013. CETIS Comprehensive Environmental Toxicity Information System Software, Version 1.8.7.20.
- USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. United States Environmental Protection Agency Office of Water, Washington DC (EPA-821-R-02-012).
- WDOE. 2016. Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. Washington State Department of Ecology. Water Quality Program. Publication number: WQ-R-95-80, Revised June 2016.

Appendix A
Statistical Summaries and Raw Bench Sheets

Water Flea Acute Test

CETIS Summary Report

Report Date: 20 Feb-17 13:46 (p 1 of 1)

Test Code: 1701-S077 | 06-1100-0696

Ceriodaphnia 48-h Acute Survival Test							Nautilus Environmental (CA)				
Batch ID:	09-0110-1318	Test Type:	Survival (48h)			Analyst:					
Start Date:	18 Jan-17 14:05	Protocol:	EPA/821/R-02-012 (2002)			Diluent:	Mod-Hard Synthetic Water				
Ending Date:	20 Jan-17 12:40	Species:	Ceriodaphnia dubia			Brine:	Not Applicable				
Duration:	47h	Source:	In-House Culture			Age:	<24h				
Sample ID:	03-0152-3685	Code:	17-0063			Client:	City of Snoqualmie				
Sample Date:	17 Jan-17 08:00	Material:	POTW Effluent			Project:					
Receive Date:	18 Jan-17 09:45	Source:	Snoqualmie WWTP (WA0022403)								
Sample Age:	30h (3 °C)	Station:	Effluent								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
16-6936-5175	48h Survival Rate	100	>100	NA	NA	1	Steel Many-One Rank Sum Test				
48h Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	0	0	0.0%	0.0%
6.25		4	1	1	1	1	1	0	0	0.0%	0.0%
12.5		4	1	1	1	1	1	0	0	0.0%	0.0%
33.3		4	1	1	1	1	1	0	0	0.0%	0.0%
50		4	1	1	1	1	1	0	0	0.0%	0.0%
100		4	1	1	1	1	1	0	0	0.0%	0.0%
48h Survival Rate Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Dilution Water	1	1	1	1						
6.25		1	1	1	1						
12.5		1	1	1	1						
33.3		1	1	1	1						
50		1	1	1	1						
100		1	1	1	1						

CETIS Analytical Report

Report Date: 20 Feb-17 13:45 (p 1 of 1)
 Test Code: 1701-S077 | 06-1100-0696

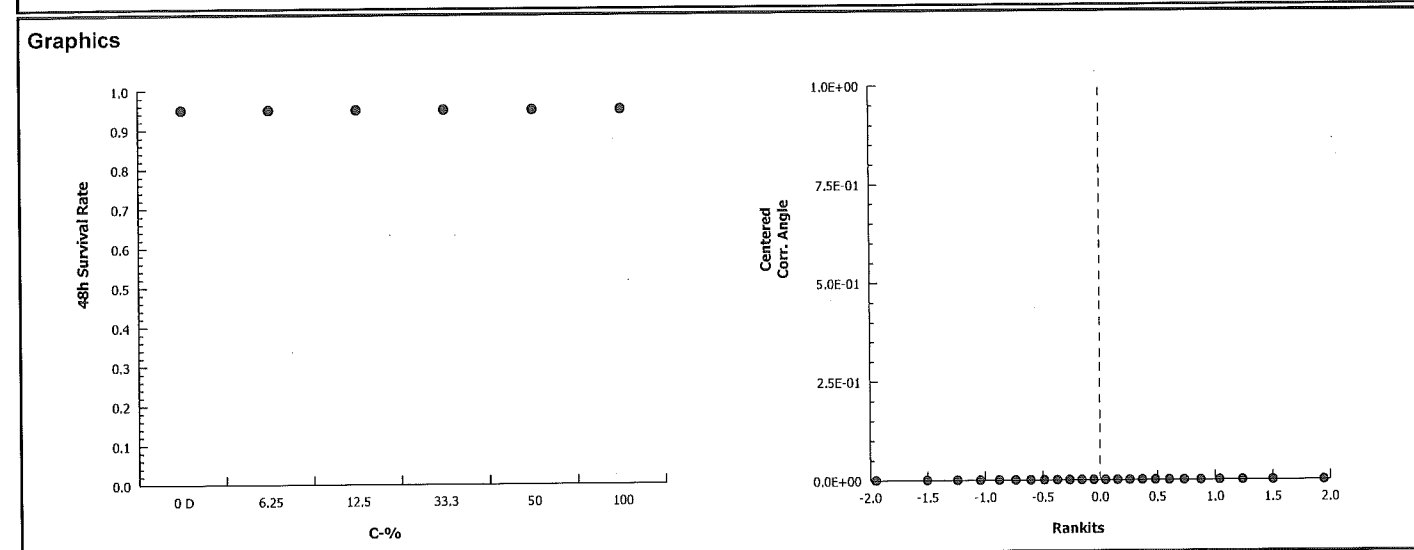
Ceriodaphnia 48-h Acute Survival Test					Nautilus Environmental (CA)			
Analysis ID:	16-6936-5175	Endpoint:	48h Survival Rate	CETIS Version:	CETISv1.8.7			
Analyzed:	20 Feb-17 13:45	Analysis:	Nonparametric-Control vs Treatments	Official Results:	Yes			
Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Angular (Corrected)	NA	C > T	NA	NA	100	>100	NA	1

Steel Many-One Rank Sum Test									
Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α :5%)
Dilution Water		6.25	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		12.5	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		33.3	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		50	18	10	1	6	0.8333	Asymp	Non-Significant Effect
		100	18	10	1	6	0.8333	Asymp	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α :5%)
Between	0	0	5	65540	<0.0001	Significant Effect
Error	0	0	18			
Total	0		23			

48h Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	1	0	0.0%	0.0%
6.25		4	1	1	1	1	1	1	0	0.0%	0.0%
12.5		4	1	1	1	1	1	1	0	0.0%	0.0%
33.3		4	1	1	1	1	1	1	0	0.0%	0.0%
50		4	1	1	1	1	1	1	0	0.0%	0.0%
100		4	1	1	1	1	1	1	0	0.0%	0.0%

Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
6.25		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
12.5		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
33.3		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
50		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
100		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%



48-hour Freshwater Acute Bioassay
Static-Renewal Conditions

Water Quality Measurements
& Test Organism Survival

City of
Client: Snoqualmie
Sample ID: Effluent
Test No.: 1701-5077
Test Species: C. dubia
Start Date/Time: 1/18/2017 1405
End Date/Time: 1/20/2017 1240

Tech Initials		
0	24	48
JH	NKC	KB
NKC	MM	KB
RH	--	--

Counts:

Readings:

Dilutions made by:

Concentration %	Rep	Number of Live Organisms			Conductivity (µmhos/cm)			Temperature (°C)			Dissolved Oxygen (mg/L)			pH (units)		
		0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Lab Control (MHSW)	A	5	5	5	269	291	301	20.2	20.1	20.1	8.2	8.7	8.2	7.66	7.75	7.13
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
6.25	A	5	5	5	303	308	311	20.2	20.0	20.1	8.4	8.5	8.6	7.72	7.78	7.75
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
12.5	A	5	5	5	317	321	316	20.1	20.0	20.1	8.5	8.7	8.6	7.70	7.88	7.77
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
33.3	A	5	5	5	363	364	358	20.1	20.1	20.1	8.6	8.5	8.5	7.64	7.91	7.83
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
50	A	5	5	5	403	403	394	20.2	19.9	20.1	8.6	8.5	8.6	7.59	7.95	7.87
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												
100	A	5	5	5	508	502	477	20.2	20.0	20.1	8.8	8.4	8.5	7.53	7.97	7.90
	B	5	5	5												
	C	5	5	5												
	D	5	5	5												

Initial Counts QC'd by: A/S

Initiated by: JH

Animal Source/Date Received: Internal / N/A Age at Initiation: 224 hr

Animal Acclimation Qualifiers (circle all that apply): Q22 / Q23 / Q24 / none

Comments: Organisms fed prior to initiation, circle one (y) / n)

QC Check: KB 2/3/17

Final Review: SW 3/1/17

Fathead Minnow Acute Test

CETIS Summary Report

Report Date: 06 Feb-17 14:49 (p 1 of 1)
 Test Code: 1701-S076 | 08-1328-8084

Fathead Minnow 96-h Acute Survival Test						Nautilus Environmental (CA)					
Batch ID:	20-5408-2372	Test Type:	Survival (96h)	Analyst:							
Start Date:	18 Jan-17 14:00	Protocol:	EPA/821/R-02-012 (2002)	Diluent:	Mod-Hard Synthetic Water						
Ending Date:	22 Jan-17 14:45	Species:	Pimephales promelas	Brine:	Not Applicable						
Duration:	4d 1h	Source:	Aquatic Biosystems, CO	Age:	9 d						
Sample ID:	03-0152-3685	Code:	17-0063	Client:	City of Snoqualmie						
Sample Date:	17 Jan-17 08:00	Material:	POTW Effluent	Project:							
Receive Date:	18 Jan-17 09:45	Source:	Snoqualmie WWTP (WA0022403)								
Sample Age:	30h (3 °C)	Station:	Effluent								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
20-6344-5708	96h Survival Rate	50	100	70.71	4.94%	2	Dunnett Multiple Comparison Test				
Point Estimate Summary											
Analysis ID	Endpoint	Level	%	95% LCL	95% UCL	TU	Method				
03-2131-3493	96h Survival Rate	EC25	>100	N/A	N/A	<1	Linear Interpolation (ICPIN)				
		EC50	>100	N/A	N/A	<1					
96h Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	0	0	0.0%	0.0%
6.25		4	1	1	1	1	1	0	0	0.0%	0.0%
12.5		4	1	1	1	1	1	0	0	0.0%	0.0%
33.3		4	1	1	1	1	1	0	0	0.0%	0.0%
50		4	1	1	1	1	1	0	0	0.0%	0.0%
100		4	0.95	0.8581	1	0.9	1	0.02887	0.05774	6.08%	5.0%
96h Survival Rate Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Dilution Water	1	1	1	1						
6.25		1	1	1	1						
12.5		1	1	1	1						
33.3		1	1	1	1						
50		1	1	1	1						
100		1	1	0.9	0.9						

CETIS Analytical Report

Report Date: 06 Feb-17 14:49 (p 1 of 2)

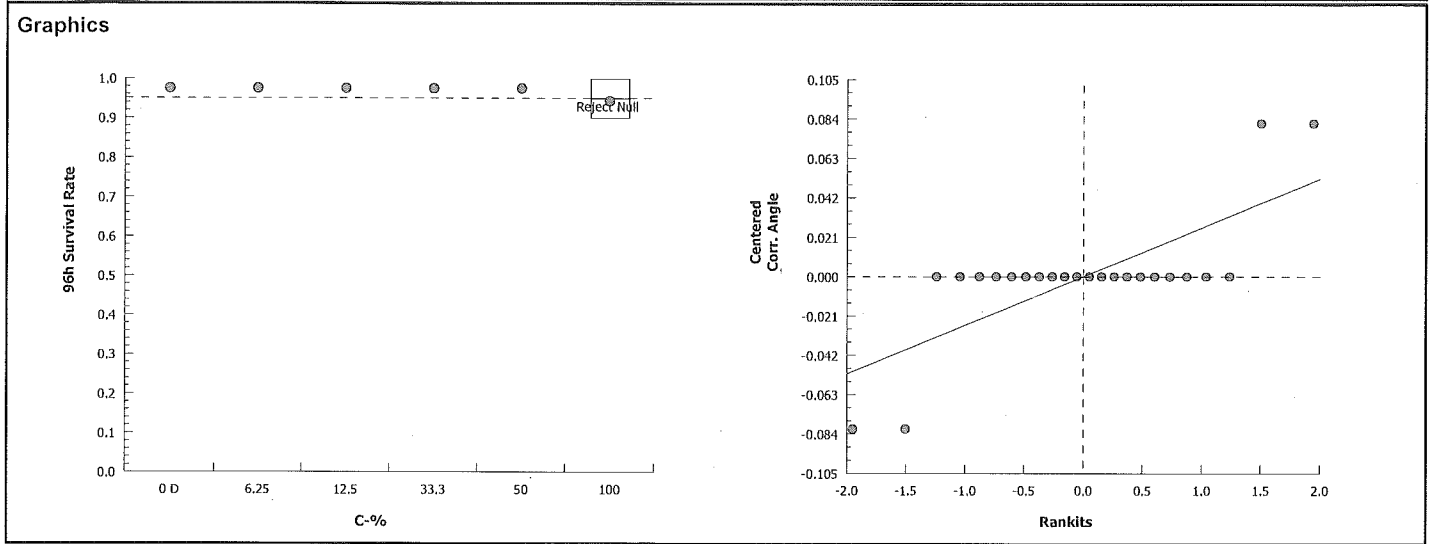
Test Code: 1701-S076 | 08-1328-8084

Fathead Minnow 96-h Acute Survival Test										Nautilus Environmental (CA)	
Analysis ID: 20-6344-5708		Endpoint: 96h Survival Rate					CETIS Version: CETISv1.8.7				
Analyzed: 06 Feb-17 14:49		Analysis: Parametric-Control vs Treatments					Official Results: Yes				
Data Transform		Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)		NA	C > T	NA	NA		4.94%	50	100	70.71	2
Dunnett Multiple Comparison Test											
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)		
Dilution Water		6.25	0	2.407	0.065	6	0.8333	CDF	Non-Significant Effect		
		12.5	0	2.407	0.065	6	0.8333	CDF	Non-Significant Effect		
		33.3	0	2.407	0.065	6	0.8333	CDF	Non-Significant Effect		
		50	0	2.407	0.065	6	0.8333	CDF	Non-Significant Effect		
		100*	3	2.407	0.065	6	0.0154	CDF	Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF		F Stat	P-Value	Decision(α:5%)		
Between	0.02213278		0.004426555		5		3	0.0384	Significant Effect		
Error	0.02655933		0.001475518		18						
Total	0.04869211				23						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value		Decision(α:1%)			
Distribution	Shapiro-Wilk W Normality			0.5784	0.884	<0.0001		Non-normal Distribution			
96h Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	1	0	0.0%	0.0%
6.25		4	1	1	1	1	1	1	0	0.0%	0.0%
12.5		4	1	1	1	1	1	1	0	0.0%	0.0%
33.3		4	1	1	1	1	1	1	0	0.0%	0.0%
50		4	1	1	1	1	1	1	0	0.0%	0.0%
100		4	0.95	0.8581	1	0.95	0.9	1	0.02887	6.08%	5.0%
Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
6.25		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
12.5		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
33.3		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
50		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
100		4	1.331	1.181	1.48	1.331	1.249	1.412	0.04705	7.07%	5.77%

CETIS Analytical Report

Report Date: 06 Feb-17 14:49 (p 2 of 2)
 Test Code: 1701-S076 | 08-1328-8084

Fathead Minnow 96-h Acute Survival Test		Nautilus Environmental (CA)	
Analysis ID: 20-6344-5708	Endpoint: 96h Survival Rate	CETIS Version: CETISv1.8.7	
Analyzed: 06 Feb-17 14:49	Analysis: Parametric-Control vs Treatments	Official Results: Yes	



CETIS Analytical Report

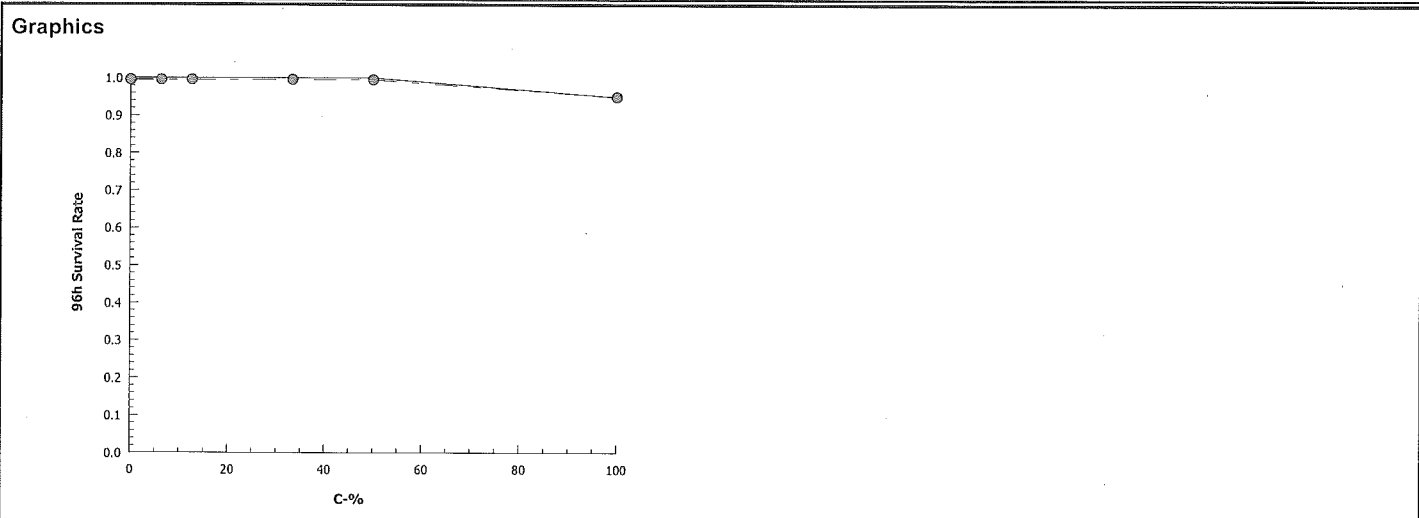
Report Date: 06 Feb-17 14:49 (p 1 of 1)
 Test Code: 1701-S076 | 08-1328-8084

Fathead Minnow 96-h Acute Survival Test				Nautilus Environmental (CA)			
Analysis ID:	03-2131-3493	Endpoint:	96h Survival Rate	CETIS Version:	CETISv1.8.7		
Analyzed:	06 Feb-17 14:49	Analysis:	Linear Interpolation (ICPIN)	Official Results:	Yes		

Linear Interpolation Options						
X Transform	Y Transform	Seed	Resamples	Exp 95% CL	Method	
Linear	Linear	398257	1000	Yes	Two-Point Interpolation	

Point Estimates						
Level	%	95% LCL	95% UCL	TU	95% LCL	95% UCL
EC25	>100	N/A	N/A	<1	NA	NA
EC50	>100	N/A	N/A	<1	NA	NA

96h Survival Rate Summary			Calculated Variate(A/B)									
C-%	Control Type	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B	
0	Dilution Water	4	1	1	1	0	0	0.0%	0.0%	40	40	
6.25		4	1	1	1	0	0	0.0%	0.0%	40	40	
12.5		4	1	1	1	0	0	0.0%	0.0%	40	40	
33.3		4	1	1	1	0	0	0.0%	0.0%	40	40	
50		4	1	1	1	0	0	0.0%	0.0%	40	40	
100		4	0.95	0.9	1	0.02887	0.05773	6.08%	5.0%	38	40	



Water Quality Measurements & Test Organism Survival

Test Species: *P. promelas*
 Start Date/Time: 1/18/2017 1400
 End Date/Time: 1/22/2017 1445

Tech Initials					
	0	24	48	72	96
S:	ACS	NHE	NHE	AG	JH
S:	NHE	MM	AS	AG	CH
V:	RH		MR		

Concentration (%)	RAND #	Number of Live Organisms					Conductivity (µmhos/cm)					Temperature (°C)					Dissolved Oxygen (mg/L)					pH (units)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Lab Control	1	10	10	10	10	10	290	295	308	314	317	20.1	20.6	20.5	20.5	20.5	8.4	7.6	6.5	7.1	6.1	7.74	7.63	7.44	7.34	7.50
(MHSW)	13	10	10	10	10	10			291					20.8					7.1					7.57		
	20	10	10	10	10	10																				
	2	10	10	10	10	10																				
6.25	4	10	10	10	10	10	303	306	335	332	335	20.1	20.5	20.5	20.4	20.5	8.5	7.5	8.6	7.3	7.7	7.74	7.64	7.48	7.55	7.50
	7	10	10	10	10	10			305					20.7					7.2					7.57		
	17	10	10	10	10	10																				
	3	10	10	10	10	10																				
12.5	16	10	10	10	10	10	318	322	343	341	344	20.6	20.5	20.7	20.6	20.6	8.5	7.6	8.6	7.3	7.8	7.70	7.60	7.44	7.63	7.60
	19	10	10	10	10	10			319					20.7					7.2					7.57		
	21	10	10	10	10	10																				
	15	10	10	10	10	10																				
33.3%	8	10	10	10	10	10	360	362	381	381	382	20.3	20.5	21.0	20.5	20.6	8.6	7.5	8.7	7.3	7.5	7.64	7.74	7.51	7.77	7.72
	24	10	10	10	10	10			358					20.7					7.2					7.67		
	22	10	10	10	10	10																				
	10	10	10	10	10	10																				
50	5	10	10	10	10	10	346	345	413	412	412	20.0	20.5	21.0	20.5	20.5	8.8	7.2	8.7	7.0	7.6	7.60	7.75	7.50	7.74	7.73
	11	10	10	10	10	10			390					20.7					7.0					7.33		
	18	10	10	10	10	10																				
	6	10	10	10	10	10																				
100	12	10	10	10	10	10	507	497	505	502	502	19.1	20.4	20.7	20.5	20.5	9.0	7.2	8.8	6.8	7.1	7.55	7.88	7.55	7.97	7.95
	23	10	10	10	10	10			493					20.7					6.8					7.91		
	14	10	10	10	10	9																				
	9	10	10	10	10	9																				
																							</			

Animal Source/Date Received: ABS / 11/17/17 Age at Initiation: 9 d
Animal Acclimation Qualifiers (circle all that apply): Q22 / Q23 / Q24 / (none)

Comments: i = initial reading in fresh test solution, f = final reading in test chamber prior to renewal
Organisms fed prior to initiation, circle one (y) / n) (R) A6 Q18 1/17/17 (A) A6 Q18 1/24/17

		Feeding Times				
		0	24	48	72	96
AM:		--	--	eggs	--	--
PM:		--	--	--	--	--

Final Review: KB 2/6/17

Appendix B
Sample Check-in Sheets

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120

Client: City of Sanagualmie
Sample ID: Effluent
Test ID No(s): 1701 - S076 to S077

Sample Check-In Information

Sample Description:

A: Light yellow, clear, no odor, no debris

Sample (A, B, C):	<u>1A</u>			
Log-in No. (17-xxxx):	<u>0063</u>			
Sample Collection Date & Time:	<u>1/17/17 0800</u>			
Sample Receipt Date & Time:	<u>1/18/17 0945</u>			
Number of Containers & Container Type:	<u>2, 4L cubis</u>			
Approx. Total Volume Received (L):	<u>8L</u>			
Check-in Temperature (°C)	<u>3.0</u>			
Temperature OK? ¹	<u>(Y) N</u>	<u>Y N</u>	<u>Y N</u>	<u>Y N</u>
DO (mg/L)	<u>10.3</u>			
pH (units)	<u>7.53</u>			
Conductivity (µS/cm)	<u>512</u>			
Salinity (ppt)	<u>0.3</u>			
Alkalinity (mg/L) ²	<u>143</u>			
Hardness (mg/L) ^{2,3}	<u>85</u>			
Total Chlorine (mg/L)	<u>20.02</u>			
Technician Initials	<u>EG</u>			

COC Complete (Y/N)?

A / B C

Filtration? Y (N)

Pore Size: _____

Organisms _____ or _____ Debris

Salinity Adjustment? Y (N)

Test: _____ Source: _____ Target ppt: _____

Test: _____ Source: _____ Target ppt: _____

Test: _____ Source: _____ Target ppt: _____

pH Adjustment? Y (N)

	A	B	C
Initial pH:			
Amount of HCl added:			
Final pH:			

Cl₂ Adjustment? Y (N)

	A	B	C
Initial Free Cl ₂ :			
STS added:			
Final Free Cl ₂ :			

Sample Aeration? Y (N)

	A	B	C
Initial D.O.			
Duration & Rate			
Final D.O.			

Subsamples for Additional Chemistry Required? (Y) N

(NH₃) Other _____
Tech Initials A EG B C

QC Check: KB 2/6/17

Final Review: KRP 2/17/17

Test Performed: Acute Fathead and water flea Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: MHSinc

Alkalinity: 59 Hardness or Salinity: 81

Additional Control? Y (N) = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: _____ Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: _____

Alkalinity: _____ Hardness or Salinity: _____

Additional Control? Y N = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: _____ Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: _____

Alkalinity: _____ Hardness or Salinity: _____

Additional Control? Y N = _____ Alkalinity: _____ Hardness or Salinity: _____

Notes: ¹ Temperature of sample should be 0-6°C, if received more than 24 hours past collection time.

² mg/L as CaCO₃, ³ Measured for freshwater samples only, NA = Not Applicable

Additional Comments: _____

Overlying Water

DI Blank: 0.0
Test Start Date: 11/18/17

Analyst: SG
Analysis Date: 1/18/17


N x 1.22

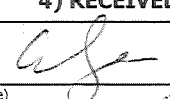
Nautilus Environmental, 4340 Vandever Avenue, San Diego, CA 92120.

Appendix C
Chain-of-Custody Forms

Date 1-17-17 Page 1 of 1

Sample Collection By: <u>Lyle Beach</u>							ANALYSES REQUIRED										Receipt Temperature (°C)
Report to: Company <u>City of Snoqualmie</u> Address <u>PO BOX 987</u> City/State/Zip <u>Snoqualmie, WA 98065</u> Contact <u>Lyle Beach</u> Phone <u>425-888-4153</u> Email <u>lbeach@ci.snoqualmie.wa.us</u>				Invoice To: Company <u>City of Snoqualmie</u> Address <u>P.O. Box 987</u> City/State/Zip <u>Snoqualmie, WA 98065</u> Contact <u>Tom Holmes</u> Phone <u>425-888-4153</u> Email <u>tholmes@ci.snoqualmie.wa.us</u>			<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Fathhead minnow 96-hour static-renewal test</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Daphnid 48-hr static test</div> </div>										
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS											
1 SNOQ1	1-17-17	8:00a	W		1												
2 SNOQ2	1-17-17	8:00a	W		1												
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

PROJECT INFORMATION		SAMPLE RECEIPT		1) RELINQUISHED BY (CLIENT)		2) RECEIVED BY (COURIER)	
Client:		Total No. of Containers	2	(Signature)	 8:35a (Time)	(Signature)	
PO No.:		Received Good Condition?	Y	(Printed Name)	Lyle Beach 1-17-17 (Date)	(Printed Name)	(Date)
Shipped Via:		Matches Test Schedule?	Y	(Company)	City of Snoqualmie	(Company)	

SPECIAL INSTRUCTIONS/COMMENTS:				3) RELINQUISHED BY (COURIER)		4) RECEIVED BY (LABORATORY)	
Confirmed to be the same sample in email to client. MP 2/6/17				(Signature)	(Time)	(Signature)	(Time)
				(Printed Name)	(Date)	(Printed Name)	(Date)
				(Company)		(Company)	
						 ERIC GREEN Nautilus 10:17-0063-64 1/18/17	

Appendix D
Qualifier Code Glossary

Glossary of Qualifier Codes:

- Q1 - Temperatures out of recommended range; corrective action taken and recorded in Test Temperature Correction Log
- Q2 - Temperatures out of recommended range; no action taken, test terminated same day
- Q3 - Sample aerated prior to initiation or renewal due to dissolved oxygen (D.O.) levels below 6.0 mg/L
- Q4 - Test aerated; D.O. levels dropped below 4.0 mg/L
- Q5 - Test initiated with aeration due to an anticipated drop in D.O.
- Q6 - Airline obstructed or fell out of replicate and replaced; drop in D.O. occurred
- Q7 - Salinity out of recommended range
- Q8 - Spilled test chamber/ Unable to recover test organism(s)
- Q9 - Inadequate sample volume remaining, 50% renewal performed
- Q10 - Inadequate sample volume remaining, no renewal performed
- Q11 - Sample out of holding time; refer to QA section of report
- Q12 - Replicate(s) not initiated; excluded from data analysis
- Q13 - Survival counts not recorded due to poor visibility or heavy debris
- Q14 - D.O. percent saturation was checked and was $\leq 110\%$
- Q15 - Did not meet minimum test acceptability criteria. Refer to QA section of report.
- Q16 - Percent minimum significant difference (PMSD) was below the lower bound limit for acceptability. This indicates that statistics may be over-sensitive in detecting a difference from the control due to low variability in the data set.
- Q17 - Percent minimum significant difference (PMSD) was above the upper bound limit for acceptability. This indicates that statistics may be under-sensitive in detecting a difference from the control due to high variability in the data set.
- Q18 - Incorrect Entry
- Q19 - Illegible Entry
- Q20 - Miscalculation
- Q21 - Other (provide reason in comments section)
- Q22 - Greater than 10% mortality observed upon receipt and/or in holding prior to test initiation. Organisms acclimated to test conditions at Nautilus and ultimately deemed fit to use for testing.
- Q23 - Test organisms received at a temperature greater than 3°C outside the recommended test temperature range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.
- Q24 - Test organisms received at salinity greater than 3 ppt outside of the recommended test salinity range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.



