CLACKAMAS
WATER ENVIRONMENT SERVICES

GREGORY L. GEIST | DIRECTOR
Water Quality Protection
Surface Water Management
Wastewater Collection & Treatment

November 1, 2021

Mr. Pablo Martos, Senior MS4 Permit Writer
Oregon Dept. of Environmental Quality, NW Region
700 NE Multnomah Street, Ste. 600
Portland, OR 97232

RE: **Clackamas Water Environment Services and the Cities of Happy Valley and Rivergrove NPDES MS4 Discharge Permit 2020-21 Annual Report**

Dear Mr. Martos,

Here is the 2020-21 Annual Report for WES and the Cities of Happy Valley and Rivergrove as required by our NPDES Municipal Separate Storm Sewer System Discharge Permit.

This is the document of record. A hard copy is forthcoming.

For your convenience, we have also forwarded an electronic copy to each basin coordinator.

We look forward to your comments. Please call if you have any questions or need additional information at (503) 742-4581.

Sincerely,

Ron Wierenga
Environmental Services Manager
Clackamas Water Environment Services

cc: Mr. Brian Creutzburg
Ms. Nancy Gramlich
Ms. Andrea Matzke
Ms. Roxy Nayar

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CLACKAMAS
WATER
ENVIRONMENT
SERVICES

NPDES MS4 Discharge Permit

Annual Report

For

Clackamas Water Environment Services and the Cities of Happy Valley and Rivergrove

July 1, 2020 – June 30, 2021

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November 1, 2021

Clackamas Water Environment Services

and the

Cities of Happy Valley and Rivergrove

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) DISCHARGE PERMIT No. 101348

We, the undersigned, hereby submit this National Pollutant Discharge Elimination System (NPDES) Municipal Stormwater System Annual Report in accordance with NPDES Permit Number 101348. We certify under penalty of law that this document and all attachments were prepared under our direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on our inquiry of the person, or persons, who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of our knowledge and belief, true, accurate and complete. We are aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Gregory L. Geist, Director
Water Environment Services

October 26, 2021
Date

Jason Tuck, City Manager
City of Happy Valley

Oct 26, 2021
Date

Heather L. Kibbey
Heather L. Kibbey (Oct 27, 2021 11:15 PDT)

Heather L. Kibbey
City Manager / City Recorder
City of Rivergrove

Oct 27, 2021
Date

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SECTION 1 MS4 PERMIT REQUIREMENTS FOR ANNUAL REPORTING

This annual report provides a summary of MS4 Permit program implementation activities by Clackamas Water Environment Services (WES) and the Cities of Rivergrove and Happy Valley from July 1, 2020 to June 30, 2021. WES is a municipal partnership formed under ORS 190 by Clackamas County Service District No. 1 (CCSD#1), the Surface Water Management Agency of Clackamas County (SWMACC) and the Tri-City Service District governed by the Board of County Commissioners but a legally distinct entity from Clackamas County. WES administers MS4 activities within its service area as defined by the underlying boundaries of SWMACC and CCSD#1. On July 1, 2017, SWMACC transferred its assets and permit obligations to WES. CCSD#1 joined the municipal partnership on July 1, 2018. WES works closely within its service area with Clackamas County, which administers its own MS4 Stormwater Management Program and submits a separate annual compliance report. There are references throughout this document to Clackamas County's Department of Transportation and Development (DTD) where program elements are jointly implemented, and reported separately.

Table 1 (below) includes the 2020-21 MS4 Permit annual report submittal requirements found in Permit Schedule (B)(5) and the location in this document with the applicable program implementation information and data.

Table 1: MS4 Permit Annual Report Submittal Requirement Locations in the Document

Summary of Schedule B(5) Requirements for 2020-21		Document Section Where Annual Report Requirement is Met:
a.	The status of implementing the stormwater management program and each SWMP program element, including progress in meeting the measurable goals identified in the SWMP.	Section 1.1 and Appendix A
b.	Status or results, or both, of any public education program effectiveness evaluation conducted during the reporting year and a summary of how the results were or will be used for adaptive management.	Section 1.2
c.	A summary of the adaptive management process implementation during the reporting year, including any proposed changes to the stormwater management program (e.g., new Best Management Practices) identified through implementation of the adaptive management process.	Section 1.3
d.	Any proposed changes to SWMP program elements that are designed to reduce TMDL pollutants to the maximum extent practicable (MEP).	Section 1.4
e.	A summary of total stormwater program expenditures and funding sources over the reporting fiscal year, and those anticipated in the next fiscal year.	Section 1.5
f.	A summary of monitoring program results, including monitoring data that are accumulated throughout the reporting year and any assessments or evaluations conducted.	Section 1.6
g.	Any proposed modifications to the monitoring plan that are necessary to ensure that adequate data and information are collected to conduct stormwater program assessments	Section 1.7

h.	A summary describing the number and nature of enforcement actions, inspections, and public education programs, including results of ongoing field screening and follow-up activities related to illicit discharges.	Section 1. 8
i.	A summary, as it relates to MS4 discharges, describing land use changes, Urban Growth Boundary (UGB) expansion, land annexations, and new development activities that occurred within these areas during the reporting year. The number of new post-construction permits issued and an estimate of the total new and replaced impervious surface area related to development projects that commenced during the reporting year must also be included.	Section 1.9
j.	A summary, as related to MS4 discharges, describing concept planning or other activities conducted in preparation of UGB expansion or land annexation, if anticipated for the following year.	Section 1.10

1.1 Schedule B(5)(a) -- The status of implementing the stormwater management program and each Stormwater management plan (SWMP) program element, including progress in meeting the measurable goals identified in the SWMP.

See Appendix A in this annual report for this data and information. This appendix includes the tracking measures and measurable goal status from Best Management Practices (BMPs) in the Stormwater Management Plans.

1.2 Schedule B(5)(b). -- Status or results, or both, of any public education program effectiveness evaluation conducted during the reporting year and a summary of how the results were or will be used for adaptive management.

MS4 Permit Schedule A(4)(d)(vi) contains a requirement to create a Public Education Effectiveness Evaluation and to submit it to the DEQ no later than July 1, 2015. CCSD#1, the SWMACC, Clackamas County, and the Cities of Rivergrove and Happy Valley submitted the Evaluation to DEQ on June 30, 2015. The results of this evaluation were used in the adaptive management of the education and outreach program; see the June 30, 2015 Evaluation for more information.

During the pandemic which has limited in-person educational opportunities, WES has increased its effective use of social media and other digital means such as Zoom to provide a wide variety of educational messages for students, customers and other stakeholders. WES takes advantage of the 27,000 followers Clackamas County has on its Facebook page, nearly 18,000 followers on its Twitter account, approximately 130,000 members on NextDoor, and more than 6,000 subscribers to WES updates via Constant Contact.

WES has also gathered insightful information via surveys of customers and other stakeholders to learn about their preferred channels for receiving educational information from WES. One example of this is our 2021 Clean Water Exchange Survey, which sought this and other types of information to strengthen our understanding of what customers and stakeholders value the most.

In addition to providing educational information and links to web pages with additional educational content for all ages, social media outreach has proven to be one of the most effective ways to engage, and even build relationships, with customers, partners, and the general public. In 2020-21, WES' educational content, which hundreds of thousands of people saw posted on social media, came with measurements of effectiveness available that far exceed the limitations of printed publications (usually limited to circulation statistics).

During this reporting period, WES employed a more precise measuring tool to gauge the effectiveness of its educational messages and articles on social media and, therefore, on WES'

Public Education management strategies. The difference from years past is that WES can now report well beyond the name of the article and the size of the net cast on Facebook, NextDoor, and Twitter. Articles addressing certain BMPs (*Alternatives to Pesticide, Herbicides, and Fertilizers* and the *Reporting of Illicit Discharges and Spills and Other Types of Improper Disposal of Materials*), which engage the community in championing clean water to protect our rivers and streams, provide these three ascending levels of impact:

- Impressions – The number of times public education content is displayed
- Reach – The total number of readers who see WES' social media content
- Engagement – This last level of content impact is new and offers insight to the highest form of reader interaction and involvement where the reader engages with the article by "liking" it, "sharing" it with others, or commenting on the content

This last piece of information provides deeper and more insightful measures on how effective WES has been in reaching its target audiences and garnering support, and it can reveal what adjustments may be needed to ensure maximum community engagement and support in keeping our rivers clean now and well into the future.

1.3 Schedule B(5)(c) – A summary of the adaptive management process implementation during the reporting year, including any proposed changes to the stormwater management program (e.g., new BMPs) identified through implementation of the adaptive management process.

Permit Schedule D(10)(a) defines adaptive management as a structured, iterative process designed to refine and improve stormwater programs over time by evaluating results and adjusting actions on the basis of what has been learned. Our October 2012 "Outline for Adaptive Management Approach" was used to guide our adaptive management process in 2020-21. A review of BMP implementation and an analysis of environmental monitoring data was performed. The draft Shared MS4 Permit SWMP is a recent product of our Adaptive Management Approach. At the present time, Clackamas County, WES, and the Cities of Rivergrove and Happy Valley implement their MS4 permit programs through three separate SWMPs. To improve coordination and overall program effectiveness, a single, combined, Shared MS4 Permit SWMP (Shared SWMP) was created. The Shared SWMP was submitted to DEQ with WES' MS4 Permit renewal application package in February 2017, but as of October 2021, DEQ still had not authorized the implementation of the Shared SWMP.

An extensive Adaptive Management-based process was undertaken as the three SWMPs were integrated into one Shared SWMP. This process included a project kickoff meeting, three separate Workshops, three separate visioning sessions, and over a dozen other meetings to receive input and direction, which was subsequently used to determine the depth and breadth of the program described in the Shared SWMP. Attendees at the Workshops, visioning sessions,

and meetings included numerous staff from WES, Clackamas County's DTD and Business and Community Services (BCS), the City of Happy Valley and the City of Rivergrove.

WES completed a Gap Analysis in October 2016 which compared the Coordinated Participants' current SWMPs with requirements in the March 2012 MS4 permit to ensure that the February 2017 Shared SWMP fully complies with the MS4 permit.

A substantial number of modifications were made to various BMPs (Best Management Practices) during the process of integrating the three existing SWMPs into the Shared SWMP. The Shared SWMP has thirty-six (36) BMPs, many of which have new, improved measurable goals and tracking measures. For a summary of these modifications, please see Appendix B of the February 2017 MS4 Permit Renewal Application Package: https://dochub.clackamas.us/documents/drupal/2da8983d-d7e4-4241-9184-9ded9357e491

1.4 Schedule B(5)(d) -- Any proposed changes to SWMP program elements that are designed to reduce TMDL pollutants to the maximum extent practicable (MEP).

Please see section 1.3 (above). As the three existing SWMPs were integrated into the draft Shared SWMP, many BMPs were modified, and several of these proposed modifications are expected to reduce levels of TMDL pollutants which are discharged. Examples include:

- Portions of some proposed Construction Site Runoff BMPs are expected to reduce levels of these pollutants in stormwater: total phosphorus (Tualatin River only), settleable volatile solids (Load Allocation for Tualatin River's dissolved oxygen TMDL), mercury, and DDT and dieldrin (Johnson Creek only).
- Portions of some proposed Post-Construction Site Runoff BMPs, BMP PREV-6 ("Storm System Retrofit Program"), and BMPs MAINT-3 & MAINT-4 & MAINT-7 ("Structural Stormwater Facility Operations and Maintenance" BMPs) are expected to reduce levels of these pollutants in stormwater: E. coli, total phosphorus (Tualatin River only), settleable volatile solids (Load Allocation for Tualatin River's dissolved oxygen TMDL), mercury, and DDT and dieldrin (Johnson Creek only).

1.5 Schedule B(5)(e) -- A summary of total stormwater program expenditures and funding sources over the reporting fiscal year, and those anticipated in the next fiscal year.

WES and the City of Happy Valley dedicated sufficient resources to implement the Stormwater Management Program in 2020-21. WES dedicated over 20,771 employee hours or the

equivalent of 12.16 full-time employees (FTEs) to the MS4 Permit program, to our Underground Injection Control WPCF Permit program, to our Willamette/Tualatin TMDL non-point source pollution programs, and to our flooding reduction/drainage improvement programs – all of which make up WES' Surface Water Program. The City of Happy Valley has five and a half FTEs in the Public Works Department who, in part, perform MS4 duties. In addition, WES is the service provider in the City of Rivergrove and, as a result, the City dedicates a sufficient but limited amount of staff time to implement the MS4 SWMP; therefore, the City's expenditures are not worth tracking or reporting in this section.

WES' Operating and Construction Fund resources, including Fund Balances, budgeted in the recent past, during the reporting period and in the current fiscal year, are on the next page in Table 2.

Table 2: Stormwater Resources and Requirements for WES

WES	2018-19 Actual	2019-20 Actual	2020-21 Budget	2020-21 Estimate[1]	2021-22 Adopted
Resources	**19,688,391**	**22,139,630**	**22,420,379**	**23,197,771**	**23,846,919**
Materials & Services	3,711,515	4,244,759	5,089,029	4,734,352	6,211,141
Capital Outlay	1,945,225	716,375	2,141,500	750,000	1,092,000
Transfers	1,000,000	3,000,000	3,000,000	3,000,000	3,000,000
Contingency			1,383,375	0	1,308,000
Ending Fund Balance	13,031,651	14,178,496	10,806,475	14,713,419	12,235,778
Total Requirements	**19,688,391**	**22,139,630**	**22,420,379**	**23,197,771**	**23,846,919**

1 "Estimated" year-end expenditures are not shown as "Actual" until the fiscal year closes.

Annual funding for the Stormwater Management Program for WES in FY 2020-21 came from four sources (unaudited numbers):

Monthly Stormwater Utility Fees	$ 5,139,918
Maintenance Fees, paid Monthly	$ 363,064
Systems Development Charges (SDCs)	$ 167,739
Stormwater and Erosion Control Permit Fees	$ 224,332

In 2020-21, customers in the North Clackamas unit of Rate Zone 2 (CCSD#1) paid a monthly program fee of $7.65 per Equivalent Service Unit (ESU) and customers in Rate Zone 3 (SWMACC) paid a monthly fee of $4.65 per ESU. An ESU is a single-family residence or 2,500 square feet of impervious surface for nonresidential customers. Fees were increased to $7.75 per ESU in Rate Zone 2 and $4.70 per ESU in Rate Zone 3, respectively, soon after this reporting period ended on June 30, 2021.

Newly constructed single-family residential properties in Rate Zone 2, since 1998, also paid a monthly maintenance agreement fee of $3.00 per ESU which is dedicated for maintenance of local subdivision stormwater conveyance, detention, retention, treatment, and infiltration facilities.

Only a portion of Rate Zone 3 revenues come from the MS4-permitted area. Rate Zone 3 also includes:

1. A large, rural unincorporated area in the Tualatin River watershed
2. An area near the City of Rivergrove which is served by stormwater injection devices (i.e., drywells), which are regulated by a Stormwater WPCF permit.

