		State of Washington Department of Ecology WASTEWATER TREATMENT PLANT COMPLIANCE INSPECTION REPORT			Northwest Regional Office 3190160 th Ave SE Bellevue, WA 98008 ph: (425) 649-7000 fax: (425) 649-7098 (rev. 9-15-15)	
Section A: General Information						
Report Version	PERMIT #	mm/dd/yy	Inspection Type	Inspector Code	Facility Type	
<input checked="" type="checkbox"/> New <input type="checkbox"/> Changed <input type="checkbox"/> Deleted	WA0029548	7/8/2019	S	S	<input checked="" type="checkbox"/> 1 Municipal <input type="radio"/> Public <input type="radio"/> Private	
Remarks						
Inspection work days	Facility Self-Monitoring	Photos Taken	Samples Taken	BI	QA	
2.5	4	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	F	N	
Lead Ecology Inspector(s) Lazaro Eleuterio, PE.						
Section B: Facility Data						
Name, Location, and Phone of Facility Inspected Snohomish Wastewater Treatment Plant 2115 2 nd Street Snohomish, WA 98290				Entry Time	Permit Effective Date	
				8:31 AM	07/01/2018	
Name(s)/Title(s) of On-Site Representative(s) Duane Leach, Senior Wastewater Treatment Plant Operator				Exit Time	Permit Expiration Date	
				10:46 AM	06/30/2023	
Name, Address, Title, Phone, and Fax Number of Responsible Official Steve Schuller, City Administrator City of Snohomish 116 Union Avenue Snohomish, WA 98291 Phone Number 360-568-3115 E-mail _____				Ecology Staff On-Site Lazaro Eleuterio, NPDES Permit Manager		
Other Facility Data Dual Powered Aerated Lagoon Augmented with Integrated Fixed-Film Media System, Chlorine Disinfection to Snohomish River; CSO				Contacted? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		
Section C: Areas Evaluated During Inspection (Check only those areas evaluated)						
<input checked="" type="checkbox"/> Permit	<input checked="" type="checkbox"/> Flow Measurement	<input checked="" type="checkbox"/> Operations & Maintenance	<input checked="" type="checkbox"/> CSO/SSO (Sewer Overflow)			
<input type="checkbox"/> Records/Reports	<input checked="" type="checkbox"/> Effluent <input type="radio"/> Receiving Water	<input checked="" type="checkbox"/> Sludge Handling/Disposal	<input type="checkbox"/> Pollution Prevention			
<input checked="" type="checkbox"/> Facility Site Review	<input type="checkbox"/> Compliance Schedules	<input type="checkbox"/> Pretreatment	<input type="checkbox"/> Multimedia			
<input checked="" type="checkbox"/> Self-Monitoring Program	<input type="checkbox"/> Laboratory	<input type="checkbox"/> Storm Water	<input type="checkbox"/> Other			

Section D: Summary of Findings/Comments

I. INTRODUCTION

A NPDES Class I Inspection was conducted at the City of Snohomish Wastewater Treatment Plant (WWTP) on July 8, 2019. Lazaro Eleuterio (Municipal Permit Manager) with the Washington State Department of Ecology conducted the inspection with assistance from Mr. Duane Leach. This was an announced inspection to assure that a key facility contact was available.

The City owns, operates and maintains a four-stage lagoon system followed by gravity sand filtration and chlorination prior to discharge to the Snohomish River. In 2012, the lagoon system was retrofitted with submerged fixed-film (SFF) media to improve nitrification. Further discussion on the treatment processes is provided below.

The purpose of this inspection was to fulfill the NPDES Class I compliance inspection requirements by conducting a site inspection, assessing flow measurements and evaluating compliance with the permit requirements. The facility is regulated by Permit No. WA0029548 (Permit), issued on May 21, 2018. The permit expires on June 30, 2023.

II. RESULTS AND DISCUSSION

Collection System:

The collection system serves a population of over 10,000 people and local businesses within the City's boundaries. The system consists of a small area of combined sewers along with a larger area of separate sanitary sewers. The system has two CSO outfalls in the Snohomish River, 40,000 feet of sewer lines in the combined sewer area and 130,000 feet of lines in the separated area. The collection system includes 15 pump stations, force mains, and sewer pipes. The City has a grease ordinance with inspections and enforcement.