Whole Effluent Toxicity Test Report City of Snoqualmie Wastewater Treatment and Water Reclamation Facility

❖ April 2017 Sampling Event

Prepared for: City of Snoqualmie
Wastewater Treatment and
Water Reclamation Facility
38190 SE Sterns Road
Snoqualmie, WA 98065

Prepared by: Nautilus Environmental
4340 Vandever Ave
San Diego, California 92120

Submitted: May 17, 2017

Data Quality Assurance:

- Nautilus Environmental is accredited in accordance with NELAP by the State of Oregon Environmental Laboratory Accreditation Program (Lab ID 4053). It is also certified by the State of California Water Resources Control Board Environmental Laboratory Accreditation Program (Certificate No. 1802) and the State of Washington Department of Ecology (Lab ID C552).
- All data have been reviewed and verified.
- All test results have met minimum test acceptability criteria under their respective EPA protocols, unless otherwise noted in this report.
- All test results have met internal Quality Assurance Program requirements.

Nautilus Environmental
4340 Vandever Avenue
San Diego, California 92120
858.587.7333
fax: 858.587.3961

Results verified by:

Katie Payne

Introduction

Toxicity tests were conducted using effluent collected from the City of Snoqualmie Wastewater Treatment and Water Reclamation Facility in April of 2017 to satisfy monitoring requirements. Chronic bioassays were conducted using the water flea *Ceriodaphnia dubia* and fathead minnow *Pimephales promelas* in order to meet National Pollutant Discharge Elimination System (NPDES) permit biomonitoring requirements for permit number WA0022403. Testing was performed at Nautilus Environmental (Nautilus) located in San Diego, California between April 25 and May 2, 2017.

Materials and Methods

Effluent samples were collected into low-density polyethylene cubitainers. The cubitainers were packed in a cooler containing ice and shipped to Nautilus via overnight delivery service. Appropriate chain-of-custody (COC) procedures were employed during sample collection and transport. Upon arrival at Nautilus, coolers were opened, samples inspected, and the contents verified against information on the COC form. Receipt temperature was measured and recorded on the COC form. Standard water quality parameters were measured and recorded on a sample check-in sheet. Samples were stored at 4°C in the dark until used for testing. Standard water quality measurements conducted upon sample receipt are summarized in Table 1.

Table 1. Sample Information

Sample ID	Effluent		
Nautilus Log-In No.	17-0492	17-0499	17-0503
Collection Date and Time	04/24/2017, 08:00	04/26/2017, 08:00	04/28/2017, 08:00
Receipt Date and Time	04/25/2017, 09:59	04/27/2017, 08:50	04/29/2017, 11:30
Receipt Temperature (°C)	3.0	3.0	2.5
Dissolved Oxygen (mg/L)	11.8	10.8	9.4
pH	7.75	7.52	7.44
Conductivity (µS/cm)	422	427	439
Hardness (mg/L CaCO ₃)	111	97	98
Alkalinity (mg/L CaCO ₃)	107	108	98
Total Chlorine (mg/L)	<0.02	<0.02	0.03
Total Ammonia (mg/L)	1.7	0.9	0.7

Test Methods

Chronic toxicity tests were conducted according to procedures presented by USEPA (2002) and the methods are summarized in Tables 2 and 3.

Table 2. Summary of Methods for the Chronic Water Flea Toxicity Test

Test Period	04/25/2017, 15:05 to 05/02/2017, 10:45
Test Organism	<i>Ceriodaphnia dubia</i> (water flea)
Test Organism Source; Age at Initiation	In-house culture; < 24 hours
Dilution/Control Water	EPA diluted mineral water (80% deionized water and 20% Perrier mineral water)
Test Concentrations (% Sample)	100, 50, 33.3, 12.5, 2.4, 0 (laboratory control)
Test Design	10 replicates; 1 organism per replicate
Test Protocol	EPA/821/R-02-013 (2002)
Test Acceptability Criteria	Mean control survival of ≥ 80 percent; 60 percent of surviving control females must produce ≥ 3 broods of offspring; Total control offspring per surviving female must average ≥ 15 ; percent minimum significant difference (PMSD) for reproduction should be between 13 and 47
Statistical Analysis Software	CETIS™ v.1.8.7.20

Table 3. Summary of Methods for the Chronic Fathead Minnow Toxicity Test

Test Period	04/25/2017, 14:10 to 05/02/2017, 10:00
Test Organism	<i>Pimephales promelas</i> (fathead minnow)
Test Organism Source; Age at Initiation	Aquatic Biosystems (Fort Collins, CO); 1 day old
Dilution/Control Water	Moderately Hard Synthetic Water
Test Concentrations (% Sample)	100, 50, 33.3, 12.5, 2.4, 0 (laboratory control)
Test Design	4 replicates; 10 organisms per replicate
Test Protocol	EPA/821/R-02-013 (2002)
Test Acceptability Criteria	Mean control survival of ≥ 80 percent; mean control biomass of ≥ 0.25 mg per organism; PMSD for biomass should be between 12 and 30.
Statistical Analysis Software	CETIS™ v.1.8.7.20

Results

There were no statistically significant effects detected in any effluent concentration tested for both species, including the acute critical effluent concentration (ACEC) of 33.3 percent effluent and the chronic critical effluent concentration (CCEC) of 2.4 percent effluent.

Statistical results for the chronic toxicity tests are summarized in Table 4 and detailed test results are summarized in Table 5. Individual statistical summaries for all tests including laboratory bench data sheets, and copies of the sample receipt information and COC forms are provided in Appendices A through C.

Table 4. Summary of Chronic Toxicity Statistical Results

Species and Endpoint	NOEC (% effluent)	EC ₅₀ (% effluent)
Water Flea		
Survival	100	> 100
Reproduction	100	> 100
Fathead Minnow		
Survival	100	> 100
Growth (biomass)	100	> 100

NOEC = No Observed Effect Concentration; the highest concentration at which no effect is observed.

EC₅₀ = Median effect concentration; the effluent concentration estimated to produce an adverse effect to 50 percent of the test organisms.

Table 5. Summary of Chronic Toxicity Test Results

Test Concentration (% effluent)	Water Flea		Fathead Minnow	
	Mean Survival (%)	Mean Reproduction (#neonates/org)	Mean Survival (%)	Mean Biomass (mg)
Lab Control	100	31.0	100	0.381
6.25	100	33.9	100	0.407
12.5	100	35.5	100	0.393
33.3	100	35.6	100	0.420
50	100	36.2	97.5	0.436
100	90.0	40.5	97.5	0.453

Quality Assurance

Samples were received in good condition and within the recommended temperature range according to WDOE, 2016. Both tests were initiated within the required 36-hour holding time. Mean control responses for both tests met minimum test acceptability criteria. Statistical analyses followed standard USEPA flowchart selections and dose response relationships were reviewed to ensure the validity of the data. Based on the dose responses observed during testing, the statistical results are deemed reliable. Minor QA/QC issues that were not likely to have any bearing on results are noted on test data sheets. A list of laboratory qualifier codes used on bench data sheets is provided in Appendix D.

Reference Toxicant Test

The monthly reference toxicant tests for both species met minimum test acceptability requirements. The calculated median effect values for water flea survival and reproduction and fathead minnow survival and growth were within two standard deviations of the historical means, indicating typical organism sensitivity to copper for our laboratory. Reference toxicant test results, including control chart coefficients of variation (CV), are summarized in Table 6.

Table 6. Reference Toxicant Test Results

Species and Endpoint	Date Initiated	EC ₅₀ (µg/L copper)	Historical Mean ± 2 SD (µg/L copper)	CV (%)
Water flea				
Survival	04/18/17	70.7	58.1 ± 19.8	17.1
Reproduction		72.2	60.9 ± 23.1	19.0
Fathead minnow				
Survival	04/13/17	50.5	57.8 ± 37.3	32.3
Growth (biomass)		47.6	61.4 ± 43.3	35.3

EC₅₀ = Median effect concentration; the effluent concentration estimated to produce an adverse effect to 50 percent of the test organisms.

Historical Mean ± 2 SD = the mean EC₅₀ value from 20 previous reference toxicant tests conducted at Nautilus, ± two standard deviations (SD).

CV = coefficient of variation

References

- Tidepool Scientific Software. 2000-2013. CETIS Comprehensive Environmental Toxicity Information System Software, Version 1.8.7.20.
- USEPA. 2002. Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. United States Environmental Protection Agency Office of Water, Washington DC (EPA-821-R-02-013).
- WDOE. 2016. Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. Washington State Department of Ecology. Water Quality Program. Publication number: WQ-R-95-80, Revised June 2016.

Appendix A
Statistical Summaries and Raw Bench Sheets

Water Flea Chronic Test

CETIS Summary Report

Report Date: 17 May-17 12:12 (p 1 of 1)
Test Code: 1704-S076 | 04-2332-1882

Ceriodaphnia 3 Brood Survival & Reproduction Test							Nautilus Environmental (CA)				
Batch ID:	09-8457-5695		Test Type: Reproduction and Survival			Analyst:					
Start Date:	25 Apr-17 15:05		Protocol: EPA/821/R-02-013 (2002)			Diluent:		Diluted Mineral Water (8:2)			
Ending Date:	02 May-17 10:45		Species: Ceriodaphnia dubia			Brine:		Not Applicable			
Duration:	6d 20h		Source: In-House Culture			Age:		<24h			
Sample ID:	03-6070-6765		Code: 17-0492			Client:		City of Snoqualmie			
Sample Date:	24 Apr-17 08:00		Material: POTW Effluent			Project:					
Receive Date:	25 Apr-17 09:59		Source: Snoqualmie WWTP (WA0022403)								
Sample Age:	31h (3 °C)		Station:								
Batch Note: (a) Organism in random number position 28 lost in progress therefore excluded from statistical analysis.											
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
02-9093-2729	3 Brood Reproduction	100	>100	NA	16.8%	1	Bonferroni Adj t Test				
17-4778-0492	3 Brood Survival	100	>100	NA	NA	1	Fisher Exact/Bonferroni-Holm Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute		Test Stat	TAC Limits		Overlap	Decision			
02-9093-2729	3 Brood Reproduction	Control Resp		31	15 - NL		Yes	Passes Acceptability Criteria			
17-4778-0492	3 Brood Survival	Control Resp		1	0.8 - NL		Yes	Passes Acceptability Criteria			
02-9093-2729	3 Brood Reproduction	PMSD		0.168	0.13 - 0.47		Yes	Passes Acceptability Criteria			
3 Brood Reproduction Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	31	28.12	33.88	25	38	1.274	4.028	12.99%	0.0%
2.4		10	33.9	32.53	35.27	30	36	0.6046	1.912	5.64%	-9.36%
12.5		10	35.5	31.18	39.82	25	45	1.91	6.042	17.02%	-14.52%
33.3		9	35.56	32.97	38.14	31	41	1.119	3.358	9.45%	-14.7%
50		10	36.2	31.73	40.67	27	47	1.977	6.25	17.27%	-16.77%
100		10	40.5	36.37	44.63	30	50	1.827	5.778	14.27%	-30.65%
3 Brood Survival Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	1	1	1	1	1	0	0	0.0%	0.0%
2.4		10	1	1	1	1	1	0	0	0.0%	0.0%
12.5		10	1	1	1	1	1	0	0	0.0%	0.0%
33.3		9	1	1	1	1	1	0	0	0.0%	0.0%
50		10	1	1	1	1	1	0	0	0.0%	0.0%
100		10	0.9	0.6738	1	0	1	0.1	0.3162	35.14%	10.0%
3 Brood Reproduction Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	34	28	33	34	27	28	38	33	25	30
2.4		34	34	30	32	33	36	34	36	34	36
12.5		33	41	25	31	41	34	45	37	30	38
33.3	(a)	34	31	35	31	41	39	37	35	37	
50		27	31	36	31	39	36	47	45	33	37
100		40	36	36	30	45	50	43	40	39	46
3 Brood Survival Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	1
2.4		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
33.3	(a)	1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	1	1
100		1	1	0	1	1	1	1	1	1	1

CETIS Analytical Report

Report Date: 17 May-17 12:12 (p 1 of 1)
Test Code: 1704-S076 | 04-2332-1882

Ceriodaphnia 3 Brood Survival & Reproduction Test Nautilus Environmental (CA)

Analysis ID: 02-9093-2729	Endpoint: 3 Brood Reproduction	CETIS Version: CETISv1.8.7
Analyzed: 17 May-17 12:11	Analysis: Parametric-Multiple Comparison	Official Results: Yes

Batch Note: Organism in random number position 28 lost in progress therefore excluded from statistical analysis.

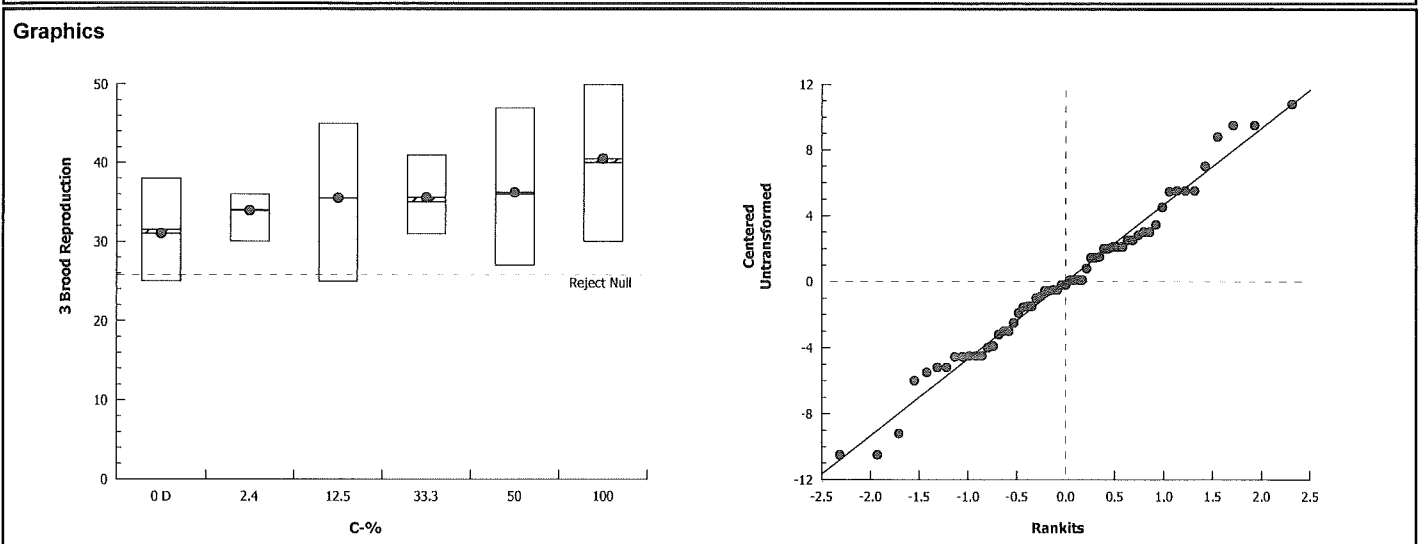
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	16.8%	100	>100	NA	1

Bonferroni Adj t Test									
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Dilution Water		2.4	-1.335	2.399	5.209	18	1.0000	CDF	Non-Significant Effect
		12.5	-2.072	2.399	5.209	18	1.0000	CDF	Non-Significant Effect
		33.3	-2.042	2.399	5.352	17	1.0000	CDF	Non-Significant Effect
		50	-2.395	2.399	5.209	18	1.0000	CDF	Non-Significant Effect
		100	-4.375	2.399	5.209	18	1.0000	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	482.8202	96.56403	5	4.095	0.0032	Significant Effect
Error	1249.722	23.57966	53			
Total	1732.542		58			

Distributional Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	13.83	15.09	0.0167	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9817	0.9451	0.5175	Normal Distribution

3 Brood Reproduction Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	10	31	28.12	33.88	31.5	25	38	1.274	12.99%	0.0%
2.4		10	33.9	32.53	35.27	34	30	36	0.6046	5.64%	-9.36%
12.5		10	35.5	31.18	39.82	35.5	25	45	1.91	17.02%	-14.52%
33.3		9	35.56	32.97	38.14	35	31	41	1.119	9.45%	-14.7%
50		10	36.2	31.73	40.67	36	27	47	1.977	17.27%	-16.77%
100		10	40.5	36.37	44.63	40	30	50	1.827	14.27%	-30.65%



CETIS Analytical Report

Report Date: 17 May-17 12:12 (p 1 of 1)
Test Code: 1704-S076 | 04-2332-1882

Ceriodaphnia 3 Brood Survival & Reproduction Test Nautilus Environmental (CA)

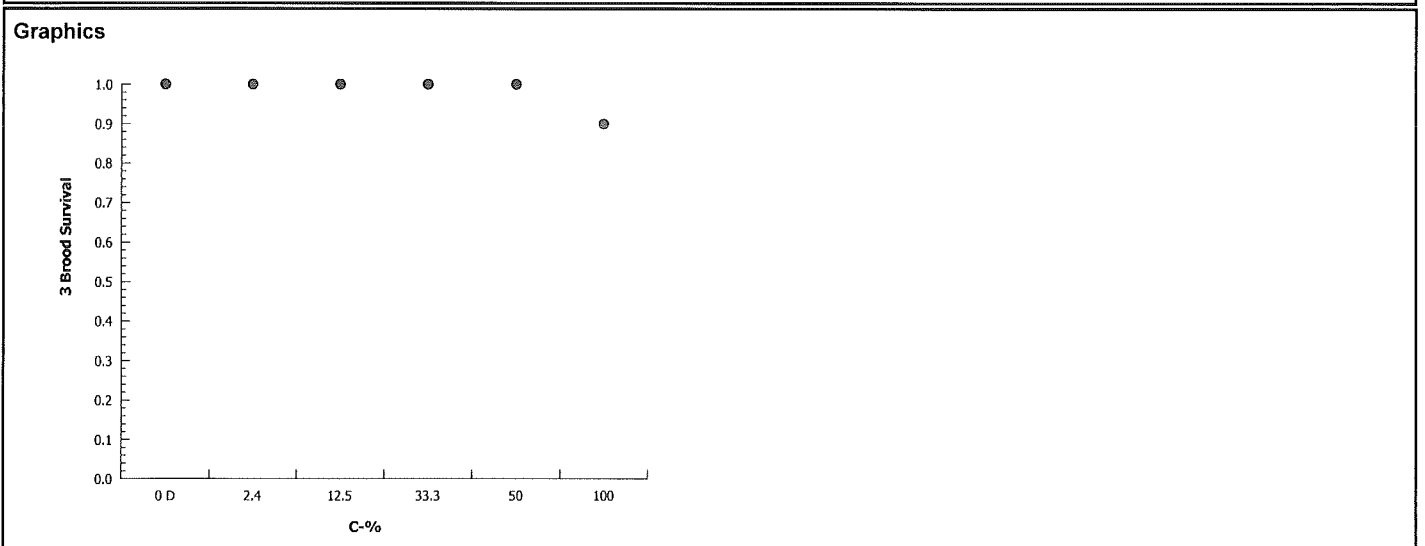
Analysis ID: 17-4778-0492	Endpoint: 3 Brood Survival	CETIS Version: CETISv1.8.7
Analyzed: 17 May-17 12:11	Analysis: STP 2x2 Contingency Tables	Official Results: Yes

Batch Note: Organism in random number position 28 lost in progress therefore excluded from statistical analysis.

Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Untransformed		C > T	NA	NA	100	>100	NA	1

Fisher Exact/Bonferroni-Holm Test						
Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α:5%)
Dilution Water		2.4	1	1.0000	Exact	Non-Significant Effect
		12.5	1	1.0000	Exact	Non-Significant Effect
		33.3	1	1.0000	Exact	Non-Significant Effect
		50	1	1.0000	Exact	Non-Significant Effect
		100	0.5	1.0000	Exact	Non-Significant Effect

Data Summary							
C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Dilution Water	10	0	10	1	0	0.0%
2.4		10	0	10	1	0	0.0%
12.5		10	0	10	1	0	0.0%
33.3		9	0	9	1	0	0.0%
50		10	0	10	1	0	0.0%
100		9	1	10	0.9	0.1	10.0%



Ceriodaphnia 3 Brood Survival & Reproduction Test

Nautilus Environmental (CA)

Test Type: Reproduction and Survival

Organism: Ceriodaphnia dubia (Water Flea)

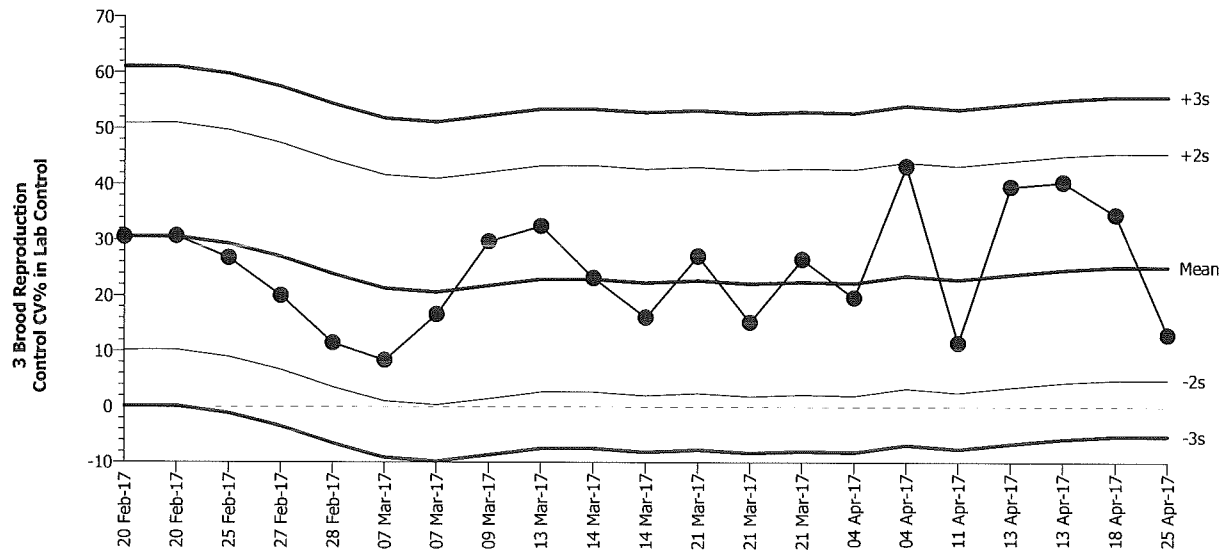
Material: All Materials

Protocol: EPA/821/R-02-013 (2002)

Endpoint: 3 Brood Reproduction

Source: All SampleID Sources

Ceriodaphnia 3 Brood Survival & Reproduction Test



Mean: 25.16

Count: 20

-2s Warning Limit: 4.843

-3s Action Limit: -5.317

Sigma: 10.16

CV: 40.40%

+2s Warning Limit: 45.48

+3s Action Limit: 55.64

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Feb	20	13:45	30.56	5.4	0.5315			15-5449-8395	
2			20	14:15	30.64	5.48	0.5394			05-0849-7391	
3			25	16:50	26.77	1.61	0.1585			18-1329-3009	
4			27	15:10	19.99	-5.17	-0.5089			00-9838-5538	
5			28	15:00	11.49	-13.67	-1.345			19-3328-3000	
6		Mar	7	15:20	8.373	-16.79	-1.652			19-6428-1476	
7			7	15:50	16.61	-8.55	-0.8415			07-4534-1407	
8			9	14:35	29.67	4.51	0.4439			00-2664-3960	
9			13	15:40	32.43	7.27	0.7156			19-4374-2483	
10			14	14:20	23.14	-2.02	-0.1988			13-2127-9213	
11			14	14:40	16.08	-9.08	-0.8937			00-0322-9197	
12			21	15:20	27.07	1.91	0.188			14-7452-3098	
13			21	15:50	15.2	-9.96	-0.9803			19-5513-4014	
14			21	16:15	26.52	1.36	0.1339			00-5967-7559	
15		Apr	4	15:25	19.6	-5.56	-0.5472			17-7988-9835	
16			4	15:30	43.18	18.02	1.774			06-6473-5323	
17			11	15:15	11.5	-13.66	-1.344			07-3543-9262	
18			13	14:00	39.56	14.4	1.417			10-2193-0811	
19			13	14:10	40.36	15.2	1.496			21-3814-3197	
20			18	15:35	34.52	9.36	0.9213			01-0396-4031	
21			25	15:05	12.99	-12.17	-1.198			04-2332-1882	

Ceriodaphnia 3 Brood Survival & Reproduction Test

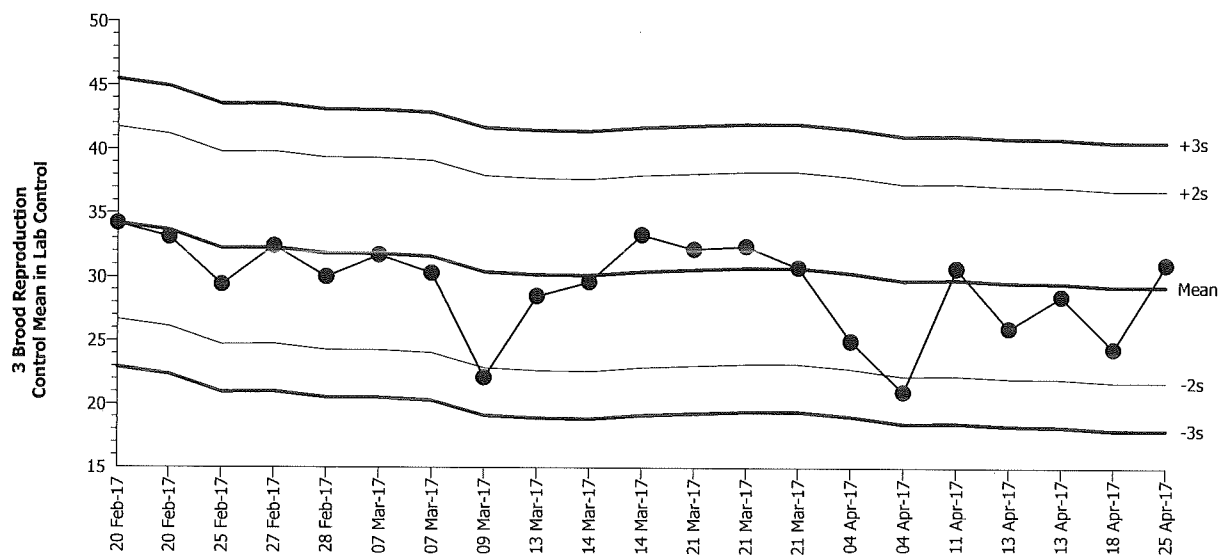
Nautilus Environmental (CA)