WES collects System Development Charges from new development and dedicates those revenues to planning, design, and construction of additional stormwater infrastructure capacity needed to accommodate growth. The current SDC rate is $215 per Equivalent Dwelling Unit which increased to $220 soon after this reporting period ended on June 30, 2021.

City of Happy Valley

MS4 Permit Program Funding Sources:

- **Permit fees for development** of land (plan review and inspection) are based upon the construction value of the project. In 2020-21, the City generated $380,941.81 in fees from 18 land development permits. Only a portion of these $380,941.81 were spent on the implementation of the MS4 Permit Program.
- Nineteen **Erosion Control Permits** yielded $15,500 in revenue in 2020-21. The City expects to receive a range from $15,000 to $20,000 in Erosion Control Permit revenue in 2021-22. The $15,500 of MS4 permit program revenue is a subset of $380,941.81.
- $56,400-- from the **Streets Maintenance** portion of the budget for street sweeping. Street sweeping is also conducted to improve road safety and for aesthetic reasons. An undefined portion of the $56,400 was spent to improve stormwater quality.
- Approximately $8,858.50 from the City of Happy Valley's **General Operating Budget** were spent by the City of Happy Valley during 2020-21 to administer the overall MS4 Permit Program (e.g., attendance at monthly Watershed Protection Program meetings, compiling data for this annual report). The City of Happy Valley expects to dedicate a similar amount of money from this portion of this budget during 2021-22 for administration of the overall MS4 Permit Program.

MS4 Permit Program Expenditures:

- **Street Sweeping Program:** The City of Happy Valley spent $56,400 on their street sweeping program in 2020-21. The City of Happy Valley expects to spend a similar amount of money on street sweeping in 2021-22.
- **Erosion Control Program**: Erosion Control Permit fee revenue is spent by the City of Happy Valley to administer this program. The City spent approximately $15,500 to administer this program in 2020-21 and the City expects to spend a similar amount in 2021-22.
- **MS4 Permit Program Administration:** Approximately $8,858.50 were spent by the City of Happy Valley during 2020-21 to administer the overall MS4 Permit Program (e.g., attendance at monthly Watershed Protection Program meetings, compiling data for this annual report). The City of Happy Valley expects to spend a similar amount of money during 2021-22 for administration of the overall MS4 Permit Program.

1.6 Schedule B(5)(f) -- A summary of monitoring program results, including monitoring data that are accumulated throughout the reporting year and any assessments or evaluations conducted.

See Appendix B for the summary of the monitoring program's results and for information about any assessments or evaluations which were conducted.

1.7 Schedule B(5)(g) -- Any proposed modifications to the monitoring plan that are necessary to ensure that adequate data and information are collected to conduct stormwater program assessments

No additional modifications are proposed in this annual report. WES on behalf of Clackamas County, and the Cities of Rivergrove and Happy Valley participates in a combined Comprehensive Clackamas County NPDES MS4 Stormwater Monitoring Plan (Monitoring Plan). Other participants of this Monitoring Plan include, but are not limited to, the Cities of Milwaukie and Oregon City. This Monitoring Plan was revised most recently in January 2017 and was implemented on July 1, 2017. Please see the January 2017 Monitoring Plan for more information.

1.8 Schedule B(5)(h) -- A summary describing the number and nature of enforcement actions, inspections, and public education programs, including results of ongoing field screening and follow-up activities related to illicit discharges.

See the sections of the BMP table in Appendix A which apply to BMP #1 (titled "Conduct Dry Weather Inspections" for illicit discharges) and BMP #12 (titled "Facilitate Public Reporting of Illicit Discharges…") for portions of the response to this requirement. See the Table 3 located on the next page for the responses to the other portions of this requirement.

Table 3: Illicit Discharge Events

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
7/21/2020	7/22/2020	Illicit Discharge: Received report of food cart near SE 82nd and SE Lamphier Street in Clackamas dumping water that appeared white, milky and greasy. Approached food cart with photos that complainant provided showing sudsy water on street near cart. An interpreter stated that a vehicle had run over a discharge hose and had caused release. In addition, the landlord learned that cart owners were pressure washing an outdoor seating area. WES staff left written notice with cart staff to not discharge waste/wash water to street or environment and to use the discharge vault provided for this purpose, which conveys wastewater to WES' sanitary sewer system.	Yes
7/28/20	7/28/20	Illicit Discharge: A Happy Valley Code Compliance Officer forwarded complaint of a pressure washing company dumping liquid into storm catch basin at or near SE Denali Drive in Happy Valley. WES staff spoke to owner of company who stated he had washed a patio and driveway using cold	Yes Education letter

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
		potable water to clean without the use of soap or cleaner. Owner explained that he was trying to divert water towards a landscaped area but some water had escaped and had entered the street. Said he had dumped clean potable water from his equipment's tank to lighten it for transport, and that is most likely what complainant had witnessed.	
7/28/2020	7/28/2020	Illicit Discharge: Received report from Happy Valley Code Compliance Officer of paint spill to SE 145th Avenue and Scouter's Mountain. Crews from an environmental cleanup company were dispatched and continued operations late into the evening. WES staff visually inspected the area on 7/29/20 after the cleanup was completed and found only dry paint on the asphalt and no signs of the contaminant in the storm water system.	No
8/20/2020	8/20/2020	Illicit Discharge: During a vegetation-control-of-easements inspection, WES staff discovered that an SSO event had occurred recently but was not active at two manholes structures near SE Causey Avenue in Happy Valley. An unknown amount of sewage was released to an unidentified drainage ending at the I-205 corridor. In response, WES staff removed roots, grease and debris from the two affected manholes, which were feet away from a small creek, ensuring that any existing blockage was cleared and that all	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
		debris on the ground in the affected area was cleaned. OERS Case No. 2020-2060	
10/5/2020	10/5/2020	Illicit Discharge: A Happy Valley building official reported a cross-connection from a sanitary sewer system to the storm system in a newly constructed subdivision near the intersection of SE 129th and SE Yoakum Lane. In response to cross-connection discovery, WES verified the location of the cross connection, cleaned the affected storm system, and removed debris from the outfall. The City then made the contractor repair the affected storm and sewer connections. After the repair, WES staff then identified and remarked all storm and sewer lines in the subdivision using closed circuit television as a guide. WES' Permits group then followed up to ensure that the storm and sewer connections were corrected.	No
12/9/2020	12/9/2020	Illicit Discharge: Clackamas County Hazmat reported a diesel fuel spill on Hwy 212 near Clackamas within WES' MS4 service area. CC Hazmat reported that a semi-truck crash had discharged an estimated 100 gallons of diesel without affecting the waterway as the fire department had blocked the storm drains in the area. On the scene soon after, ODOT reported the crash but added that some diesel had flowed	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
		into a storm drain (unknown ODOT incident number). WES staff confirmed that fuel had entered the storm drain and reached the Clackamas River. In response, an environmental clean-up company placed absorbent booms at and below the storm outfall on the Clackamas River to contain the diesel while WES cleaned the storm structure upstream to cut off the fuel flow. With a vactor truck, WES cleaned the WQ structure located next to a sand and gravel company and hauled 4 loads of contaminated water to WES' decant facility. Heavy rainfall following the spill made capturing all fuel difficult. The next day, WES staff inspected the area and returned service to the WQ structure. OERS Case No. 2020-3023	
12/21/2020	12/22/2020	Illicit Discharge: Resident reported construction equipment leaking oil onto roadway near the intersection of SE Scenic Ridge Road and SE 132nd Avenue in Clackamas (97015). Staff met with contractor on site and investigated source of complaint. A road grader parked on pavement downslope of construction project blocked access to site. No signs of leaks from grader but recent heavy rains may have washed alleged leakage away. No real signs of oil in nearest catch basin. Had contractor move	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
		grader off the pavement and onto graveled roadbed.	
12/31/2020	12/31/2020	Investigation: Received report of motor oil leaking from vehicle into storm drain. WES staff checked 4 catch basins and 3 manhole structures near the intersection of SE Upman Way and SE Partagas Street in a portion of Damascus which is in the WES SWM service area, finding no standing oil from a car anywhere. There was a parked car nearby in the street but no signs of leaking oil were found.	No
1/29/2021	1/29/2021	Investigation: Received report of a suspected illicit discharge to storm drain in Happy Valley from a recreational vehicle. WES staff investigated and found no discharge.	No
2/3/2021	2/3/2021	Illicit Discharge: Caller reported that there was an oil sheen on the road for approximately 2 blocks near SE Jack Road and SE 66th Avenue in Milwaukie. Caller did not know what caused the oil sheen, if any had flowed into any of the storm drains in the area, and reported that a truck from the local garbage company was parked on the roadway close to the oil sheen. When WES contacted and told the garbage company of the oil sheen and their parked garbage truck, the company volunteered to remove the parked truck. Site investigation found only rainbow trails on asphalt and no catch basins	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
		in the area for the contaminant to collect and be removed. OERS No. 2021-0350	
2/8/2021	2/8/2021	Illicit Discharge: WES received an email reporting a white oil being discharged to a creek that drains into a wetland between 9570 and 9700 LAWNFIELD Road from buildings on the west side of the creek about 100 yards from the main road. WES staff found little evidence and an unrecoverable amount of oil in the creek.	No
2/12/21	2/16/21	Illicit Discharge: PGE reported that approximately 12 gallons of non-PCB mineral oil from a transformer spilled onto the ground near SE Theissen Road in Clackamas. PGE noted a sheen in a catch basin during clean-up. Time of incident was unknown. This spill occurred as a result of the largest freezing rain/ice storm to hit the area in at least 30 years. OERS Case No. 2021-0515	No
2/12/21	2/14/21	Illicit Discharge: Caller reported an unknown amount of PCB transformer oil spilling onto the ground near SE Buser Lane in Clackamas. On 2/14, PGE assessed situation the spill and, as a result, placed absorbents. This spill occurred as a result of the largest freezing rain/ice storm to hit the area in at least 30 years.	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
		OERS Case No. 2021-0555	
2/12/21	2/24/21	Illicit Discharge: A business on SE Mather Road in Clackamas reported that an unknown amount of transformer oil was spilling into a storm drain. Once PGE deemed the area safe, the business that called in the oil spill placed granular, absorbent pads and booms around the affected storm drain. In addition, WES' inspection revealed oil in private catch basins along Mather, so the affected business also cleaned those. All transformer spills and responses were detailed in a combined report, which PGE sent to DEQ and copied WES. This spill occurred as a result of the largest freezing rain/ice storm to hit the area in at least 30 years. OERS Case No. 2021-0488	No
2/15/21	2/24/21	Illicit Discharge: A contractor reported an unknown amount of diesel fuel spilled onto the ground and into a storm drain near SE 84th Avenue in Clackamas. The contractor explained that, while filling a generator with fuel, a couple of "drops" of diesel spilled onto the melting snow-covered ground. Said that the snow appeared as a sheen in the storm drain. The next day WES found no traces of diesel fuel in storm system. OERS Case No. 2021-495	No
2/24/21	2/25/2021	Illicit Discharge: The County's Hazmat Team 303 reported that unknown household	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
		chemicals, which were leaking from a house garage fire at SE Aldercrest Court in Milwaukie, were in danger of flowing towards Kellogg Creek. The hazmat team mitigated the spill and WES staff inspected the site the following day. Booms had been deployed across Kellogg Creek downstream of the private driveway and near the front yard of the home that had burned. There were no visible signs that the pollutants had reached the creek. OERS Case No. 2021-0609	
3/31/2021	3/31/2021	Illicit Discharge: Received report of an illegal outhouse that was built over small tributary leading to a green space near Strawberry Lane in Clackamas / Johnson City. WES staff investigated this incidence, took photos, and forwarded case to County Code Enforcement.	No
4/19/2021	4/19/2021	Illicit Discharge: WES staff cleaned surrounding catch basins and structures after someone had dumped a white substance near the intersection of SE Mountain Gate Road and SE Snowfire Drive in Happy Valley. WES found no evidence that the contaminant had made it past the adjacent catch basins	No
5/17/2021	5/17/2021	Illicit Discharge: Received report of hose water draining into a catch basin on SE 93rd Avenue in Happy Valley. A pond maintenance company had drained and cleaned a decorative pond at the address and discharged to a storm drain in the cul-de-sac.	Yes

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
		WES instructed that the pump be shut off immediately, and informed worker and homeowner of the illicit discharge. Helped owner look for sewer cleanout but could not find one. The company and owner ceased the work. Issued a written notice to cease pumping pond water to public drains.	
5/18/2021	5/18/2021	Illicit Discharge: DEQ requested that we follow up on this: Neighbor saw a resident of SE Lone Pine Drive in Clackamas discharge paint into the catch basin. WES' inspection found that the catch basin grate had white paint residue on it as well as a small amount of latex caulking. The caulking was dry before it was discharged. The catch basin's sump had a white layer and the downstream manhole was diluted white, and the next downstream manhole was even more diluted. WES staff cleaned the affected storm catch basins and manhole structures with a vactor truck.	No
5/27/2021	5/27/2021	Illicit Discharge: A caller witnessed a Waste Management of Oregon yard debris truck leaking hydraulic fluid onto several roadways in Clackamas (97015), including SE Brackenbush Rd, Berkshire Rd, Stanhope Rd and SE 150 Place. At least four ounces of hydraulic fluid were released onto the road/asphalt. Discharge spread over a distance while truck was in motion. WES staff made the call to notify OERS. A Waste Management of Oregon staff member did clean up a small amount of spilled material in	No

Report Date	Inspection Date	Incident Description, including follow-up activity	Enforcement action taken?
		the one place where there was a recoverable amount. Most of the fluid spilled as the truck drove around, dripping it for blocks of road. Rain pushed most of it into and through the storm sewer system and into Graham Creek. OERS Case No. 2021-1390	

1.9 Schedule B(5)(i) -- A summary, as it relates to MS4 discharges, describing land use changes, Urban Growth Boundary (UGB) expansion, land annexations, and new development activities that occurred within these areas during the reporting year. The number of new post-construction permits issued and an estimate of the total new and replaced impervious surface area related to development projects that commenced during the reporting year must also be included.

Land Use Changes:

- Number of zone changes approved in Happy Valley: 2
- Number of new residential building lots approved by partition, Subdivision, and planned unit development in Happy Valley: 75
- Number of Approved Zone Changes in Clackamas County[1]: 7
- Number of New Land Partitions: 40
- Number of New Land Subdivisions: 9

UGB Expansion:

- During 2020-21, the UGB was not expanded in or near the Cities of Happy Valley or Rivergrove, or any other portion of WES' MS4-permitted service area.

[1] These land use statistics capture the entire unincorporated area of Clackamas County regulated by the MS4 permit, which is primarily comprised of lands in the Oak Lodge Water Services district and in the WES service area.