The combined sewer system is confined to 325 acres in the historic downtown area with two overflow outfalls (CSOs) that discharge untreated wastewater directly to the Snohomish River whenever rainfall causes flow to exceed the sewer system's capacity. According to the 2014 Combined Sewer Overflow Management Plan (CSO Management Plan) prepared by BHC Consultants LLC, both CSO outfalls were determined to have met the performance standard based on review of historical data and were projected to continue to be in compliance into the future, based on hydraulic modeling using historical rainfall data.

In 2019, the City completed an I/I analysis based on the EPA Guidelines for an I/I Evaluation. The results of the analysis determined that the estimated infiltration rate into the system is not excessive. However, the estimate inflow rate into the system was determined to be excessive. The City is in the process of separating the storm and sanitary sewers within the combined sewer service area along Avenue F, which is tributary to Combined Sewer Outfall #1 (CSO #1). This project is estimated to reduce total inflow by approximately 6%. The City also is planning to further separate of the storm and sanitary sewers in the drainage areas tributary to both CSO #1 and #2.

Liquid Stream:

Raw sewage from the fifteen lift stations in the service area flows through a Parshall Flume equipped with ultrasonic flowmeter for flow measurement (Photo # 1), pumped by influent screw pumps (Photo # 2) and then screened by a ¼ inch mechanically cleaned bar screen (Photos # 3 and # 4). One 1/2-inch manual bypass bar screen (Photo # 5) is available for emergency, and in case of maintenance and inspection of the mechanical screen. After screening, wastewater flows into a grit chamber and then flows by gravity to the four-stage lagoon system. Magnesium hydroxide is flow-paced injected into the dewatered wastewater for alkalinity and pH control purposes (Photo # 6).

Dewatered wastewater flows by gravity to the completely mixed aerated Lagoon # 1 (Photo # 7) with a total capacity of 10 million gallons and equipped with eighteen mechanical mixers/aerators. Following Lagoon # 1, wastewater flows through three partially-mixed lagoons in series with a total treatment capacity of 3.5 million gallons. Each partially-mixed lagoon (Lagoons #2, #3 and #4) is equipped with 18 integrated submerged fixed film (SFF) modules for further BOD removal and nitrification (Photos # 8, # 9, and # 10), and three mechanical mixers/aerators. The SFF modules are air scoured by coarse bubble diffusers weekly to remove excess biofilm. In the winter, only half of the WWTP's aerators are typically running. Conversely, in the summer, all aerators are ON at all times.

A portion of Lagoon # 4 effluent (approximately 1 MGD) flows to an effluent control structure and then to four Parkson DynaSand® EcoWash® continuous-backwash sand filters (Photos # 12 and # 13), which allow continuous filtration with intermittent sand washing. Therefore, filters are not shut down during backwashing. The primary purpose of the sand filters is to enhance TSS removals, particularly during dry weather conditions. The City has interest in expanding and upgrading the capacity of the filtration facility in the future; however, it has not determined which filtration technology would be suitable for the City of Snohomish WWTP yet. Air compressors are used for backwashing purpose (Photo # 14).

The remainder of the Lagoon #4 effluent and the effluent from the sand filters are combined in a wet well (Photo # 15) and then pumped to the chlorine contact basin (Photo # 16) for disinfection prior to discharge to the Snohomish River. An effluent structure is used to control discharge flows downstream of the chlorine contact chamber. Sulfur dioxide gas is used for dechlorination.

Solids Stream:

Screenings, rags and grit are dewatered, compacted and then discharged to a dumpster (Photo # 17). Captured grit passes through a grit classifier prior to being discharged to the dumpster, which is furnished with plastic bags. Waste activated sludge (WAS) is stabilized and stored in the four-stage lagoon system. The last time solids were dredged from the lagoons was in 2015. Approximately 697 dry tons of solids were removed and sent to BUF Cascade Materials for land application. The next biosolids dredging project may take place in 2025 or later. Biosolids survey is conducted every year to determine the level of biosolids accumulation in the lagoons and to plan for future dredging.

Sampling:

Both influent and effluent composite samplers were inspected. The composite influent sample (Photo # 18) and composite effluent sample (Photo # 19) have been refrigerated at 4.8° C and 5.1° C, respectively. Both temperature values meet the Standard Methods requirement for BOD (SM5210-B) and TSS (SM2540-D) analyses, which is sample storage and preservation between 2° and 6 °C. At the time of the inspection, the influent sampler indicated in the monitoring/control panel that sampling tube needs to be replaced.