Test Type: Reproduction and Survival
Protocol: EPA/821/R-02-013 (2002)

Organism: Ceriodaphnia dubia (Water Flea)
Endpoint: 3 Brood Reproduction

Material: All Materials
Source: All SampleID Sources

Ceriodaphnia 3 Brood Survival & Reproduction Test



Mean: 29.28
Sigma: 3.761

Count: 20
CV: 12.80%

-2s Warning Limit: 21.75
+2s Warning Limit: 36.8

-3s Action Limit: 17.99
+3s Action Limit: 40.56

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Feb	20	13:45	34.2	4.92	1.308			15-5449-8395	
2			20	14:15	33.1	3.82	1.016			05-0849-7391	
3			25	16:50	29.4	0.12	0.03191			18-1329-3009	
4			27	15:10	32.4	3.12	0.8296			00-9838-5538	
5			28	15:00	30	0.72	0.1914			19-3328-3000	
6		Mar	7	15:20	31.7	2.42	0.6434			19-6428-1476	
7			7	15:50	30.3	1.02	0.2712			07-4534-1407	
8			9	14:35	22.1	-7.18	-1.909			00-2664-3960	
9			13	15:40	28.5	-0.78	-0.2074			19-4374-2483	
10			14	14:20	29.6	0.32	0.08508			13-2127-9213	
11			14	14:40	33.3	4.02	1.069			00-0322-9197	
12			21	15:20	32.18	2.9	0.7711			14-7452-3098	
13			21	15:50	32.4	3.12	0.8296			19-5513-4014	
14			21	16:15	30.74	1.46	0.3882			00-5967-7559	
15		Apr	4	15:25	25	-4.28	-1.138			17-7988-9835	
16			4	15:30	21	-8.28	-2.202	(-)		06-6473-5323	
17			11	15:15	30.7	1.42	0.3776			07-3543-9262	
18			13	14:00	26	-3.28	-0.8721			10-2193-0811	
19			13	14:10	28.5	-0.78	-0.2074			21-3814-3197	
20			18	15:35	24.4	-4.88	-1.298			01-0396-4031	
21			25	15:05	31	1.72	0.4573			04-2332-1882	

Freshwater Chronic Bioassay

Daphnid Survival and Reproduction Datasheet

Test Species: *C. dubia*

Client/Sample ID: City of Snoqualmie / Effluent

Start Date/Time: 4/25/2017 1505

Test No: 1704-S076

End Date/Time: 5/2/17 1045

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
LC	1	20	0	0	0	6	11	17	0		34	
	2	14	0	0	0	6	11	12	0		29	
	3	13	0	0	0	6	12	0	17		35	
	4	33	0	0	0	6	14	0	14		34	
	5	9	0	0	0	6	11	0	12		29	12
	6	37	0	0	3	0	12	13	10/B		28	
	7	49	0	0	6	0	14	18	24/B		38	
	8	50	0	0	4	0	12	17	10/B		33	
	9	39	0	0	0	5	10	0	10		25	
	10	6	0	0	0	0	12	0	12		30	

Tech: CG ACS ACS CG ACS CH KFP

Mean neonates/surviving female (for TAC): 31.0

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
33.3%	1	28	0	0	6	11/4P	—	—	—	—	4P	AD
	2	15	0	0	0	7	12	15	0	—	34	0
	3	36	0	0	0	5	12	14	0	—	31	
	4	11	0	0	0	5	7	6	17		35	
	5	18	0	0	0	3	13	0	15		31	
	6	22	0	0	4	3	14	20	17/B	41	37	
	7	1	0	0	0	2	17	0	20/B		31	
	8	55	0	0	3	0	15	19	20/B		37	
	9	21	0	0	0	7	10	0	18		35	
	10	48	0	0	0	5	13	0	19		37	

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
2.4%	1	24	0	0	4	0	14	16	20/B		34	
	2	2	0	0	0	5	12	0	17		34	
	3	34	0	0	0	5	11	15	0		30	
	4	4	0	0	0	3	12	0	17		32	
	5	54	0	0	0	6	12	15	13/B		35	
	6	31	0	0	4	0	13	19	21/B		36	
	7	23	0	0	6	0	11	17	21/B		34	
	8	40	0	0	6	0	13	17	21/B		36	
	9	45	0	0	0	0	6	13	15		34	
	10	59	0	0	0	6	14	0	16		36	17

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
50%	1	57	0	0	3	0	11	13	22/B		27	
	2	17	0	0	0	6	9	16	0		31	
	3	26	0	0	0	7	14	15	0		36	
	4	47	0	0	0	0	0	12	19		31	19
	5	58	0	0	0	7	13	19	0		39	
	6	38	0	0	4	12	0	20	22/B		36	
	7	5	0	0	7	0	17	23	23/B		47	
	8	16	0	0	6	0	17	22	28/B		45	
	9	43	0	0	0	5	15	0	13		33	
	10	35	0	0	0	7	16	7	7		37	

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
12.5%	1	51	0	0	5	0	11	17	0		33	
	2	60	0	0	0	8	0	15	18		41	
	3	19	0	0	0	1	11	0	13		25	
	4	7	0	0	0	3	13	0	15		31	
	5	30	0	0	0	7	16	18	0		41	
	6	29	0	0	7	0	12	15	23/B		34	
	7	25	0	0	8	2	16	19	20/B		45	
	8	46	0	0	6	0	17	14	22/B		37	
	9	3	0	0	0	6	10	0	14		30	
	10	27	0	0	0	4	15	0	16		35	

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
100%	1	41	0	0	5	0	15	20	18/B		40	
	2	52	0	0	0	6	13	0	17		36	
	3	32	0	0	0	4	14	0	18/B		36	
	4	8	0	0	0	3	12	0	15		30	
	5	42	0	0	0	7	19	19	17/B		45	
	6	10	0	0	0	9	17	0	21/B		50	24
	7	56	0	0	7	0	16	20	24/B		43	
	8	12	0	0	0	6	12	22	0		40	
	9	44	0	0	0	7	14	0	13		34	
	10	53	0	0	0	8	16	0	22		46	

Neonates for each replicate were blocked across concentrations at test initiation

Notes: d = dead; M = male; LIP = lost in progress;

B = 4th brood (only the first 3 broods are included in total)

* = dead neonates observed, but only live neonate counts recorded

Rep:	1	2	3	4	5	6	7	8	9	10
Board:	50									2
Cup:	1	11	12	13	14	16	18	20	23	24
Rand # QC:	CG									
Verified By:	CK									
Initiated By:	CG									
QC'd By:	RM									

Time Fed/Test Solution Renewed (day): (0) 1505 (1) 1240 (2) 1810 (3) 1240 (4) 1400 (5) 1100 (6) 0820 (7) —

Comments: @KFP 5/18/17 @JW 5/11/17

QC Check: KFP 5/10/17

Final Review: JW 5/11/17

Freshwater Chronic Bioassay

Water Quality Measurements

Client: City of Snoqualmie ^{4/25/17}
 Sample ID: Effluent
 Test No: 1704-S076

Test Species: C. dubia
 Start Date/Time: 4/25/17 1505
 End Date/Time: 5/2/17 1045

Concentration	Lab Control							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.15	8.25	8.16	8.21	8.28	8.15	8.14	
DO (mg/L)	7.6	7.9	7.7	8.1	8.2	7.8	8.0	
Cond. (µmhos/cm)	191	192	193	190	191	188	191	
Temp (°C)	25.3	25.3	24.8	24.6	24.1	24.5	24.9	
Final								
pH		7.99	8.24	8.13	8.12	8.25	8.12	8.22
DO (mg/L)		8.0	7.8	8.0	8.4	7.7	8.2	7.8
Temp (°C)		25.5	25.3	25.3	25.5	25.7	25.4	25.3

Concentration	33.3%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.00	8.09	8.07	7.92	8.09	7.97	8.00	
DO (mg/L)	7.7	7.9	7.7	7.9	8.1	7.8	8.1	
Cond. (µmhos/cm)	272	268	274	271	268	271	272	
Temp (°C)	25.6	25.6	24.8	25.2	25.6	24.6	24.8	
Final								
pH		8.12	8.29	8.22	8.21	8.30	8.28	8.22
DO (mg/L)		7.8	7.7	8.0	8.3	7.6	8.3	7.9
Temp (°C)		25.5	25.3	25.7	25.5	25.7	25.4	25.3

Concentration	2.4%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.16	8.25	8.16	8.19	8.29	8.15	8.13	
DO (mg/L)	7.6	7.8	7.6	7.7	7.9	7.8	7.9	
Cond. (µmhos/cm)	196	198	197	196	198	195	195	
Temp (°C)	25.5	25.4	24.9	24.9	24.3	24.5	25.0	
Final								
pH		7.97	8.24	8.17	8.16	8.21	8.20	8.19
DO (mg/L)		7.9	7.7	8.0	8.3	7.7	8.4	7.9
Temp (°C)		25.5	25.3	25.3	25.5	25.7	25.1	25.3

Concentration	50%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	7.92	8.03	8.02	7.87	8.00	7.91	7.88	
DO (mg/L)	7.8	7.9	7.8	8.0	8.1	8.0	8.1	
Cond. (µmhos/cm)	310	300	314	310	321	309	314	
Temp (°C)	25.6	25.5	24.7	25.1	24.5	24.6	24.9	
Final								
pH		8.12	8.27	8.22	8.22	8.20	8.28	8.27
DO (mg/L)		7.7	7.7	7.8	8.2	7.2	8.3	7.9
Temp (°C)		25.5	25.3	25.3	25.5	25.7	25.4	25.3

Concentration	12.5%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	8.10	8.19	8.15	8.07	8.20	8.08	8.09	
DO (mg/L)	7.6	7.8	7.7	7.7	8.0	7.8	7.9	
Cond. (µmhos/cm)	220	221	221	220	223	219	221	
Temp (°C)	25.5	25.5	24.9	25.0	24.3	24.6	24.9	
Final								
pH		8.12	8.27	8.21	8.19	8.27	8.26	8.21
DO (mg/L)		7.9	7.8	8.6	8.3	7.6	8.3	8.0
Temp (°C)		25.5	25.3	25.3	25.5	25.7	25.4	25.3

Concentration	100%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	7.73	7.88	7.75	7.64	7.83	7.76	7.71	
DO (mg/L)	8.0	8.0	7.8	8.3	8.3	8.2	8.5	
Cond. (µmhos/cm)	430	427	433	431	436	436	435	
Temp (°C)	25.6	25.6	25.4	25.4	24.5	24.5	24.9	
Final								
pH		8.15	8.30	8.26	8.27	8.34	8.32	8.27
DO (mg/L)		7.6	7.6	7.8	8.3	7.5	8.4	8.0
Temp (°C)		25.5	25.3	25.3	25.5	25.7	25.4	25.3

Animal Source/Date Received: Internal / N/A
 Animal Age at Initiation: 24 hrs
 Sample Log-in Numbers: A: 17-0492 C: 17-0503
 B: 17-0499

	0	1	2	3	4	5	6	7
Analysts: Initial:	CG	CG	ACS	AD	CG	ACS	CH	
Final:	-	CG	ACS	ACS	CG	ACS	CH	ACS
Dilutions made by:	CG	MM	AD	ACS	CG	ACS	CH	
Sample Used (A, B, C):	A	A	B	B	C	C	C	

Comments: ⓐ EG 8/5 4/25/17 ⓑ CG 8/4 4/24/17

QC Check: KFP 5/10/17

Final Review: W 5/11/17

Fathead Minnow Chronic Test

CETIS Summary Report

Report Date: 10 May-17 11:31 (p 1 of 1)

Test Code: 1704-S075 | 07-4827-7383

Fathead Minnow 7-d Larval Survival and Growth Test							Nautilus Environmental (CA)				
Batch ID:	00-9532-6144		Test Type: Growth-Survival (7d)				Analyst:				
Start Date:	25 Apr-17 14:10		Protocol: EPA/821/R-02-013 (2002)				Diluent: Mod-Hard Synthetic Water				
Ending Date:	02 May-17 10:00		Species: Pimephales promelas				Brine: Not Applicable				
Duration:	6d 20h		Source: Aquatic Biosystems, CO				Age: 1d				
Sample ID:	10-6928-9625		Code: 17-0492				Client: City of Snoqualmie				
Sample Date:	24 Apr-17 08:00		Material: POTW Effluent				Project:				
Receive Date:	25 Apr-17 09:59		Source: Snoqualmie WWTP (WA0022403)								
Sample Age:	30h (3 °C)		Station:								
Comparison Summary											
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Method			
11-4815-0795	7d Survival Rate		100	>100	NA	5.6%	1	Steel Many-One Rank Sum Test			
04-7522-3928	Mean Dry Biomass-mg		100	>100	NA	9.26%	1	Dunnett Multiple Comparison Test			
Test Acceptability											
Analysis ID	Endpoint		Attribute		Test Stat	TAC Limits		Overlap	Decision		
11-4815-0795	7d Survival Rate		Control Resp		1	0.8 - NL		Yes	Passes Acceptability Criteria		
04-7522-3928	Mean Dry Biomass-mg		Control Resp		0.3813	0.25 - NL		Yes	Passes Acceptability Criteria		
04-7522-3928	Mean Dry Biomass-mg		PMSD		0.09256	0.12 - 0.3		Yes	Below Acceptability Criteria		
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	0	0	0.0%	0.0%
2.4		4	1	1	1	1	1	0	0	0.0%	0.0%
12.5		4	1	1	1	1	1	0	0	0.0%	0.0%
33.3		4	1	1	1	1	1	0	0	0.0%	0.0%
50		4	0.975	0.8954	1	0.9	1	0.025	0.05	5.13%	2.5%
100		4	0.975	0.8954	1	0.9	1	0.025	0.05	5.13%	2.5%
Mean Dry Biomass-mg Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	0.3812	0.3522	0.4103	0.355	0.397	0.009114	0.01823	4.78%	0.0%
2.4		4	0.407	0.3818	0.4322	0.392	0.427	0.007906	0.01581	3.89%	-6.75%
12.5		4	0.3933	0.362	0.4245	0.374	0.42	0.00981	0.01962	4.99%	-3.15%
33.3		4	0.4195	0.3742	0.4648	0.402	0.462	0.01424	0.02848	6.79%	-10.03%
50		4	0.4358	0.4053	0.4662	0.408	0.449	0.009578	0.01916	4.4%	-14.3%
100		4	0.4525	0.4194	0.4856	0.424	0.469	0.01041	0.02082	4.6%	-18.69%
7d Survival Rate Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Dilution Water	1	1	1	1						
2.4		1	1	1	1						
12.5		1	1	1	1						
33.3		1	1	1	1						
50		1	0.9	1	1						
100		1	0.9	1	1						
Mean Dry Biomass-mg Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Dilution Water	0.385	0.355	0.397	0.388						
2.4		0.427	0.392	0.412	0.397						
12.5		0.394	0.42	0.385	0.374						
33.3		0.409	0.405	0.402	0.462						
50		0.449	0.448	0.408	0.438						
100		0.467	0.424	0.469	0.45						

CETIS Analytical Report

Report Date: 10 May-17 11:31 (p 1 of 3)
Test Code: 1704-S075 | 07-4827-7383

Fathead Minnow 7-d Larval Survival and Growth Test								Nautilus Environmental (CA)			
Analysis ID: 11-4815-0795		Endpoint: 7d Survival Rate		CETIS Version: CETISv1.8.7							
Analyzed: 10 May-17 11:30		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform		Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)		NA	C > T	NA	NA		5.6%	100	>100	NA	1
Steel Many-One Rank Sum Test											
Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)		
Dilution Water		2.4	18	10	1	6	0.8333	Asymp	Non-Significant Effect		
		12.5	18	10	1	6	0.8333	Asymp	Non-Significant Effect		
		33.3	18	10	1	6	0.8333	Asymp	Non-Significant Effect		
		50	16	10	1	6	0.6105	Asymp	Non-Significant Effect		
		100	16	10	1	6	0.6105	Asymp	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.00885311		0.001770622		5	0.8	0.5640	Non-Significant Effect			
Error	0.039839		0.002213278		18						
Total	0.04869211				23						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Mod Levene Equality of Variance			0.8	4.248	0.5640	Equal Variances				
Variances	Levene Equality of Variance			7.2	4.248	0.0007	Unequal Variances				
Distribution	Shapiro-Wilk W Normality			0.6154	0.884	<0.0001	Non-normal Distribution				
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	1	0	0.0%	0.0%
2.4		4	1	1	1	1	1	1	0	0.0%	0.0%
12.5		4	1	1	1	1	1	1	0	0.0%	0.0%
33.3		4	1	1	1	1	1	1	0	0.0%	0.0%
50		4	0.975	0.8954	1	1	0.9	1	0.025	5.13%	2.5%
100		4	0.975	0.8954	1	1	0.9	1	0.025	5.13%	2.5%
Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
2.4		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
12.5		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
33.3		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	0.0%
50		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%
100		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	2.89%

Fathead Minnow 7-d Larval Survival and Growth Test

Nautilus Environmental (CA)

Analysis ID: 11-4815-0795

Endpoint: 7d Survival Rate

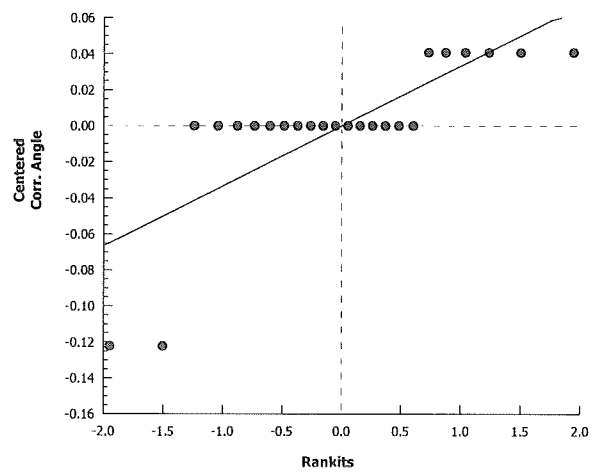
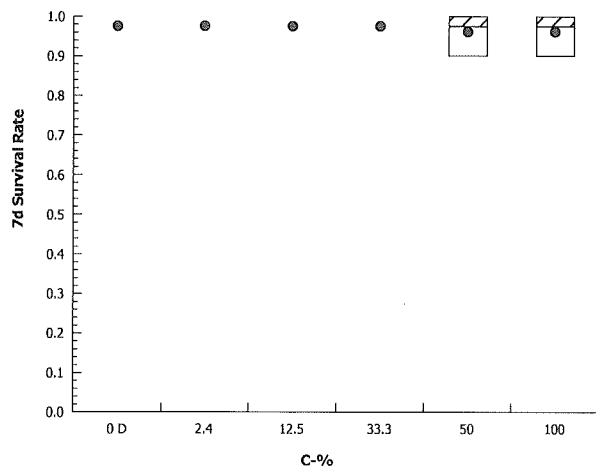
CETIS Version: CETISv1.8.7

Analyzed: 10 May-17 11:30

Analysis: Nonparametric-Control vs Treatments

Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 10 May-17 11:31 (p 3 of 3)
Test Code: 1704-S075 | 07-4827-7383

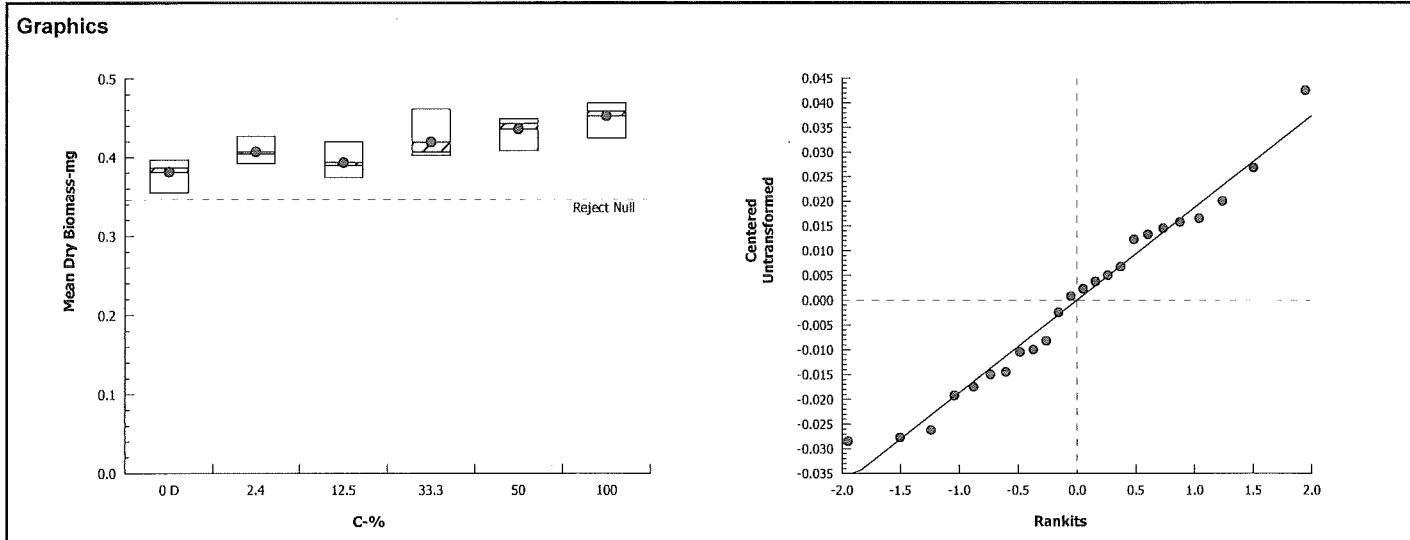
Fathead Minnow 7-d Larval Survival and Growth Test						Nautilus Environmental (CA)				
Analysis ID:	04-7522-3928	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7					
Analyzed:	10 May-17 11:30	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes					
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU	
Untransformed	NA	C > T	NA	NA	9.26%	100	>100	NA	1	

Dunnett Multiple Comparison Test										
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)	
Dilution Water		2.4	-1.757	2.407	0.035	6	0.9981	CDF	Non-Significant Effect	
		12.5	-0.8186	2.407	0.035	6	0.9721	CDF	Non-Significant Effect	
		33.3	-2.609	2.407	0.035	6	0.9999	CDF	Non-Significant Effect	
		50	-3.718	2.407	0.035	6	1.0000	CDF	Non-Significant Effect	
		100	-4.86	2.407	0.035	6	1.0000	CDF	Non-Significant Effect	

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.01413238	0.002826476	5	6.576	0.0012	Significant Effect
Error	0.007736252	0.0004297917	18			
Total	0.02186863		23			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance	1.125	15.09	0.9518	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.9713	0.884	0.7001	Normal Distribution	

Mean Dry Biomass-mg Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	0.3812	0.3522	0.4103	0.3865	0.355	0.397	0.009114	4.78%	0.0%
2.4		4	0.407	0.3818	0.4322	0.4045	0.392	0.427	0.007906	3.89%	-6.75%
12.5		4	0.3933	0.362	0.4245	0.3895	0.374	0.42	0.00981	4.99%	-3.15%
33.3		4	0.4195	0.3742	0.4648	0.407	0.402	0.462	0.01424	6.79%	-10.03%
50		4	0.4358	0.4053	0.4662	0.443	0.408	0.449	0.009577	4.4%	-14.3%
100		4	0.4525	0.4194	0.4856	0.4585	0.424	0.469	0.01041	4.6%	-18.69%



Fathead Minnow 7-d Larval Survival and Growth Test

Nautilus Environmental (CA)

Test Type: Growth-Survival (7d)

Organism: Pimephales promelas (Fathead Minn

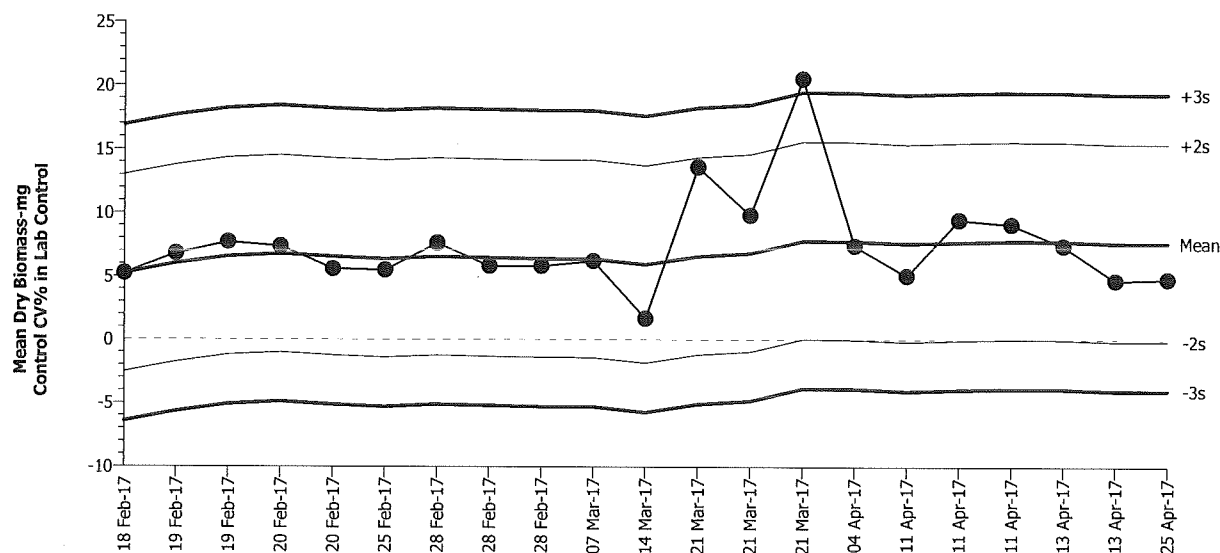
Material: All Materials

Protocol: EPA/821/R-02-013 (2002)

Endpoint: Mean Dry Biomass-mg

Source: All SampleID Sources

Fathead Minnow 7-d Larval Survival and Growth Test



Mean: 7.619

Count: 20

-2s Warning Limit: -0.1626

-3s Action Limit: -4.054

Sigma: 3.891

CV: 51.10%

+2s Warning Limit: 15.4

+3s Action Limit: 19.29

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Feb	18	15:30	5.232	-2.387	-0.6135			08-9450-6306	
2			19	12:05	6.791	-0.828	-0.2128			15-8474-8234	
3			19	12:45	7.703	0.084	0.02159			19-7498-7582	
4			20	14:40	7.389	-0.23	-0.05911			16-5267-6571	
5			20	15:15	5.589	-2.03	-0.5217			12-8946-2780	
6			25	18:10	5.501	-2.118	-0.5443			18-0742-2223	
7			28	14:35	7.625	0.006	0.001542			05-5823-0250	
8			28	15:00	5.803	-1.816	-0.4667			18-7325-7085	
9			28	15:35	5.803	-1.816	-0.4667			11-4197-8362	
10		Mar	7	16:00	6.196	-1.423	-0.3657			10-8849-7420	
11			14	14:50	1.669	-5.95	-1.529			19-4221-0442	
12			21	15:50	13.62	6.001	1.542			19-2295-1068	
13			21	16:05	9.822	2.203	0.5662			04-5529-9726	
14			21	16:50	20.53	12.91	3.318	(+)	(+)	08-3965-4612	
15		Apr	4	16:20	7.411	-0.208	-0.05346			14-7409-6878	
16			11	14:05	5.049	-2.57	-0.6605			03-4329-1473	
17			11	14:30	9.463	1.844	0.4739			03-0166-0412	
18			11	15:05	9.108	1.489	0.3827			18-7710-6960	
19			13	13:55	7.409	-0.21	-0.05397			05-9883-7861	
20			13	14:15	4.675	-2.944	-0.7566			02-3432-1935	
21			25	14:10	4.781	-2.838	-0.7294			07-4827-7383	