Land Annexations:

- Acreage annexed into WES' retail service area: 11.2
- Acreage de-annexed from WES' retail service area: None
- Acreage annexed into the City of Happy Valley: None

The Number of New Post-Construction Permits Issued and related information:

- Number of development permits reviewed by Clackamas County[2]: 35
- Number of building division permits in Happy Valley: 456
- Number of engineering division development permits in Happy Valley: 7
- Total number of plans reviewed and approved by WES: 114
- Number of building division site plan reviews in Happy Valley: 456
- Number of engineering division site plan reviews in Happy Valley: 48
- Number of new units of multi-family housing approved in Happy Valley: 0
- Square feet of new commercial/office development approved in Happy Valley: 417,023

Estimated total new and replaced impervious surface area related to development projects:

- 37.8 acres

When the lands described here in Section 1.9 were developed, post-construction stormwater management program requirements implemented by the City of Happy Valley, Clackamas County, and/or WES reduced storm sewer system pollution levels to the maximum extent practicable. For more information, see the post-construction program-related sections of this annual report.

1.10 Schedule B(5)(j) -- A summary, as related to MS4 discharges, describing concept planning or other activities conducted in preparation of UGB expansion or land annexation, if anticipated for the following year.

City of Happy Valley

As discussed above, no UGB expansion occurred in the City of Happy Valley in 2020-21 and the UGB is not expected to be expanded in 2021-22. There were no acres annexed into the City of Happy Valley in 2020-21. With respect to annexations anticipated for 2021-22, the City is currently working on the Pleasant Valley North Carver Comprehensive Plan, which is approximately 2,700-acre plan area. The City is aiming to adopt the plan in 2022. When these

[2] ibid

lands are eventually urbanized, regulations are expected to be applied by the City of Happy Valley and WES (formerly CCSD#1) as properties are developed (to construct stormwater treatment systems, for example) which will reduce pollution levels to the maximum extent practicable.

Clackamas County

No UGB expansion occurred in 2020-21 in or near the WES-Rivergrove-Happy Valley MS4 Permit area, nor is it expected to occur in 2021-22.

Appendix A: Best Management Practices

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2020-21 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2020 - 21 Tracking Measure or Measurable Goal Response	2020 - 21 Response Comment
1	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of outfalls inspected during dry-weather	40	Conducted 40 dry weather inspections; one inspection at each of the 40 priority locations.
2	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number and type of illicit discharges that were encountered and controlled	0	No illicit discharges were found during outfall inspections.
3	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Status of updating procedures to address new permit requirements	Attained	On July 31, 2019, we updated our written summary of the current Priority Locations for conducting dry-weather storm sewer system field screening work. Three new Priority Locations for monitoring were added, bringing the total number of Priority Locations to be monitored to 40.
4	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Inspect major or priority outfalls for the presence of illicit discharges at least once per year	Attained	Of the 40 dry weather inspections conducted, 35 were at major outfalls. The remaining five were minor outfalls.
5	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Update maps of major outfalls on an annual basis	Attained	This map of outfalls was updated on July 31, 2019.
6	**Component #1: Illicit Discharge Detection and Elimination**	**Conduct Dry Weather Inspections**	**1**	**1**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Update dry weather field screening program to address new permit requirements by November 1, 2012	Attained	The dry weather field screening program was updated to address new permit requirements by November 1, 2012.
7	**Component #1: Illicit Discharge Detection and Elimination**	**Implement the Spill Response Program**	**2**	**2**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of reported spills to the MS4 system	21	There were 21 spills reported that WES staff investigated. Of those 21 spills, 19 were illicit discharges and 2 were investigations which found no evidence of a discharge. Please see Section 1.8 for additional information.
8	**Component #1: Illicit Discharge Detection**	**Implement the Spill Response Program**	**2**	**2**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number and type of response to the reported spills	21	WES investigated all 21 spills that were reported. Nineteen (19) of the 21 spills, including one sanitary sewer overflow and one cross-connection, were confirmed non-stormwater discharges consisting of various oil & diesel fuel spills, paint, pond discharge, miscellaneous dumping of materials, and non-PCB oil from electrical transformers due to ice storm; WES or the responsible party contained the illicit discharges. The remaining two investigations found no evidence of a spill. Please see Table 3 in Section 1.8 for additional information.

2020-21 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2020 - 21 Tracking Measure or Measurable Goal Response	2020 - 21 Response Comment
	and Elimination								
9	**Component #1: Illicit Discharge Detection and Elimination**	**Implement the Spill Response Program**	**2**	**2**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Implement the spill response program and associated protocols.	Attained	WES has developed and maintains an appropriate spill response program. The spill response standard operating procedure has been reviewed for improvements and WES staff has been trained on its use.
10	**Component #1: Illicit Discharge Detection and Elimination**	**Respond to reports involving illicit discharges**	**3**	**3**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of alleged illicit discharges and non-stormwater (i.e., fire suppression flows and dechlorinated flows from swimming pools) discharges which were reported each year	21	There were 21 alleged illicit discharges reported that WES staff investigated. Of those 21 incidents, 19 were confirmed illicit discharges and two were investigations which found no evidence of a discharge. Nineteen (19) of the 21 alleged illicit discharges, including one sanitary sewer overflow and one cross-connection, were confirmed non-stormwater discharges consisting of various oil & diesel fuel spills, paint, pond discharge, miscellaneous dumping of materials, and non-PCB oil from electrical transformers due to ice storm. Please see Table 3 in Section 1.8 for additional information.
11	**Component #1: Illicit Discharge Detection and Elimination**	**Respond to reports involving illicit discharges**	**3**	**3**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of illicit discharges that were controlled	19	All 19 confirmed illicit discharges were located in the MS4 permitted area and controlled by either WES staff or the responsible party.
12	**Component #1: Illicit Discharge Detection and Elimination**	**Respond to reports involving illicit discharges**	**3**	**3**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Respond to reports involving alleged illicit discharges within two weeks.	Attained	All illicit discharges were responded to within two weeks of receiving the report.
13	**Component #2: Industrial and Commercial Facilities**	**Screen Existing and New Industrial Facilities**	**4**	**4**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track the number of existing or new industrial facilities subject to a stormwater industrial NPDES permit during the permit term.	26 1200Z permits One 1200A permit	Approximately 26 facilities in our MS4 Permit area have a 1200Z permit and one facility has a 1200A permit. Note: some of these facilities discharge to our MS4, and some don't. During the current MS4 Permit term, ten industrial facilities were referred to DEQ per MS4 Permit schedule A(4)(b) for potential 1200-Z permitting.
14	**Component #2: Industrial and Commercial Facilities**	**Screen Existing and New Industrial Facilities**	**4**	**4**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Review new industrial development applications once during the permit term to identify additional facilities needing to obtain 1200Z permits.	Attained	This review of building permit applications for new industrial facilities was completed in March 2017.
15	**Component #2: Industrial and Commercial Facilities**	**Address Other Industrial Facilities**	**5**	**5**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	The number of inspections performed, and where applicable, monitoring data collected	112 Inspections	112 inspections were performed by WES staff from the list of prioritized commercial/industrial facilities.

2020-21 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2020 - 21 Tracking Measure or Measurable Goal Response	2020 - 21 Response Comment
16	**Component #2: Industrial and Commercial Facilities**	**Address Other Industrial Facilities**	**5**	**5**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	The number of letters, enforcement actions, or other contacts made	45 Corrective Notices	45 sites were given corrective notices for correcting deferred maintenance of their storm system or for other issues related to the property's storm system. Due to Covid 19 the Pacific NW Pollution Prevention Center (PPRC) conducted the following industrial/commercial stormwater outreach work – "other contacts made" – on WES' behalf in WES' service area: 1) 29 auto repair shops and 2 carwashes were contacted and EcoBiz program technical assistance was offered. 2) 23 multi-family housing facilities were contacted and technical assistance was offered. 5 educational markers were installed at catch basins. 19 religious facilities (churches) were contacted and technical assistance was offered. 123 educational markers were installed at catch basins.
17	**Component #2: Industrial and Commercial Facilities**	**Address Other Industrial Facilities**	**5**	**5**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of pretreatment inspections of storm sewer systems performed (CCSD#1- only)	34 Pretreatment Inspections	The Industrial Permits group conducted a total of 25 annual storm sewer system inspections of permitted industrial users. Five inspections were performed on categorical non-discharger industrial users. Four inspections were done in response to NRQ surveys received, as first-time visits, or in response to industrial user requests.
18	**Component #2: Industrial and Commercial Facilities**	**Address Other Industrial Facilities**	**5**	**5**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Notify and work with industries to improve stormwater management if an inspection is conducted that indicates improvement is needed.	Attained	If an inspection indicated that improvement was needed, it was handled through enforcement (see other sections of reports) or through technical assistance which WES provided.
19	**Component #3 Construction Site Runoff**	**Conduct Procedures for Site Planning**	**6**	**6**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of permitted, active construction projects (i.e., those projects disturbing 800 sq. ft. or more)	665	There were 446 dwellings, 10 commercial building and 7 site development permits in Happy Valley. WES had 202 active construction projects.
20	**Component #3 Construction Site Runoff**	**Conduct Procedures for Site Planning**	**6**	**6**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of site plan reviews and approved plans	668	WES reviewed and approved 52 single-family and 62 non-single family site plans in WES' portion of the WES, Happy Valley and Rivergrove area. In addition, there were 456 building division site plan reviews and 48 engineering division site plan reviews in Happy Valley. Of the 48 engineering division site plan reviews, the City approved 22 plans.
21	**Component #3 Construction Site Runoff**	**Conduct Procedures for Site Planning**	**6**	**6**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	Review all applicable erosion and sediment control plans submitted as part of the building permit process	Attained	All applicable erosion and sediment control plans were reviewed, approved and permitted.
22	**Component #3 Construction Site Runoff**	**Implement Requirements for Structural and Non-Structural Best Management Practices**	**7**	**7**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of permitted, active construction projects (i.e., those projects disturbing 800 sq. ft. or more)	665	See tracking measure comment in BMP #6.

2020-21 Best Management Practices

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23	**Component #3 Construction Site Runoff**	**Implement Requirements for Structural and Non-Structural Best Management Practices**	**7**	**7**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of site plan reviews and approved plans	668	See tracking measure comment in BMP #6.
24	**Component #3 Construction Site Runoff**	**Implement Requirements for Structural and Non-Structural Best Management Practices**	**7**	**7**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	WES and Happy Valley require structural and non-structural BMPs for erosion prevention and sediment control on all construction sites disturbing 800 sq. ft. of land or more	Attained	All construction sites disturbing 800 sq. ft. of land or more received structural and non-structural BMPs for erosion prevention and sediment control.
25	**Component #3 Construction Site Runoff**	**Conduct Training for Construction Site Operators**	**8**	**8**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Track the number and type of educational and training events the District conducts and/or participates in annually	1875	WES made the ***Erosion Prevention and Sediment Control Planning and Design Manual*** available on the County website while providing in-the-field training during 1,875 ERCO inspections. This year, the City of Happy Valley did not sponsor training courses for construction site operators.
26	**Component #3 Construction Site Runoff**	**Conduct Training for Construction Site Operators**	**8**	**8**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	Conduct training for new employees as appropriate and whenever there is a significant update to the Erosion Prevention and Sediment Control Planning and Design Manual.	Attained	WES and the City of Happy Valley had no new employees to receive the training. Additional training will be provided as needed and as available.
27	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of permitted sites and percentage of sites inspected	100%	Inspected 100% of 481 permitted sites in Happy Valley and 202 permitted sites in WES' service area.
28	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of erosion control inspections conducted	4,083 inspections	WES inspections - 1,875 Happy Valley Building Division Inspections - 1,876 Happy Valley Engineering Division Inspections - 332

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29	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	Annual number of enforcement actions	28 enforcement actions	19 Happy Valley enforcement actions and 9 WES Erosion Control enforcement actions
30	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	Inspect construction sites disturbing 800 s.f. of land or more a minimum of three times during construction to verify proper implementation of required BMPs	Attained	100% of the erosion control permits that WES and Happy Valley issued were inspected a minimum of three times.
31	**Component #3 Construction Site Runoff**	**Identify Priorities for Inspecting Sites and Conducting Enforcement Actions**	**9**	**9**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Measurable Goal	Monitor compliance with the erosion control regulations for sites disturbing 800 sq. ft. of land or more and, when necessary, issue deficiency notices, charge re-inspection fees, issue fines and stop land-disturbing development work at the site until provisions of the regulations are met	Attained	WES posted no Stop-Work orders, and issued 9 enforcement actions requiring corrective action without fines. In Happy Valley, two of the five erosion control cases resulted in fines. Happy Valley posted three Stop-Work orders. Happy Valley didn't charge any re-inspection fees and didn't issue any deficiency notices. When these actions were taken, the provisions of the regulation were then met.
32	**Component #4 Education and Outreach**	**Public Education to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**10**	**10**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track program messages delivered, type of communication piece, and where appropriate, the number of people affected.	Attained	**WES Quarterly Newsletter Articles** • **April 2021**: "Lawn Care Tips (reduce pesticides, dangerous chemicals)" Sent to 5,905 subscribers. • **January 2021:** "Landscape Maintenance Best Practices - avoiding herbicides, pesticides, and dangerous chemicals" and "Carli Creek Water Quality Project Update - Keeping toxic chemicals out of the river and creek". Sent to 6,036 subscribers • **October 2020 article**s: "Education through Art: Protecting our Streams" and "Preparing for Rainy Days to protect our rivers and streams" from pesticides, herbicides and fertilizers - Sent to 5,995 subscribers. **Community Education** • Due to COVID-19, **The Children's Clean Water Festival** was conducted online this year. WES and partners posted at-home lessons online and shared them with teachers to use with 4th and 5th grade classes. The Children's Clean Water Festival engaged more than 31,000 students in a day of learning and fun that included more than 40 water-focused activities. Presentation topics included pesticides, herbicides and fertilizers. • **Regional Coalition for Clean Rivers and Streams (Coalition)** of which WES is a member, provided coordinated messaging via social media, webpages and other channels, including how yard and garden products wash into our rivers and streams, and how people can protect our water by eliminating these products or using compost and slow-release fertilizer. Total website sessions: 7,856 (▲214 %) Users: 5,855 (▲244%). **Facebook**: Followers: 1,676 (▲2). Weekly organic reach: 140. Posts: 123 (▲34). Facebook ads and boosted posts: 10, Reach: 141,189, Post engagements: 2,477. **Twitte**r: Followers: 1,441 (▲3). Tweets: 61 (▲8). **Instagram**: - Followers: 364 (▲200). Posts: 31. **County Publications** • **Clackamas Review** (weekly circulation 9,000 - WES ads to reduce pesticide use ran in March 21 and April 21 editions • **MyClackCo Magazine Articles**, Circulation 180,000 ○ **Fall 2020**: ▪ Safely Dispose of Toxic Products like Pesticides ▪ Happy Valley Art Project to Reduce Discharges to Prevent pollution caused by pesticides, fertilizers, etcetera ▪ Water Environment Services awards more than $287k in grants through RiverHealth Stewardship, Program including non-profit organizations that educate the public on alternatives to pesticide and herbicide use and train landscapers (in Spanish) on the maintenance of stormwater facilities without

