

	State of Washington Department of Ecology WASTEWATER TREATMENT PLANT COMPLIANCE INSPECTION REPORT		Northwest Region Office 15700 Dayton Ave N Shoreline, WA 98133 206-594-0000 ph 206-366-7810 fax (last update 7-6-2021)
	Section A: General Information		

Report Version <input checked="" type="checkbox"/> New <input type="checkbox"/> Changed <input type="checkbox"/> Delete	PERMIT # WA0032182	mo/day/yr 09/08/2023	Inspection Type C	Inspector Code S	Facility Type <input checked="" type="checkbox"/> 1 Municipal <input type="checkbox"/> Public <input type="checkbox"/> Private
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Remarks

Non-Sampling Facility Inspection

Inspection workdays 1.0	Facility Self-Monitoring 4	Photos Taken <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Samples Taken <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	BI N	QA N
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Lead Ecology Inspector(s)

Sean Wilson and Greg Lipnickey

Section B: Facility Data

Name, Location, and Phone of Facility Inspected King County – Carnation Wastewater Treatment Plant 4405 Larson Ave, Carnation WA 98014		Entry Time 9:30 AM	Permit Effective Date 09/24/2021
		Exit Time 12:30 PM	Permit Expiration Date 10/31/2026
Name(s)/Title(s) of On-Site Representative(s) Chapin Brackett (WTD Manager – Process & Environmental Compliance) Rachel Dyda (Process Supervisor/Chief Process Analyst) Matt McDonald (Process Engineer) Norm Cook (East Offsite Manager) Dustin Harris (East Offsite Supervisor) Tyler Stiltner (Operator) Wade Shaw (Operator)		Ecology Staff On-Site Sean Wilson, Greg Lipnickey	
Name, Address, Title, Phone, and Fax Number of Responsible Official Christie True, Director DNR and Parks 201 S Jackson St KSC-NR-0700 Seattle, WA 98104 Phone Number (206) 296-6500 Fax		Other Facility Data	
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 type="checkbox"/> CSO/SSO (Sewer Overflow)
<input checked="" type="checkbox"/> Records/Reports	<input checked="" type="checkbox"/> Effluent <input type="checkbox"/> 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 checked="" type="checkbox"/> Laboratory	<input checked="" type="checkbox"/> Storm Water	<input type="checkbox"/> Other

Section D: Summary of Findings/Comments

I. INTRODUCTION

The Department of Ecology conducted a compliance inspection at King County's Carnation Wastewater Treatment Plant on September 8, 2023. Sean Wilson (the current King County Permit Manager for Ecology) led the inspection with support from Greg Lipnickey (NWRO Municipal Water Quality Enforcement Lead). King County employees Rachel Dyda, Chapin Brackett, Matt McDonald, Norm Cook, Dustin Harris, Tyler Stiltner, and Wade Shaw assisted with the inspection. The purpose of this announced inspection was to familiarize new personnel with the facility to help with permit development, to assess the permittee's self-monitoring procedures, and to evaluate compliance with permit requirements.

The Carnation Treatment Plant facility is located in the City of Carnation located in the Snoqualmie River valley. The facility was constructed by King County Wastewater Treatment Division (County) and began operation/discharging in 2008. It is designed to primarily discharge reclaimed water to the Chinook Bend Natural Area for wetland restoration but is also capable of discharging to the Snoqualmie River.

The facility is regulated by an individual National Pollution Discharge Elimination System (NPDES) permit #WA0032182 which was issued September 24, 2021, and is set to expire on October 31, 2026. The facility is not required to apply for Industrial Stormwater General Permit coverage as its capacity is below the 1 Million Gallons per Day (MGD) threshold.

II. RESULTS AND DISCUSSION

Collection System: The City of Carnation owns and operates a vacuum collection system for sewage collection in the City and surrounding areas. All drain lines from the City collect at receiving facility located adjacent to the County-operated treatment plant. The receiving facility sends sewage to the treatment plant at a rate of approximately 1000 Gallons per Minute (GPM) in 10–20 minute pulses making the flow into the plant intermittent. The vacuum collection system was installed around the same time as the treatment plant's construction and is a fairly new system. County operators stated that they have started to notice a small amount of flow increase during wet weather which could indicate that there is some infiltration and inflow, but it is still minor.