Fathead Minnow 7-d Larval Survival and Growth Test

Nautilus Environmental (CA)

Test Type: Growth-Survival (7d)

Organism: Pimephales promelas (Fathead Minn

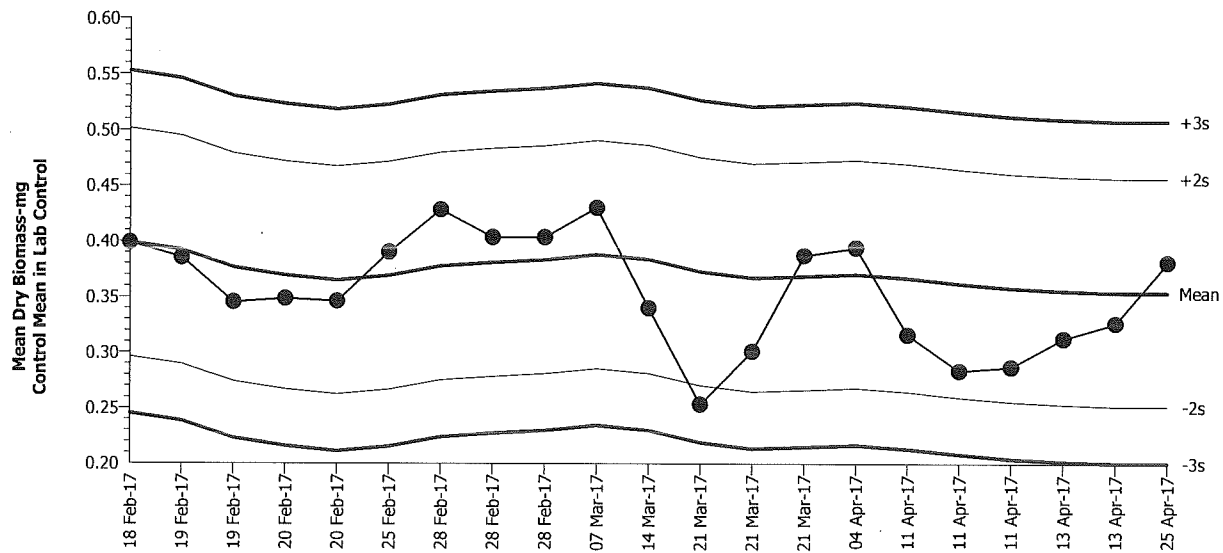
Material: All Materials

Protocol: EPA/821/R-02-013 (2002)

Endpoint: Mean Dry Biomass-mg

Source: All SampleID Sources

Fathead Minnow 7-d Larval Survival and Growth Test



Mean: 0.3542

Count: 20

-2s Warning Limit: 0.2516

-3s Action Limit: 0.2004

Sigma: 0.05127

CV: 14.50%

+2s Warning Limit: 0.4567

+3s Action Limit: 0.508

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Feb	18	15:30	0.399	0.0448	0.8738			08-9450-6306	
2			19	12:05	0.3855	0.0313	0.6105			15-8474-8234	
3			19	12:45	0.3455	-0.0087	-0.1697			19-7498-7582	
4			20	14:40	0.3485	-0.0057	-0.1112			16-5267-6571	
5			20	15:15	0.3462	-0.008	-0.156			12-8946-2780	
6			25	18:10	0.3903	0.0361	0.7041			18-0742-2223	
7			28	14:35	0.4283	0.0741	1.445			05-5823-0250	
8			28	15:00	0.4038	0.0496	0.9674			18-7325-7085	
9			28	15:35	0.4038	0.0496	0.9674			11-4197-8362	
10		Mar	7	16:00	0.4302	0.076	1.482			10-8849-7420	
11			14	14:50	0.3402	-0.014	-0.2731			19-4221-0442	
12			21	15:50	0.2533	-0.1009	-1.968			19-2295-1068	
13			21	16:05	0.3012	-0.053	-1.034			04-5529-9726	
14			21	16:50	0.3872	0.033	0.6437			08-3965-4612	
15		Apr	4	16:20	0.3943	0.0401	0.7821			14-7409-6878	
16			11	14:05	0.3163	-0.0379	-0.7392			03-4329-1473	
17			11	14:30	0.2837	-0.0705	-1.375			03-0166-0412	
18			11	15:05	0.287	-0.0672	-1.311			18-7710-6960	
19			13	13:55	0.3127	-0.0415	-0.8094			05-9883-7861	
20			13	14:15	0.3265	-0.0277	-0.5403			02-3432-1935	
21			25	14:10	0.3812	0.027	0.5266			07-4827-7383	

Freshwater Chronic Bioassay

Larval Fish Survival

Client: City of Snoqualmie

Test Species: P. promelas

Sample ID: Effluent

Start Date/Time: 4/25/2017 1410

Test No.: 1704-S075

End Date/Time: 5/2/2017 1000

Concentration (%)	Rep.	Rand #	Test Day / No. Organisms Alive								Percent Survival
			0	1	2	3	4	5	6	7	
Lab Control	a	13	10	10	10	10	10	10	10	10	100
	b	4	10	10	10	10	10	10	10	10	100
	c	18	10	10	10	10	10	10	10	10	100
	d	22	10	10	10	10	10	10	10	10	100
2.4	a	23	10	10	10	10	10	10	10	10	100
	b	16	10	10	10	10	10	10	10	10	100
	c	14	10	10	10	10	10	10	10	10	100
	d	15	10	10	10	10	10	10	10	10	100
12.5	a	20	10	10	10	10	10	10	10	10	100
	b	6	10	10	10	10	10	10	10	10	100
	c	19	10	10	10	10	10	10	10	10	100
	d	12	10	10	10	10	10	10	10	10	100
33.3	a	10	10	10	10	10	10	10	10	10	100
	b	17	10	10	10	10	10	10	10	10	100
	c	21	10	10	10	10	10	10	10	10	100
	d	8	10	10	10	10	10	10	10	10	100
50	a	5	10	10	10	10	10	10	10	10	100
	b	7	10	10	10	10	10	10	9	9	90
	c	1	10	10	10	10	10	10	10	10	100
	d	3	10	10	10	10	10	10	10	10	100
100	a	24	10	10	10	10	10	10	10	10	100
	b	11	10	10	9	9	9	9	9	9	90
	c	2	10	10	10	10	10	10	10	10	100
	d	9	10	10	10	10	10	10	10	10	100

Rand # QC: EG

Tech Initials

Initial Count QC'd by: RM

Time

Initiated by: MM

MM	MM	MM	CH	AD	AB	RH	KFP
1410	1515	1445	1050	1500	1030	0930	1000

Time Fed (day): 0 1 2 3 4 5 6

morning:	-	0810	0820	0845	0830	0935	0945
midday:	-	1240	1120	1120	1200	1230	1130
evening:	1640	1635	1600	1540	1740	1520	1600

Comments: _____

Drying Oven Info

Tare wt. Initials/Date: EG 4/2/17

Date/Time in: 5/2/17 1025

Date/Time out: 5/4/17 0845

Temp (°C): 64.4

QC Check: KFP 5/10/17

Final Review: JW 5/11/17

Freshwater Chronic Bioassay

Larval Fish Weights

Client: City of SnoqualmieTest Species: Pimephales promelasSample ID: EffluentStart Date/Time: 4/25/2017 1410Test No.: 1704-SD75End Date/Time: 5/2/2017 1000

Conc. (<u> </u> % <u> </u>)	Rep.	pan weight (mg)	pan + fish weight (mg)	organism weight (mg)
Lab Control	a	26.87	30.72	3.85
	b	22.70	26.25	3.55
	c	25.79	29.76	3.97
	d	25.24	29.12	3.88
2.4	a	27.24	31.51	4.27
	b	19.37	23.29	3.92
	c	21.98	26.1	4.12
	d	24.54	28.51	3.97
12.5	a	31.78	35.72	3.94
	b	19.56	23.76	4.20
	c	22.10	25.95	3.85
	d	22.25	25.99	3.74
33.3	a	24.42	28.51	4.09
	b	21.05	25.1	4.05
	c	20.97	24.99	4.02
	d	23.25	27.87	4.62
50	a	28.32	32.81	4.49
	b	22.10	26.58	4.48
	c	20.21	24.29	4.08
	d	22.51	26.89	4.38
100	a	23.83	28.5	4.67
	b	19.44	23.68	4.24
	c	21.87	26.56	4.69
	d	22.59	27.09	4.50
	a			0
	b			0
	c			0
	d			0

Tech Initials:

EG

DM

Date/Time:

5/2/17 0825

5/4/17 0903

KPS
5/8
5/10/17QC Check: KPS 5/10/17Final Review: JW 5/11/17

Freshwater Chronic Bioassay

Client: City of Snoqualmie

Sample ID: Effluent

Test No: 1704-S075

Concentration	Lab Control							
Day	0	1	2	3	4	5	6	7
Initial								
pH	7.63	7.67	7.60	7.59	7.56	7.73	7.72	
DO (mg/L)	7.5	7.9	8.0	7.5	7.8	7.5	8.2	
Cond. (µmhos/cm)	300	299	303	303	311	315	344	
Temp (°C)	24.3	25.2	24.2	24.7	24.4	24.4	24.7	
Final								
pH		7.68	7.75	7.5	7.51	7.60	7.50	7.59
DO (mg/L)		7.5	7.0	6.0	6.1	7.0	7.2	7.3
Temp (°C)		24.3	24.5	25.1	25.0	24.6	24.4	24.5

Concentration	2.4%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	7.63	7.68	7.61	7.60	7.57	7.73	7.74	
DO (mg/L)	7.7	8.0	8.0	7.6	7.9	7.7	8.2	
Cond. (µmhos/cm)	303	302	305	306	312	317	346	
Temp (°C)	24.3	24.6	24.3	24.6	24.6	24.5	24.9	
Final								
pH		7.74	7.83	7.74	7.64	7.69	7.67	7.71
DO (mg/L)		7.3	7.1	6.7	6.4	6.9	7.0	7.13
Temp (°C)		24.2	24.1	24.4	24.6	24.1	24.4	24.3

Concentration	12.5%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	7.62	7.65	7.62	7.59	7.58	7.70	7.73	
DO (mg/L)	7.7	8.0	7.9	7.7	8.0	7.7	8.2	
Cond. (µmhos/cm)	315	314	319	319	324	330	354	
Temp (°C)	24.4	25.0	24.4	24.7	24.6	24.5	25.1	
Final								
pH		7.78	7.83	7.70	7.69	7.77	7.76	7.74
DO (mg/L)		7.3	7.0	6.4	6.5	7.0	7.1	7.6
Temp (°C)		24.5	24.3	24.9	24.5	24.1	24.4	24.6

Animal Source/Date Received:

ABS/ 4-25-17

Animal Age at Initiation:

1d

Animal Acclimation Qualifiers (circle all that apply): Q22 / Q23 / Q24 / none

Sample Log-in Numbers: A: 17-0492 C: 17-0503

B: 17-0499

Comments:

@CG 04/25/17 @AD 018 4/29/17

QC Check:

KTP 5/10/17

Water Quality Measurements

Test Species: *P. promelas*

Start Date/Time: 4/25/17 1410

End Date/Time: 5/2/17 1000

Concentration	33.3%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	7.60	7.64	7.62	7.57	7.55	7.65	7.67	
DO (mg/L)	7.9	8.1	8.0	7.8	8.2	7.9	8.4	
Cond. (µmhos/cm)	343	341	346	346	352	355	374	
Temp (°C)	24.6	24.6	24.4	24.6	24.5	24.4	25.1	
Final								
pH		7.75	7.74	7.64	7.58	7.65	7.71	7.72
DO (mg/L)		7.0	6.5	5.9	5.6	6.2	6.3	6.6
Temp (°C)		24.3	24.3	25.1	25.0	25.0	24.9	25.0

Concentration	50%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	7.58	7.61	7.62	7.55	7.55	7.61	7.65	
DO (mg/L)	8.0	8.2	8.0	8.2	8.4	8.2	8.5	
Cond. (µmhos/cm)	365	362	371	370	371	370	385	
Temp (°C)	24.8	25.0	24.2	24.6	24.4	24.4	24.8	
Final								
pH		7.83	7.88	7.73	7.74	7.76	7.83	7.82
DO (mg/L)		7.0	6.6	6.0	5.9	6.4	6.7	6.6
Temp (°C)		24.5	24.3	25.1	25.0	24.6	24.6	24.7

Concentration	100%							
Day	0	1	2	3	4	5	6	7
Initial								
pH	7.53	7.59	7.61	7.52	7.53	7.55	7.58	
DO (mg/L)	8.3	8.5	8.2	8.7	8.9	8.7	8.7	
Cond. (µmhos/cm)	432	432	435	437	435	436	435	
Temp (°C)	25.3	24.7	24.5	24.5	24.3	24.4	25.1	
Final								
pH		7.95	8.01	7.88	7.84	7.86	7.94	7.93
DO (mg/L)		6.9	6.6	6.0	5.8	6.6	6.5	6.5
Temp (°C)		24.3	24.3	24.7	24.6	24.3	24.3	24.4

		0	1	2	3	4	5	6	7
Analysts:	Initial:	CG	MM	MM	AD	AD	AG	RH	-
	Final:	-	MM	MM	AD	AD	AG	RH	EG
Dilutions made by:		EG	MM	AD	ACS	AD	ACS	RH	-
Sample Used (A, B, C):		A	A	B	B	C	C	C	-

Final Review: JW 5/11/17

Appendix B
Sample Check-in Sheets

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120

Client: City of Snoqualmie
Sample ID: Effluent
Test ID No(s): 1704-8075 to -8077

NORTHWEST CLIENTS

Sample Check-In Information

Sample Description:

A: light yellow color, clear, no odor, light debris
B: light yellow, clear, no odor, light debris
C: light yellow, clear, no odor, light debris

Subsamples for Additional Chemistry Required:

NH3 (always required)

Other _____

Tech Initials ACH BMM CAD

COC Complete (Y/N)?

A ☒ B ☒ C ☒

Filtration? Y ☒ N

Pore Size: _____

Organisms _____ or Debris _____

Salinity Adjustment? Y ☒ N

Test: _____ Source: _____ Target ppt: _____

Test: _____ Source: _____ Target ppt: _____

Test: _____ Source: _____ Target ppt: _____

pH Adjustment? Y ☒ N

	A	B	C
Initial pH:			
Amount of HCl added:			
Final pH:			

Cl₂ Adjustment? Y ☒ N

	A	B	C
Initial Free Cl ₂ :			
STS added:			
Final Free Cl ₂ :			

Sample Aeration? Y ☒ N

	A	B	C
Initial D.O.			
Duration & Rate			
Final D.O.			

Sample (A, B, C):	A	B	C	
Log-in No. (17-xxxx):	0492	0499	0503	
Sample Collection Date & Time:	4/24/17 0800	4/26/17 0800	4/28/17 0800	
Sample Receipt Date & Time:	4/25/17 0959	4/27/17 0850	4/29/17 1130	
Number of Containers & Container Type:	1, 10L cub.	1, 10L cub.	1, 10L cub.	
Approx. Total Volume Received (L):	10L	10L	10L	
Check-in Temperature (°C)	3.0	3.0	2.5	
Temperature OK? ¹	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	<input checked="" type="checkbox"/> Y <input type="checkbox"/> N	Y N
DO (mg/L)	11.8	10.8	9.4	
pH (units)	7.75	7.52	7.44	
Conductivity (µS/cm)	422	427	439	
Salinity (ppt)	0.3	0.2	0.3	
Alkalinity (mg/L) ²	107	108	98	
Hardness (mg/L) ^{2,3}	111	97	98	
Total Chlorine (mg/L)	20.02	20.02	0.03	
Technician Initials	CH	MM	AD	

Test Performed: Chronic Fathead Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: MHSW

Alkalinity: 64 Hardness or Salinity: 81

Additional Control? Y ☒ N = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: Chronic Water Flea Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: _____

Alkalinity: 82 Hardness or Salinity: 81

Additional Control? Y ☒ N = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: _____ Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: _____

Alkalinity: _____ Hardness or Salinity: _____

Additional Control? Y ☐ N = _____ Alkalinity: _____ Hardness or Salinity: _____

Notes: ¹ Temperature of sample should be 0-6°C at receipt.

² mg/L as CaCO₃, ³ Measured for freshwater samples only, NA = Not Applicable

Additional Comments: _____

QC Check: AD 4/29/17
Final Review: CH 5/10/17

Overlying Water

Analyst: DM
Analysis Date: 5/11/17

N x 1.22

D. 98

Acceptable Range: 0-20%

Acceptable Range: 80-120%^b

Comments: (A) Q19 DM 5/11/17

^c Calculation not performed due to one or both values below the method detection limit.

Method Detection Limit = 0.5 mg/L

Final Review: AC 5/17/17

Appendix C
Chain-of-Custody Forms

Date 4-24 Page 1 of 1


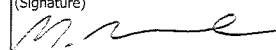
Sample Collection By: <u>Lyle Beach</u>							ANALYSES REQUIRED										Receipt Temperature (°C)				
Report to:				Invoice To:			Fathead Minnow	Water Flea													
Company <u>City of Snoqualmie</u>				Company <u>City of Snoqualmie</u>																	
Address <u>38190 SE Stearns RD</u>				Address <u>P.O. Box 987</u>																	
City/State/Zip <u>Snoqualmie, WA 98065</u>				City/State/Zip <u>Snoqualmie, WA 98065</u>																	
Contact <u>Lyle Beach</u>				Contact <u>Tom Holmes</u>																	
Phone <u>858-425-888-4153</u>				Phone <u>425-766-1210</u>																	
Email <u>lbeach@ci.snoqualmie.wa.us</u>				Email <u>tholmes@ci.snoqualmie.wa.us</u>																	
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS															
1 SNOG001	4-24-17	8:00a	W	cube	1	Chronic Toxicity	✓	✓												3.0	
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

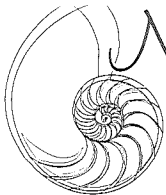
PROJECT INFORMATION		SAMPLE RECEIPT		1) RELINQUISHED BY (CLIENT)		2) RECEIVED BY (COURIER)	
Client:		Total No. of Containers	<u>1</u>	(Signature)	<u>[Signature]</u>	(Signature)	
PO No.:		Received Good Condition?	<u>✓</u>	(Time)	<u>8:49a</u>	(Time)	
Shipped Via:		Matches Test Schedule?	<u>✓</u>	(Printed Name)	<u>Lyle Beach</u>	(Printed Name)	
				(Date)	<u>4-24-17</u>	(Date)	
				(Company)	<u>City of Snoqualmie</u>	(Company)	
SPECIAL INSTRUCTIONS/COMMENTS:				3) RELINQUISHED BY (COURIER)		4) RECEIVED BY (LABORATORY)	
				(Signature)		(Signature)	<u>[Signature]</u>
				(Time)		(Time)	<u>0959</u>
				(Printed Name)		(Printed Name)	<u>Caitlin Hamer</u>
				(Date)		(Date)	<u>4/25/17</u>
				(Company)		(Company)	<u>Nautilus</u>

Additional costs maybe required for sample disposal or storage.
Payment Net 30 unless otherwise contracted.

Date 4-26 Page 1 of 1

Sample Collection By: <u>Lyle Beach</u>							ANALYSES REQUIRED										Receipt Temperature (°C)				
Report to:				Invoice To:			Fathead Minnow	Water Flea													
Company <u>City of Snoqualmie</u> Address <u>38190 SE Stearns RD</u> City/State/Zip <u>Snoqualmie, WA 98065</u> Contact <u>Lyle Beach</u> Phone <u>425-888-4153</u> Email <u>lbeach@ci.snoqualmie.wa.us</u>				Company <u>City of Snoqualmie</u> Address <u>P.O. Box 987</u> City/State/Zip <u>Snoqualmie, WA 98065</u> Contact <u>Tom Holmes</u> Phone <u>425-766-1210</u> Email <u>tholmes@ci.snoqualmie.wa.us</u>																	
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS															
1 <u>SNOQ02</u>	<u>4-26-17</u>	<u>8:00a</u>	<u>W</u>	<u>cube</u>	<u>1</u>	<u>Chronic Toxicity</u>	✓	✓												3.0	
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

PROJECT INFORMATION		SAMPLE RECEIPT		1) RELINQUISHED BY (CLIENT)		2) RECEIVED BY (COURIER)	
Client:		Total No. of Containers	✓	(Signature)	 <u>8:42a</u>	(Signature)	
PO No.:		Received Good Condition?	✓	(Printed Name)	<u>Lyle Beach</u> <u>4-26-17</u>	(Printed Name)	
Shipped Via:		Matches Test Schedule?	✓	(Company)	<u>City of Snoqualmie</u>	(Company)	
SPECIAL INSTRUCTIONS/COMMENTS:				3) RELINQUISHED BY (COURIER)		4) RECEIVED BY (LABORATORY)	
				(Signature)	(Time)	(Signature)	(Time)
				(Printed Name)	(Date)	(Printed Name)	(Date)
				(Company)		(Company)	
				(Signature)		 <u>0850</u>	
				(Printed Name)		<u>Mandarin Mathachan</u> <u>4/27/17</u>	
				(Company)		<u>Nautilus</u> <u>20 17:0449</u>	



Nautilus Environmental

4340 Vandever Avenue
San Diego, CA 92120
Phone 858.587.7333
Fax 858.587.3961

Chain of Custody

Date 4-28-17 Page 1 of 1

Sample Collection By: <u>Lyle Beach</u>							ANALYSES REQUIRED										Receipt Temperature (°C)																																																																																																																																																																																																																																																																							
Report to: Company <u>City of Snoqualmie</u> Address <u>38190 SE Stearns RD</u> City/State/Zip <u>Snoqualmie, WA 98065</u> Contact <u>Lyle Beach</u> Phone <u>425-888-4153</u> Email <u>lbeach@ci.snoqualmie.wa.us</u>				Invoice To: Company <u>City of Snoqualmie</u> Address <u>P.O. Box 987</u> City/State/Zip <u>Snoqualmie, WA 98065</u> Contact <u>Tom Holmes</u> Phone <u>425-766-1210</u> Email <u>tholmes@ci.snoqualmie.wa.us</u>			<div style="display: flex; justify-content: space-between;"> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Fathead Minnow</div> <div style="writing-mode: vertical-rl; transform: rotate(180deg);">Water Flea</div> </div>																																																																																																																																																																																																																																																																																	
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:10%;">SAMPLE ID</th> <th style="width:10%;">DATE</th> <th style="width:10%;">TIME</th> <th style="width:10%;">MATRIX</th> <th style="width:10%;">CONTAINER TYPE</th> <th style="width:10%;">NO. OF CONTAINERS</th> <th style="width:30%;">COMMENTS</th> </tr> </thead> <tbody> <tr> <td>1 <u>SNOQ03</u></td> <td><u>4-28-17</u></td> <td><u>8:00a</u></td> <td><u>W</u></td> <td><u>cube</u></td> <td><u>1</u></td> <td><u>chronic Toxicity</u></td> </tr> <tr><td>2</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>6</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>7</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>8</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>9</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>10</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>														SAMPLE ID	DATE	TIME		MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS	1 <u>SNOQ03</u>	<u>4-28-17</u>	<u>8:00a</u>	<u>W</u>	<u>cube</u>	<u>1</u>	<u>chronic Toxicity</u>	2							3							4							5							6							7							8							9							10							<table border="1" style="width:100%; border-collapse: collapse;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>																																																																																																																																																																																												
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PROJECT INFORMATION		SAMPLE RECEIPT		1) RELINQUISHED BY (CLIENT)		2) RECEIVED BY (COURIER)	
Client:		Total No. of Containers		(Signature)	(Time)	(Signature)	(Time)
					<u>8:42a</u>		
PO No.:		Received Good Condition?	<input checked="" type="checkbox"/>	(Printed Name)	(Date)	(Printed Name)	(Date)
				<u>Lyle Beach</u>	<u>4-28-17</u>		
Shipped Via:		Matches Test Schedule?	<input checked="" type="checkbox"/>	(Company)		(Company)	
				<u>city of Snoqualmie</u>			
SPECIAL INSTRUCTIONS/COMMENTS:				3) RELINQUISHED BY (COURIER)		4) RECEIVED BY (LABORATORY)	
				(Signature)	(Time)	(Signature)	(Time)
				(Printed Name)	(Date)	(Printed Name)	(Date)
						<u>Claire Gonzales</u>	<u>4/29/17</u>
				(Company)		(Company)	
						<u>Nautilus</u>	

Additional costs maybe required for sample disposal or storage.
Payment Net 30 unless otherwise contracted.

www.nautilusenvironmental.com

DISTRIBUTION: WHITE - Nautilus Environmental, COLOR - Originator

Nautilus T.D# 17-0503

Appendix D
Qualifier Code Glossary

Glossary of Qualifier Codes:

- Q1 - Temperatures out of recommended range; corrective action taken and recorded in Test Temperature Correction Log
- Q2 - Temperatures out of recommended range; no action taken, test terminated same day
- Q3 - Sample aerated prior to initiation or renewal due to dissolved oxygen (D.O.) levels below 6.0 mg/L
- Q4 - Test aerated; D.O. levels dropped below 4.0 mg/L
- Q5 - Test initiated with aeration due to an anticipated drop in D.O.
- Q6 - Airline obstructed or fell out of replicate and replaced; drop in D.O. occurred
- Q7 - Salinity out of recommended range
- Q8 - Spilled test chamber/ Unable to recover test organism(s)
- Q9 - Inadequate sample volume remaining, 50% renewal performed
- Q10 - Inadequate sample volume remaining, no renewal performed
- Q11 - Sample out of holding time; refer to QA section of report
- Q12 - Replicate(s) not initiated; excluded from data analysis
- Q13 - Survival counts not recorded due to poor visibility or heavy debris
- Q14 - D.O. percent saturation was checked and was $\leq 110\%$
- Q15 - Did not meet minimum test acceptability criteria. Refer to QA section of report.
- Q16 - Percent minimum significant difference (PMSD) was below the lower bound limit for acceptability. This indicates that statistics may be over-sensitive in detecting a difference from the control due to low variability in the data set.
- Q17 - Percent minimum significant difference (PMSD) was above the upper bound limit for acceptability. This indicates that statistics may be under-sensitive in detecting a difference from the control due to high variability in the data set.
- Q18 - Incorrect Entry
- Q19 - Illegible Entry
- Q20 - Miscalculation
- Q21 - Other (provide reason in comments section)
- Q22 - Greater than 10% mortality observed upon receipt and/or in holding prior to test initiation. Organisms acclimated to test conditions at Nautilus and ultimately deemed fit to use for testing.
- Q23 - Test organisms received at a temperature greater than 3°C outside the recommended test temperature range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.
- Q24 - Test organisms received at salinity greater than 3 ppt outside of the recommended test salinity range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.



Whole Effluent Toxicity Test Report City of Snoqualmie Wastewater Treatment and Water Reclamation Facility

❖ July 2017 Sampling Event

Prepared for: City of Snoqualmie
Wastewater Treatment and
Water Reclamation Facility
38190 SE Sterns Road
Snoqualmie, WA 98065

Prepared by: Nautilus Environmental
4340 Vandever Ave
San Diego, California 92120

Submitted: August 7, 2017

Data Quality Assurance:

- Nautilus Environmental is accredited in accordance with NELAP by the State of Oregon Environmental Laboratory Accreditation Program (Lab ID 4053). It is also certified by the State of California Water Resources Control Board Environmental Laboratory Accreditation Program (Certificate No. 1802) and the State of Washington Department of Ecology (Lab ID C552).
- All data have been reviewed and verified.
- All test results have met minimum test acceptability criteria under their respective EPA protocols, unless otherwise noted in this report.
- All test results have met internal Quality Assurance Program requirements.