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									the use of pesticides, herbicides and fertilizers, such as *Geston De Agua De Tormenta* presentation with Northwest Center for Alternatives for Pesticides ○ **Spring 2021** ▪ How You Can Help Prevent Water Pollution (when it comes to weed removal, fertilizer, pesticides, herbicides) ▪ **Hire ECOBIZ Certified Landscaper** that uses green approaches as alternatives to pesticides, herbicides and fertilizers • **WES Annual Report, January 2021 -** Articles about reduction of pollution in stormwater runoff due to pesticides, fertilizers, etc., surface water management, watershed health education art and activities at Happy Valley Park, watershed health restoration projects and volunteers. • **ClackCo Monthly sent to 12,500 subscribers, articles:** • Clean Water Festival – Youth education, Rain gardens to protect streams. Presentation topics included pesticides, herbicides and fertilizers. ○ Clean Water: It's our Future (learn how to help keep our streams and waterways clean and free from harmful chemicals like pesticides, etc., July 2020- January 2021) **Community Outreach** • Outreach with KPTV regarding avoidance of pesticide, fertilizer and other use of harmful chemicals. Regional partners: KPTV.com Ad Impressions 1,400,222, Ad clicks: 1,883. • KPTV.com/Water page views 2,136. Television Impressions: 9,853,700 Adults 18+, Television Reach, 98.2% Adults 18+. Facebook Impressions: 81,680, Facebook Clicks: 1,398. **(Impressions are the number of times the content was displayed).** **Tualatin Basin Public Awareness Committee (WES is a member) innovative stormwater public awareness and education activities about pesticides, fertilizers, spills, etc.** • Will Hornyak created six video presentations (three for grades K-2 and three for grades 3-5, 10 min each) specific to the Tualatin River Watershed. TBPAC members shared video links with teacher/school contacts and community groups.
33	**Component #4 Education and Outreach**	**Public Education to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**10**	**10**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue to maintain relevant public education materials on the County's website	Attained	**Website articles in Education page** (607 views) and **Watershed Health** (1039 views): • Looking to Hire a Landscaper? Best practices regarding pesticides, fertilizers and other chemicals to protect rivers • Think of Me, Your Friend, the Bee! Pesticides, herbicides, and fertilizers can help control pesky weeds and insects, but every pesticide (including organic) has some level of toxicity • Storm Drains, Water Pollution Prevention for Property Managers • Backyard Habitat Certification Program • Garden Awareness/Chemical Flier • Love your Lawn without pesticides • Moss on Roofs: Pesticide-free control. Weed and Pesticide Information and Tips • Got Weeds? • Get help from CRISP Parting with Pesticides Pledge Program for the Clackamas Watershed
34	**Component #4 Education and Outreach**	**Public Education to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**10**	**10**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Prepare a minimum of one relevant article per year for inclusion with Clackamas County customer billing statements	Attained	**May 2021 WES Bill Insert**- Interactive Clean Water Exchange – announced articles about • Online reporting tool • Tips for pressure washing and surface cleaning • Spills and leaks • Landscaping tips to avoid pesticides, herbicides, and other toxic chemicals, which linked to WES' Education webpage • Reducing pollutants by keeping storm drains clean

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2020 - 21 Tracking Measure or Measurable Goal Response	2020 - 21 Response Comment
35	**Component #4 Education and Outreach**	**Public Education to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**10**	**10**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Pursue additional relevant USGS studies if the opportunity presents itself.	Attained	No additional USGS studies were funded during the 2020-2021 MS4 permit year. Note that CCSD#1, the SWMACC, and the Cities of Rivergrove and Happy Valley contributed funds towards a USGS-led pesticide monitoring study, which assessed pesticide concentrations in creek water, creek bed sediments, and discharges from MS4 outfalls, during the current 2012-2017 MS4 permit term. This monitoring study satisfies the pesticide monitoring requirement in table B-1 of the MS4 permit. The USGS wrote an article about this study which was published in the Journal of Environmental Monitoring Assessment, a scientific journal, in May 2016.
36	**Component #4 Education and Outreach**	**Proper Disposal Practices to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**11**	**11**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of calls received and referred to Metro annually.	0	WES did not receive customer inquiries about the proper way to dispose of these dangerous and/or hazardous materials. Hence, WES did not refer any customers to Metro.
37	**Component #4 Education and Outreach**	**Proper Disposal Practices to Reduce Discharges of Pesticides, Herbicides and Fertilizers**	**11**	**11**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Refer all pesticide/herbicide disposal related calls to Metro.	Not applicable	No customers were referred to Metro because did not WES receive inquiries on disposing of these dangerous and/or hazardous materials.
38	**Component #4 Education and Outreach**	**Facilitate Public Reporting of Illicit Discharges and Spills and of Other Types of Improper Disposal of Materials**	**12**	**12**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Describe news articles reported per year when appropriate	Attained	**Articles and Other Media That Facilitated Reporting of Illicit Discharges** • **Television** ○ **Clean Water: It's our Future** (learn how to help keep our streams and waterways clean, July 2020- January 2021) outreach with KPTV, regional partners: KPTV.com Ad Impressions 1,400,222, Ad Clicks: 1,883. KPTV.com/Water page views 2,136. Television Impressions: 9,853,700 Adults 18+, Television Reach, 98.2% Adults 18+. Facebook Impressions: 81,680, Facebook Clicks: 1,398. • **Facebook Articles** ○ **February 1:** Tips to protect streams, rivers while pressure washing, 1908 impressions and 24 engagements ○ **March 18:** Tips to protect rivers and streams from toxic chemicals, 2,609 impressions and 24 engagements ○ **March 27**: How to help protect our watersheds, 2,243 impressions and 21 engagements ○ **April 20:** Steps to prevent spills, leaks and how report them, 1879 impressions and 7 engagements "Impressions" are the number of times the content was displayed. "Engagements" are any interaction a viewer has with a social media content that shows they are interested in your post such as a "like" or a "share.") • **MyClackCo Magazine Articles**, Circulation 180,000 • **Fall 2020**: ▪ Happy Valley Art Project to Reduce Discharges to Prevent pollution • **Spring 2021 articles** ▪ Pressure Washing & Surface Cleaning: Tips to Protect our Water ▪ WES: Your Front line of Defense in Health, Environment with information about how to report spills or discharges • **WES Quarterly Newsletters**, 5,905 Subscribers ○ July 2020 articles ▪ Wash Your Car and Protect Our Waterways by keeping dangerous chemicals out of rivers and streams

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Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2020 - 21 Tracking Measure or Measurable Goal Response	2020 - 21 Response Comment
									• **<u>May 2021 WES Bill Insert</u>** Linked retail customers to articles about ○ Online reporting tool: WES replaced its online form with a link (https://www.clackamas.us/wes/reportaproblem.html) directing the community to a webpage offering options to reporting a discharge or disposal. One can email or call in information during the day or afterhours. Appropriate staff responds and investigates the alleged illicit discharge or improper disposal. ○ Tips for pressure washing and surface cleaning ○ Spills and leaks **Articles and Events that Facilitated Reporting of Other Types of Improper Disposal of Materials** • **<u>Facebook Articles</u>** ○ **February 24**: Landscaping to protect rivers and streams from pesticides, herbicides, etcetera, 2,949 impressions and 20 engagements ○ **March 18:** Tips to protect rivers and streams from toxic chemicals, 2,609 impressions and 24 engagements ○ **March 27**: How to help protect our watersheds, 2,243 impressions and 21 engagements ○ **May 8**: Professional landscaper tips to avoid pesticides, herbicides, use rain gardens, natural lawn care, pollinator gardens, 1993 impressions and 29 engagements ○ **June 13**: Picking up Pet Waste, 8,668 impressions and 406 engagements • **MyClackCo Magazine Articles**, Circulation 180,000 ○ **Fall 2020**: ▪ Safely Dispose of Toxic Products like Pesticides • **<u>May 2021 WES Bill Insert</u>** Linked retail customers to articles about ○ Online reporting tool: WES replaced its online form with a link (https://www.clackamas.us/wes/reportaproblem.html) directing the community to a webpage offering options to reporting a discharge or disposal. One can email or call in information during the day or afterhours. Appropriate staff responds and investigates the alleged illicit discharge or improper disposal.
39	**Component #4 Education and Outreach**	**Facilitate Public Reporting of Illicit Discharges and Spills and of Other Types of Improper Disposal of Materials**	**12**	**12**	WES (formerly, SWMACC and CCSD#1) Public & Government Affairs	Tracking Measure	Describe type of public complaints received. Resulting follow up actions per year will be kept in a database.	Attained	WES investigates all illicit discharge complaints received as well as those that WES staff encounter. Section 1.8 in this annual report provides additional information. Details about all follow-up actions are kept in a database.
40	**Component #4 Education and Outreach**	**Facilitate Public Reporting of Illicit Discharges and Spills and of Other Types of**	**12**	**12**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Include a relevant article in The Citizen News (for the County) once a permit term (where permit term is from March 2012 through March 1, 2017)	Attained	**MyClackCo Magazine, Circulation 180,000,** • **Fall 2020 articles** ○ Safely Dispose of Toxic Products like Pesticides, fertilizers, herbicides • **Spring 2021 articles** ○ Pressure Washing & Surface Cleaning: Tips to Protect our Water

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		Improper Disposal of Materials							○ WES: Your Front line of Defense in Health, Environment with information about how to report spills or discharges
41	**Component #4 Education and Outreach**	**Facilitate Public Reporting of Illicit Discharges and Spills and of Other Types of Improper Disposal of Materials**	**12**	**12**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue to include area for public complaints on the County's website and track number of complaints for reporting	Attained	WES replaced the online form with a link (https://www.clackamas.us/wes/reportaproblem.html) directing the community to a webpage offering options to reporting a discharge or disposal. One can email or call in information during the day or afterhours. Customer service enters the information into WES' maintenance tracking software, *Lucity*, so the appropriate staff can respond and investigate the alleged illicit discharge or improper disposal.
42	**Component #4 Education and Outreach**	**Participate in a Public Education Effectiveness Evaluation**	**13**	**13**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Report on activities annually.	Attained	WES submitted its Evaluation to DEQ in 2015.
43	**Component #4 Education and Outreach**	**Participate in a Public Education Effectiveness Evaluation**	**13**	**13**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Provide/compile information regarding a public education effectiveness evaluation over the permit term.	Attained	WES submitted its Evaluation to DEQ in 2015.
44	**Component #4 Education and Outreach**	**Training for Employees**	**14**	**14**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track the number of employees receiving training in stormwater management annually.	90	Ninety employees received stormwater management training in 19 different workshops relevant to stormwater management.
45	**Component #4 Education and Outreach**	**Training for Employees**	**14**	**14**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Attend relevant stormwater management related training based on need and availability	Attained	Many of the 90 WES employees who received training attended one or more of the following: the ACWA Stormwater Summit, CESCL Re-Certification Training, CESCL: Lead Training, Environmental Laboratory Conference, Erosion Control & Stormwater Management Summit, Managing Stormwater in Oregon, National Planning Conference, PFAS Workshop: Focus on Idaho, PNCWA Lunch & Learns, PNCWA Summit Series, Strategic Communications: H2O Virtual Event, Vegetated Stormwater Facilities, Virtual Catalyst Mastermind Summit, Water Environment School, Water Quality NPDES Permitting 3 Series Workshop, and WEFTEC. Two employees who belong in the Permits group attended four training surface water management sessions: one attended ***Recertification in Erosion & Sediment Control Inspector***, ***Certified Erosion & Sediment Control Lead***, ***Erosion Control & Stormwater Management Summit***, and ***Maintenance Certification Training – PerkFilter;*** *the other* attended ***Wetland Delineation Workshop***, ***ORWEF Short School***, **ACWA Stormwater Summit**, and **American Planning Association Conference**. Another employee attended ***ACWA Stormwater Summit*** and ***ORWEF Short School***. Three employees from Happy Valley received the ***Construction Project Management*** training. One existing employee took ***How to Read a Geotechnical Report*** training; ***Construction Cost Estimating***; and ***Handling Ethical Issues in Government Projects***. Another employee took ***How to Design and Construct MSE Walls***. The Public Works had 21 employees attend the following trainings: ***ORWEF Water Environment School*** – March 2021, ***Improving Safety Features of Local Roads & Streets*** – March 2021, and ***Pesticide Training*** – (19) credit hours.

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46	**Component #4 Education and Outreach**	**Training for Employees**	**14**	**14**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Check in with the Fire Department regarding stormwater issues during the permit's 5-year term.	Attained	During a spot inspection in Spring 2021, while Clackamas Fire District No. 1 was conducting fire training exercises at their training facility on SE 130th Avenue, WES staff noted that the Fire District was operating their facility with the storm/sanitary sewer valves in the correct orientation. Flows from fire-fighting training activities utilizing foam were directed correctly to sanitary sewer as per the Fire District's AOP.
47	**Component # 5 Public Involvement and Participation**	**Provide for Public Participation with SWMP and Benchmark Submittals**	**15**	**15**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Provide for public participation with the SWMP and pollutant load reduction benchmarks prior to the permit renewal application deadline	Attained	The public comment period for documents related to the MS4 permit renewal application submittal ran from January 20, 2017 to February 21, 2017. WES submitted these documents to DEQ on February 24, 2017.
48	**Component # 5 Public Involvement and Participation**	**Provide for Public Participation with SWMP and Benchmark Submittals**	**15**	**15**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Provide for public participation with the monitoring plan due to the Department by September 1, 2012	Attained	This public participation opportunity was provided in 2012.
49	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	The number and type of flow control, water quality treatment or infiltration facilities installed in accordance with the requirements	16	Includes water quality, infiltration and flow control ponds.
50	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Narrative to describe the status of the private facility database	Attained	The upgrades to the GIS and maintenance management system software and databases is undergoing installation and testing. Initial customization of the LUCITY maintenance management software system has begun to facilitate testing. These systems will be used for the private facility database for commercial/industrial properties.
51	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Narrative to describe results of tracking compliance with private facility maintenance agreements	66/146 = 45.2% of CMA holders submitted reports to WES in 2020	• 146 Commercial Maintenance Agreements in the MS4 area • 66 CMA properties submitted reports in calendar year 2020 with 608 structures cleaned • See BMP 28 in this table for information about WES' Stormdrain Cleaning Assistance Program (SCAP)
52	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue to implement and enforce controls for stormwater quality treatment from new and re-development	Attained	WES continues to implement and enforce controls for stormwater quality treatment from new and re-development.
53	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Track the location, type, and drainage area of new water quality facilities using GIS	Attained	WES staff tracks areas that drain to water quality and flow control facilities by mapping project areas from as-builts. Staff is actively improving the existing GIS data and mapping new projects.