Flow Measurement:

Influent flow is measured at the headworks using an ultrasonic flowmeter above a Parshall Flume (Photo # 1). Effluent flow is measured downstream of the chlorine contact basin using an ultrasonic flowmeter mounted above a weir. Lagoon # 4 is equipped with a flowmeter and a weir at the final effluent. Influent and effluent flowmeters are calibrated once a year as part of the plant's preventative maintenance program per manufacturer's recommendations. The last calibration was conducted on June 10, 2019.

Alarms/Backup Power:

Two standby generators are used to power the plant and the laboratory during power outages. The old generator (Photo # 20) with a capacity of 350 Kilowatts can power Lagoon # 1, headworks and the laboratory. The new generator (Photo # 21) with a capacity of 300 Kilowatts can power Lagoons # 2, 3 and 4; blowers, sand filters and chlorine disinfection system. Generators are exercised once a week for one hour.

Staffing:

Currently, the City of Snohomish WWTP is staffed with one Group II senior operator, a Group II laboratory specialist, and one Group I maintenance operator. The plant is staffed from 7:00 A.M. to 3:30 P.M. Monday through Friday. During the week, there is one person on standby and after-hours and weekends are covered by one operator on-call. The City uses rotation among the three operators to provide coverage on weekends.

Records and Laboratory Review:

The laboratory records were not reviewed during this inspection. A copy of the current permit and fact sheet, and O&M manual were on site and available.

Operation and Maintenance:

Daily checks of all major equipment and treatment processes are conducted and information is logged. At headworks, screw pumps and screens are inspected and greased weekly. Mechanical bar screen and channels are washed down with hose weekly or as needed. The manual bar screen can be placed in service every time the mechanical bar screen is placed offline for emergencies and maintenance services.

Typically, the plant can be operated with one screw pump on duty and two on standby under normal operating conditions. Under wet weather conditions, there are two pumps available but with limited redundancy with screening process.

Lagoon # 1 is furnished eighteen mechanical mixers, and pH and DO probes. A SCADA system is used to monitor and control mixing, and oxygen, pH and alkalinity levels. Typically, in the summer months, all mixers are ON at all times. However, in the winter, due to lower oxygen demands, only six mixers are needed and rotation is applied using the SCADA system. Lagoons # 2, 3 and 4 are equipped with an ultrasonic unit (Sonic Solutions) to control algae growth without chemicals (Photo # 11). These units are ON at all times throughout spring and summer months (May through September), which is when most of the algal blooms occur at the facility. Plant staff is satisfied with this method to control algae and improve TSS removals.

The City has replaced seven existing mechanical mixers in Lagoon # 1 with high-energy efficiency mechanical mixers in the last years. The City is planning to replace the remainder in the next years to reduce operating costs. Mechanical mixers in

the lagoon system are cleaned and inspected, as needed. DO and pH probes in the entire lagoon system are inspected and cleaned, as needed.

Air is supplied to the four-stage lagoon system using three positive displacement blowers (Photo # 22). During summer, there are two blowers on duty and one standby. During winter, only one blower is needed and automatic rotation is scheduled for every seven days. Rotation schedule is programmed via SCADA. Blowers are checked daily, and oil and filter are changed as needed.

Even though the sand filters are continuously backwashed, they still get clogged. As a result, the City is not satisfied with the filters' performance and has conducted a one-month pilot testing with a mobile Fuzzy Filter in 2018. Fuzzy filters are well known for being compact, modular and suitable for a variety of wastewater applications. The purpose of the pilot testing was evaluate the performance of different filtration method and assist the City's decision-making with regards to the best alternative to upgrade and expand its filtration treatment facilities. At this time, the City has not made a decision related to this issue.

Every summer, flows from Lagoon #4 are shut off so that the chlorination and sand filters facilities can be inspected, cleaned and properly maintained. Specifically, the chlorine contact basin is drained for a deep cleaning. Additionally, all ancillary equipment from both facilities are inspected and maintained. This year, the maintenance of the sand filters and chlorine contact basin is scheduled for the end of July.