Nautilus Environmental
4340 Vandever Avenue
San Diego, California 92120
858.587.7333
fax: 858.587.3961

Results verified by: _____

Katie Payne

Introduction

Toxicity tests were conducted using an effluent sample collected from the City of Snoqualmie Wastewater Treatment and Water Reclamation Facility in July of 2017 to satisfy monitoring requirements. Acute bioassays were conducted using the water flea *Ceriodaphnia dubia* and fathead minnow *Pimephales promelas* in order to meet National Pollutant Discharge Elimination System (NPDES) permit biomonitoring requirements for permit number WA0022403. Testing was performed at Nautilus Environmental (Nautilus) located in San Diego, California between July 11 and 15, 2017.

Materials and Methods

An effluent sample was collected into two low-density polyethylene cubitainers. The cubitainers were packed in a cooler containing ice and shipped to Nautilus via overnight delivery service. Appropriate chain-of-custody (COC) procedures were employed during sample collection and transport. Upon arrival at Nautilus, the cooler was opened, the sample inspected, and the contents verified against information on the COC form. Receipt temperature was measured and recorded on the COC form. Standard water quality parameters were measured and recorded on a sample check-in sheet. The sample was stored at 4°C in the dark until used for testing. Standard water quality measurements conducted upon receipt of the sample are summarized in Table 1.

Table 1. Sample Information

Sample ID	Effluent
Nautilus Log-In No.	17-0761
Collection Date and Time	07/10/2017, 08:00
Receipt Date and Time	07/11/2017, 09:50
Receipt Temperature (°C)	3.0
Dissolved Oxygen (mg/L)	9.9
pH	7.85
Conductivity (µS/cm)	536
Hardness (mg/L CaCO ₃)	141
Alkalinity (mg/L CaCO ₃)	151
Total Chlorine (mg/L)	<0.02
Total Ammonia (mg/L)	<0.5

Test Methods

Acute toxicity tests were conducted according to procedures presented by USEPA (2002) and the methods are summarized in Tables 2 and 3.

Table 2. Summary of Methods for the 48-hour Water Flea Acute Survival Test

Test Period	07/11/2017, 13:00 to 07/13/2017, 11:05
Test Organism	<i>Ceriodaphnia dubia</i> (water flea)
Test Organism Source; Age at Initiation	In-house culture; < 24 hours
Dilution/Control Water	Moderately Hard Synthetic Water
Test Concentrations (% Sample)	100, 50, 33.3, 12.5, 6.25, 0 (laboratory control)
Test Design	4 replicates; 5 organisms per replicate
Test Protocol	EPA-821-R-02-012
Test Acceptability Criterion	Mean control survival \geq 90%
Statistical Analysis Software	CETIS™ v.1.8.7.20

Table 3. Summary of Methods for the 96-hour Fathead Minnow Acute Survival Test

Test Period	07/11/2017, 14:55 to 07/15/2017, 14:10
Test Organism	<i>Pimephales promelas</i> (fathead minnow)
Test Organism Source; Age at Initiation	Aquatic Biosystems (Fort Collins, CO); 7 days old
Dilution/Control Water	Moderately Hard Synthetic Water
Test Concentrations (% Sample)	100, 50, 33.3, 12.5, 6.25, 0 (laboratory control)
Test Design	4 replicates; 10 organisms per replicate
Test Protocol	EPA-821-R-02-012
Test Acceptability Criterion	Mean control survival \geq 90%
Statistical Analysis Software	CETIS™ v.1.8.7.20

Results

There were no statistically significant effects detected in any effluent concentration tested for either the acute water flea or the fathead minnow test. This resulted in a NOEC of 100 percent effluent for both tests. Additionally, no statistically significant effects were observed in the acute critical effluent concentration (ACEC) of 33.3 percent effluent for either species tested. Statistical results for the acute toxicity tests are summarized in Table 4 and detailed test results are summarized in Table 5. Individual statistical summaries for all tests including laboratory bench data sheets, and copies of the sample receipt information and COC forms are provided in Appendices A through C.

Table 4. Summary of Acute Toxicity Statistical Results

Species and Endpoint	NOEC (% effluent)	EC ₅₀ (% effluent)
Water Flea 48hr Survival	100	> 100
Fathead Minnow 96hr Survival	100	> 100

NOEC = No Observed Effect Concentration; the highest concentration at which no effect is observed.

EC₅₀ = Median effect concentration; the effluent concentration estimated to produce an adverse effect to 50 percent of the test organisms.

Table 5. Summary of Acute Toxicity Results

Test Concentration (% effluent)	Water Flea	Fathead Minnow
	Mean 48hr Survival (%)	Mean 96hr Survival (%)
Lab Control	100	95.0
6.25	100	95.0
12.5	100	100
33.3	100	100
50	100	90.0
100	100	92.5

Quality Assurance

The sample was received in good condition and within the recommended temperature range according to WDOE, 2016. Both tests were initiated within the required 36-hour holding time. Mean control responses for both tests met minimum test acceptability criteria. Statistical analyses followed standard USEPA flowchart selections and dose response relationships were reviewed to ensure the validity of the data. Based on the dose responses observed during testing, the statistical results are deemed reliable. Minor QA/QC issues that were not likely to have any bearing on results are noted on test data sheets. A list of laboratory qualifier codes used on bench data sheets is provided in Appendix D.

Reference Toxicant Test

The monthly reference toxicant tests for both species met minimum test acceptability requirements. The calculated median effect values for water flea and fathead minnow survival were within two standard deviations of the historical mean, indicating typical organism sensitivity to copper for our laboratory. Reference toxicant test results, including control chart coefficients of variation (CV), are summarized in Table 6.

Table 6. Reference Toxicant Test Results

Species and Endpoint	Date Initiated	EC ₅₀ (µg/L copper)	Historical Mean ± 2 SD (µg/L copper)	CV (%)
Water flea 48hr Survival	7/17/2017	25.5	18.3 ± 11.0	30.1
Fathead minnow 96hr Survival	7/18/2017	67.2	82.3 ± 73.7	44.8

EC₅₀ = Median effect concentration; the effluent concentration estimated to produce an adverse effect to 50 percent of the test organisms.

Historical Mean ± 2 SD = the mean EC₅₀ value from 20 previous reference toxicant tests conducted at Nautilus, ± two standard deviations (SD).

CV = coefficient of variation.

References

- Tidepool Scientific Software. 2000-2013. CETIS Comprehensive Environmental Toxicity Information System Software, Version 1.8.7.20.
- USEPA. 2002. Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. United States Environmental Protection Agency Office of Water, Washington DC (EPA-821-R-02-012).
- WDOE. 2016. Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. Washington State Department of Ecology. Water Quality Program. Publication number: WQ-R-95-80, Revised June 2016.

Appendix A
Statistical Summaries and Raw Bench Sheets

Water Flea Acute Test

CETIS Summary Report

Report Date: 25 Jul-17 18:51 (p 1 of 1)

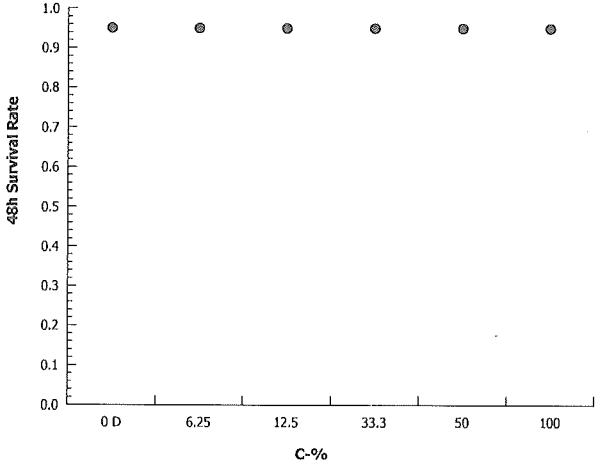
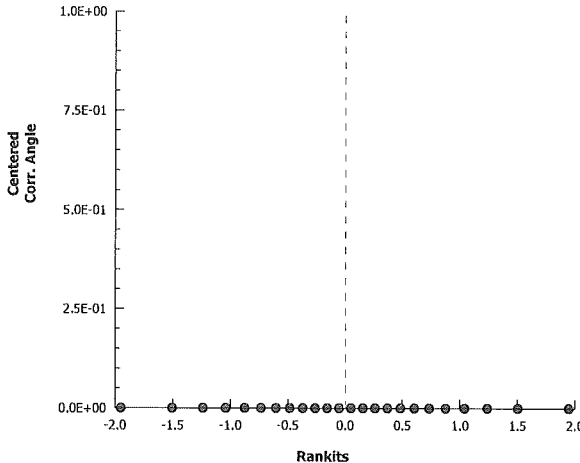
Test Code: 1707-S025 | 19-0985-8930

Ceriodaphnia 48-h Acute Survival Test							Nautilus Environmental (CA)				
Batch ID:	16-2604-3936	Test Type:	Survival (48h)				Analyst:				
Start Date:	11 Jul-17 13:00	Protocol:	EPA/821/R-02-012 (2002)				Diluent:	Mod-Hard Synthetic Water			
Ending Date:	13 Jul-17 11:05	Species:	Ceriodaphnia dubia				Brine:	Not Applicable			
Duration:	46h	Source:	In-House Culture				Age:	<24h			
Sample ID:	19-8434-9264	Code:	17-0761				Client:	City of Snoqualmie			
Sample Date:	10 Jul-17 08:00	Material:	POTW Effluent				Project:				
Receive Date:	11 Jul-17 09:50	Source:	Snoqualmie WWTP (WA0022403)								
Sample Age:	29h (3 °C)	Station:	Effluent								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
14-4406-8603	48h Survival Rate	100	>100	NA	NA	1	Steel Many-One Rank Sum Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision					
14-4406-8603	48h Survival Rate	Control Resp	1	0.9 - NL	Yes	Passes Acceptability Criteria					
48h Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	0	0	0.0%	0.0%
6.25		4	1	1	1	1	1	0	0	0.0%	0.0%
12.5		4	1	1	1	1	1	0	0	0.0%	0.0%
33.3		4	1	1	1	1	1	0	0	0.0%	0.0%
50		4	1	1	1	1	1	0	0	0.0%	0.0%
100		4	1	1	1	1	1	0	0	0.0%	0.0%
48h Survival Rate Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Dilution Water	1	1	1	1						
6.25		1	1	1	1						
12.5		1	1	1	1						
33.3		1	1	1	1						
50		1	1	1	1						
100		1	1	1	1						

CETIS Analytical Report

Report Date: 25 Jul-17 18:51 (p 1 of 1)

Test Code: 1707-S025 | 19-0985-8930

Ceriodaphnia 48-h Acute Survival Test								Nautilus Environmental (CA)			
Analysis ID: 14-4406-8603		Endpoint: 48h Survival Rate				CETIS Version: CETISv1.8.7					
Analyzed: 25 Jul-17 18:50		Analysis: Nonparametric-Control vs Treatments				Official Results: Yes					
Data Transform		Zeta	Alt Hyp	Trials	Seed			NOEL	LOEL	TOEL	TU
Angular (Corrected)		NA	C > T	NA	NA			100	>100	NA	1
Steel Many-One Rank Sum Test											
Control		vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)	
Dilution Water			6.25	18	10	1	6	0.8333	Asymp	Non-Significant Effect	
			12.5	18	10	1	6	0.8333	Asymp	Non-Significant Effect	
			33.3	18	10	1	6	0.8333	Asymp	Non-Significant Effect	
			50	18	10	1	6	0.8333	Asymp	Non-Significant Effect	
			100	18	10	1	6	0.8333	Asymp	Non-Significant Effect	
ANOVA Table											
Source		Sum Squares		Mean Square		DF		F Stat	P-Value	Decision(α:5%)	
Between		0		0		5		65540	<0.0001	Significant Effect	
Error		0		0		18					
Total		0				23					
48h Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1	1	1	1	1	1	0	0.0%	0.0%
6.25		4	1	1	1	1	1	1	0	0.0%	0.0%
12.5		4	1	1	1	1	1	1	0	0.0%	0.0%
33.3		4	1	1	1	1	1	1	0	0.0%	0.0%
50		4	1	1	1	1	1	1	0	0.0%	0.0%
100		4	1	1	1	1	1	1	0	0.0%	0.0%
Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
6.25		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
12.5		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
33.3		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
50		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
100		4	1.345	1.345	1.346	1.345	1.345	1.345	0	0.0%	0.0%
Graphics											
											

Water Quality Measurements & Test Organism Survival

Tech Initials		
0	24	48
CG	CH	AR
CG	AD	AD
CG	--	--

Rand # QC: 415
ial Count QC: RH

Age at Initiation: < 24 hrs

Organisms fed prior to initiation, circle one (y) n) (A) ^{4th day} AD Q218 7/13/17

KSP 7/17/17

AC 7/29/17

Fathead Minnow Acute Test

CETIS Summary Report

Report Date: 25 Jul-17 18:57 (p 1 of 1)

Test Code: 1707-S024 | 05-9108-2819

Fathead Minnow 96-h Acute Survival Test							Nautilus Environmental (CA)				
Batch ID:	21-2116-8688		Test Type:	Survival (96h)			Analyst:				
Start Date:	11 Jul-17 14:55		Protocol:	EPA/821/R-02-012 (2002)			Diluent:	Mod-Hard Synthetic Water			
Ending Date:	15 Jul-17 14:10		Species:	Pimephales promelas			Brine:	Not Applicable			
Duration:	95h		Source:	Aquatic Biosystems, CO			Age:	7d			
Sample ID:	19-8434-9264		Code:	17-0761			Client:	City of Snoqualmie			
Sample Date:	10 Jul-17 08:00		Material:	POTW Effluent			Project:				
Receive Date:	11 Jul-17 09:50		Source:	Snoqualmie WWTP (WA0022403)							
Sample Age:	31h (3 °C)		Station:	Effluent							
Comparison Summary											
Analysis ID	Endpoint		NOEL	LOEL	TOEL	PMSD	TU	Method			
00-4925-8955	96h Survival Rate		100	>100	NA	12.0%	1	Steel Many-One Rank Sum Test			
Test Acceptability											
Analysis ID	Endpoint		Attribute		Test Stat	TAC Limits		Overlap	Decision		
00-4925-8955	96h Survival Rate		Control Resp		0.95	0.9 - NL		Yes	Passes Acceptability Criteria		
96h Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	0.95	0.7909	1	0.8	1	0.05	0.1	10.53%	0.0%
6.25		4	0.95	0.7909	1	0.8	1	0.05	0.1	10.53%	0.0%
12.5		4	1	1	1	1	1	0	0	0.0%	-5.26%
33.3		4	1	1	1	1	1	0	0	0.0%	-5.26%
50		4	0.9	0.7701	1	0.8	1	0.04082	0.08165	9.07%	5.26%
100		4	0.925	0.8454	1	0.9	1	0.025	0.05	5.41%	2.63%
96h Survival Rate Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4						
0	Dilution Water	1	0.8	1	1						
6.25		1	1	1	0.8						
12.5		1	1	1	1						
33.3		1	1	1	1						
50		0.8	1	0.9	0.9						
100		0.9	1	0.9	0.9						

CETIS Analytical Report

Report Date: 25 Jul-17 18:57 (p 1 of 2)

Test Code: 1707-S024 | 05-9108-2819

Fathead Minnow 96-h Acute Survival Test								Nautilus Environmental (CA)			
Analysis ID: 00-4925-8955		Endpoint: 96h Survival Rate		CETIS Version: CETISv1.8.7							
Analyzed: 25 Jul-17 18:57		Analysis: Nonparametric-Control vs Treatments		Official Results: Yes							
Data Transform		Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)		NA	C > T	NA	NA		12.0%	100	>100	NA	1
Steel Many-One Rank Sum Test											
Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)		
Dilution Water		6.25	18	10	2	6	0.8333	Asymp	Non-Significant Effect		
		12.5	20	10	1	6	0.9516	Asymp	Non-Significant Effect		
		33.3	20	10	1	6	0.9516	Asymp	Non-Significant Effect		
		50	15	10	2	6	0.4761	Asymp	Non-Significant Effect		
		100	15.5	10	1	6	0.5438	Asymp	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.08108482		0.01621696		5	1.418	0.2652	Non-Significant Effect			
Error	0.2059188		0.01143993		18						
Total	0.2870036				23						
Distributional Tests											
Attribute	Test		Test Stat	Critical	P-Value	Decision(α:1%)					
Variances	Mod Levene Equality of Variance		0.5508	4.248	0.7358	Equal Variances					
Variances	Levene Equality of Variance		3.146	4.248	0.0325	Equal Variances					
Distribution	Shapiro-Wilk W Normality		0.8641	0.884	0.0040	Non-normal Distribution					
96h Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	0.95	0.7909	1	1	0.8	1	0.05	10.53%	0.0%
6.25		4	0.95	0.7909	1	1	0.8	1	0.05	10.53%	0.0%
12.5		4	1	1	1	1	1	1	0	0.0%	-5.26%
33.3		4	1	1	1	1	1	1	0	0.0%	-5.26%
50		4	0.9	0.7701	1	0.9	0.8	1	0.04082	9.07%	5.26%
100		4	0.925	0.8454	1	0.9	0.9	1	0.025	5.41%	2.63%
Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1.336	1.093	1.578	1.412	1.107	1.412	0.07622	11.41%	0.0%
6.25		4	1.336	1.093	1.578	1.412	1.107	1.412	0.07622	11.41%	0.0%
12.5		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	-5.71%
33.3		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.0%	-5.71%
50		4	1.254	1.056	1.453	1.249	1.107	1.412	0.06231	9.94%	6.1%
100		4	1.29	1.16	1.419	1.249	1.249	1.412	0.04074	6.32%	3.44%

Fathead Minnow 96-h Acute Survival Test

Nautilus Environmental (CA)

Analysis ID: 00-4925-8955

Endpoint: 96h Survival Rate

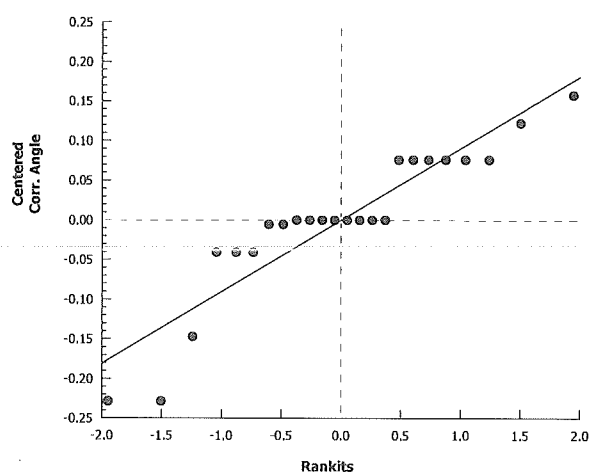
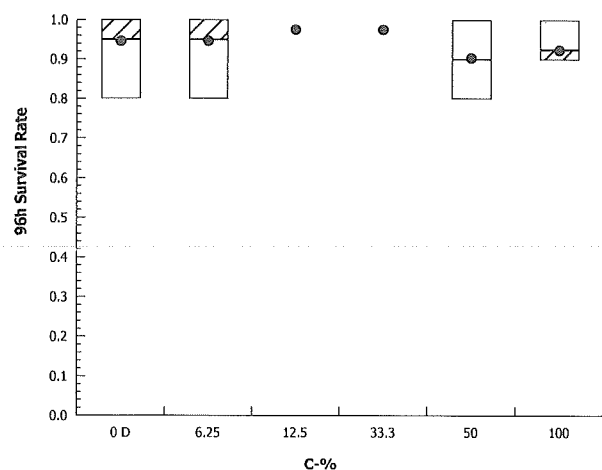
CETIS Version: CETISv1.8.7

Analyzed: 25 Jul-17 18:57

Analysis: Nonparametric-Control vs Treatments

Official Results: Yes

Graphics



96-hour Freshwater Acute Bioassay
Static-Renewal Conditions

Water Quality Measurements
& Test Organism Survival

Client: Snoqualmie
Sample ID: Effluent
Test No.: 1707-5024

Test Species: P. promelas
Start Date/Time: 7/11/2017 1455
End Date/Time: 7/15/2017 1410

Tech Initials				
0	24	48	72	96
0	24	48	72	96
0	24	48	72	96
0	24	48	72	96

Counts:

Readings:

Dilutions made by:

Concentration (%)	RAND #	Number of Live Organisms					Conductivity (µmhos/cm)					Temperature (°C)					Dissolved Oxygen (mg/L)					pH (units)				
		0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96	0	24	48	72	96
Lab Control	1	10	10	10	10	10	281	310	302	302	305	20.9	20.0	20.5	20.4	20.2	8.1	7.7	8.9	8.4	8.0	7.7	7.6	7.6	7.8	7.8
(MHSW)	13	10	10	10	9	8			310					20.5					8.0					7.8		
	20	10	10	10	10	10																				
	2	10	10	10	10	10																				
6.25	4	10	10	10	10	10	295	325	316	319	321	20.9	20.4	20.5	20.0	20.1	8.1	7.9	9.0	8.5	7.7	7.7	7.7	7.6	7.8	7.8
	7	10	10	10	10	10			325					20.1					7.9					7.8		
	17	10	10	10	10	10																				
	3	10	10	10	10	8																				
12.5	16	10	10	10	10	10	311	314	330	334	337	20.9	20.2	20.6	19.9	19.8	8.0	8.0	9.0	8.4	7.8	7.7	7.7	7.6	7.7	7.8
	19	10	10	10	10	10			315					20.2					7.9					7.8	7.7	7.8
	21	10	10	10	10	10																				
	15	10	10	10	10	10													8.1							
33.3	8	10	10	10	10	10	359	393	386	381	382	20.7	20.2	20.7	19.7	19.9	8.2	7.9	9.1	8.4	7.7	7.7	7.8	7.8	7.8	7.8
	24	10	10	10	10	10			394					20.2					7.9					7.9		
	22	10	10	10	10	10																				
	10	10	10	10	10	10													8.1							
50	5	10	8	8	8	8	399	427	429	425	424	20.5	20.4	20.9	20.0	20.0	8.5	7.0	9.2	8.6	7.9	7.7	7.8	7.8	8.4	8.4
	11	10	10	10	10	10			428					20.3					7.6					7.9		
	18	10	10	9	9	9																				
	6	10	10	10	10	9													8.1							
100	12	10	10	10	10	9	527	535	552	562	564	20.0	20.1	21.0	19.5	19.8	8.9	8.0	9.5	8.7	7.8	7.7	7.8	7.9	8.2	8.2
	23	10	10	10	10	10			559					20.1					7.9					9.2		
	14	10	10	9	9	9																				
	9	10	10	9	9	9																				

Rand # QC:

Initial Count QC'd by:

Initiated by:

Animal Source/Date Received:

Age at Initiation:

Animal Acclimation Qualifiers (circle all that apply):

Q22 / Q23 / Q24 / none

Comments:

i = initial reading in fresh test solution, f = final reading in test chamber prior to renewal

Organisms fed prior to initiation, circle one (y) n)

QC Check:

Final Review:

Appendix B
Sample Check-in Sheets

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120

Client: City of Imperial
Sample ID: Effluent
Test ID No(s): 1707-S024 to -S026

NORTHWEST CLIENTS
Sample Check-In Information

Sample Description:
A: NO CLUE, CLEAR, NO ODOR, LIGHT DEBRIS

Sample (A, B, C):	A			
Log-in No. (17-xxxx):	17-0761			
Sample Collection Date & Time:	7/10/17 0800			
Sample Receipt Date & Time:	7/11/17 0950			
Number of Containers & Container Type:	2 - 4L GBI			
Approx. Total Volume Received (L):	8L			
Check-in Temperature (°C)	3.0			
Temperature OK? ¹	<input checked="" type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N	<input type="radio"/> Y <input type="radio"/> N
DO (mg/L)	9.9			
pH (units)	7.85			
Conductivity (µS/cm)	536			
Salinity (ppt)	0.3			
Alkalinity (mg/L) ²	151			
Hardness (mg/L) ^{2,3}	141			
Total Chlorine (mg/L)	20.02			
Technician Initials	EG, TW, RT			

Subsamples for Additional Chemistry Required:

NH3 (always required)

Other _____

Tech Initials A B C

COC Complete (Y/N)?

A B C

Filtration? Y N

Pore Size: _____

Organisms _____ or _____ Debris

Salinity Adjustment? Y N

Test: _____ Source: _____ Target ppt: _____

Test: _____ Source: _____ Target ppt: _____

Test: _____ Source: _____ Target ppt: _____

pH Adjustment? Y N

	A	B	C
Initial pH:			
Amount of HCl added:			
Final pH:			

Cl₂ Adjustment? Y N

	A	B	C
Initial Free Cl ₂ :			
STS added:			
Final Free Cl ₂ :			

Sample Aeration? Y N

	A	B	C
Initial D.O.			
Duration & Rate			
Final D.O.			

Test Performed: Acute Fathead Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: MHSW

Alkalinity: 55 Hardness or Salinity: 82

Additional Control? Y N = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: Acute Water Flea Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: MHSW

Alkalinity: 55 Hardness or Salinity: 82

Additional Control? Y N = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: _____ Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: _____

Alkalinity: _____ Hardness or Salinity: _____

Additional Control? Y N = _____ Alkalinity: _____ Hardness or Salinity: _____

Notes: ¹ Temperature of sample should be 0-6°C at receipt.

² mg/L as CaCO₃, ³ Measured for freshwater samples only, NA = Not Applicable

Additional Comments: _____

QC Check: KFP 7/17/17
Final Review: ACT 7/29/17

Overlying Water

Project: Effluent Compliance

Test Type: Acute Fathead + Ceriodaphnia

DI Blank: 0.0
Test Start Date: 7/11/17

Analyst: SG
Analysis Date: 7/12/17

N x 1.22

[illegible]

$$\text{Relative Percent Difference (RPD)} = \frac{[\text{sample}] (\text{mg/L}) - [\text{sample duplicate}] (\text{mg/L})}{[\text{average ammonia}] (\text{mg/L})} \times 100$$

Acceptable Range: 0-20%

$$\text{Percent Recovery} = \frac{[\text{spiked sample}] \text{ (mg/L)} - [\text{sample}] \text{ (mg/L)}}{\text{nominal [spike] (mg/L)}} \times 100$$

Acceptable Range: 80-120%^b

QC Sample ID	[NH ₃]	[Sample Dup]	Measured [Spike]	Nominal [Spike]	RPD	% Recovery
Blank	0.0	NA	8.3	10	NA	83
1	<0.5	<0.5	8.8	10	C	C

Comments: _____

Notes: ^aUnless otherwise noted, the last sample listed on the datasheet is used for duplicate and duplicate + spike QC check.

^b Acceptable range for % recovery applies only to the blank spike. Spike recoveries in samples may vary based on sample matrix and are for information only.

^c Calculation not performed due to one or both values below the method detection limit.