Control System/Alarms: Similar to the other County-operated treatment plants, all critical plant operations and alarms are monitored and/or controlled from a central control room using a supervisory control and data acquisition (SCADA) system. Changes to operational set points must be made on-site, but operators at South Plant are able to monitoring operations 24/7.

Liquid Stream: All flows received by the treatment plant enter the facility via underground piping. The facility has the capability (although it does not typically use it) to chemically dose influent flows to enhance treatment. The chemical addition system was originally designed to dose sodium hypochlorite, but theoretically can be used to dose a wide range of chemicals. After the chemical dosing vault, flows proceed to two fine rotary screens. The automated influent sampler was recently relocated to a location after the rotary screens to reduce the likelihood of clogging the sample lines.

Once screened, influent then passes through one of two identical aeration basin trains. Typically, the facility uses only one train and keeps the other empty. The empty aeration basin train is used for emergency storage or to store flows that facility does not want to immediately discharge. Most frequently, this is treated wastewater that contains residual chlorine from biannual membrane cleaning activities. Return Activated Sludge (RAS) is reintroduced immediately before the first aeration basin. The first two aeration basins in the train are not agitated and have no oxygen addition. The third and fourth basins do have oxygen injection and are currently targeting approximately 0.9-1.1 mg/L Dissolved Oxygen (DO). This set point was lowered when new nutrient limits were introduced in the permit in 2018.

There is a scum trough after the aeration basins and before the membrane trains. Operators stated that, in general, they have had issues with foaming in the aeration basins.

After the scum trough, flows are split into the five membrane trains. At any given time, the facility is typically sending flow to only two of the membrane trains (leaving three on standby or in maintenance). The whole system runs at roughly 2-4Q recycle rate. Agitation air is constantly flowing around the membranes, but there is also a periodic release of air or 'burping' that discharges larger bubbles to knock off built up solids. Membranes are also cleaned via back pulse cycles, weekly cleaning with low dose sodium hypochlorite, and biannual high concentration sodium hypochlorite soaking. All membranes were replaced in 2022 as part of the County's preventative maintenance program.

Membrane effluent, then moves into a series of pipes equipped with flow, pH, and turbidity meters. The flow meters are used to determine the require ultraviolet (UV) dosage to be applied in the subsequent UV disinfection system. The turbidity meters are used to determine if the current membrane train is working effectively while the pH reading is used to determine if effluent meets permit requirements for discharge. The whole treatment train will shut down if the pH reading is below 6.3 standard units (SU). UV disinfection itself is done with medium pressure UV bulbs that are set perpendicular to the flow. This UV bulb arrangement can be restrictive of low flow scenarios and there is a potentially a plan to replace the system in the end of 2023.

Solids generated in the treatment process, either in the screening process or during waste activated sludge (WAS) wasting, are transported to South Plant for further processing. Currently the facility generates approximately two truckloads of solids per week.

inDense Trial: The Facility is preparing to conduct a trial of the inDense™ system. This trial will take a side stream of approximately 3000 gallons of flow from Zone 4 in the aeration basin and send it through a centrifugal density separation system. The higher-density sludge is returned to the treatment system with the return activated sludge (RAS) and the expectation is that this process will improve settleability and phosphorus removal.

Staffing: Carnation's treatment plant is staffed from 5:30 AM to 2:00 PM seven days a week. They currently have two operators but will very shortly have three. All operators hold either a Level 3 or 4 operators' certificate. All operators certificate were displayed in the control room and up-to-date during the inspection.

Records Review: During the inspection, data from three Discharge Monitoring Reports (DMRs) were reviewed and compared to the available lab and process information stored/used on site. Three of the DMRs reviewed were for the facility's individual wastewater permit: July 2020, January 2022, and April 2023. No discrepancies were found between onsite and submitted

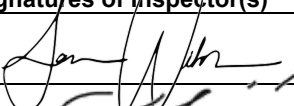


data.

Outfall: Both permitted outfalls were visited as part of the inspection. Outfall 002 (Chinook Bend Natural Area) was in good condition and had a clear access path. A thorough inspection of the entire wetland area for evidence of algae blooms or other potential impacts of effluent was not conducted. However, the immediate area near the outfall showed no evidence of impact.

The above water portion of the outfall attached to the NE Carnation Farm Road bridge across the Snoqualmie River (Outfall 001) appeared to be in good condition. County staff indicated they recently discovered that the outlet of Outfall 001 seems to be buried in roughly four feet of sediment. The County is currently investigating the best way to restore this outfall to full functionality. This outfall was recently used when residual chlorine levels at the plant exceeded what is allowed for discharge to the wetland.