Chlorine disinfection system has a low residual alarm and a vacuum low alarm to indicate when there is no chlorine flow. The chlorine system has only one pump. If the pump fails, the system must be shut down until the pump is placed back in service or replaced. At the time of this inspection, the chlorine contact basin was completely covered with duckweeds (Photo # 23). Ecology has a concern that the high concentration of duckweeds may deteriorate the capacity of the final effluent to be properly disinfected.

The City submitted the design documents and specifications for the Peracetic Acid Disinfection System project for Ecology review and approval in June 2019. This project is expected to be completed by July 31, 2020.

III. RECOMMENDATIONS

1. Change sampling tube of the influent composite sampler as currently indicated by the equipment.
2. Control algae and duckweed growth in the chlorine contact basin during spring and winter.

IV. CONCLUSIONS

Overall, the facility is well operated and maintained, and the final effluent looked clear (Photo # 24) at the time of this inspection. Please contact Lazaro Eleuterio (425-649-7027) with permit related questions, Carl Jones (360-407-6431) with operation-related questions, Amy Jankowiak (425-649-7195) with compliance-related questions, and Amber Corfman (360-594-6407; amber.corfman@ecy.wa.gov) with biosolids-related questions.

IV. ACKNOWLEDGEMENTS

The author of this inspection report wants to thank Mr. Leach for the tour at the City of Snohomish WWTP and the discussions regarding the facility's operation and maintenance.

Copies to:

Duane Leach, Senior WWTP Operator, City of Snohomish
Lazaro Eleuterio, Municipal Facility Manager, Ecology NWRO; e-copy
Amy Jankowiak, Municipal Compliance, Ecology NWRO, e-copy
Carl Jones, Outreach Operator Trainer, Ecology SWRO, e-copy
Central Files: City of Snohomish WWTP; WA-0029548; WQ 6.1

Name(s) and Signatures of Inspector(s)	Agency/Office/Telephone	Date
Lazaro Eleuterio, P.E. <i>Lazaro Eleuterio</i>	WA Dept. of Ecology, NWRO, (425)649-7027	7.10.2019
Name and Signature of Management QA Reviewer	Agency/Office/Telephone	Date
Laura Fricke, P.E., Municipal Unit Supervisor <i>Laura Fricke</i>	WA Dept. of Ecology, NWRO, (425)649-7103	7/10/19

ANNOUNCED Inspection

Appendix A

Compliance Inspection Report Form

INSTRUCTIONS

Section A: General Information

Report Version: N for 1st version, C for Changed or amended, or D for Delete

NPDES Permit No.: Enter the facility's NPDES or State permit number.

Inspection Date: Insert the date entry was made into the facility. Use the month/day/year format (e.g., 06/30/04 = June 30, 2004).

Inspection Type: Use one of the codes listed below to describe the type of inspection:

A Performance Audit	L Enforcement Case Support	2 IU Sampling Inspection
B Compliance Biomonitoring	M Multimedia	3 IU Non-Sampling Inspection
C Compliance Evaluation (non-sampling)	P Pretreatment Compliance Inspection	4 IU Toxics Inspection
D Diagnostic	R Reconnaissance	5 IU Sampling Inspection with Pretreatment
E Corps of Engineers Inspection	S Compliance Sampling	6 IU Non-Sampling Inspection with pretreatment
F Pretreatment Follow-up	U IU Inspection with Pretreatment Audit	7 IU Toxics with Pretreatment
G Pretreatment Audit	X Toxics Inspection	
I Industrial User (IU) Inspection	Z Sludge	

Inspector Code: Use one of the codes listed below to describe the *lead agency* in the inspection:

C - Contractor or Other Inspectors (Specify in Remarks Columns)	N - NEIC Inspectors
E - Corps of Engineers	R - EPA Regional Inspector
J - Joint EPA/State Inspectors - EPA Lead	S - State Inspector
	T - Joint State/EPA Inspectors - State Lead

Facility Type: Use one of the choices below to describe the facility.

- 1 - Municipal. Publicly Owned Treatment Works (POTWs) with 1987 Standard Industrial Code (SIC) 4952.
- 2 - Industrial. Other than municipal, agricultural, and Federal facilities.
- 3 - Agricultural. Facilities classified with 1987 SIC 0111 to 0971.
- 4 - Federal. Facilities identified as Federal by the EPA Regional Office

Remarks: These columns are reserved for remarks.

Inspection Work Days.: Estimate the total work effort (to the nearest 0.1 work day), up to 99.9 days, that were used to complete the inspection. This estimate includes the accumulative effort of all participating inspectors; any effort for laboratory analyses, testing, travel time and preparation time. This estimate does not require detailed documentation.