Method Detection Limit = 0.5 mg/L

QC Check: KFP 7/17/17

Final Review: AC 7/29/17

Appendix C
Chain-of-Custody Forms



Date _____ Page _____ of _____

Lyle Beach

ANALYSES REQUIRED

City of Snoqualmie
P.O. Box 987
Snoqualmie, WA 98065
Lyle Beach
425-888-4153
lbeach@ci.snoqualmie.wa.us

City of Snoqualmie
P.O. Box 987
Snoqualmie, WA 98065
Tom Holmes
425-888-4153
tholmes@ci.snoqualmie.wa.us

Fathead Minnow 96hr

Daphnid 48hr static - renewal

Receipt Temperature (°C)

3.0

2) RECEIVED BY (COURIER)

Time)

(Date)

	(Company)
--	-----------

4) RECEIVED BY (LABORATORY)

(Time)

(Date)

(Company)	
-----------	--

Nautilus

www.nautilusenvironmental.com

DISTRIBUTION: WHITE - Nautilus Environmental, COLOR - Originator

Nantiles ID: 17-0761

Appendix D
Qualifier Code Glossary

Glossary of Qualifier Codes:

- Q1 - Temperatures out of recommended range; corrective action taken and recorded in Test Temperature Correction Log
- Q2 - Temperatures out of recommended range; no action taken, test terminated same day
- Q3 - Sample aerated prior to initiation or renewal due to dissolved oxygen (D.O.) levels below 6.0 mg/L
- Q4 - Test aerated; D.O. levels dropped below 4.0 mg/L
- Q5 - Test initiated with aeration due to an anticipated drop in D.O.
- Q6 - Airline obstructed or fell out of replicate and replaced; drop in D.O. occurred
- Q7 - Salinity out of recommended range
- Q8 - Spilled test chamber/ Unable to recover test organism(s)
- Q9 - Inadequate sample volume remaining, 50% renewal performed
- Q10 - Inadequate sample volume remaining, no renewal performed
- Q11 - Sample out of holding time; refer to QA section of report
- Q12 - Replicate(s) not initiated; excluded from data analysis
- Q13 - Survival counts not recorded due to poor visibility or heavy debris
- Q14 - D.O. percent saturation was checked and was $\leq 110\%$
- Q15 - Did not meet minimum test acceptability criteria. Refer to QA section of report.
- Q16 - Percent minimum significant difference (PMSD) was below the lower bound limit for acceptability. This indicates that statistics may be over-sensitive in detecting a difference from the control due to low variability in the data set.
- Q17 - Percent minimum significant difference (PMSD) was above the upper bound limit for acceptability. This indicates that statistics may be under-sensitive in detecting a difference from the control due to high variability in the data set.
- Q18 - Incorrect Entry
- Q19 - Illegible Entry
- Q20 - Miscalculation
- Q21 - Other (provide reason in comments section)
- Q22 - Greater than 10% mortality observed upon receipt and/or in holding prior to test initiation. Organisms acclimated to test conditions at Nautilus and ultimately deemed fit to use for testing.
- Q23 - Test organisms received at a temperature greater than 3°C outside the recommended test temperature range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.
- Q24 - Test organisms received at salinity greater than 3 ppt outside of the recommended test salinity range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.



Whole Effluent Toxicity Test Report City of Snoqualmie Wastewater Treatment and Water Reclamation Facility

❖ October 2017 Sampling Event

Prepared for: City of Snoqualmie
Wastewater Treatment and
Water Reclamation Facility
38190 SE Sterns Road
Snoqualmie, WA 98065

Prepared by: Nautilus Environmental
4340 Vandever Ave
San Diego, California 92120

Submitted: October 26, 2017

Data Quality Assurance:

- Nautilus Environmental is accredited in accordance with NELAP by the State of Oregon Environmental Laboratory Accreditation Program (Lab ID 4053). It is also certified by the State of California Water Resources Control Board Environmental Laboratory Accreditation Program (Certificate No. 1802) and the State of Washington Department of Ecology (Lab ID C552).
- All data have been reviewed and verified.
- All test results have met minimum test acceptability criteria under their respective EPA protocols, unless otherwise noted in this report.
- All test results have met internal Quality Assurance Program requirements.

Nautilus Environmental
4340 Vandever Avenue
San Diego, California 92120
858.587.7333
fax: 858.587.3961

Results verified by: _____

Katie Payne

Introduction

Toxicity tests were conducted using effluent collected from the City of Snoqualmie Wastewater Treatment and Water Reclamation Facility in October of 2017 to satisfy monitoring requirements. Chronic bioassays were conducted using the water flea *Ceriodaphnia dubia* and fathead minnow *Pimephales promelas* in order to meet National Pollutant Discharge Elimination System (NPDES) permit biomonitoring requirements for permit number WA0022403. Testing was performed at Nautilus Environmental (Nautilus) located in San Diego, California between October 3 and 10, 2017.

Materials and Methods

Effluent samples were collected into low-density polyethylene cubitainers. The cubitainers were packed in a cooler containing ice and shipped to Nautilus via overnight delivery service. Appropriate chain-of-custody (COC) procedures were employed during sample collection and transport. Upon arrival at Nautilus, coolers were opened, samples inspected, and the contents verified against information on the COC form. Receipt temperature was measured and recorded on the COC form. Standard water quality parameters were measured and recorded on a sample check-in sheet. Samples were stored at 4°C in the dark until used for testing. Standard water quality measurements conducted upon sample receipt are summarized in Table 1.

Table 1. Sample Information

Parameter	Effluent Samples		
Nautilus Log-In No.	17-1067	17-1071	17-1074
Collection Date and Time	10/02/2017, 08:00	10/04/2017, 08:00	10/06/2017, 08:00
Receipt Date and Time	10/03/2017, 09:50	10/05/2017, 10:15	10/07/2017, 11:00
Receipt Temperature (°C)	4.0	4.5	2.5
Dissolved Oxygen (mg/L)	8.6	9.2	8.7
pH	7.36	7.33	7.29
Conductivity (µS/cm)	435	433	428
Hardness (mg/L CaCO ₃)	81	94	96
Alkalinity (mg/L CaCO ₃)	75	53	62
Total Chlorine (mg/L)	<0.02	<0.02	0.04
Total Ammonia (mg/L as N)	ND	ND	ND

ND = not detected

Test Methods

Chronic toxicity tests were conducted according to procedures presented by USEPA (2002) and the methods are summarized in Tables 2 and 3.

Table 2. Summary of Methods for the Chronic Water Flea Toxicity Test

Test Period	10/03/2017, 14:30 to 10/10/2017, 12:30
Test Organism	<i>Ceriodaphnia dubia</i> (water flea)
Test Organism Source; Age at Initiation	In-house culture; < 24 hours
Dilution/Control Water	EPA diluted mineral water (80% deionized water and 20% Perrier mineral water)
Test Concentrations (% Sample)	100, 50, 33.3, 12.5, 2.4, 0 (laboratory control)
Test Design	10 replicates; 1 organism per replicate
Test Protocol	EPA/821/R-02-013 (2002)
Test Acceptability Criteria	Mean control survival of ≥ 80 percent; 60 percent of surviving control females must produce ≥ 3 broods of offspring; Total control offspring per surviving female must average ≥ 15 ; percent minimum significant difference (PMSD) for reproduction should be between 13 and 47
Statistical Analysis Software	CETIS™ v.1.8.7.20

Table 3. Summary of Methods for the Chronic Fathead Minnow Toxicity Test

Test Period	10/03/2017, 15:05 to 10/10/2017, 11:45
Test Organism	<i>Pimephales promelas</i> (fathead minnow)
Test Organism Source; Age at Initiation	Aquatic Biosystems (Fort Collins, CO); 1 day old
Dilution/Control Water	Moderately Hard Synthetic Water
Test Concentrations (% Sample)	100, 50, 33.3, 12.5, 2.4, 0 (laboratory control)
Test Design	4 replicates; 10 organisms per replicate
Test Protocol	EPA/821/R-02-013 (2002)
Test Acceptability Criteria	Mean control survival of ≥ 80 percent; mean control biomass of ≥ 0.25 mg per organism; PMSD for biomass should be between 12 and 30.
Statistical Analysis Software	CETIS™ v.1.8.7.20

Results

There were no statistically significant effects detected in any effluent concentration tested for both species, including the acute critical effluent concentration (ACEC) of 33.3 percent effluent and the chronic critical effluent concentration (CCEC) of 2.4 percent effluent.

Statistical results for the chronic toxicity tests are summarized in Table 4 and detailed test results are summarized in Table 5. Individual statistical summaries for all tests including laboratory bench data sheets, and copies of the sample receipt information and COC forms are provided in Appendices A through C.

Table 4. Summary of Chronic Toxicity Statistical Results

Species and Endpoint	NOEC (% effluent)	EC ₅₀ (% effluent)
Water Flea		
Survival	100	> 100
Reproduction	100	> 100
Fathead Minnow		
Survival	100	> 100
Growth (biomass)	100	> 100

NOEC = No Observed Effect Concentration; the highest concentration at which no effect is observed.

EC₅₀ = Median effect concentration; the effluent concentration estimated to produce an adverse effect to 50 percent of the test organisms.

Table 5. Summary of Chronic Toxicity Test Results

Test Concentration (% effluent)	Water Flea		Fathead Minnow	
	Mean Survival (%)	Mean Reproduction (#neonates/org)	Mean Survival (%)	Mean Biomass (mg)
Lab Control	90.0	20.9	92.5	0.340
2.4	100	23.7	97.5	0.370
12.5	100	25.9	92.5	0.357
33.3	100	25.1	97.5	0.397
50	90.0	22.4	92.5	0.403
100	90.0	25.0	97.5	0.395

Quality Assurance

Samples were received in good condition and within the recommended temperature range according to WDOE, 2016. Both tests were initiated within the required 36-hour holding time. Mean control responses for both tests met minimum test acceptability criteria. Statistical analyses followed standard USEPA flowchart selections and dose response relationships were reviewed to ensure the validity of the data. Based on the dose responses observed during testing, the statistical results are deemed reliable. Minor QA/QC issues that were not likely to have any bearing on results are noted on test data sheets. A list of laboratory qualifier codes used on bench data sheets is provided in Appendix D.

Reference Toxicant Test

The monthly reference toxicant tests for both species met minimum test acceptability requirements. The calculated median effect values for water flea survival and reproduction and fathead minnow survival and growth were within two standard deviations of the historical means, indicating typical organism sensitivity to copper for our laboratory. Reference toxicant test results, including control chart coefficients of variation (CV), are summarized in Table 6.

Table 6. Reference Toxicant Test Results

Species and Endpoint	Date Initiated	EC ₅₀ (µg/L copper)	Historical Mean ± 2 SD (µg/L copper)	CV (%)
Water flea				
Survival	10/05/17	66.0	64.2 ± 25.9	20.1
Reproduction		68.9	64.1 ± 21.8	17.0
Fathead minnow				
Survival	10/03/17	48.6	56.6 ± 31.8	28.0
Growth (biomass)		60.2	63.4 ± 41.7	32.9

EC₅₀ = Median effect concentration; the effluent concentration estimated to produce an adverse effect to 50 percent of the test organisms.

Historical Mean ± 2 SD = the mean EC₅₀ value from 20 previous reference toxicant tests conducted at Nautilus, ± two standard deviations (SD).

CV = coefficient of variation

References

- Tidepool Scientific Software. 2000-2013. CETIS Comprehensive Environmental Toxicity Information System Software, Version 1.8.7.20.
- USEPA. 2002. Methods for Measuring the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms. Fourth Edition. United States Environmental Protection Agency Office of Water, Washington DC (EPA-821-R-02-013).
- WDOE. 2016. Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria. Washington State Department of Ecology. Water Quality Program. Publication number: WQ-R-95-80, Revised June 2016.

Appendix A
Statistical Summaries and Raw Bench Sheets

Water Flea Chronic Test

CET IS Summary Report

Report Date: 22 Oct-17 13:12 (p 1 of 1)
 Test Code: 1710-S002 | 12-0004-2915

Ceriodaphnia 3 Brood Survival & Reproduction Test							Nautilus Environmental (CA)				
Batch ID:	00-1746-8184	Test Type:	Reproduction and Survival				Analyst:				
Start Date:	03 Oct-17 14:30	Protocol:	EPA/821/R-02-013 (2002)				Diluent:	Diluted Mineral Water (8:2)			
Ending Date:	10 Oct-17 12:30	Species:	Ceriodaphnia dubia				Brine:	Not Applicable			
Duration:	6d 22h	Source:	In-House Culture				Age:	<24h			
Sample ID:	03-6734-7053	Code:	17-1067				Client:	City of Snoqualmie			
Sample Date:	02 Oct-17 08:00	Material:	POTW Effluent				Project:				
Receiving Date:	03 Oct-17 09:50	Source:	Snoqualmie WWTP (WA0022403)								
Sample Age:	30h (4 °C)	Station:	Effluent								
Comparison Summary											
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method				
11-17 57-9289	3 Brood Reproduction	100	>100	NA	38.9%	1	Steel Many-One Rank Sum Test				
03-49 94-2201	3 Brood Survival	100	>100	NA	NA	1	Fisher Exact Test				
Test Acceptability											
Analysis ID	Endpoint	Attribute		Test Stat	TAC Limits		Overlap	Decision			
11-17 57-9289	3 Brood Reproduction	Control Resp		20.9	15 - NL		Yes	Passes Acceptability Criteria			
03-49 94-2201	3 Brood Survival	Control Resp		0.9	0.8 - NL		Yes	Passes Acceptability Criteria			
11-17 57-9289	3 Brood Reproduction	PMSD		0.3894	0.13 - 0.47		Yes	Passes Acceptability Criteria			
3 Brood Reproduction Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	20.9	13.73	28.07	0	32	3.171	10.03	47.98%	0.0%
2.4		10	23.7	19.35	28.05	13	31	1.921	6.075	25.63%	-13.4%
12.5		10	25.9	22.99	28.81	20	32	1.286	4.067	15.7%	-23.92%
33.3		10	25.1	20.74	29.46	14	35	1.929	6.1	24.3%	-20.1%
50		10	22.4	15.32	29.48	0	33	3.128	9.891	44.15%	-7.18%
100		10	25	18.21	31.79	0	31	3.004	9.499	37.99%	-19.62%
3 Brood Survival Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	10	0.9	0.6738	1	0	1	0.1	0.3162	35.14%	0.0%
2.4		10	1	1	1	1	1	0	0	0.0%	-11.11%
12.5		10	1	1	1	1	1	0	0	0.0%	-11.11%
33.3		10	1	1	1	1	1	0	0	0.0%	-11.11%
50		10	0.9	0.6738	1	0	1	0.1	0.3162	35.14%	0.0%
100		10	0.9	0.6738	1	0	1	0.1	0.3162	35.14%	0.0%
3 Brood Reproduction Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	26	32	11	27	27	21	30	22	13	0
2.4		26	27	17	26	29	31	26	26	13	16
12.5		32	29	27	29	29	27	22	22	22	20
33.3		31	35	20	26	25	26	14	30	24	20
50		12	25	33	30	29	23	28	25	0	19
100		31	31	23	29	29	0	28	28	20	31
3 Brood Survival Detail											
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4	Rep 5	Rep 6	Rep 7	Rep 8	Rep 9	Rep 10
0	Dilution Water	1	1	1	1	1	1	1	1	1	0
2.4		1	1	1	1	1	1	1	1	1	1
12.5		1	1	1	1	1	1	1	1	1	1
33.3		1	1	1	1	1	1	1	1	1	1
50		1	1	1	1	1	1	1	1	0	1
100		1	1	1	1	1	0	1	1	1	1

CETIS Analytical Report

Report Date: 22 Oct-17 13:11 (p 1 of 1)
Test Code: 1710-S002 | 12-0004-2915

Ceriodaphnia 3 Brood Survival & Reproduction Test Nautilus Environmental (CA)

Analysis ID: 11-1757-9289 Endpoint: 3 Brood Reproduction CETIS Version: CETISv1.8.7
Analyzed: 22 Oct-17 13:11 Analysis: Nonparametric-Control vs Treatments Official Results: Yes

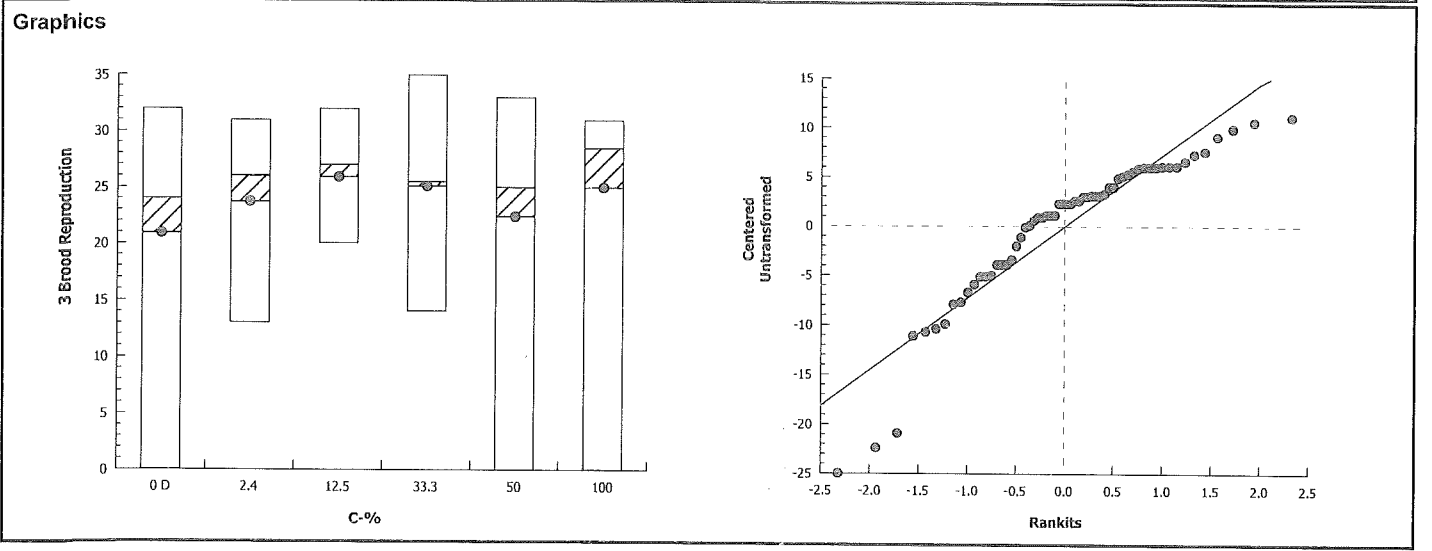
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	38.9%	100	>100	NA	1

Steel Many-One Rank Sum Test									
Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)
Dilution Water		2.4	109.5	75	3	18	0.9155	Asymp	Non-Significant Effect
		12.5	119	75	3	18	0.9875	Asymp	Non-Significant Effect
		33.3	112.5	75	2	18	0.9503	Asymp	Non-Significant Effect
		50	110	75	2	18	0.9223	Asymp	Non-Significant Effect
		100	122.5	75	1	18	0.9948	Asymp	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	179.1333	35.82667	5	0.5668	0.7250	Non-Significant Effect
Error	3413.2	63.20741	54			
Total	3592.333		59			

Distributional Tests						
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)	
Variances	Bartlett Equality of Variance	9.935	15.09	0.0771	Equal Variances	
Distribution	Shapiro-Wilk W Normality	0.8852	0.9459	<0.0001	Non-normal Distribution	

3 Brood Reproduction Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	10	20.9	13.73	28.07	24	0	32	3.171	47.98%	0.0%
2.4		10	23.7	19.35	28.05	26	13	31	1.921	25.63%	-13.4%
12.5		10	25.9	22.99	28.81	27	20	32	1.286	15.7%	-23.92%
33.3		10	25.1	20.74	29.46	25.5	14	35	1.929	24.3%	-20.1%
50		10	22.4	15.32	29.48	25	0	33	3.128	44.15%	-7.18%
100		10	25	18.21	31.79	28.5	0	31	3.004	37.99%	-19.62%



CETIS Analytical Report

Report Date: 22 Oct-17 13:12 (p 1 of 1)

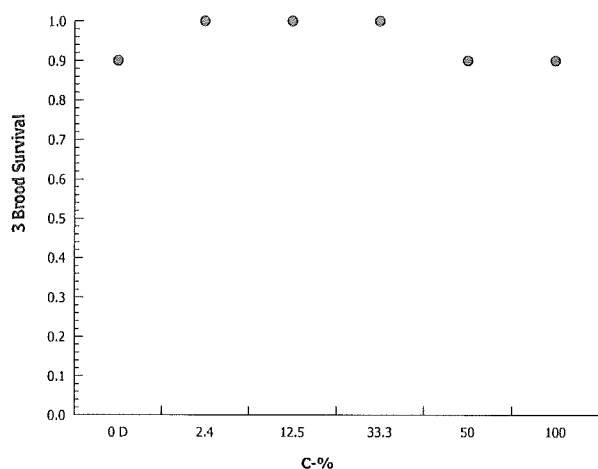
Test Code: 1710-S002 | 12-0004-2915

Ceriodaphnia 3 Brood Survival & Reproduction Test						Nautilus Environmental (CA)		
Analysis ID:	03-4994-2201	Endpoint:	3 Brood Survival	CETIS Version:	CETISv1.8.7			
Analyzed:	22 Oct-17 13:11	Analysis:	Single 2x2 Contingency Table	Official Results:	Yes			
Data Transform	Zeta	Alt Hyp	Trials	Seed	NOEL	LOEL	TOEL	TU
Untransformed		C > T	NA	NA	100	>100	NA	1

Fisher Exact Test						
Control	vs	C-%	Test Stat	P-Value	P-Type	Decision(α :5%)
Dilution Water		2.4	1	1.0000	Exact	Non-Significant Effect
		12.5	1	1.0000	Exact	Non-Significant Effect
		33.3	1	1.0000	Exact	Non-Significant Effect
		50	0.7632	0.7632	Exact	Non-Significant Effect
		100	0.7632	0.7632	Exact	Non-Significant Effect

Data Summary							
C-%	Control Type	NR	R	NR + R	Prop NR	Prop R	%Effect
0	Dilution Water	9	1	10	0.9	0.1	0.0%
2.4		10	0	10	1	0	-11.11%
12.5		10	0	10	1	0	-11.11%
33.3		10	0	10	1	0	-11.11%
50		9	1	10	0.9	0.1	0.0%
100		9	1	10	0.9	0.1	0.0%

Graphics



Ceriodaphnia 3 Brood Survival & Reproduction Test

Nautilus Environmental (CA)

Test Type: Reproduction and Survival

Organism: Ceriodaphnia dubia (Water Flea)

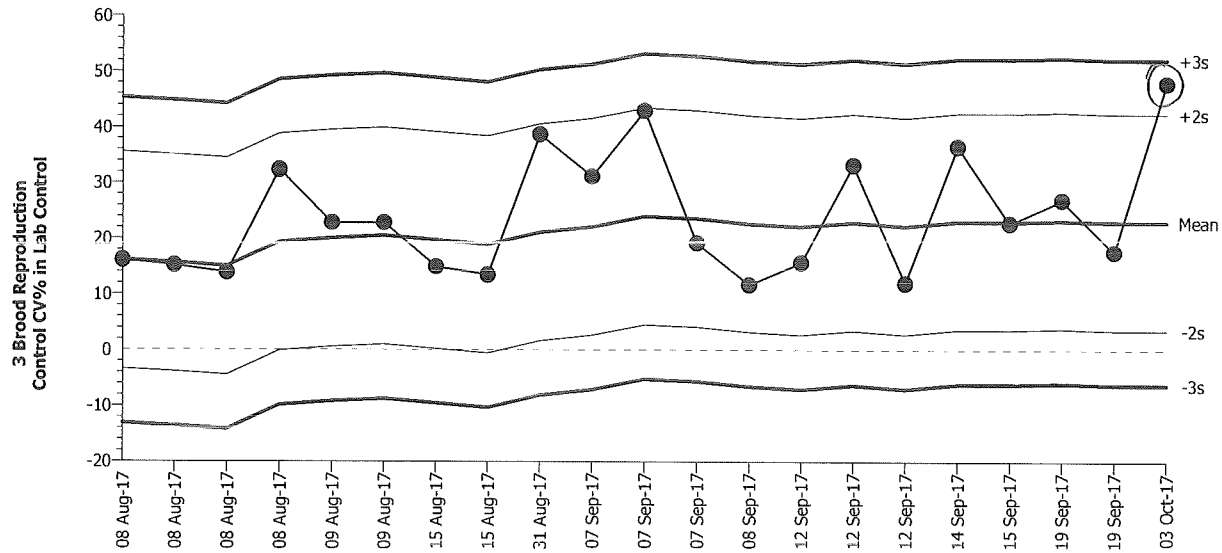
Material: All Materials

Protocol: EPA/821/R-02-013 (2002)

Endpoint: 3 Brood Reproduction

Source: All SampleID Sources

Ceriodaphnia 3 Brood Survival & Reproduction Test



Mean: 23.01

Count: 20

-2s Warning Limit: 3.525

-3s Action Limit: -6.217

Sigma: 9.743

CV: 42.30%

+2s Warning Limit: 42.5

+3s Action Limit: 52.24

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Aug	8	14:35	16.11	-6.9	-0.7082			11-7134-1578	
2			8	15:25	15.16	-7.85	-0.8057			00-4520-3078	
3			8	15:35	13.86	-9.15	-0.9391			16-1294-6468	
4			8	16:00	32.38	9.37	0.9617			18-4350-4592	
5			9	15:10	22.8	-0.21	-0.02155			13-8616-1625	
6			9	15:45	22.8	-0.21	-0.02155			04-5021-0400	
7			15	14:00	14.91	-8.1	-0.8314			16-0429-5306	
8			15	15:00	13.46	-9.55	-0.9802			10-2761-3032	
9			31	13:35	38.7	15.69	1.61			06-1441-8057	
10		Sep	7	15:00	31.18	8.17	0.8386			09-2270-1537	
11			7	15:40	43.01	20	2.053	(+)		14-9805-2918	
12			7	16:15	19.22	-3.79	-0.389			11-2156-0054	
13			8	15:40	11.71	-11.3	-1.16			10-3500-4717	
14			12	14:30	15.69	-7.32	-0.7513			06-3742-7486	
15			12	15:35	33.26	10.25	1.052			13-6827-5505	
16			12	15:40	11.98	-11.03	-1.132			19-0665-6460	
17			14	15:15	36.63	13.62	1.398			20-2505-0881	
18			15	15:30	22.78	-0.23	-0.02361			01-1367-9365	
19			19	14:05	26.98	3.97	0.4075			10-5576-2223	
20			19	14:35	17.61	-5.4	-0.5542			19-6125-0369	
21		Oct	3	14:30	47.98	24.97	2.563	(+)		12-0004-2915	

Ceriodaphnia 3 Brood Survival & Reproduction Test

Nautilus Environmental (CA)

Test Type: Reproduction and Survival

Organism: Ceriodaphnia dubia (Water Flea)

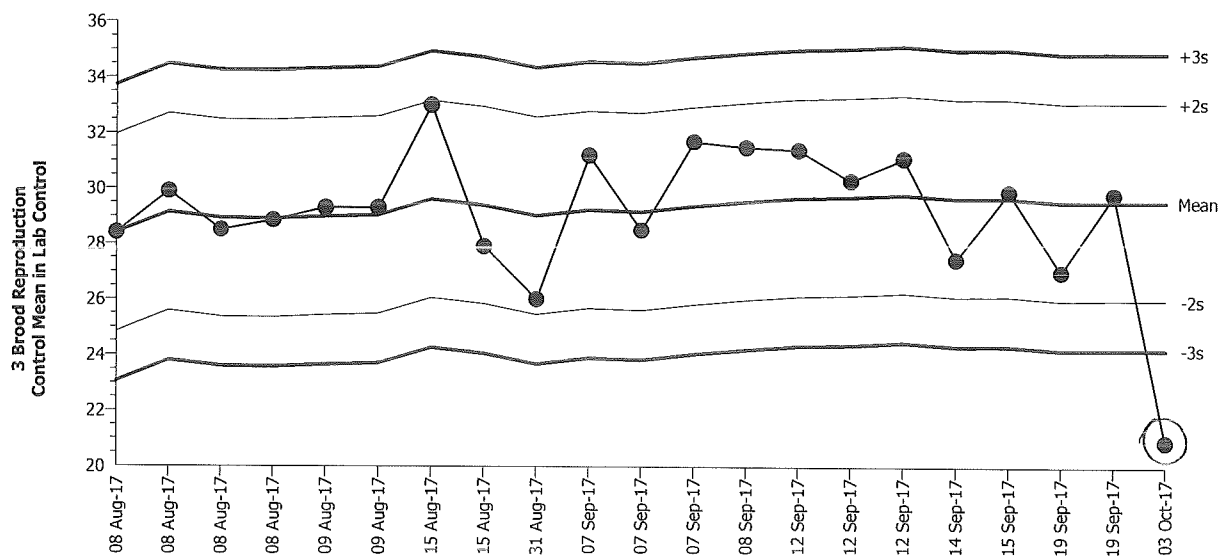
Material: All Materials

Protocol: EPA/821/R-02-013 (2002)