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54	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue with work to compile a database of private facilities	Attained	During this 12 month reporting period, WES improved and maintained our database of private facilities.
55	**Component # 6 Post-Construction Site Runoff**	**Planning Procedures for New Development and Significant Redevelopment**	**16**	**16**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Annually, check in on compliance with terms of private facility maintenance agreements	Attained	Since reporting from commercial properties is due by December 31st of each year, the following information is for calendar year 2020 rather than permit year 2020-21. WES sent one mailing and had two cleaning campaigns in 2020 to not only the properties within the MS4 area that had Commercial Maintenance Agreements, but rather to all commercial/industrial stormwater accounts that had storm systems. The letter was to remind them of the annual inspection and reporting requirements as well as to offer them an opportunity for discounted cleaning through the Stormdrain Cleaning Assistance Program (SCAP). WES continues to conduct site inspections as a means to encourage compliance with maintenance agreement requirements. Two items affected performance for 2020. The first was some business that signed up for SCAP did not get cleaned since the original vendor selected for 2020 had issues completing the work. The alternate vendor took over but not in time to be able to correct the missed sites. The second constraint was that the COVID-19 pandemic restricted the staffing and the financial resources of many businesses to meet the inspection and cleaning requirements so compliance numbers are lower for 2020 and the volume of material removed was not captured from many sites. Total cleaning of all private commercial/industrial facilities through SCAP (See BMP 28} and other methods: 278 CMA and non-CMA businesses reported the cleaning of 1682 structures {many more than that were inspected}, and over 72,000 gallons of material removed.
56	**Component # 6 Post-Construction Site Runoff**	**Update Procedures for New Development and Significant Redevelopment**	**17**	**17**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track status of adopting proposed changes to the stormwater standards for new and re-development.	Attained	The revised Stormwater Standards took effect on July 1, 2013. WES completed the updates to the standards on June 28, 2013 by adopting new CCSD#1 Stormwater standards. In July 2018 WES started a project to update WES' stormwater standards which includes the MS4 requirement to capture and treat 80% of the annual average runoff volume, which roughly equates to 1" of rainfall on a development site. The new standards will prioritize Low Impact Development Approach (LIDA) to mitigate stormwater runoff. The project is anticipated to be completed in January 2022, and the process will include internal staff involvement from applicable divisions of WES, Clackamas County engineering & planning, City of Happy Valley and regional stakeholders.
57	**Component # 6 Post-Construction Site Runoff**	**Update Procedures for New Development and Significant Redevelopment**	**17**	**17**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	CCSD#1: Complete updates to standards to meet new permit requirements by June 30, 2013	Attained	See Row 56's response.
58	**Component # 6 Post-Construction Site Runoff**	**Update Procedures for New Development and Significant Redevelopment**	**17**	**17**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	CCSD#1: Complete guidance manual for developers to facilitate the implementation of the new standards by June 30, 2013	Attained	The revised Stormwater Standards took effect on July 1, 2013, and included a guidance manual for the development community to implement the standards and assist in the planning and design of a stormwater management plan.

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59	**Component # 6 Post-Construction Site Runoff**	**Update Procedures for New Development and Significant Redevelopment**	**17**	**17**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	SWMACC: Policy development and implementation by November 1, 2014.	Attained	See Row 56's response.
60	**Component # 6 Post-Construction Site Runoff**	**Sizing Tool Development to Address Hydro-modification**	**18**	**N/A**	WES (formerly, CCSD#1)	Tracking Measure	Net impervious area treated by LID	19.34 acres	The WES Development Services team approved six development permits which treated stormwater runoff by LID BMPs with the net impervious area of 19.34 acres.
61	**Component # 6 Post-Construction Site Runoff**	**Sizing Tool Development to Address Hydro-modification**	**18**	**N/A**	WES (formerly, CCSD#1)	Tracking Measure	Number of applications submitted using sizing tool	6	Six development projects utilized the BMP Sizing Tool to control stormwater runoff.
62	**Component # 6 Post-Construction Site Runoff**	**Sizing Tool Development to Address Hydro-modification**	**18**	**N/A**	WES (formerly, CCSD#1)	Tracking Measure	Customer feedback and community relations about the simplified tool (for development engineers) that sizes LID BMPs (in order to address the duration of elevated flow levels in addition to addressing flow volumes and peaks; and in order to address the long-term impacts of increased runoff from development).	Attained	As part of the ongoing update to the SW standards in partnership with Brown and Caldwell, WES conducted a robust public outreach and comment period on proposed changes alongside WES Staff, meeting with major WES stakeholders such as regional watershed councils, and community planning organizations.
63	**Component # 6 Post-Construction Site Runoff**	**Sizing Tool Development to Address Hydro-modification**	**18**	**N/A**	WES (formerly, CCSD#1)	Measurable Goal	The primary goal is to develop, by June 30, 2013, a tool to assist development engineers with the design/sizing of stormwater management facilities in order to reduce target pollutants and stream degradation impacts (i.e., hydro modification) associated with the development of impervious surfaces.	Attained	The revised Stormwater Standards took effect on July 1, 2013, and the BMP Sizing Tool was in these Standards. In July 2018 WES started a project to update WES' stormwater standards which includes the MS4 requirement to capture and treat 80% of the annual average runoff volume, which roughly equates to 1" of rainfall on a development site. The new standards will prioritize Low Impact Development Approach (LIDA) to mitigate stormwater runoff. The project is anticipated to be completed in January 2022, and the process will include internal staff involvement from applicable divisions of WES, Clackamas County engineering & planning, City of Happy Valley and regional stakeholders.
64	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Street Sweeping**	**19**	**18**	Happy Valley DTD	Tracking Measure	Number of miles that were swept in Happy Valley	1,413 miles For Clackamas County roads, please, see DTD 2020-21 MS4 Annual Report.	780 miles of streets swept in the City. On behalf of WES, Happy Valley swept an additional 633 miles in the remaining WES MS4 service area through an IGA between WES and the City. For miles swept by Clackamas County DTD sweepers, please see DTD's 2020-21 MS4 annual report.

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65	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Street Sweeping**	**19**	**18**	Happy Valley DTD	Tracking Measure	Mass or volume of material removed during sweeping in Happy Valley	989 cubic yards For Clackamas County roads, please, see DTD 2020-21 MS4 Annual Report.	Happy Valley removed 743 cubic yards. On behalf of WES, Happy Valley removed 246 cubic yards of street sweeping debris from the remaining MS4 service area. For the mass or volume of debris that Clackamas County DTD removed, see DTD's 2020-21 MS4 annual report.
66	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Street Sweeping**	**19**	**18**	Happy Valley DTD	Measurable Goal	City of Happy Valley sweeps approximately 100 lane miles of curbed streets per year on average	Attained For Clackamas County roads, please, see DTD 2020-21 MS4 Annual Report.	City of Happy Valley exceeded its goal of 100 miles.
67	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**	Happy Valley DTD	Tracking Measure	Mass or volume of material removed by the City of Happy Valley "Adopt-a-Road" program	Not Applicable	Happy Valley no longer has an Adopt-a-Road program as part of its operations and maintenance of public streets. Instead, the City captures litter from its streets through its street sweeping program, where Happy Valley removed 21 cubic yards of material through its street sweeping program. The Shared SWMP, which was submitted to DEQ for approval in 2017, removed this BMP, but Happy Valley has been unable to implement this updated SWMP because it has not been approved by DEQ, as of October 2021.
68	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**	Happy Valley	Tracking Measure	Number of illegal solid waste dumps that are removed in the City of Happy Valley	Unknown	Happy Valley partners with Metro's RID Patrol program to remove the illegal dump sites in the City. Metro tracks the amount of material removed in Happy Valley.
69	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**	Happy Valley DTD	Tracking Measure	Mass or volume of material that is removed by the elimination of illegal solid waste dumping sites in the City of Happy Valley	Unknown	See Row 68's response.
70	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**	Happy Valley DTD	Tracking Measure	Amount of sand applied and then removed by Happy Valley as a result of a snow/ice event and time of removal after the event	125 yards applied of sand and 111 yards of sand removed	Happy Valley applied 125 yards of sand as a result of this year's snow/ice events and picked up 111 yards of sand within the required 10 days after the end of the snow/ice events.
71	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**	Happy Valley DTD	Measurable Goal	Remove illegal solid waste dumps as they are discovered	Attained	Metro partners with Happy Valley to remove the illegal dump sites in the City. Metro tracks the amount of material removed in Happy Valley.

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72	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**	Happy Valley DTD	Measurable Goal	Collect sand applied for ice/snow events within 10 days of the end of the event	Attained	Happy Valley collected 111 of the 125 yards that it applied during snow and ice events within 10 days of the end of the events.
73	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Operations & Maintenance for Public Streets**	**20**	**19**	Happy Valley DTD	Measurable Goal	DTD: See DTD's MS4 NPDES SWMP	See DTD's 2020-21 MS4 Annual Report	See DTD's 2020-21 MS4 Annual Report for the work DTD performed on County-maintained roads.
74	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Proper Road Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**21**	**20**	Happy Valley DTD	Tracking Measure	Happy Valley - The quantity of herbicide products used per zip code. This is the same data that will be reported to Oregon's Department of Agriculture per the Pesticide Use Reporting System.	0	City of Happy Valley did not use any chemicals in the Right of Way.
75	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Proper Road Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**21**	**20**	Happy Valley DTD	Tracking Measure	DTD roads: See tracking measures in the DTD MS4 NPDES SWMP	See DTD's 2020-21 MS4 Annual Report	See DTD's 2020-21 MS4 Annual Report for the County's pesticide, herbicide and fertilizer use in County-maintained roads.
76	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Proper Road Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**21**	**20**	Happy Valley DTD	Measurable Goal	Happy Valley Roads: Continue to implement the integrated pest management portion of the ODOT Routine Road Maintenance Manual	Attained	City of Happy Valley continues to implement the Integrated Pest Management portion of the ODOT Routine Road Maintenance Manual. For DTD's practice, see DTD's 2020-21 MS4 Annual Report.
77	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Landscape Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**22**	**21**	WES (formerly, SWMACC and CCSD#1) Happy Valley DTD	Tracking Measure	The number of meetings conducted	Attained	No meetings were held in 2020-2021 because the meetings which were required to be held during the permit term have already been held. Note: The meetings with the local government agencies and districts who are not MS4 co-permittees have also been held already.
78	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Landscape Maintenance Practices to Reduce the Discharge of Pesticides,**	**22**	**21**	WES (formerly, SWMACC and CCSD#1) Happy Valley	Tracking Measure	The results and follow-up activities conducted as a result of the meetings	Attained	During the 2020-2021 permit year, WES did not conduct follow-up activities as a result of the meetings which were held in previous years during this permit term, since this work has already been done.

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		Herbicides and Fertilizers			DTD				
79	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Landscape Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**22**	**21**	WES (formerly, SWMACC and CCSD#1) Happy Valley DTD	Measurable Goal	Check back in with all County & City of Happy Valley buildings and facilities that were visited (during the last permit cycle) at least once during this permit cycle	Attained	This check-in process occurred during meetings which were held during this time period: June 2016 to February 2017. WES sent a follow-up letter to each public agency after the meetings were held.
80	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Landscape Maintenance Practices to Reduce the Discharge of Pesticides, Herbicides and Fertilizers**	**22**	**21**	WES (formerly, SWMACC and CCSD#1) Happy Valley Rivergrove	Measurable Goal	Develop and implement an Integrated Pest Management plan by December 31, 2012	Attained	These IPM plans were developed and implemented prior to December 31, 2012 and they continued to be implemented in 2020-2021. The first IPM Plan is co-owned/implemented by the City of Happy Valley and WES. The second IPM Plan is owned and implemented by the City of Rivergrove.
81	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Control Infiltration and Cross Connections to the District's Stormwater System**	**23**	**22**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of cross-connections/ sanitary discharges identified	1	A Happy Valley building official reported a cross-connection from a sanitary sewer system to the storm system in a newly constructed subdivision. A cross-connection from sanitary sewer to the storm system was discovered in a newly constructed subdivision. WES crews went through the subdivision and identified & remarked the sanitary sewer and storm connections. The WES Permits group followed up with the builder to ensure corrections to the sewer connection was made.
82	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Control Infiltration and Cross Connections to the District's Stormwater System**	**23**	**22**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	The number and type of inspections performed, abatement actions and enforcement actions taken	1 abatement action, 1 enforcement action, and 1,527 water quality facilities and structures inspected for infiltration and cross connection	In response to the cross-connection discovery in the City of Happy Valley's sub-division, WES verified the location of the cross connection, cleaned the affected storm system, and removed debris from the outfall. The City then made the contractor repair the affected storm and sewer connections. After the repair, WES staff then identified and remarked all storm and sewer lines in the subdivision using closed circuit television as a guide. WES' Permits group then followed up to ensure that the storm and sewer connections were corrected. Through preventative maintenance activities within the MS4, staff visually inspects some structures for condition assessment to include evidence of cross connections. WES staff looks for evidence of cross connection during daily inspection and cleaning activities. Staff also conducts routine video surveillance using closed-circuit television inspections of the sanitary system in an effort to find and eliminate any cross connection.
83	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Control Infiltration and Cross Connections to the District's Stormwater System**	**23**	**22**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Eliminate any identified sanitary discharges to the storm system.	Attained	Upon the cross connection discovery in Happy Valley, WES verified the location of the cross connection, cleaned the affected storm system, and removed debris from the outfall. The City then made the contractor repair the affected storm and sewer connections. After the repair, WES staff then identified and remarked all storm and sewer lines in the subdivision using closed circuit television as a guide. WES' Permits group then followed up to ensure that the storm and sewer connections were corrected.

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84	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Flood Management Projects and Water Quality**	**24**	**N/A**	WES (formerly, CCSD#1)	Tracking Measure	Number of retrofits constructed that address water quality treatment	No projects were completed or underway in 2020-2021, but we are working on plans for future years	WES has begun work on the 3-Creeks project. The project will address flood management and improve water quality. The design of this project will be complete during 2021-22 and construction is anticipated in 2023-24.
85	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Flood Management Projects and Water Quality**	**24**	**N/A**	WES (formerly, CCSD#1)	Tracking Measure	Number of flood management projects implemented or constructed and the percentage of those projects that include water quality Components	No projects have been completed in these categories, but we are working on plans for future years	See Row 84's response in this table.
86	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Flood Management Projects and Water Quality**	**24**	**N/A**	WES (formerly, CCSD#1)	Measurable Goal	Ensure all planned stormwater CIPs include consideration of water quality.	No projects have been completed in these categories, but we are working on plans for future years	WES is finalizing a formalized CIP with the Storm System Master Planning project. This effort will include water quality improvement projects.
87	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Detention Pond Retrofit Program**	**25**	**N/A**	WES (formerly, CCSD#1)	Tracking Measure	Track pilot testing activities	No projects have been completed in these categories in 2020-2021, but we are working on plans for future years	Opti equipment, which was planned, constructed and test piloted before 2018-19, is fully operational in three detention ponds. Performance data shows an increase in detention time and a decrease in wet weather discharge rates from the ponds.
88	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Detention Pond Retrofit Program**	**25**	**N/A**	WES (formerly, CCSD#1)	Tracking Measure	Number, type, and location of detention pond retrofits	No projects have been completed in these categories in 2020-2021, but we are working on plans for future years	WES is finalizing a formalized CIP with the Storm System Master Planning project. The new CIP includes a program for detention pond retrofits.
89	**Component # 7 Pollution Prevention for Municipal Operations BMPs**	**Detention Pond Retrofit Program**	**25**	**N/A**	WES (formerly, CCSD#1)	Measurable Goal	The primary goal of the retrofit program is to retrofit existing ponds to improve their function to better meet watershed health goals. The goal will be to conduct 2 to 5 retrofits per year.	No projects have been completed in these categories in 2020-2021, but we are working on plans for future years	WES is finalizing a formalized CIP with the Storm System Master Planning project. The new CIP includes a program for detention pond retrofits.