Facility Evaluation Rating: Use information gathered during the inspection (regardless of inspection type) to evaluate the quality of the facility self-monitoring program. Grade the program using a scale of 1 to 5 with a score of 5 being used for very reliable self-monitoring programs, 3 being satisfactory, and 1 being used for very unreliable programs.

Biomonitoring Information. Enter D for static testing. Enter F for flow through testing. Enter N for no biomonitoring.

Quality Assurance Data Inspection. Enter Q if the inspection was conducted as follow-up on quality assurance sample results. Enter N otherwise.

Photos Taken: Yes or No

Samples Taken: Yes or No

Lead Ecology Inspector: Enter lead inspector's name

Section B: Facility Data

This section is self-explanatory except for: "Other Facility Data," which may include new information not in the permit or PCS (e.g., new outfalls, names of receiving waters, new ownership, and other updates to the record), e-mail addresses...; and "Ecology Staff On-Site", which may include staff names, titles, phone numbers, or e-mail addresses.

Section C: Areas Evaluated During Inspection

- Check only those areas evaluated by marking the appropriate box. Use Section D and additional sheets as necessary.

Section D: Summary of Findings/Comments

Support the findings, as necessary, in a narrative report. Use the headings given on the report form (staffing, back-up power) as appropriate. Reference a list of attachments, such as completed checklists, photos, lab reports, etc. Use extra sheets as necessary.

LINKS AND INFORMATION:

"Informational Manual for Treatment Plant Operators"; February 2004; by the Department of Ecology

Publication Number 04-10-020: <http://www.ecy.wa.gov/pubs/0410020.pdf>

The manual was prepared to help wastewater treatment plant operators complete and submit their Discharge Monitoring Reports (DMRs) and other annual reports to the Department of Ecology. The manual is available in hard copy. To request a copy, contact the Department of Ecology, Publications Distribution Center at P.O. Box 47600, Olympia, WA 98504-7600 or by Telephone: (360) 407-7472. Updates to the manual are included on the website version.

Ecology's Wastewater and Reuse website:

<http://www.ecy.wa.gov/programs/wq/wastewater/index.html>

Ecology's Operator Certification website:

http://www.ecy.wa.gov/programs/wq/wastewater/op_cert/index.html

Ecology's Laboratory Accreditation website:

http://www.ecy.wa.gov/programs/eap/labs/labs_main.html

Ecology's Biosolids website:

<http://www.ecy.wa.gov/programs/swfa/biosolids/>

Ecology's Operator Outreach:

Carl Jones (360) 407-6431; carl.jones@ecy.wa.gov

Ecology's Municipal Compliance Specialist (Northwest Regional Office):

Amy Jankowiak (425) 649-7195; amy.jankowiak@ecy.wa.gov

Ecology's Wastewater Operator Certification Coordinator:

Poppy Carre (360) 407-6449; 1-800-633-6193 (within the state); poppy.carre@ecy.wa.gov

Ecology's Biosolids Coordinator:

Amber Corfman 360-594-6407; amber.corfman@ecy.wa.gov

Reporting Spills/Overflows/Upsets/Bypasses/Loss of Disinfection IMMEDIATELY:

Ecology's 24-hour number: (425) 649-7000 to report a spill

Department of Health – Shellfish Program: (360) 236-3330 (business hours) or (360) 789-8962 (after hours)

Inspection Photos – City of Snohomish WWTP WA0029548
Photos taken on 07/08/2019 by Lazaro Eleuterio



Photo 1 – Influent Parshall Flume and Ultrasonic Flowmeter



Photo 2 – Influent Screw Pumps



Photo 3 – 1/4-inch Mechanical Bar Screen



Photo 4 – Mechanical Bar Screen (Detail)

Inspection Photos – City of Snohomish WWTP WA0029548

Photos taken on 07/08/2019 by Lazaro Eleuterio



Photo 5 – Bypass Manual Bar Screen



Photo 6 – Magnesium Hydroxide Injection Pipe (Smaller Pipe)