III. CONCLUSION

With the exception of Outfall 001 to the Snoqualmie River, the facility is well maintained. The County is advised to continue its investigation on how to restore Outfall 001, and to keep Ecology informed of any planned operation changes related to the outfall restoration (if required). There is no evidence of spills, diversion of flows around treatment, or non-operational equipment. Staff interviewed were knowledgeable, helpful, open, and honest. Ecology found no evidence of non-compliance with any permit conditions during the inspection.

Name(s) and Signatures of Inspector(s)	Agency/Office/Telephone	Date
Sean Wilson 	WA Dept. of Ecology, NWRO, 425-577-4864	01/10/2024
Greg Lipnickey 	WA Dept. of Ecology, NWRO, 425-449-6560	01/11/2024
Name and Signature of Management QA Reviewer	Agency/Office/Telephone	Date
Shawn McKone 	WA Dept. of Ecology, NWRO, 206-549-0158	01/12/2024

ANNOUNCED Inspection**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: Shane Cooper, (360) 870-6297 (cell); shane.cooper@ecy.wa.gov

Ecology's Municipal Compliance Specialist (Northwest Regional Office): Greg Lipnickey, QEP (425) 449-6560;

greg.lipnickey@ecy.wa.gov

Ecology's Wastewater Operator Certification Coordinator: Poppy Carre; (360) 407-6449; 1-800-633-6193 (within the state);

poca461@ecy.wa.gov

Ecology's Biosolids Coordinator (Northwest Regional Office): Amber Corfman; (360) 918-4786; amber.corfman@ecy.wa.gov

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

Ecology's 24-hour number: (206) 594-0000 to report a spill

Department of Health – Shellfish Program 24-hour number: (360) 236-3330

Inspection Photos

PHOTO NO. 1

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:

Vacuum transfer station owned and operated by City of Carnation located adjacent to the treatment plant.



PHOTO NO. 2

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:

Chemical addition location prior to screening.



PHOTO NO. 3

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
Rotary screens used to remove debris from influent.



PHOTO NO. 4

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
Aeration basins (closest basin is 1).

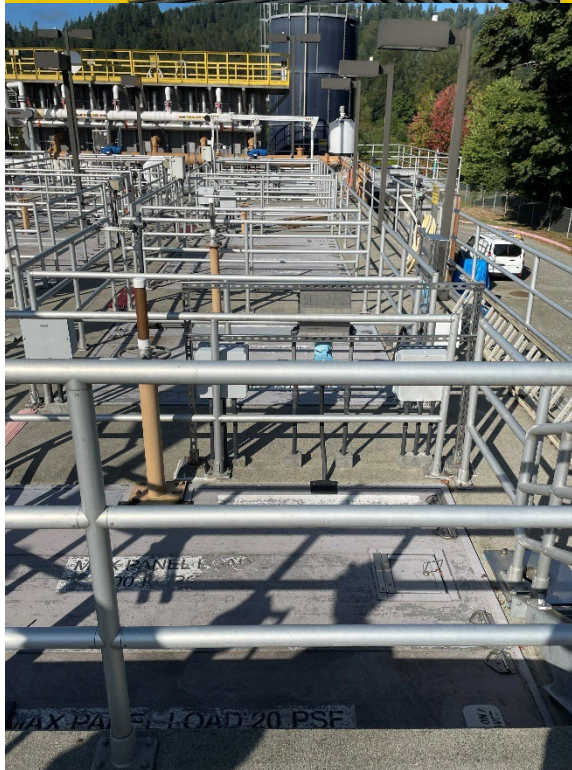


PHOTO NO. 5

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
Scum trough.



PHOTO NO. 6

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
View into one of the membrane basins.



PHOTO NO. 7

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
Turbidity meter located in membrane effluent.



PHOTO NO. 8

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
Open UV contact chamber undergoing bulb replacement.