2020-21 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2020 - 21 Tracking Measure or Measurable Goal Response	2020 - 21 Response Comment
90	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Miles of ditches and storm lines maintained	6.51 Miles	WES inspected and/or cleaned 6.38 miles of storm pipe. Happy Valley maintained 700 linear feet (or 0.133 miles) of ditches. For ditch cleaning that DTD has performed, please, see DTD's MS4 Annual Report.
91	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number and type of components inspected and/or cleaned	1,230 assets	WES inspected and /or cleaned 268 ponds, 6.38 miles of pipe, 678 catch basins, and 211 structures including flow control and water quality structures. Happy Valley inspected five catch basins and three field inlets
92	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Mass or volume of material removed during cleaning	148 cubic yards	WES removed approximately 116 cubic yards of material from catch basins. Happy Valley removed approximately 32 cubic yards of material from catch basins and field inlets.
93	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	WES: Clean storm lines and ditches on an as-needed basis. Identify inspection frequency.	Attained	WES inspects its conveyance system components and structural controls using a preventative maintenance schedule.
94	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	WES: Maintain structural water quality facilities on a 3-year cycle.	Attained	WES is transitioning to an inspection based maintenance program where all of water quality structures are inspected and/or cleaned within a three-year cycle.
95	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Maintenance of Conveyance System Components and Structural Controls**	**26**	**23**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	WES: Conduct conveyance system assessment by January 31, 2013.	Attained	WES conducted the initial conveyance system assessment prior to January 31, 2013. As part of its operations, WES continues to improve its asset management best practices. WES has made improvements to GIS and the computerized maintenance management system (CMMS). Maintenance crews have field tablets with access to current mapping and the CMMS to improve the tracking of activities pertaining to the conveyance system assets.
96	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Conduct Catch Basin Cleaning and Maintenance**	**27**	**24**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track the percent of District owned or District operated/maintained catch basins cleaned per year	7.8%	WES cleaned 678 catch basins.

2020-21 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2020 - 21 Tracking Measure or Measurable Goal Response	2020 - 21 Response Comment
97	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Conduct Catch Basin Cleaning and Maintenance**	**27**	**24**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Track the volume of debris removed during cleaning activities	148 cubic yards	A standard catch basin sump is 60% full and has 0.172 cubic yards of debris, which is contained and then removed during cleaning, totaling approximately 116 cubic yards of debris removed from the 678 catch basins that WES cleaned. Happy Valley removed approximately thirty 32 cubic yards of material from catch basins and field inlets.
98	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Conduct Catch Basin Cleaning and Maintenance**	**27**	**24**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Clean 15% of District owned or District operated/maintained public catch basins each year. The 50 percent cited in the Stormwater Management Plan is a typo.	7.8% were cleaned	WES cleaned 7.8% of all District operated catch basins (or 678 of 8,684), or about half of the performance target for the year. This is lower than in previous years, and was mainly due to availability of Field Operations staff to clean structures. Reasons for limited resources include operational issues related to COVID-19, and several declared emergencies including fire and ice storms. WES also targeted catch basin cleaning in areas with limited maintenance history, which slowed the rate of cleaning to a degree. WES will make adjustments to achieve the targeted proportion of catch basin cleaning in the 2021-22 regulatory year.
99	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Conduct Catch Basin Cleaning and Maintenance**	**27**	**24**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Schedule repair or replacement of catch basins based on inspection results	Attained	Repairs were completed as discovered by inspections or referred to our capital engineering staff for a larger repair project.
100	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Storm Drain Cleaning Assistance Program**	**28**	**25**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of agreement holders compared with the number of annual reports received and the number devices being serviced by the vendor	146 Active Commercial Maintenance Agreements in the MS4 area 66 CMA properties submitted reports 608 structures cleaned (249 by the vendor)	SCAP and other commercial private storm drain cleaning tracking has been changed to calendar year reporting rather than permit year. The information cited is the 2020 calendar year.
101	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Storm Drain Cleaning Assistance Program**	**28**	**25**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Total number of businesses serviced by the vendor with total number of devices maintained and volume of debris removed	A total of 278 property owners and businesses cleaned 1,682 structures and removed over 72,000 gallons. The SCAP vendor served 153 of the 278 businesses, maintained 852 of the 1,682 storm structures, and removed 27,000 of the 72,000 gallons.	Storm Drain Cleaning Assistance Program (SCAP) and other commercial private storm drain cleaning tracking has been changed to calendar year reporting rather than permit year. The information cited is the 2020 calendar year. Two items affected performance for 2020. The first was some business that signed up for SCAP did not get cleaned since the original vendor selected for 2020 had issues completing the work. The alternate vendor took over but not in time to be able to correct the missed sites. The second constraint was that the COVID-19 pandemic restricted the staffing and financial resources of many businesses to meet the inspection and cleaning requirements so compliance numbers are lower for 2020 and the volume of material removed was not captured from many sites.

2020-21 Best Management Practices

Row No.	Surface Water Management Plan Component	Best Management Practice (BMP)	Former CCSD#1 BMP #	Former SWMACC BMP #	Jurisdiction	Type	Tracking Measures and Measurable Goals (as listed in the 2012 SWMP)	2020 - 21 Tracking Measure or Measurable Goal Response	2020 - 21 Response Comment
102	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Storm Drain Cleaning Assistance Program**	**28**	**25**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Continue to provide assistance to commercial and industrial facilities to support their water quality facility maintenance.	Attained	WES partnered with the cities of Milwaukie, Gresham, Fairview, Oregon City, Wood Village and Oak Lodge Water Services District on a Storm Drain Cleaning Assistance Program (SCAP) for private stormwater facilities. The program consisted of a Spring and Fall campaign with a USPS mailing for the Fall portion. To seek better compliance, WES staff continued a series of prioritized onsite inspections that included assessments and guidance on avoiding possible onsite practices that could serve as sources of pollution to the MS4. Where deficiencies were identified by WES staff, corrections were required of the properties.
103	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	WES (formerly, SWMACC and CCSD#1)	Tracking Measure	Number of structures inspected and cleaned	1222 assets	BMP #29 is only for those storm sewer systems constructed since approximately 1996 which are located in single-family residential areas; homeowners in these areas pay an additional $3 fee to WES per month which funds the operation and maintenance of these storm sewer systems. WES inspected and /or completed vegetation management on 268 ponds, inspected and/or cleaned 6.38 miles of pipe, inspected and/or cleaned 211 structures including flow control and water quality structures, and cleaned 678 catch basins. These are assets that WES owns and/or operates.
104	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Inspect 70% of our maintenance agreement sub-divisions annually	59%	WES completed inspections in 208 of 353 maintenance agreement subdivisions.
105	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Cleaning and repair schedules will be developed based on inspection outcomes	Attained	Any repairs or cleanings were subsequently scheduled and/or completed based on the inspection results.
106	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	All non-maintenance agreement cleaning and repairs will be request or service driven	Attained	Any non-maintenance agreement cleanings and/or repairs were initiated by requests for service.
107	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	Emergency driven cleaning and maintenance will be addressed within 24 hours of the call being received	Attained	All emergency requests were responded to once the requests were received.
108	**Component #8 Structural Stormwater Facility Operations and Maintenance**	**Private Water Quality Facility Maintenance Program**	**29**	**26**	WES (formerly, SWMACC and CCSD#1)	Measurable Goal	All non-emergency requests for service will be addressed within 72 hours of the call received	Attained	All non-emergency requests for service were addressed within the 72 hour time frame.

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Appendix B: MS4 Pollutant Monitoring Results

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Table A-1. WES (CCSD #1) Instream Water Quality Monitoring Results (2020-2021)

Carli Creek

				Water Quality Standard Comparison																Additional Parameters of Concern								Supporting Parameters			
WES ID and Location	Date	Rain Event (Y/N)	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Total Phosphorus (mg/L)[5]	WQ Std (mg/L)	Copper, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Lead, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Zinc, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Ortho-phosphate (mg/L)	Copper, Total (ug/L)	Lead, Total (ug/L)	Zinc, Total (ug/L)	Hardness (mg/L)	pH[7]	Conductivity (uS/cm)
#05 SE 120th & Carpenter Dr. MH	7/16/20	N	Routine	16.5	18	9.5	6.5	0.96	10	2	406	0.07	0.14	1.0	10.0	15.2	0.03	2.90	74.46	9.0	132.0	130.9	222	4	189	<0.05	0.06	1.0	0.26	13	114	7.6	270.0
#05 SE 120th & Carpenter Dr. MH	8/10/20	N	Routine	16.6	18	7.7	6.5	0.88	10	34	406	0.08	0.14	0.5	10.3	15.7	<0.02	3.01	77.30	8.3	135.9	134.8	181	4	179	<0.05	0.07	0.9	0.13	16	118	7.7	280.0
#05 SE 120th & Carpenter Dr. MH	9/23/20	N	Routine	17.5	18	5.5	6.5	0.83	10	111	406	0.08	0.14	1.0	9.6	14.6	<0.02	2.76	70.93	16.9	127.1	126.1	196	3	183	<0.05	0.06	1.5	0.09	22	109	7.4	208.7
#05 SE 120th & Carpenter Dr. MH	10/22/20	N	Routine	15.2	18	8.9	6.5	0.91	10	1300	406	0.12	0.14	0.6	9.9	15.0	<0.02	2.85	73.05	9.1	130.0	129.0	215	3	184	<0.05	0.08	1.4	0.29	26	112	7.6	268.0
#05 SE 120th & Carpenter Dr. MH	11/17/20	N	Routine	13.9	18	9.0	6.5	1.03	10	29	406	0.12	0.14	2.4	6.2	9.0	0.09	1.57	40.28	34.8	82.0	81.3	108	5	109	<0.05	0.05	6.3	1.46	82	65	7.2	140.7
#05 SE 120th & Carpenter Dr. MH	12/2/20	N	Routine	14.1	18	7.0	6.5	1.12	10	13	406	0.06	0.14	0.5	8.1	12.0	<0.02	2.22	56.87	10.9	107.0	106.2	164	1	158	<0.05	0.06	0.9	0.05	15	89	7.5	219.0
#05 SE 120th & Carpenter Dr. MH	1/14/21	N	Routine	11.2	18	9.9	6.5	1.80	10	61	406	0.06	0.14	0.9	6.4	9.2	<0.02	1.62	41.65	13.8	84.1	83.5	153	7	119	<0.025	0.03	1.6	0.14	20	67	7.2	164.3
#05 SE 120th & Carpenter Dr. MH	3/10/21	N	Routine	11.7	18	9.9	6.5	1.30	10	<1	406	0.06	0.14	0.6	7.8	11.5	<0.02	2.11	54.08	13.3	102.9	102.1	124	2	145	<0.05	0.04	0.9	0.06	18	85	7.3	208.0
#05 SE 120th & Carpenter Dr. MH	4/15/21	N	Routine	12.6	18	10.2	6.5	1.10	10	11	406	0.08	0.14	0.5	9.8	14.8	<0.02	2.82	72.34	7.5	129.1	128.0	192	1	165	<0.01	0.05	0.7	0.05	11	111	7.3	265.0
#05 SE 120th & Carpenter Dr. MH	6/23/21	N	Routine	17.0	18	9.0	6.5	1.10	10	1	406	NM	0.14	NM	9.9	15.0	NM	2.85	73.05	NM	130.0	129.0	190	2	168	0.014	0.06	0.7	0.36	14	112	7.5	255.0
Median [4]				14.7		9.0		1.07		21		0.08		0.6			0.01			10.9			186	3	167	0.025	0.06	1.0	0.13	17	110	7.5	237.0
Maximum [4]				17.5		10.2		1.80		1300		0.12		2.4			0.09			34.8			222	7	189	0.014	0.08	6.3	1.46	82	118	7.7	280.0
Minimum [4]				11.2		5.5		0.83		<1		0.06		0.5			<0.02			7.5			108	1	109	<0.01	0.03	0.7	0.05	11	65	7.2	140.7
Water Quality Exceedance (number of samples)				0		1		0		1		0																				
#05 SE 120th & Carpenter Dr. MH	2/23/21	Y[8]	Routine	11.3	18	10.0	6.5	1.30	10	10	406	0.06	0.14	0.7	6.8	9.9	<0.02	1.76	45.08	22.5	89.4	88.7	144	1	132	<0.05	0.03	2.7	0.11	26	72	7.2	181.4
#05 SE 120th & Carpenter Dr. MH	5/4/21	Y[8]	Routine	14.2	18	8.9	6.5	0.89	10	75	406	0.07	0.14	1.6	8.3	12.3	0.02	2.27	58.27	21.9	109.1	108.2	156	1	147	<0.05	0.04	2.3	0.16	33	91	7.4	205.0
Water Quality Exceedance (number of samples)				0		0		0		0		0																				