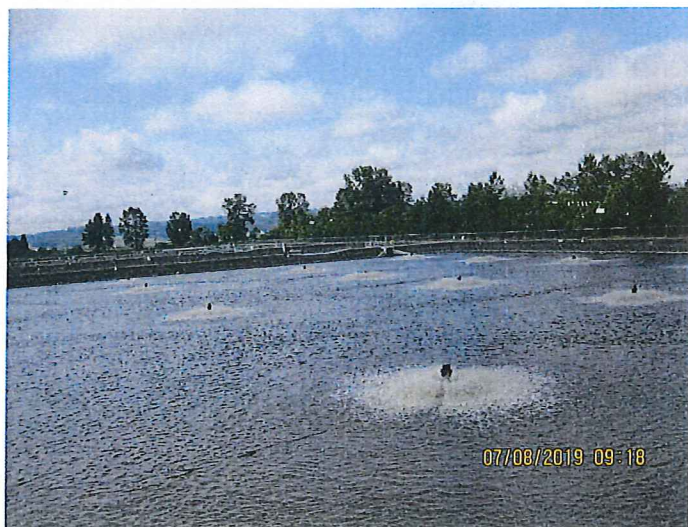


Photo 7– Lagoon # 1 and Mechanical Mixers/Aerators



Photo 8 – Lagoon # 2 and Partial View of the SFF Modules

Inspection Photos – City of Snohomish WWTP WA0029548
Photos taken on 07/08/2019 by Lazaro Eleuterio

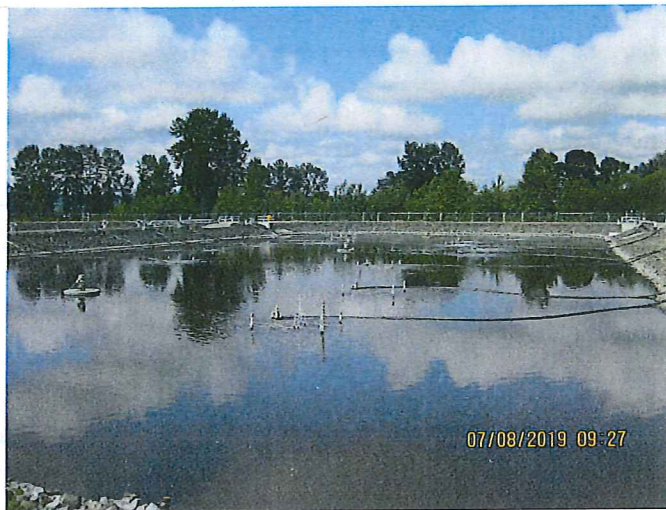


Photo 9 – Lagoon # 3

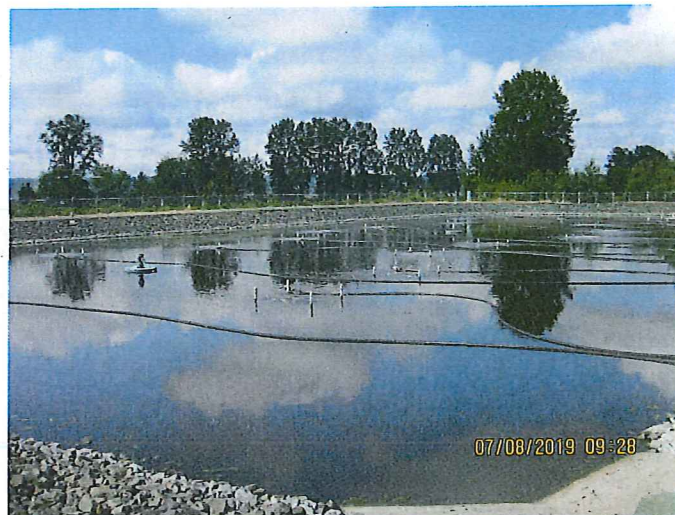


Photo 10 – Lagoon # 4



Photo 11 – Ultrasonic Unit for Algae Control (Lagoon # 3)



Photo 12 – DynaSand Filtration System

Inspection Photos – City of Snohomish WWTP WA0029548
Photos taken on 07/08/2019 by Lazaro Eleuterio