Endpoint: 3 Brood Reproduction

Source: All SampleID Sources

Ceriodaphnia 3 Brood Survival & Reproduction Test



Mean: 29.55

Count: 20

-2s Warning Limit: 25.99

-3s Action Limit: 24.21

Sigma: 1.779

CV: 6.02%

+2s Warning Limit: 33.11

+3s Action Limit: 34.89

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Aug	8	14:35	28.4	-1.15	-0.6464			11-7134-1578	
2			8	15:25	29.9	0.35	0.1967			00-4520-3078	
3			8	15:35	28.5	-1.05	-0.5902			16-1294-6468	
4			8	16:00	28.85	-0.7	-0.3935			18-4350-4592	
5			9	15:10	29.3	-0.25	-0.1405			13-8616-1625	
6			9	15:45	29.3	-0.25	-0.1405			04-5021-0400	
7			15	14:00	33	3.45	1.939			16-0429-5306	
8			15	15:00	27.9	-1.65	-0.9275			10-2761-3032	
9			31	13:35	26	-3.55	-1.996			06-1441-8057	
10		Sep	7	15:00	31.2	1.65	0.9275			09-2270-1537	
11			7	15:40	28.5	-1.05	-0.5902			14-9805-2918	
12			7	16:15	31.7	2.15	1.209			11-2156-0054	
13			8	15:40	31.5	1.95	1.096			10-3500-4717	
14			12	14:30	31.4	1.85	1.04			06-3742-7486	
15			12	15:35	30.3	0.75	0.4216			13-6827-5505	
16			12	15:40	31.1	1.55	0.8713			19-0665-6460	
17			14	15:15	27.45	-2.1	-1.18			20-2505-0881	
18			15	15:30	29.9	0.35	0.1967			01-1367-9365	
19			19	14:05	27	-2.55	-1.433			10-5576-2223	
20			19	14:35	29.8	0.25	0.1405			19-6125-0369	
21		Oct	3	14:30	20.9	-8.65	-4.862	(-)	(-)	12-0004-2915	

Freshwater Chronic Bioassay

Daphnid Survival and Reproduction Datasheet

Test Species: *C. dubia*Client/Sample ID: Pharmaceutical/EffluentStart Date/Time: 10/3/2017 1430Test No: 1710-5002End Date/Time: 10/10/2017 1230

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
LC	1	20	0	0	0	4	7	0	15		26	
	2	14	0	0	0	5	11	0	16		32	
	3	13	0	0	0	0	2	9	0		11	
	4	33	0	0	0	4	9	14	13/15		27	
	5	9	0	0	0	4	9	0	14		27	14
	6	37	0	0	0	3	8	10	0		21	
	7	49	0	0	0	3	9	2	14		30	
	8	50	0	0	0	5	6	11	0		32	
	9	39	0	0	0	4	3	6	0		13	
	10	6	0/2	1	1	1	1	1	1		0/2	
Tech:		RT	CG	CG	CG	ACS	ACS	RT			23.2	LTP
Mean neonates/surviving female (for TAC):												

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
33.3%	1	28	0	0	0	5	0	9	17		31	
	2	15	0	0	0	4	13	0	18		35	
	3	36	0	0	0	2	6	12	0		20	
	4	11	0	0	0	5	9	12	0		26	
	5	18	0	0	3	10	9	13	0		25	
	6	22	0	0	0	5	9	13	0		26	
	7	1	0	0	0	0	4	10	0		14	
	8	55	0	0	5	0	9	16	21/15		30	21
	9	21	0	0	0	4	7	13	0		24	
	10	48	0	0	0	3	6	11	0		20	

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
2.40%	1	24	0	0	0	5	9	0	12		26	
	2	2	0	0	0	0	5	8	14		27	
	3	34	0	0	0	0	5	12	0		17	
	4	4	0	0	0	4	9	13	0		26	
	5	54	0	0	0	3	10	16	0		29	
	6	31	0	0	0	5	11	15	0		31	
	7	23	0	0	0	5	7	0	14		26	
	8	40	0	0	0	0	8	14	16/15		26	17
	9	45	0	0	0	2	4	7	0		13	
	10	59	0	0	0	4	0	4	8		16	

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
50%	1	57	0	0	0	3	0	8	1		12	
	2	17	0	0	0	0	0	10	10		25	9
	3	26	0	0	0	0	4	12	17		33	
	4	47	0	0	0	6	10	14	18/15		30	
	5	58	0	0	0	0	9	16	17/15		39	
	6	38	0	0	0	0	8	10	18/15		23	
	7	5	0	0	0	0	8	0	15		23	
	8	16	0	0	0	0	4	16	21/15		25	
	9	43	0	0/1	1	1	1	1	1		0/1	
	10	35	0	0	0	5	5	10	0		19	

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
12.50%	1	51	0	0	0	0	0	10	16		32	
	2	60	0	0	0	5	0	11	13		29	
	3	19	0	0	0	3	8	0	16		27	10
	4	7	0	0	0	0	10	13	0		23	
	5	30	0	0	5	0	11	13	22/15		29	
	6	29	0	0	0	5	9	13	0		27	
	7	25	0	0	0	3	0	7	12		22	
	8	46	0	0	0	0	6	12	15/15		22	
	9	3	0	0	0	2	5	0	10		12	
	10	27	0	0	0	3	6	11	0		20	

Conc.	Rep	Rand #	Daily Reproduction/ Survival								Total	QC
			1	2	3	4	5	6	7	8		
100%	1	41	0	0	0	4	0	11	16		31	
	2	52	0	0	0	3	0	10	18		31	
	3	32	0	0	0	0	8	15	12		23	
	4	8	0	0	0	0	10	15	0		29	
	5	42	0	0	0	0	9	15	20/15		29	
	6	10	0/2	1	1	1	1	1	1		0/2	
	7	56	0	0	0	0	9	0	14		28	
	8	12	0	0	0	0	9	15	13/15		28	13
	9	44	0	0	0	3	0	6	11		20	
	10	53	0	0	0	0	5	11	15		31	

Neonates for each replicate were blocked across concentrations at test initiation

Rep:	1	2	3	4	5	6	7	8	9	10
Board:	105									
Cup:	1	2	3	4	6	8	10	17	19	21
Rand # QC:	RT									
Verified By:	CH									
Initiated By:	RT									
QC'd By:	CH									

Notes: d = dead; M = male; LIP = lost in progress;

B = 4th brood (only the first 3 broods are included in total)

Time Fed/Test Solution Renewed (day): (0) 1430 (1) 1100 (2) 1445 (3) 1400 (4) 1450 (5) 1350 (6) 1345 (7) 1230

Comments: (A) Q18 ACS 10/8/17 (B) Q18 ACS 10/9/17 (C) Q18 RT 10/10/17

QC Check: CH 10/12/17Final Review: 1450 10/16/17

Freshwater Chronic Bioassay

Water Quality Measurements

Client: Snoqualmie
 Sample ID: Effluent
 Test No: 1710-5002

Test Species: *C. dubia*
 Start Date/Time: 10/3/2017 1430
 End Date/Time: 10/10/2017 1230

Concentration	Lab Control (8:2)							
Day	0	1	2	3	4	5	6	7
pH	8.18	8.20	8.11	8.24	8.18	8.13	8.13	
DO (mg/L)	7.6	7.4	7.4	7.3	7.5	7.3	7.7	
Cond. (µmhos/cm)	196	193	192	192	192	192	188	
Temp (°C)	25.0	24.6	25.0	24.3	24.5	24.7	24.5	
pH		8.14	8.14	8.03	8.28	8.18	8.16	8.25
DO (mg/L)		7.8	8.1	7.5	7.8	7.8	8.1	7.8
Temp (°C)		24.3	24.5	24.6	24.1	24.6	24.7	24.7

Concentration	33.3%							
Day	0	1	2	3	4	5	6	7
pH	7.91	8.03	8.00	8.09	8.22	8.01	8.09	
DO (mg/L)	7.8	7.6	7.7	7.5	7.4	7.5	7.9	
Cond. (µmhos/cm)	281	280	276	276	278	276	268	
Temp (°C)	25.0	24.9	25.0	24.6	24.9	24.8	24.6	
pH		8.17	8.19	8.14	8.25	8.24	8.18	8.26
DO (mg/L)		7.5	8.0	7.5	7.8	7.7	8.1	7.6
Temp (°C)		24.3	24.5	24.6	24.1	24.6	24.7	24.7

Concentration	2.40%							
Day	0	1	2	3	4	5	6	7
pH	8.19	8.21	8.16	8.24	8.20	8.14	8.25	
DO (mg/L)	7.7	7.4	7.5	7.4	7.6	7.4	7.7	
Cond. (µmhos/cm)	201	201	198	199	199	199	194	
Temp (°C)	25.0	24.8	25.0	24.6	24.6	24.8	24.6	
pH		8.15	8.15	8.10	8.22	8.19	8.16	8.25
DO (mg/L)		7.7	8.1	7.5	7.7	7.6	8.1	7.7
Temp (°C)		24.3	24.5	24.6	24.1	24.6	24.7	24.7

Concentration	50%							
Day	0	1	2	3	4	5	6	7
pH	7.84	7.95	7.90	8.05	8.13	7.91	8.01	
DO (mg/L)	7.8	7.6	7.8	7.5	7.6	7.8	8.1	
Cond. (µmhos/cm)	313	308	304	314	323	314	297	
Temp (°C)	25.0	25.0	25.0	24.6	25.0	24.8	24.6	
pH		8.18	8.20	8.16	8.25	8.22	8.20	8.26
DO (mg/L)		7.8	8.1	7.4	7.8	7.6	8.1	7.6
Temp (°C)		24.3	24.5	24.6	24.1	24.6	24.7	24.7

Concentration	12.50%							
Day	0	1	2	3	4	5	6	7
pH	8.03	8.15	8.11	8.19	8.21	8.11	8.21	
DO (mg/L)	7.6	7.5	7.6	7.4	7.6	7.5	7.8	
Cond. (µmhos/cm)	226	227	223	222	230	225	218	
Temp (°C)	25.0	24.9	25.1	24.6	24.6	24.8	24.6	
pH		8.18	8.18	8.14	8.24	8.21	8.17	8.26
DO (mg/L)		7.8	8.1	7.5	7.8	7.7	8.2	7.7
Temp (°C)		24.3	24.5	24.6	24.1	24.6	24.7	24.7

Concentration	100%							
Day	0	1	2	3	4	5	6	7
pH	7.47	7.72	7.69	7.86	8.04	7.68	7.87	
DO (mg/L)	7.8	7.8	7.9	7.6	7.6	8.2	8.4	
Cond. (µmhos/cm)	449	449	439	441	443	442	432	
Temp (°C)	25.1	25.0	25.0	24.6	25.3	24.8	24.6	
pH		8.23	8.25	8.21	8.29	8.24	8.21	8.27
DO (mg/L)		7.7	8.1	7.5	7.8	7.6	8.1	7.6
Temp (°C)		24.3	24.5	24.6	24.1	24.6	24.7	24.7

Animal Source/Date Received: Internal / N/A
 Animal Age at Initiation: < 24 hrs
 Animal Acclimation Qualifiers (circle all that apply): Q22 / Q23 / Q24 (none)
 Sample Log-in Numbers: A: 17-1067 C: 17-1074
 B: 17-1071

Analysts: Initial: RT RT BO RT AD AS BO
 Final: — RT AD RT AD AS AS
 Dilutions made by: BO BO BO BO AD PH BO
 Sample Used (A, B, C): A A B B C C C

Comments: @CG 10/6/17 @M 10/8 10/7/17 @Q 10/12/17 RT
 QC Check: CH 10/12/17

Final Review: KRP 10/16/17

Fathead Minnow Chronic Test

CETIS Summary Report

Report Date: 22 Oct-17 13:18 (p 1 of 2)
 Test Code: 1710-S001 | 11-9805-8852

Fathead Minnow 7-d Larval Survival and Growth Test				Nautilus Environmental (CA)	
Batch ID:	10-0869-8073	Test Type:	Growth-Survival (7d)	Analyst:	
Start Date:	03 Oct-17 15:05	Protocol:	EPA/821/R-02-013 (2002)	Diluent:	Mod-Hard Synthetic Water
Ending Date:	10 Oct-17 11:45	Species:	Pimephales promelas	Brine:	Not Applicable
Duration:	6d 21h	Source:	Aquatic Biosystems, CO	Age:	1d
Sample ID:	20-1410-6035	Code:	17-1067	Client:	City of Snoqualmie
Sample Date:	02 Oct-17 08:00	Material:	POTW Effluent	Project:	
Receive Date:	03 Oct-17 09:50	Source:	Snoqualmie WWTP (WA0022403)		
Sample Age:	31h (4 °C)	Station:	Effluent		
Batch Note: Q16: PMSD for mean dry biomass was below the lower bound limit for acceptability. Proper NOEC and LOEC pair is reported according to EPA 2000.					

Comparison Summary							
Analysis ID	Endpoint	NOEL	LOEL	TOEL	PMSD	TU	Method
17-4617-4404	7d Survival Rate	100	>100	NA	16.0%	1	Steel Many-One Rank Sum Test
15-2437-2018	Mean Dry Biomass-mg	100	>100	NA	11.0%	1	Dunnett Multiple Comparison Test

Test Acceptability							
Analysis ID	Endpoint	Attribute	Test Stat	TAC Limits	Overlap	Decision	
17-4617-4404	7d Survival Rate	Control Resp	0.925	0.8 - NL	Yes	Passes Acceptability Criteria	
15-2437-2018	Mean Dry Biomass-mg	Control Resp	0.3398	0.25 - NL	Yes	Passes Acceptability Criteria	
15-2437-2018	Mean Dry Biomass-mg	PMSD	0.1101	0.12 - 0.3	Yes	Below Acceptability Criteria	

7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	0.925	0.8454	1	0.9	1	0.025	0.05	5.41%	0.0%
2.4		4	0.975	0.8954	1	0.9	1	0.025	0.05	5.13%	-5.41%
12.5		4	0.925	0.6863	1	0.7	1	0.075	0.15	16.22%	0.0%
33.3		4	0.975	0.8954	1	0.9	1	0.025	0.05	5.13%	-5.41%
50		4	0.925	0.7727	1	0.8	1	0.04787	0.09574	10.35%	0.0%
100		4	0.975	0.8954	1	0.9	1	0.025	0.05	5.13%	-5.41%

Mean Dry Biomass-mg Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Min	Max	Std Err	Std Dev	CV%	%Effect
0	Dilution Water	4	0.3398	0.2956	0.3839	0.301	0.363	0.01386	0.02773	8.16%	0.0%
2.4		4	0.3703	0.3299	0.4106	0.349	0.407	0.01267	0.02534	6.85%	-8.98%
12.5		4	0.3567	0.3057	0.4078	0.309	0.377	0.01605	0.03211	9.0%	-5.0%
33.3		4	0.3968	0.3642	0.4293	0.375	0.42	0.01023	0.02047	5.16%	-16.78%
50		4	0.4025	0.3959	0.4091	0.398	0.406	0.002062	0.004123	1.02%	-18.47%
100		4	0.3948	0.3876	0.4019	0.391	0.401	0.00225	0.0045	1.14%	-16.19%

CETIS Summary Report

Report Date: 22 Oct-17 13:18 (p 2 of 2)
 Test Code: 1710-S001 | 11-9805-8852

Fathead Minnow 7-d Larval Survival and Growth Test					Nautilus Environmental (CA)
7d Survival Rate Detail					
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	0.9	0.9	1	0.9
2.4		1	1	1	0.9
12.5		1	0.7	1	1
33.3		1	1	0.9	1
50		0.8	0.9	1	1
100		1	0.9	1	1
Mean Dry Biomass-mg Detail					
C-%	Control Type	Rep 1	Rep 2	Rep 3	Rep 4
0	Dilution Water	0.301	0.339	0.363	0.356
2.4		0.407	0.349	0.361	0.364
12.5		0.377	0.309	0.367	0.374
33.3		0.407	0.385	0.375	0.42
50		0.406	0.406	0.4	0.398
100		0.395	0.391	0.401	0.392

CETIS Analytical Report

Report Date: 22 Oct-17 13:17 (p 1 of 3)
Test Code: 1710-S001 | 11-9805-8852

Fathead Minnow 7-d Larval Survival and Growth Test										Nautilus Environmental (CA)	
Analysis ID: 17-4617-4404		Endpoint: 7d Survival Rate					CETIS Version: CETISv1.8.7				
Analyzed: 12 Oct-17 14:42		Analysis: Nonparametric-Control vs Treatments					Official Results: Yes				
Batch Note: Q16: PMSD for mean dry biomass was below the lower bound limit for acceptability. Proper NOEC and LOEC pair is reported according to EPA 2000.											
Data Transform		Zeta	Alt Hyp	Trials	Seed		PMSD	NOEL	LOEL	TOEL	TU
Angular (Corrected)		NA	C > T	NA	NA		16.0%	100	>100	NA	1
Steel Many-One Rank Sum Test											
Control	vs	C-%	Test Stat	Critical	Ties	DF	P-Value	P-Type	Decision(α:5%)		
Dilution Water		2.4	22	10	2	6	0.9908	Asymp	Non-Significant Effect		
		12.5	20.5	10	1	6	0.9667	Asymp	Non-Significant Effect		
		33.3	22	10	2	6	0.9908	Asymp	Non-Significant Effect		
		50	18.5	10	2	6	0.8729	Asymp	Non-Significant Effect		
		100	22	10	2	6	0.9908	Asymp	Non-Significant Effect		
ANOVA Table											
Source	Sum Squares		Mean Square		DF	F Stat	P-Value	Decision(α:5%)			
Between	0.03351445		0.006702891		5	0.4351	0.8182	Non-Significant Effect			
Error	0.2773055		0.01540586		18						
Total	0.3108199				23						
Distributional Tests											
Attribute	Test			Test Stat	Critical	P-Value	Decision(α:1%)				
Variances	Bartlett Equality of Variance			5.24	15.09	0.3873	Equal Variances				
Distribution	Shapiro-Wilk W Normality			0.8642	0.884	0.0041	Non-normal Distribution				
7d Survival Rate Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	0.925	0.8454	1	0.9	0.9	1	0.025	5.41%	0.0%
2.4		4	0.975	0.8954	1	1	0.9	1	0.025	5.13%	-5.41%
12.5		4	0.925	0.6863	1	1	0.7	1	0.075	16.22%	0.0%
33.3		4	0.975	0.8954	1	1	0.9	1	0.025	5.13%	-5.41%
50		4	0.925	0.7727	1	0.95	0.8	1	0.04787	10.35%	0.0%
100		4	0.975	0.8954	1	1	0.9	1	0.025	5.13%	-5.41%
Angular (Corrected) Transformed Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	1.29	1.16	1.419	1.249	1.249	1.412	0.04074	6.32%	0.0%
2.4		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	-6.32%
12.5		4	1.307	0.972	1.642	1.412	0.9912	1.412	0.1052	16.1%	-1.32%
33.3		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	-6.32%
50		4	1.295	1.061	1.529	1.331	1.107	1.412	0.07348	11.35%	-0.41%
100		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	-6.32%

Fathead Minnow 7-d Larval Survival and Growth Test

Nautilus Environmental (CA)

Analysis ID: 17-4617-4404

Endpoint: 7d Survival Rate

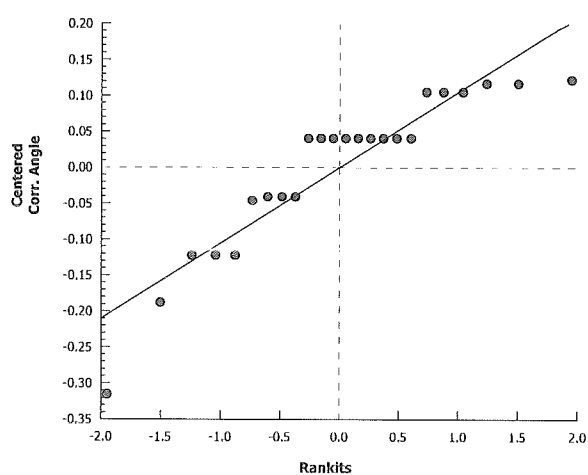
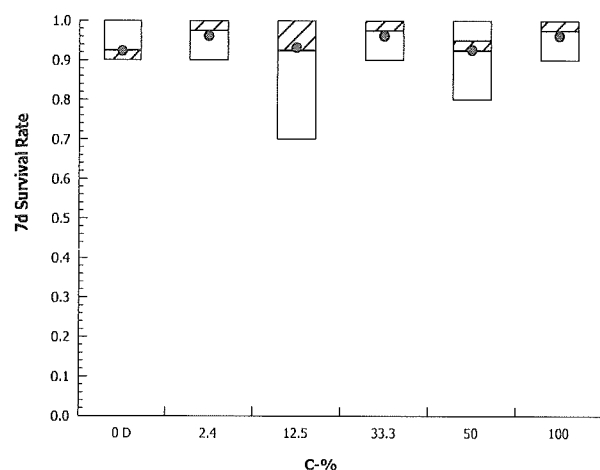
CETIS Version: CETISv1.8.7

Analyzed: 12 Oct-17 14:42

Analysis: Nonparametric-Control vs Treatments

Official Results: Yes

Graphics



CETIS Analytical Report

Report Date: 22 Oct-17 13:18 (p 3 of 3)
Test Code: 1710-S001 | 11-9805-8852

Fathead Minnow 7-d Larval Survival and Growth Test				Nautilus Environmental (CA)	
Analysis ID:	15-2437-2018	Endpoint:	Mean Dry Biomass-mg	CETIS Version:	CETISv1.8.7
Analyzed:	12 Oct-17 14:42	Analysis:	Parametric-Control vs Treatments	Official Results:	Yes
Batch Note:	Q16: PMSD for mean dry biomass was below the lower bound limit for acceptability. Proper NOEC and LOEC pair is reported according to EPA 2000.				

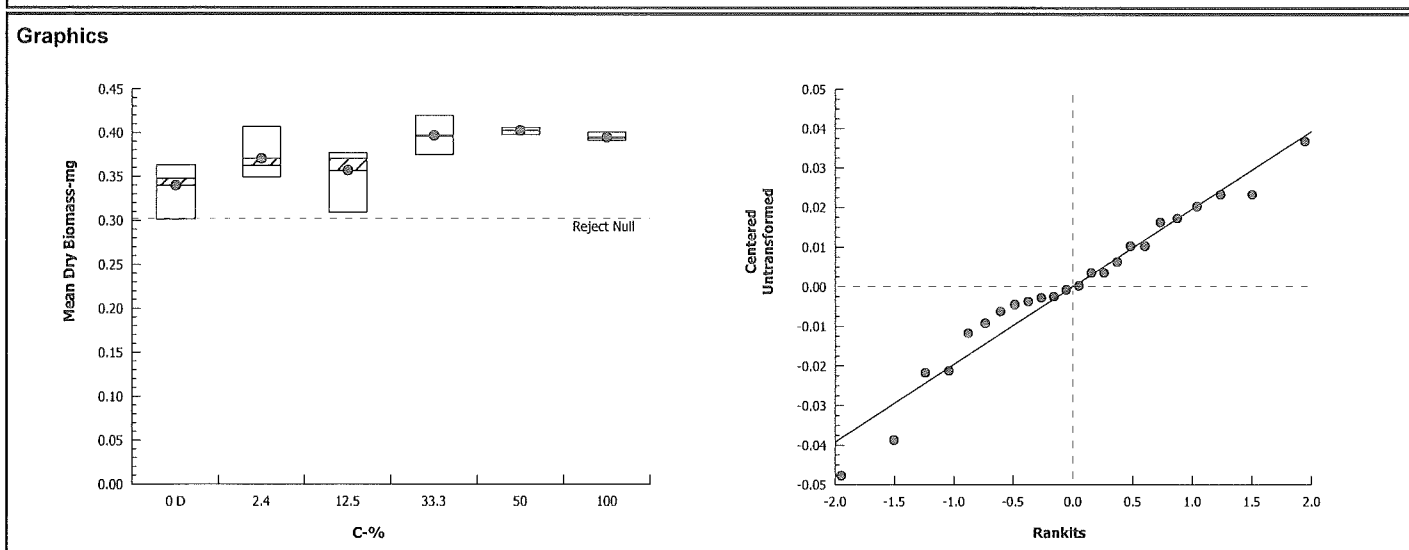
Data Transform	Zeta	Alt Hyp	Trials	Seed	PMSD	NOEL	LOEL	TOEL	TU
Untransformed	NA	C > T	NA	NA	11.0%	100	>100	NA	1

Dunnett Multiple Comparison Test									
Control	vs	C-%	Test Stat	Critical	MSD	DF	P-Value	P-Type	Decision(α:5%)
Dilution Water		2.4	-1.963	2.407	0.037	6	0.9990	CDF	Non-Significant Effect
		12.5	-1.094	2.407	0.037	6	0.9867	CDF	Non-Significant Effect
		33.3	-3.668	2.407	0.037	6	1.0000	CDF	Non-Significant Effect
		50	-4.038	2.407	0.037	6	1.0000	CDF	Non-Significant Effect
		100	-3.539	2.407	0.037	6	1.0000	CDF	Non-Significant Effect

ANOVA Table						
Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	0.0127932	0.00255864	5	5.297	0.0036	Significant Effect
Error	0.008694718	0.0004830399	18			
Total	0.02148791		23			

Distributional Tests					
Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Bartlett Equality of Variance	13.69	15.09	0.0177	Equal Variances
Distribution	Shapiro-Wilk W Normality	0.9632	0.884	0.5054	Normal Distribution

Mean Dry Biomass-mg Summary											
C-%	Control Type	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	Dilution Water	4	0.3398	0.2956	0.3839	0.3475	0.301	0.363	0.01386	8.16%	0.0%
2.4		4	0.3703	0.3299	0.4106	0.3625	0.349	0.407	0.01267	6.85%	-8.98%
12.5		4	0.3567	0.3057	0.4078	0.3705	0.309	0.377	0.01605	9.0%	-5.0%
33.3		4	0.3968	0.3642	0.4293	0.396	0.375	0.42	0.01023	5.16%	-16.78%
50		4	0.4025	0.3959	0.4091	0.403	0.398	0.406	0.002061	1.02%	-18.47%
100		4	0.3948	0.3876	0.4019	0.3935	0.391	0.401	0.00225	1.14%	-16.19%



Fathead Minnow 7-d Larval Survival and Growth Test

Nautilus Environmental (CA)

Test Type: Growth-Survival (7d)

Organism: Pimephales promelas (Fathead Minn)