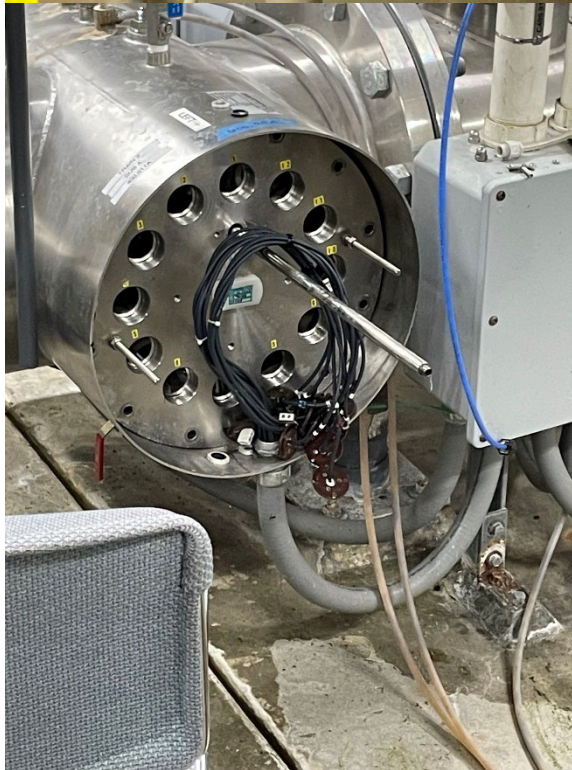


PHOTO NO. 9

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
Removed UV bulbs.



PHOTO NO. 10

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
Effluent sampling location and refrigerator.



Inspection Report

PHOTO NO. 11

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
Colorimeter calibration log for week of 08/29/23.

Hach Pocket Colorimeter Benchsheet and Validation Log

Date	Location	DI Water Blank	Sample Result	Duplicate

Date: 8/29/23 / Calibration Lab	Check Standard 1	Check Standard 2	Check Standard 3	Check Standard 4
Low Range Standard	Blank	2.4 % .09	.88 % .10	1.52 % .14
Result	0	.17	.89	1.46
High Range Standard	Blank	2.1 % .2	3.8 % .3	6.5 % .6
Result	0	2.1	3.8	6.6

Date:	Check Standard 1	Check Standard 2	Check Standard 3	Check Standard 4
Low Range Standard				
Result				
High Range Standard				
Result				

Date:	Check Standard 1	Check Standard 2	Check Standard 3	Check Standard 4
Low Range Standard				
Result				
High Range Standard				
Result				

PHOTO NO. 12

Date: 09/08/2023
Taken by: Greg Lipnickey
Witness: Sean Wilson

Description:
pH sampling records for August 2023.

Carnation Treatment Plant

pH Analyser Log (pH 504-4300) v1.5

MONTH: August
Year: 2003

DATE	SAMPLE ID	TIME	ANALYST	SAMPLE TEMP	SAMPLE RESULT (pH)
08/10	EFFLUENT	9:12	JS	28.0	7.17
	INFLUENT			X	X
	ML			24.7	7.81
08/02	EFFLUENT	10:16	WS	24.3	7.53
	INFLUENT				
	ML			24.7	6.74
08/103	EFFLUENT	8:33	JS	24.8	7.26
	INFLUENT				
	ML				
08/108	EFFLUENT	9:19	JS	24.9	6.94
	INFLUENT			27.3	7.36
	ML				
08/109	EFFLUENT	9:07	JS	25.1	6.91
	INFLUENT			26.5	7.18
	ML				
08/110	EFFLUENT	10:14	JS	25.3	6.92
	INFLUENT			26.0	7.04
	ML				
08/115	EFFLUENT	6:51	JS	25.0	6.88
	INFLUENT			24.5	7.21
	ML				
08/116	EFFLUENT	8:19	JS	23.7	6.95
	INFLUENT			28.0	7.39
	ML				
08/117	EFFLUENT	09:00	WS	25.5	7.05
	INFLUENT			24.7	7.23
	ML				
08/122	EFFLUENT	10:36	JS	25.1	7.17
	INFLUENT			25.2	7.21
	ML				
08/23	EFFLUENT	8:13	JS	24.0	7.03
	INFLUENT			26.5	7.28
	ML				
08/24	EFFLUENT	10:33	JS	24.5	6.98
	INFLUENT			24.0	7.54
	ML				
08/139	EFFLUENT	9:13	JS	23.8	6.95
	INFLUENT			24.1	7.28
	ML				
08/130	EFFLUENT	08:50	WS	23.1	6.85
	INFLUENT			24.2	7.16
	ML				
08/31	EFF	7:55	JS	23.9	6.94
	ML			24.3	7.18
				26.0	7.45