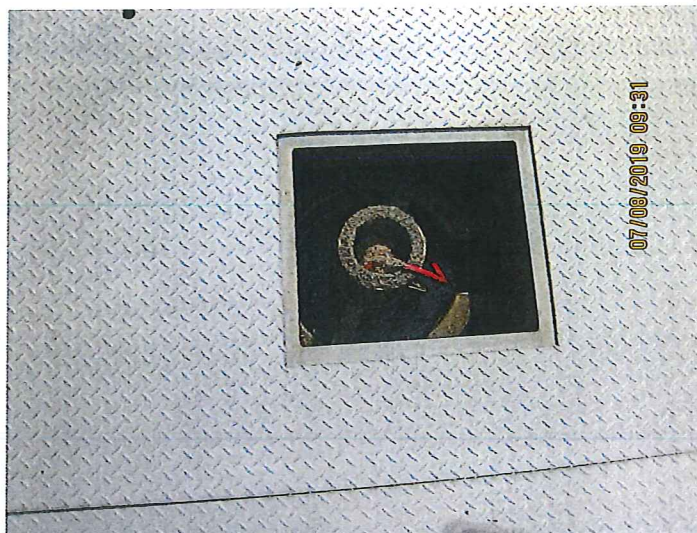


Photo 13 – Sand Filter (Detail)



Photo 14 – Air Compressors for the Filtration System



Photo 15 – Wet Well for Lagoon # 4's and Sand Filters' Effluent



Photo 16 – Chlorine Contact Basin



Photo 17 – Dumpster with Screenings, Rags and Grit

Inspection Photos – City of Snohomish WWTP WA0029548
Photos taken on 07/08/2019 by Lazaro Eleuterio

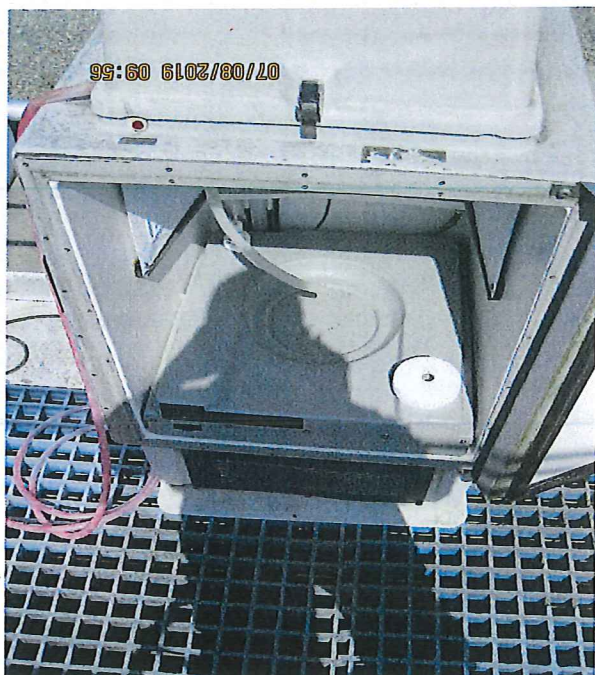


Photo 18 – Influent Composite Sampler



Photo 19 – Effluent Composite Sampler

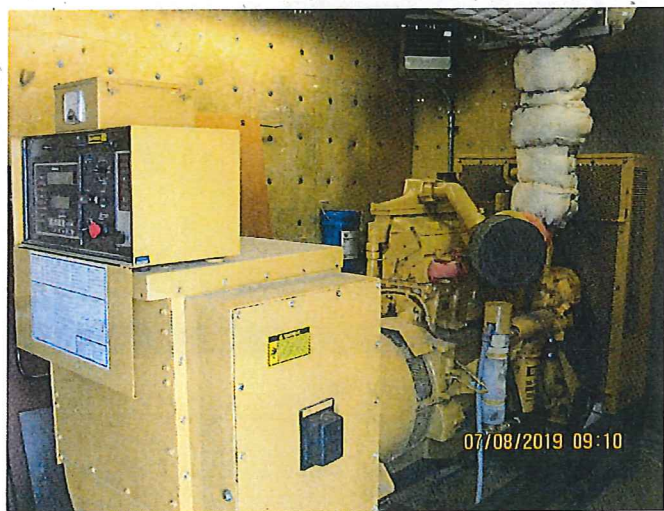


Photo 20 – Old Backup Power Generator



Photo 21 – Newer Backup Power Generator

Inspection Photos – City of Snohomish WWTP WA0029548
Photos taken on 07/08/2019 by Lazaro Eleuterio



Photo 22 – Positive Displacement Aeration Blowers



Photo 23 – Duckweed Growth in the Chlorine Contact Basin .



Photo 24 – Final Effluent