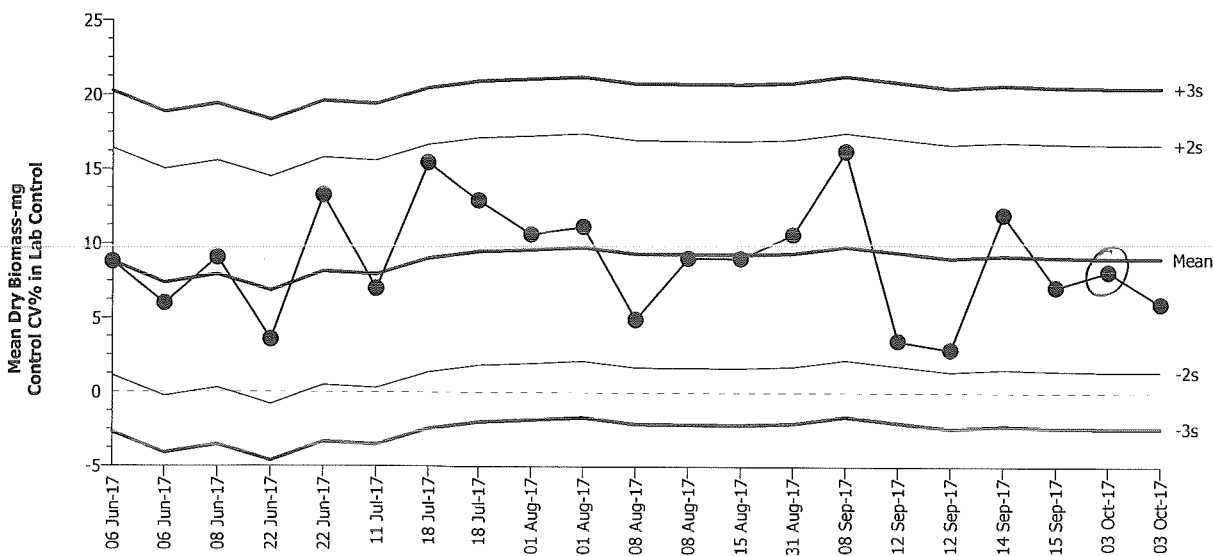
Material: All Materials

Protocol: EPA/821/R-02-013 (2002)

Endpoint: Mean Dry Biomass-mg

Source: All SampleID Sources

Fathead Minnow 7-d Larval Survival and Growth Test



Mean: 9.072

Count: 20

-2s Warning Limit: 1.422

-3s Action Limit: -2.403

Sigma: 3.825

CV: 42.20%

+2s Warning Limit: 16.72

+3s Action Limit: 20.55

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Jun	6	15:15	8.78	-0.292	-0.07634			08-0427-7062	
2			6	15:20	5.989	-3.083	-0.806			13-8790-1118	
3			8	14:55	9.058	-0.014	-0.00366			13-2638-0280	
4			22	13:20	3.557	-5.515	-1.442			19-2839-2466	
5			22	15:10	13.25	4.178	1.092			09-8417-7763	
6		Jul	11	15:15	6.971	-2.101	-0.5493			06-9461-1824	
7			18	15:35	15.45	6.378	1.667			09-2357-9895	
8			18	15:45	12.93	3.858	1.009			07-7117-0756	
9		Aug	1	14:15	10.66	1.588	0.4152			14-8432-6788	
10			1	15:25	11.18	2.108	0.5511			11-9592-4501	
11			8	14:35	4.936	-4.136	-1.081			07-6952-3575	
12			8	16:15	9.043	-0.029	-0.00758			02-4182-1821	
13			15	16:15	9.036	-0.036	-0.00941			11-9842-4949	
14			31	14:00	10.65	1.578	0.4125			19-2800-6180	
15		Sep	8	17:15	16.27	7.198	1.882			06-3982-8846	
16			12	16:15	3.507	-5.565	-1.455			12-7020-7139	
17			12	16:50	2.908	-6.164	-1.612			10-6103-3340	
18			14	16:20	11.99	2.918	0.7629			14-8408-6061	
19			15	16:45	7.109	-1.963	-0.5132			20-0153-7026	
20		Oct	3	15:05	8.162	-0.91	-0.2379			11-9805-8852	
21			3	16:00	5.982	-3.09	-0.8078			01-4995-5965	

Fathead Minnow 7-d Larval Survival and Growth Test

Nautilus Environmental (CA)

Test Type: Growth-Survival (7d)

Organism: Pimephales promelas (Fathead Minn)

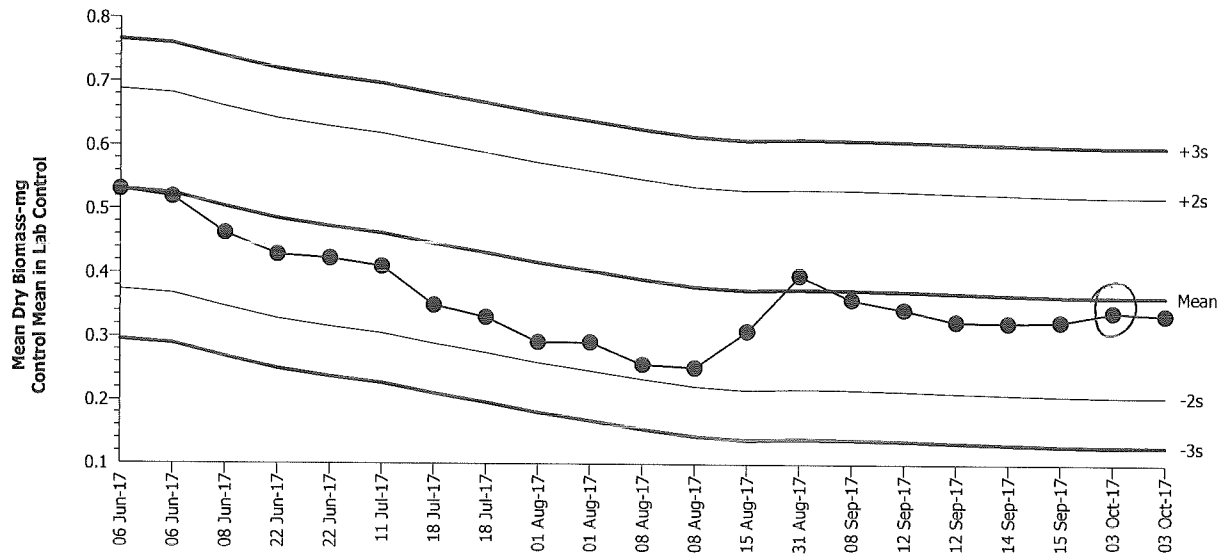
Material: All Materials

Protocol: EPA/821/R-02-013 (2002)

Endpoint: Mean Dry Biomass-mg

Source: All SampleID Sources

Fathead Minnow 7-d Larval Survival and Growth Test



Mean: 0.3632

Count: 20

-2s Warning Limit: 0.2063

-3s Action Limit: 0.1278

Sigma: 0.07846

CV: 21.60%

+2s Warning Limit: 0.5201

+3s Action Limit: 0.5986

Quality Control Data

Point	Year	Month	Day	Time	QC Data	Delta	Sigma	Warning	Action	Test ID	Analysis ID
1	2017	Jun	6	15:15	0.5308	0.1676	2.136	(+)		08-0427-7062	
2			6	15:20	0.5188	0.1556	1.983			13-8790-1118	
3			8	14:55	0.462	0.0988	1.259			13-2638-0280	
4			22	13:20	0.4285	0.0653	0.8323			19-2839-2466	
5			22	15:10	0.4225	0.0593	0.7558			09-8417-7763	
6		Jul	11	15:15	0.41	0.0468	0.5965			06-9461-1824	
7			18	15:35	0.3492	-0.014	-0.1784			09-2357-9895	
8			18	15:45	0.3302	-0.033	-0.4206			07-7117-0756	
9		Aug	1	14:15	0.2915	-0.0717	-0.9138			14-8432-6788	
10			1	15:25	0.2915	-0.0717	-0.9138			11-9592-4501	
11			8	14:35	0.2565	-0.1067	-1.36			07-6952-3575	
12			8	16:15	0.2518	-0.1114	-1.42			02-4182-1821	
13			15	16:15	0.3092	-0.054	-0.6882			11-9842-4949	
14			31	14:00	0.3965	0.0333	0.4244			19-2800-6180	
15		Sep	8	17:15	0.3592	-0.004	-0.05098			06-3982-8846	
16			12	16:15	0.3432	-0.02	-0.2549			12-7020-7139	
17			12	16:50	0.325	-0.0382	-0.4869			10-6103-3340	
18			14	16:20	0.3228	-0.0404	-0.5149			14-8408-6061	
19			15	16:45	0.3248	-0.0384	-0.4894			20-0153-7026	
20		Oct	3	15:05	0.3398	-0.0234	-0.2982			11-9805-8852	
21			3	16:00	0.3353	-0.0279	-0.3556			01-4995-5965	

Client: SnoqualmieTest Species: P. promelasSample ID: EffluentStart Date/Time: 10/3/2017 1505Test No.: 1710-8001End Date/Time: 10/10/2017 1145

Concentration (%)	Rep.	Rand #	Test Day / No. Organisms Alive								Percent Survival
			0	1	2	3	4	5	6	7	
Lab Control	a	13	10	9	9	9	9	9	9	9	90
(MHSW)	b	4	10	9	9	9	9	9	9	9	90
	c	18	10	10	10	10	10	10	10	10	100
	d	22	10	10	9	9	9	9	9	9	90
2.4	a	23	10	10	10	10	10	10	10	10	100
	b	16	10	10	10	10	10	10	10	10	100
	c	14	10	10	10	10	10	10	10	10	100
	d	15	10	9	9	9	9	9	9	9	90
12.5	a	20	10	10	10	10	10	10	10	10	100
	b	6	10	9	9	9	8	8	7	7	70
	c	19	10	10	10	10	10	10	10	10	100
	d	12	10	10	10	10	10	10	10	10	100
33.3	a	10	10	10	10	10	10	10	10	10	100
	b	17	10	10	10	10	10	10	10	10	100
	c	21	10	10	10	10	9	9	9	9	90
	d	8	10	10	10	10	10	10	10	10	100
50	a	5	10	10	10	10	9	8	8	8	80
	b	7	10	10	10	10	10	10	10	9	90
	c	1	10	10	10	10	10	10	10	10	100
	d	3	10	10	10	10	10	10	10	10	100
100	a	24	10	10	10	10	10	10	10	10	100
	b	11	10	10	10	10	9	9	9	9	90
	c	2	10	10	10	10	10	10	10	10	100
	d	9	10	10	10	10	10	10	10	10	100

Rand # QC: DM

Tech Initials

Initial Count QC'd by: DM

Time

Initiated by: BO

BO	DM	DM	AD	DM	CH	BO	DM
1505	1500	1415	1335	1420	1125	1210	1145

Time Fed (day):

0

1

2

3

4

5

6

morning:

0830

0840

0840

0815

0915

1020

midday:

1200

1145

1205

1150

1230

1300

evening:

1550

1605

1600

1550

1630

1505

1605

Comments: BO 08 10/10/17

Drying Oven Info

Tare wt. Initials/Date: SG 10/10/17Date/Time in: 10/10/17 1210Date/Time out: 10/11/17 1235Temp (°C): 63.1QC Check: CH 10/12/17Final Review: KP 10/10/17

Freshwater Chronic Bioassay

Larval Fish Weights

Client: SnoqualmieTest Species: Pimephales promelasSample ID: EffluentStart Date/Time: 10/3/2017 1505Test No.: 1710-S001End Date/Time: 10/10/2017 1145

Conc. (__%__)	Rep.	pan weight (mg)	pan + fish weight (mg)	organism weight (mg)
Lab Control	a	33.76	36.77	3.01
	b	31.18	34.57	3.39
	c	30.32	33.95	3.63
	d	30.73	34.29	3.56
2.4	a	31.36	35.43	4.07
	b	30.25	33.74	3.49
	c	31.46	35.07	3.61
	d	31.17	34.81	3.64
12.5	a	32.24	36.01	3.77
	b	31.27	34.36	3.09
	c	32.15	35.82	3.67
	d	27.33	31.07	3.74
33.3	a	32.58	36.65	4.07
	b	31.24	35.09	3.85
	c	30.64	34.39	3.75
	d	31.43	35.63	4.20
50	a	32.90	36.96	4.06
	b	31.89	35.95	4.06
	c	31.71	35.71	4.00
	d	30.70	34.68	3.98
100	a	31.34	35.29	3.95
	b	30.44	34.35	3.91
	c	29.96	33.97	4.01
	d	31.51	35.43	3.92
	a			
	b			
	c			
	d			

Tech Initials:

SG

SG

Date/Time:

10/10/2017 0910

10/11/2017 1235

QC Check: CH 10/12/17Final Review: PR 10/16/17

Freshwater Chronic Bioassay

Client: Snoqualmie
 Sample ID: Effluent
 Test No: 1710-S001

Concentration	Lab Control (MHSW)							
Day	0	1	2	3	4	5	6	7
	Initial							
pH	7.54	7.77	7.51	7.61	7.42	7.63	7.51	
DO (mg/L)	7.8	7.5	7.5	7.2	7.6	7.4	7.7	
Cond. (µmhos/cm)	315	312	316	308	320	316	295	
Temp (°C)	24.4	25.4	24.9	25.3	24.5	24.5	24.8	
	Final							
pH		7.81	7.53	7.64	7.66	7.68	7.51	7.66
DO (mg/L)		7.0	6.8	6.6	6.6	6.8	6.8	6.9
Temp (°C)		24.8	24.9	24.6	24.4	24.4	24.8	24.8

Concentration	2.40%							
Day	0	1	2	3	4	5	6	7
	Initial							
pH	7.60	7.45	7.54	7.63	7.43	7.64	7.51	
DO (mg/L)	7.8	7.6	7.4	7.3	7.6	7.5	7.9	
Cond. (µmhos/cm)	318	316	319	312	311	320	301	
Temp (°C)	24.4	24.8	24.8	25.3	24.5	24.5	24.8	
	Final							
pH		7.80	7.66	7.69	7.68	7.69	7.58	7.69
DO (mg/L)		6.9	6.7	6.5	6.4	6.7	7.0	6.8
Temp (°C)		25.4	25.1	25.2	24.3	24.5	24.8	25.0

Concentration	12.50%							
Day	0	1	2	3	4	5	6	7
	Initial							
pH	7.62	7.74	7.55	7.62	7.46	7.62	7.49	
DO (mg/L)	7.8	7.6	7.6	7.3	7.6	7.5	7.8	
Cond. (µmhos/cm)	331	328	332	323	328	332	309	
Temp (°C)	24.5	24.9	24.8	25.3	24.5	24.4	24.9	
	Final							
pH		7.77	7.66	7.76	7.74	7.75	7.61	7.70
DO (mg/L)		6.6	6.6	6.7	6.7	6.7	6.8	6.7
Temp (°C)		25.7	25.2	24.8	24.5	24.6	24.7	25.0

Animal Source/Date Received: ABS / 10/3/17
 Animal Age at Initiation: 1 day
 Animal Acclimation Qualifiers (circle all that apply): Q22 / Q23 / Q24 / none
 Sample Log-in Numbers: A: 17-1067 C: 17-1074
 B: 17-1071

Comments: AQ8 10/4/17 RT @ AQ 10/10/17
 QC Check: CH 10/12/17

Water Quality Measurements

Test Species: P.promelas
 Start Date/Time: 10/3/2017 1505
 End Date/Time: 10/10/2017 1145

Concentration	33.3%							
Day	0	1	2	3	4	5	6	7
	Initial							
pH	7.64	7.78	7.5	7.63	7.46	7.60	7.48	
DO (mg/L)	7.8	7.7	7.7	7.3	7.8	7.9	8.1	
Cond. (µmhos/cm)	356	334	355	349	353	355	335	
Temp (°C)	24.6	24.9	24.8	25.3	24.4	24.3	24.8	
	Final							
pH		7.81	7.64	7.67	7.71	7.73	7.58	7.66
DO (mg/L)		6.6	6.2	6.2	6.7	6.2	6.1	6.4
Temp (°C)		25.4	25.5	25.2	24.8	25.0	25.0	25.3

Concentration	50%							
Day	0	1	2	3	4	5	6	7
	Initial							
pH	7.65	7.78	7.56	7.62	7.49	7.57	7.48	
DO (mg/L)	7.8	7.7	7.8	7.7	8.0	8.1	8.4	
Cond. (µmhos/cm)	378	380	376	372	378	374	361	
Temp (°C)	24.8	24.9	24.8	25.5	24.4	24.2	24.6	
	Final							
pH		7.92	7.78	7.86	7.82	7.91	7.75	7.78
DO (mg/L)		6.9	6.5	6.6	6.6	6.8	6.6	6.6
Temp (°C)		25.4	25.2	24.8	24.6	24.6	24.9	24.8

Concentration	100%							
Day	0	1	2	3	4	5	6	7
	Initial							
pH	7.38	7.76	7.55	7.61	7.51	7.52	7.50	
DO (mg/L)	7.9	7.8	8.0	7.6	8.3	8.6	9.0	
Cond. (µmhos/cm)	450	446	438	439	442	443	430	
Temp (°C)	24.3	25.0	24.7	25.6	24.5	24.7	24.3	
	Final							
pH		7.99	7.91	8.02	7.99	7.96	7.88	7.93
DO (mg/L)		6.7	6.6	6.7	6.7	6.7	6.7	6.6
Temp (°C)		25.6	25.0	24.8	24.4	24.4	24.8	24.9

	0	1	2	3	4	5	6	7
Analysts: Initial:	RT	RT	BO	RT	AD	ACS	BO	-
Final:	-	RT	BO	RT	AD	ACS	BO	PM
Dilutions made by:	BO	BO	BO	BO	AD	PH	BO	-
Sample Used (A, B, C):	A	A	B	B	C	C	C	-

Final Review: KTP 10/16/17

Appendix B
Sample Check-in Sheets

Nautilus Environmental
4340 Vandever Avenue
San Diego, CA 92120

Client: City of Snoqualmie
Sample ID: Effluent
Test ID No(s): 1710-S001 to -S003

NORTHWEST CLIENTS
Sample Check-In Information

Sample Description:

A: light yellow, clear, no odor, no debris
B: colorless, clear, odorless, no debris
C: light yellow, clear, no odor, no debris

Subsamples for Additional Chemistry Required:

NH3 (always required)

Other _____

Tech Initials A BO B BO C AD

COC Complete (Y/N)?

A Y B Y C Y

Filtration? Y N

Pore Size: _____

Organisms _____ or _____ Debris

Salinity Adjustment? Y N

Test: _____ Source: _____ Target ppt: _____

Test: _____ Source: _____ Target ppt: _____

Test: _____ Source: _____ Target ppt: _____

pH Adjustment? Y N

	A	B	C
Initial pH:			
Amount of HCl added:			
Final pH:			
Cl ₂ Adjustment? Y <u>N</u>			

	A	B	C
Initial Free Cl ₂ :			
STS added:			
Final Free Cl ₂ :			

Sample Aeration? Y N

	A	B	C
Initial D.O.			
Duration & Rate			
Final D.O.			

Sample (A, B, C):	A	B	C	
Log-in No. (17-xxxx):	1067	1071	1074	
Sample Collection Date & Time:	10/2/17 0800	10/4/17 0800	10/6/17 0800	
Sample Receipt Date & Time:	10/3/17 0930	10/5/17 1015	10/7/17 1100	
Number of Containers & Container Type:	1, 10L CUB	1-10L CUB	1, 10L CUB	
Approx. Total Volume Received (L):	~10L	~10L	10L	
Check-in Temperature (°C)	4.0	4.5	2.5	
Temperature OK? ¹	<u>Y</u> N	<u>Y</u> N	<u>Y</u> N	Y N
DO (mg/L)	8.6	9.2	8.7	
pH (units)	7.36	7.33	7.29	
Conductivity (µS/cm)	435	433	428	
Salinity (ppt)	0.2	0.3	0.2	
Alkalinity (mg/L) ²	75	53	62	
Hardness (mg/L) ^{2,3}	81	94	96	
Total Chlorine (mg/L)	20.02	20.02	0.04	
Technician Initials	BO	BO	AD	

Test Performed: Chronic Fathead Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: MHSW

Alkalinity: 58 Hardness or Salinity: 94

Additional Control? Y N = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: Chronic Water Flea Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: _____

Alkalinity: 59 Hardness or Salinity: 83

Additional Control? Y N = _____ Alkalinity: _____ Hardness or Salinity: _____

Test Performed: _____ Control/Dilution Water: 8:2 / Lab SW / Lab ART Other: _____

Alkalinity: _____ Hardness or Salinity: _____

Additional Control? Y N = _____ Alkalinity: _____ Hardness or Salinity: _____

Notes: ¹ Temperature of sample should be 0-6°C at receipt.

² mg/L as CaCO₃, ³ Measured for freshwater samples only, NA = Not Applicable

Additional Comments: (A) TQAS 10/5/17

QC Check: JP 10/16/17
Final Review: AL 10/24/17

Overlying Water

DI Blank: 0.0
Test Start Date: 10/3/17

Analyst: SG
Analysis Date: 10/11/17
N x 1.22

Sample ID	Nautilus ID	Sub-Sample Date	Test Day	NH ₃ -N (mg/L)	Ammonia (mg/L)
Blank Spike (10 mg/L NH ₃)		NA	NA	7.7	9.4
"A" sample	1			0.0	<0.5
"B" sample	2			0.0	<0.5
"C" sample	3			0.0	<0.5
Spike Check (10 mg/L NH ₃)		NA	NA	7.7	9.4
Sample Duplicate ^a	3	NA	NA	0.1	<0.5
Sample Duplicate + Spike ^a		NA	NA	7.9	9.6
Spike Check (10 mg/L NH ₃)		NA	NA	7.7	9.4

Acceptable Range: 0-20%

Acceptable Range: 80-120%^b

QC Sample ID	[NH ₃]	[Sample Dup]	Measured [Spike]	Nominal [Spike]	RPD	% Recovery
Blank	0.0	NA	9.4	10	NA	94
3	10.5	10.5	9.6	10	C	C

Notes: ^aUnless otherwise noted, the last sample listed on the datasheet is used for duplicate and duplicate + spike QC check.

^c Calculation not performed due to one or both values below the method detection limit.


Method Detection Limit = 0.5 mg/L

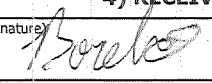
Final Review: KJP 10/16/17

Appendix C
Chain-of-Custody Forms

Date 10-2-17 Page 1 of 1

Sample Collection By: <u>Lyle Beach</u>							ANALYSES REQUIRED										Receipt Temperature (°C)			
Report to: Company <u>City of Snoqualmie</u> Address <u>38190 SE STEARNS RD</u> City/State/Zip <u>Snoqualmie, WA 98065</u> Contact <u>Lyle Beach</u> Phone <u>425-888-4153</u> Email <u>lbeach@ci.snoqualmie.wa.us</u>				Invoice To: Company <u>City of Snoqualmie</u> Address <u>P.O. Box 987</u> City/State/Zip <u>Snoqualmie, WA 98065</u> Contact <u>Tom Holmes</u> Phone <u>425-766-1210</u> Email <u>tholmes@ci.snoqualmie.wa.us</u>			Fathead Minnow	Water Flea												
SAMPLE ID	DATE	TIME	MATRIX	CONTAINER TYPE	NO. OF CONTAINERS	COMMENTS														
1 <u>SNOG001</u>	<u>10-2-17</u>	<u>8:00a</u>	<u>W</u>	<u>Cube</u>	<u>1</u>	<u>chronic Toxicity</u>	✓	✓												
2																				
3																				
4																				
5																				
6																				
7																				
8																				
9																				
10																				

PROJECT INFORMATION		SAMPLE RECEIPT		1) RELINQUISHED BY (CLIENT)		2) RECEIVED BY (COURIER)	
Client:		Total No. of Containers	<u>1</u>	(Signature)		(Time)	<u>8:27a</u>
PO No.:		Received Good Condition?	<u>Y</u>	(Printed Name)	<u>Lyle Beach</u>	(Date)	<u>10-2-17</u>
Shipped Via:		Matches Test Schedule?	<u>Y</u>	(Company)	<u>City of Snoqualmie</u>	(Company)	

SPECIAL INSTRUCTIONS/COMMENTS:				3) RELINQUISHED BY (COURIER)		4) RECEIVED BY (LABORATORY)	
				(Signature)	(Time)	(Signature)	(Time)
				(Printed Name)	(Date)	(Printed Name)	(Date)
				(Company)		(Company)	
							<u>0950</u>
						<u>Barbara Okeke</u>	<u>10/3/17</u>
						<u>Nautilus Environmental</u>	

Additional costs maybe required for sample disposal or storage.
Payment Net 30 unless otherwise contracted.

www.nautilusenvironmental.com

DISTRIBUTION: WHITE - Nautilus Environmental, COLOR - Originator

Nautilus ID: 17-1067

Temp: 4.0°C



Date 10-4-17 Page 1 of 1

Lyle Beach

Receipt Temperature (°C)

Email

City of Snoqualmie
38190 SE Stearns RD
Snoqualmie, WA 98065
Lyle Beach
425-888-4153
lbeach@ci.snoqualmie.wa.w

Email

City of Snoqualmie
P.O. Box 987
Snoqualmie, WA 98065
Tom Holmes
425-866-1210
Tholmes@ci.snoqualmie.wa.wy

Feathered Minnow

Water Flea

COMMENTS

Chronic Toxicity

☒

4.5

2) RECEIVED BY (COURIER)

1

Y

(Company)

Lytle Beach

10-4-15

city of Snogvalme

4) RECEIVED BY (LABORATORY)

(Company)

(Signature) Alvin G.

1015

(Printed Name) Claire Gonzalez

10/5/17

Company) Nay. Klu

NATURAL ID: 17-1271



**Additional costs maybe required for sample disposal or storage.
Payment Net 30 unless otherwise contracted.**

10:17-1074

Appendix D
Qualifier Code Glossary

Glossary of Qualifier Codes:

- Q1 - Temperatures out of recommended range; corrective action taken and recorded in Test Temperature Correction Log
- Q2 - Temperatures out of recommended range; no action taken, test terminated same day
- Q3 - Sample aerated prior to initiation or renewal due to dissolved oxygen (D.O.) levels below 6.0 mg/L
- Q4 - Test aerated; D.O. levels dropped below 4.0 mg/L
- Q5 - Test initiated with aeration due to an anticipated drop in D.O.
- Q6 - Airline obstructed or fell out of replicate and replaced; drop in D.O. occurred
- Q7 - Salinity out of recommended range
- Q8 - Spilled test chamber/ Unable to recover test organism(s)
- Q9 - Inadequate sample volume remaining, 50% renewal performed
- Q10 - Inadequate sample volume remaining, no renewal performed
- Q11 - Sample out of holding time; refer to QA section of report
- Q12 - Replicate(s) not initiated; excluded from data analysis
- Q13 - Survival counts not recorded due to poor visibility or heavy debris
- Q14 - D.O. percent saturation was checked and was $\leq 110\%$
- Q15 - Did not meet minimum test acceptability criteria. Refer to QA section of report.
- Q16 - Percent minimum significant difference (PMSD) was below the lower bound limit for acceptability. This indicates that statistics may be over-sensitive in detecting a difference from the control due to low variability in the data set.
- Q17 - Percent minimum significant difference (PMSD) was above the upper bound limit for acceptability. This indicates that statistics may be under-sensitive in detecting a difference from the control due to high variability in the data set.
- Q18 - Incorrect Entry
- Q19 - Illegible Entry
- Q20 - Miscalculation
- Q21 - Other (provide reason in comments section)
- Q22 - Greater than 10% mortality observed upon receipt and/or in holding prior to test initiation. Organisms acclimated to test conditions at Nautilus and ultimately deemed fit to use for testing.
- Q23 - Test organisms received at a temperature greater than 3°C outside the recommended test temperature range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.
- Q24 - Test organisms received at salinity greater than 3 ppt outside of the recommended test salinity range. However, due to age-specific protocol requirements and/or sample holding time constraints, the organisms were used to initiate tests upon the day of arrival. Organisms were acclimated to the appropriate test conditions upon receipt and prior to test initiation.