Sieben Creek

				Water Quality Standard Comparison																Additional Parameters of Concern								Supporting Parameters			
WES ID and Location	Date	Rain Event (Y/N)	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Total Phosphorus (mg/L)[5]	WQ Std (mg/L)	Copper, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Lead, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Zinc, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Ortho-phosphate (mg/L)	Copper, Total (ug/L)	Lead, Total (ug/L)	Zinc, Total (ug/L)	Hardness (mg/L)	pH[7]	Conductivity (uS/cm)
#07 Sieben Creek at Hwy 212/214	7/16/20	N	Routine	16.7	18	9.4	6.5	1.70	10	261	406	0.07	0.14	0.8	6.4	9.2	<0.01	1.62	41.65	8.0	84.1	83.5	171	2	142	<0.05	0.08	0.9	0.39	11	67	7.9	185.2
#07 Sieben Creek at Hwy 212/214	8/10/20	N	Routine	15.3	18	8.2	6.5	1.40	10	148	406	0.09	0.14	0.9	6.8	10.0	<0.02	1.78	45.77	7.8	90.5	89.8	147	1	139	<0.05	0.08	1.1	0.04	10	73	7.9	185.0
#07 Sieben Creek at Hwy 212/214	9/23/20	N	Routine	15.5	18	8.6	6.5	1.08	10	261	406	0.09	0.14	1.4	6.2	9.0	<0.02	1.57	40.28	10.9	82.0	81.3	150	4	136	<0.05	0.07	1.5	0.03	13	65	7.8	138.2
#07 Sieben Creek at Hwy 212/214	10/22/20	N	Routine	8.1	18	1.4	6.5	1.39	10	44	406	0.06	0.14	0.7	6.2	9.0	<0.02	1.57	40.28	10.3	82.0	81.3	157	3	129	<0.05	0.26	0.9	0.04	10	65	7.9	166.6
#07 Sieben Creek at Hwy 212/214	11/17/20	N	Routine	10.8	18	9.9	6.5	1.79	10	88	406	0.04	0.14	1.2	5.5	7.9	0.03	1.36	34.84	21.7	73.4	72.8	104	<5.0	97.8	<0.05	0.03	1.5	0.10	27	57	7.7	145.8
#07 Sieben Creek at Hwy 212/214	12/2/20	N	Routine	7.1	18	9.8	6.5	1.56	10	42	406	0.04	0.14	0.8	5.6	8.0	<0.02	1.38	35.52	22.2	74.5	73.9	121	1	113	<0.05	0.04	0.9	0.05	27	58	7.8	144.8
#07 Sieben Creek at Hwy 212/214	1/14/21	N	Routine	9.3	18	11.0	6.5	1.90	10	147	406	0.06	0.14	1.1	4.6	6.5	0.09	1.07	27.47	14.2	61.2	60.7	129	5	101	<0.025	0.03	1.6	0.28	23	46	7.5	121.3
#07 Sieben Creek at Hwy 212/214	3/10/21	N	Routine	7.6	18	11.7	6.5	1.70	10	23	406	0.03	0.14	0.6	5.2	7.4	<0.02	1.25	32.15	14.5	69.0	68.4	87	1	102	<0.05	<0.025	0.8	0.03	18	53	7.6	137.5
#07 Sieben Creek at Hwy 212/214	4/15/21	N	Routine	8.3	18	11.5	6.5	1.80	10	866	406	0.04	0.14	0.5	6.1	8.8	<0.02	1.54	39.60	7.1	80.9	80.3	137	3	114	<0.01	<0.025	0.7	<0.02	12	64	7.6	162.6
#07 Sieben Creek at Hwy 212/214	6/23/21	N	Routine	16.3	18	9.2	6.5	1.50	10	96	406	0.06	0.14	0.9	6.1	8.8	<0.01	1.54	39.60	8.0	80.9	80.3	136	<1.0	105	<0.03	0.06	1.1	0.34	10	64	7.8	160.9
Median [4]				10.1		9.6		1.63		122		0.06		0.9			0.01			10.6			137	2	114	0.025	0.05	1.0	0.04	12	64	7.8	153.4
Maximum [4]				16.7		11.7		1.90		866		0.09		1.4			0.09			22.2			171	5	142	<0.05	0.26	1.6	0.39	27	73	7.9	185.2
Minimum [4]				7.1		1.4		1.08		23		0.03		0.5			<0.01			7.1			87	<1.0	98	<0.01	<0.025	0.7	<0.02	10	46	7.5	121.3
Water Quality Exceedance (number of samples)				0		1		0		1		0																				
#07 Sieben Creek at Hwy 212/214	2/23/21	Y[8]	Routine	8.0	18	11.6	6.5	1.50	10	37	406	0.04	0.14	1.0	4.2	5.8	0.06	0.94	24.17	23.8	55.5	55.1	102	1	93	<0.025	<0.025	1.2	0.17	32	41	7.5	111.0
#07 Sieben Creek at Hwy 212/214	5/4/21	Y[8]	Routine	12.7	18	9.7	6.5	0.82	10	866	406	0.07	0.14	3.0	4.1	5.7	<0.02	0.92	23.51	23.8	54.4	53.9	92	2	87	<0.01	<0.025	3.9	0.11	36	40	7.6	102.2
Water Quality Exceedance (number of samples)				0		0		0		1		0																				

Phillips Creek

				Water Quality Standard Comparison																Additional Parameters of Concern								Supporting Parameters			
WES ID and Location	Date	Rain Event (Y/N)	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Total Phosphorus (mg/L)[5]	WQ Std (mg/L)	Copper, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Lead, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Zinc, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Ortho-phosphate (mg/L)	Copper, Total (ug/L)	Lead, Total (ug/L)	Zinc, Total (ug/L)	Hardness (mg/L)	pH[7]	Conductivity (uS/cm)
#11 Phillips Creek at SE 84th Ave.	7/16/20	N	Routine	18.4	18	8.2	6.5	1.10	10	147	406	0.07	0.14	0.8	6.9	10.1	0.06	1.81	46.46	8.0	91.5	90.8	171	4	141	<0.05	0.06	1.1	0.85	11	74	7.7	192.5
#11 Phillips Creek at SE 84th Ave.	8/10/20	N	Routine	17.5	18	6.8	6.5	0.69	10	186	406	0.08	0.14	1.4	7.2	10.5	0.03	1.89	48.53	7.5	94.7	93.9	133	3	132	<0.05	0.05	1.6	0.13	11	77	7.7	194.8
#11 Phillips Creek at SE 84th Ave.	9/23/20	N	Routine	17.1	18	5.2	6.5	0.62	10	326	406	0.08	0.14	1.4	6.7	9.7	0.03	1.73	44.39	6.8	88.4	87.7	146	3	139	0.051	0.03	1.8	0.13	14	71	7.3	146.7
#11 Phillips Creek at SE 84th Ave.	10/22/20	N	Routine	10.4	18	9.4	6.5	0.61	10	921	406	0.04	0.14	1.3	6.4	9.3	0.05	1.65	42.33	9.6	85.2	84.5	152	2	126	<0.05	0.03	1.7	0.18	14	68	7.6	172.1
#11 Phillips Creek at SE 84th Ave.	11/17/20	N	Routine	11.8	18	9.3	6.5	0.51	10	1200	406	0.13	0.14	2.6	3.3	4.5	0.17	0.69	17.68	30.1	43.8	43.4	68	26	58.2	<0.05	0.03	6.1	1.69	61	31	7.4	80.2
#11 Phillips Creek at SE 84th Ave.	12/2/20	N	Routine	8.8	18	9.8	6.5	0.82	10	31	406	0.03	0.14	1.0	6.0	8.7	0.03	1.52	38.92	12.5	79.9	79.2	124	1	118	<0.05	<0.025	1.4	0.18	22	63	7.6	160.1
#11 Phillips Creek at SE 84th Ave.	1/14/21	N	Routine	10.1	18	11.0	6.5	1.40	10	105	406	0.05	0.14	1.2	5.0	7.1	0.10	1.20	30.81	12.8	66.8	66.2	129	5	96	<0.025	<0.025	1.8	0.40	24	51	7.5	129.5
#11 Phillips Creek at SE 84th Ave.	3/10/21	N	Routine	9.2	18	10.8	6.5	0.99	10	76	406	0.03	0.14	0.7	6.2	9.0	<0.02	1.57	40.28	11.6	82.0	81.3	102	1	125	<0.05	<0.025	1.0	0.12	18	65	7.5	169.7
#11 Phillips Creek at SE 84th Ave.	4/15/21	N	Routine	11.2	18	10.6	6.5	0.95	10	50	406	0.04	0.14	0.8	6.8	10.0	0.03	1.78	45.77	35.1	90.5	89.8	149	2	121	<0.01	<0.025	1.1	0.07	38	73	7.7	178.9
#11 Phillips Creek at SE 84th Ave.	6/23/21	N	Routine	17.4	18	8.6	6.5	0.83	10	150	406	0.05	0.14	1.0	6.5	9.5	0.08	1.68	43.02	9.0	86.3	85.6	133	<1.0	103	<0.03	0.04	1.3	0.49	12	69	7.7	165.9
Median [4]				11.5		9.4		0.82		149		0.05		1.1			0.04			10.6			133	3	123	0.025	0.03	1.5	0.18	16	69	7.6	167.8
Maximum [4]				18.4		11.0		1.40		1200		0.13		2.6			0.17			35.1			171	26	141	0.051	0.06	6.1	1.69	61	77	7.7	194.8
Minimum [4]				8.8		5.2		0.51		31		0.03		0.7			<0.02			6.8			68	<1.0	58	<0.01	<0.025	1.0	0.07	11	31	7.3	80.2
Water Quality Exceedance (number of samples)				1		1		0		2		0																				
#11 Phillips Creek at SE 84th Ave.	2/23/21	Y[8]	Routine	8.9	18	11.2	6.5	0.97	10	52	406	0.04	0.14	1.0	5.8	8.3	0.06	1.44	36.88	18.7	76.6	76.0	122	3	114	<0.025	<0.025	1.5	0.27	26	60	7.4	154.7
#11 Phillips Creek at SE 84th Ave.	5/4/21	Y[8]	Routine	13.6	18	9.0	6.5	0.68	10	687	406	0.06	0.14	2.9	5.3	7.5	0.06	1.28	32.82	29.7	70.1	69.5	103	1	98	<0.05	<0.025	3.8	0.30	42	54	7.5	119.2
Water Quality Exceedance (number of samples)				0		0		0		1		0																				

Table A-1. WES (CCSD #1) Instream Water Quality Monitoring Results (2020-2021)

Kellogg Creek - Upstream Location

				Water Quality Standard Comparison																	Additional Parameters of Concern									Supporting Parameters		
WES ID and Location	Date	Rain Event (Y/N)	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Total Phosphorus (mg/L)[5]	WQ Std (mg/L)	Copper, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Lead, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Zinc, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Ortho-phosphate (mg/L)	Copper, Total (ug/L)	Lead, Total (ug/L)	Zinc, Total (ug/L)	Hardness (mg/L)	pH[7]	Conductivity (uS/cm)
#14 Kellogg Creek at SE Rusk Rd.	7/16/20	N	Routine	16.9	18	7.5	6.5	1.70	10	816	406	0.11	0.14	0.5	7.2	10.5	0.10	1.89	48.53	5.0	94.7	93.9	192	4	171	<0.05	0.06	4.7	0.27	6	77	7.0	195.0
#14 Kellogg Creek at SE Rusk Rd.	8/10/20	N	Routine	16.3	18	5.3	6.5	1.60	10	488	406	0.11	0.14	0.2	7.4	10.9	<0.02	1.97	50.61	2.1	97.8	97.0	157	1	155	<0.05	0.06	0.5	0.20	5	80	7.0	202.0
#14 Kellogg Creek at SE Rusk Rd.	9/23/20	N	Routine	15.5	18	5.4	6.5	1.79	10	649	406	0.17	0.14	0.3	7.2	10.6	<0.02	1.92	49.22	2.5	95.7	94.9	190	6	172	0.059	0.08	0.7	0.31	8	78	6.9	163.0
#14 Kellogg Creek at SE Rusk Rd.	10/22/20	N	Routine	11.3	18	8.5	6.5	2.11	10	687	406	0.11	0.14	0.2	7.2	10.6	0.07	1.92	49.22	5.0	95.7	94.9	197	5	161	<0.05	0.1	0.5	0.14	6	78	7.0	198.5
#14 Kellogg Creek at SE Rusk Rd.	11/17/20	N	Routine	11.0	18	8.5	6.5	1.72	10	579	406	0.13	0.14	1.6	6.0	8.7	0.08	1.52	38.92	17.7	79.9	79.2	128	6	111	0.071	0.08	2.4	0.48	25	63	7.0	155.0
#14 Kellogg Creek at SE Rusk Rd.	12/2/20	N	Routine	9.0	18	9.4	6.5	2.10	10	135	406	0.12	0.14	0.6	6.8	10.0	0.06	1.78	45.77	12.8	90.5	89.8	170	1	158	0.09	0.08	0.8	0.21	19	73	7.0	181.4
#14 Kellogg Creek at SE Rusk Rd.	1/14/21	N	Routine	9.5	18	9.8	6.5	2.20	10	142	406	0.14	0.14	1.3	5.1	7.3	0.12	1.23	31.48	14.9	67.9	67.3	152	11	111	<0.05	0.06	2.1	0.78	25	52	7.1	130.4
#14 Kellogg Creek at SE Rusk Rd.	3/10/21	N	Routine	9.9	18	9.5	6.5	2.40	10	121	406	0.11	0.14	0.6	6.7	9.7	0.04	1.73	44.39	9.2	88.4	87.7	147	6	144	<0.05	0.06	0.8	0.25	14	71	7.0	174.7
#14 Kellogg Creek at SE Rusk Rd.	4/15/21	N	Routine	11.5	18	9.6	6.5	2.50	10	3	406	0.12	0.14	0.3	7.6	11.3	<0.02	2.05	52.69	5.3	100.9	100.1	188	5	152	<0.01	0.06	0.5	0.14	9	83	7.2	191.6
#14 Kellogg Creek at SE Rusk Rd.	6/23/21	N	Routine	16.2	18	7.1	6.5	2.10	10	260	406	0.1	0.14	0.4	7.7	11.4	0.03	2.08	53.39	6.0	101.9	101.1	183	8	158	0.061	0.08	0.6	0.44	7	84	7.0	197.2
Median [4]				11.4		8.5		2.10		374		0.12		0.5			0.05			5.7			177	6	157	0.025	0.07	0.7	0.26	9	78	7.0	186.5
Maximum [4]				16.9		9.8		2.50		816		0.17		1.6			0.12			17.7			197	11	172	0.090	0.10	4.7	0.78	25	84	7.2	202.0
Minimum [4]				9.0		5.3		1.60		3		0.10		0.2			<0.02			2.1			128	1	111	<0.01	0.06	0.5	0.14	5	52	6.9	130.4
Water Quality Exceedance (number of samples)				0		2		0		5		2																					
#14 Kellogg Creek at SE Rusk Rd.	2/23/21	Y[8]	Routine	9.5	18	9.9	6.5	2.20	10	42	406	0.1	0.14	0.8	6.0	8.6	0.07	1.49	38.24	28.2	78.8	78.2	141	3	134	<0.025	0.05	1.1	0.28	32	62	7.1	154.3
#14 Kellogg Creek at SE Rusk Rd.	5/4/21	Y[8]	Routine	13.5	18	8.4	6.5	2.40	10	88	406	0.14	0.14	0.5	7.6	11.1	<0.02	2.03	52.00	7.5	99.9	99.0	177	<1.0	163	<0.05	<0.0861	0.7	0.12	12	82	7.0	191.4
Water Quality Exceedance (number of samples)				0		0		0		0		1																					

Mt Scott Creek

				Water Quality Standard Comparison																	Additional Parameters of Concern									Supporting Parameters		
WES ID and Location	Date	Rain Event (Y/N)	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Total Phosphorus (mg/L)[5]	WQ Std (mg/L)	Copper, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Lead, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Zinc, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Ortho-phosphate (mg/L)	Copper, Total (ug/L)	Lead, Total (ug/L)	Zinc, Total (ug/L)	Hardness (mg/L)	pH[7]	Conductivity (uS/cm)
#15 Mt. Scott Creek in NCCP	7/16/20	N	Routine	20.4	18	7.7	6.5	0.28	10	219	406	0.16	0.14	0.8	8.2	12.2	0.03	2.24	57.57	6.0	108.0	107.2	178	5	168	<0.05	0.09	1.0	0.33	8	90	7.6	223.0
#15 Mt. Scott Creek in NCCP	8/10/20	N	Routine	19.3	18	5.6	6.5	0.22	10	411	406	0.15	0.14	1.3	7.8	11.5	0.02	2.11	54.08	2.7	102.9	102.1	153	2	153	<0.05	0.1	1.7	0.22	9	85	7.5	215.0
#15 Mt. Scott Creek in NCCP	9/23/20	N	Routine	17.4	18	4.8	6.5	0.46	10	>2420	406	0.15	0.14	1.3	7.7	11.4	0.03	2.08	53.39	2.8	101.9	101.1	166	6	153	<0.05	0.07	1.6	0.22	9	84	7.2	165.5
#15 Mt. Scott Creek in NCCP	10/22/20	N	Routine	11.0	18	8.5	6.5	0.28	10	219	406	0.12	0.14	0.8	8.0	11.8	0.04	2.16	55.48	5.3	105.0	104.1	178	5	148	<0.05	0.08	1.1	0.16	8	87	7.5	204.0
#15 Mt. Scott Creek in NCCP	11/17/20	N	Routine	11.3	18	9.0	6.5	0.80	10	816	406	0.07	0.14	1.9	5.0	7.1	0.09	1.20	30.81	14.8	66.8	66.2	162	<5.0	82.2	<0.05	0.03	2.8	0.42	23	51	7.2	131.4
#15 Mt. Scott Creek in NCCP	12/2/20	N	Routine	8.2	18	8.4	6.5	0.54	10	47	406	0.05	0.14	1.1	6.0	8.6	0.04	1.49	38.24	6.3	78.8	78.2	133	3	121	<0.05	<0.025	1.6	0.26	18	62	7.3	156.2
#15 Mt. Scott Creek in NCCP	1/14/21	N	Routine	9.4	18	10.4	6.5	1.30	10	129	406	0.07	0.14	1.5	5.0	7.0	0.12	1.17	30.14	9.8	65.7	65.1	130	5	95	<0.025	0.04	2.2	0.55	20	50	7.3	124.5
#15 Mt. Scott Creek in NCCP	3/10/21	N	Routine	8.4	18	10.6	6.5	0.58	10	21	406	0.05	0.14	0.9	6.5	9.5	0.02	1.68	43.02	6.9	86.3	85.6	103	2	120	<0.05	<0.025	1.3	0.17	14	69	7.5	171.7
#15 Mt. Scott Creek in NCCP	4/15/21	N	Routine	13.5	18	11.7	6.5	0.33	10	260	406	0.09	0.14	0.9	8.2	12.2	<0.02	2.24	57.57	3.0	108.0	107.2	169	2	126	<0.024	<0.025	1.1	0.11	9	90	7.8	206.0
#15 Mt. Scott Creek in NCCP	6/23/21	N	Routine	20.5	18	6.0	6.5	0.32	10	204	406	0.14	0.14	0.8	8.0	11.9	0.04	2.19	56.17	5.0	106.0	105.2	157	<1.0	134	0.029	0.1	1.1	0.58	9	88	7.5	204.0
Median [4]				12.4		8.5		0.40		219		0.11		1.0			0.03			5.7			160	3	130	0.025	0.06	1.4	0.24	9	85	7.5	187.9
Maximum [4]				20.5		11.7		1.30		>2420		0.16		1.9			0.12			14.8			178	6	168	0.029	0.10	2.8	0.58	23	90	7.8	223.0
Minimum [4]				8.2		4.8		0.22		21		0.05		0.8			<0.02			2.7			103	<1.0	82	<0.024	<0.025	1.0	0.11	8	50	7.2	124.5
Water Quality Exceedance (number of samples)				3		3		0		3		4																					
#15 Mt. Scott Creek in NCCP	2/23/21	Y[8]	Routine	8.2	18	10.8	6.5	0.69	10	127	406	0.06	0.14	1.3	4.9	6.9	0.09	1.15	29.47	15.0	64.6	64.0	109	5	102	<0.025	<0.025	1.9	0.45	23	49	7.3	131.5
#15 Mt. Scott Creek in NCCP	5/4/21	Y[8]	Routine	14.2	18	8.0	6.5	0.54	10	285	406	0.1	0.14	2.2	6.4	9.3	0.02	1.65	42.33	7.0	85.2	84.5	133	3	121	0.085	0.04	2.8	0.27	17	68	7.4	156.8
Water Quality Exceedance (number of samples)				0		0		0		0		0																					

Rock Creek

				Water Quality Standard Comparison																	Additional Parameters of Concern									Supporting Parameters		
WES ID and Location	Date	Rain Event (Y/N)	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Total Phosphorus (mg/L)[5]	WQ Std (mg/L)	Copper, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Lead, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Zinc, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Ortho-phosphate (mg/L)	Copper, Total (ug/L)	Lead, Total (ug/L)	Zinc, Total (ug/L)	Hardness (mg/L)	pH[7]	Conductivity (uS/cm)
#16 Rock Creek near Mouth	7/16/20	N	Routine	17.5	18	9.5	6.5	0.63	10	51	406	0.08	0.14	0.5	6.8	9.9	<0.01	1.76	45.08	1.0	89.4	88.7	149	3	140	<0.05	0.08	0.7	0.26	2	72	8.0	181.9
#16 Rock Creek near Mouth	8/10/20	N	Routine	16.2	18	8.4	6.5	0.46	10	47	406	0.09	0.14	0.4	7.2	10.6	<0.02	1.92	49.22	<2.0	95.7	94.9	145	2	136	<0.05	0.08	0.5	0.04	<2.0	78	7.9	196.1
#16 Rock Creek near Mouth	9/23/20	N	Routine	15.5	18	7.6	6.5	0.46	10	54	406	0.09	0.14	0.5	7.2	10.6	<0.02	1.92	49.22	<2.0	95.7	94.9	155	4	143	<0.05	0.07	0.6	0.05	2	78	7.7	155.0
#16 Rock Creek near Mouth	10/22/20	N	Routine	8.9	18	10.9	6.5	0.75	10	32	406	0.06	0.14	0.4	6.8	10.0	<0.02	1.78	45.77	<2.0	90.5	89.8	159	2	129	<0.05	0.08	0.7	0.04	<2.0	73	8.0	175.7
#16 Rock Creek near Mouth	11/17/20	N	Routine	10.6	18	10.5	6.5	3.62	10	148	406	0.05	0.14	1.3	5.6	8.0	0.05	1.38	35.52	2.3	74.5	73.9	108	<5.0	109	<0.05	0.03	1.4	0.17	4	58	7.6	164.8
#16 Rock Creek near Mouth	12/2/20	N	Routine	7.1	18	10.9	6.5	2.50	10	75	406	0.03	0.14	0.7	5.0	7.1	0.03	1.20	30.81	4.4	66.8	66.2	116	2	106	<0.05	0.02	0.9	0.12	7	51	7.8	143.6
#16 Rock Creek near Mouth	1/14/21	N	Routine	8.5	18	11.4	6.5	1.90	10	153	406	0.07	0.14	0.9	3.4	4.6	0.10	0.71	18.32	<2.0	45.0	44.6	106	11	76	<0.05	<0.025	1.5	0.53	5	32	7.5	88.9
#16 Rock Creek near Mouth	3/10/21	N	Routine	7.4	18	12.6	6.5	1.40	10	48	406	0.04	0.14	0.6	4.3	5.9	<0.02	0.97	24.82	<2.0	56.6	56.2	63	2	79	<0.05	<0.025	0.6	0.06	2	42	7.8	107.9
#16 Rock Creek near Mouth	4/15/21	N	Routine	9.6	18	11.1	6.5	0.91	10	99	406	0.04	0.14	0.4	5.9	8.4	<0.02	1.46	37.56	<2.0	77.7	77.1	128	1	97	<0.01	<0.025	0.5	<0.02	<2.0	61	7.7	151.0
#16 Rock Creek near Mouth	6/23/21	N	Routine	17.9	18	8.5	6.5	0.58	10	88	406	0.06	0.14	0.6	7.2	10.5	0.01	1.89	48.53	<1.0	94.7	93.9	133	<1.0	110	<0.03	0.07	0.8	0.33	1	77	7.8	171.6
Median [4]				10.1		10.7		0.83		65		0.06		0.6			0.01			1.0			131	2	110	0.025	0.05	0.7	0.09	2	67	7.8	159.9
Maximum [4]				17.9		12.6		3.62		153		0.09		1.3			0.10			4.4			159	11	143	0.000	0.08	1.5	0.53	7	78	8.0	196.1
Minimum [4]				7.1		7.6		0.46		32		0.03		0.4			<0.01			<2.0			63	<1.0	76	<0.01	<0.025	0.5	<0.02	1	32	7.5	88.9
Water Quality Exceedance (number of samples)				0		0		0		0		0																					
#16 Rock Creek near Mouth	2/23/21	Y[8]	Routine	7.3	18	11.8	6.5	1.40	10	126	406	0.05	0.14	0.6	3.3	4.5	0.07	0.69	17.68	<2.0	43.8	43.4	80	1	75	<0.025	<0.025	0.9	0.27	4	31	7.5	84.7
#16 Rock Creek near Mouth	5/4/21	Y[8]	Routine	13.2	18	10.0	6.5	0.69	10	160	406	0.06	0.14	1.0	6.1	8.8	<0.02	1.54	39.60	<2.0	80.9	80.3	118	<1.0	108	0.041	0.04	1.1	0.05	3	64	7.8	146.3
Water Quality Exceedance (number of samples)				0		0		0		0		0																					

Table A-1. WES (CCSD #1) Instream Water Quality Monitoring Results (2020-2021)

Cow Creek

				Water Quality Standard Comparison																	Additional Parameters of Concern									Supporting Parameters			
WES ID and Location	Date	Rain Event (Y/N)	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Total Phosphorus (mg/L)[5]	WQ Std (mg/L)	Copper, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Lead, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Zinc, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Ortho-phosphate (mg/L)	Copper, Total (ug/L)	Lead, Total (ug/L)	Zinc, Total (ug/L)	Hardness (mg/L)	pH[7]	Conductivity (uS/cm)
#24 Cow Creek at SE Last Road	11/17/20	N	Routine	10.3	18	7.7	6.5	0.47	10	921	406	0.05	0.14	2.3	5.8	8.3	0.04	1.44	36.88	47.6	76.6	76.0	91	<5.0	95	<0.05	<0.02	3.0	0.19	51	60	7	144.8
#24 Cow Creek at SE Last Road	12/2/20	N	Routine	6.8	18	6.6	6.5	0.13	10	480	406	0.05	0.14	1.1	7.4	10.9	0.02	1.97	50.61	6.1	97.8	97.0	137	4	130	<0.05	<0.025	1.4	0.18	16	80	7.2	183.1
#24 Cow Creek at SE Last Road	1/14/21	N	Routine	9.3	18	9.0	6.5	1.30	10	57	406	0.05	0.14	1.6	6.4	9.2	0.05	1.62	41.65	64.2	84.1	83.5	146	2	116	<0.025	<0.025	2.1	0.21	78	67	7	175.4
#24 Cow Creek at SE Last Road	3/10/21	N	Routine	8.5	18	8.8	6.5	0.13	10	104	406	0.05	0.14	1.1	8.0	11.8	<0.02	2.16	55.48	8.8	105.0	104.1	104	1	122	<0.05	<0.025	1.5	0.09	22	87	7.1	182.1
Median [4]				8.9		8.3		0.30		292		0.05		1.3			0.03			28.2			121	2	119	0.025	0.01	1.8	0.18	36	74	7.1	178.8
Maximum [4]				10.3		9.0		1.30		921		0.05		2.3			0.05			64.2			146	4	130	0.000	0.00	3.0	0.21	78	87	7.2	183.1
Minimum [4]				6.8		6.6		0.13		57		0.05		1.1			<0.02			6.1			91	1	95	<0.025	<0.02	1.4	0.09	16	60	7.0	144.8
Water Quality Exceedance (number of samples)				0		0		0		2		0																					
#24 Cow Creek at SE Last Road	2/23/21	Y[8]	Routine	8.1	18	9.5	6.5	0.34	10	22	406	0.07	0.14	1.2	5.5	7.8	0.03	1.33	34.17	40.5	72.3	71.7	103	2	97	<0.025	<0.025	4.6	0.26	50	56	7.1	132.5
Water Quality Exceedance (number of samples)				0		0		0		0		0																					

Kellogg Creek - Downstream Location

				Water Quality Standard Comparison																	Additional Parameters of Concern									Supporting Parameters			
WES ID and Location	Date	Rain Event (Y/N)	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Total Phosphorus (mg/L)[5]	WQ Std (mg/L)	Copper, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Lead, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Zinc, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Ortho-phosphate (mg/L)	Copper, Total (ug/L)	Lead, Total (ug/L)	Zinc, Total (ug/L)	Hardness (mg/L)	pH[7]	Conductivity (uS/cm)
#27 Rowe Middle School SE Lake Rd.	7/16/20	N	Routine	19.9	18	9.0	6.5	1.10	10	435	406	0.13	0.14	0.6	8.1	12.0	0.02	2.22	56.87	3.0	107.0	106.2	196	6	168	<0.05	0.09	1.0	0.43	7	89	7.9	214.0
#27 Rowe Middle School SE Lake Rd.	8/10/20	N	Routine	18.4	18	6.8	6.5	1.10	10	435	406	0.12	0.14	0.7	7.6	11.3	<0.02	2.05	52.69	2.0	100.9	100.1	157	1	122	<0.05	0.09	1.1	0.19	6	83	7.9	211.0
#27 Rowe Middle School SE Lake Rd.	9/23/20	N	Routine	16.9	18	7.6	6.5	1.06	10	727	406	0.14	0.14	0.9	7.6	11.3	0.02	2.05	52.69	2.8	100.9	100.1	182	6	164	<0.05	0.08	1.2	0.20	9	83	7.6	169.2
#27 Rowe Middle School SE Lake Rd.	10/22/20	N	Routine	10.4	18	10.5	6.5	1.16	10	411	406	0.1	0.14	0.6	7.9	11.7	0.03	2.13	54.78	4.1	104.0	103.1	202	7	159	<0.05	0.09	0.8	0.21	7	86	7.8	206.0
#27 Rowe Middle School SE Lake Rd.	11/17/20	N	Routine	11.3	18	9.9	6.5	1.12	10	387	406	0.08	0.14	1.9	5.6	8.0	0.09	1.38	35.52	12.9	74.5	73.9	101	<5.0	109	<0.05	0.05	2.6	0.37	19	58	7.3	147.6
#27 Rowe Middle School SE Lake Rd.	12/2/20	N	Routine	7.8	18	7.0	6.5	1.05	10	105	406	0.07	0.14	0.9	6.6	9.6	0.04	1.70	43.71	7.4	87.3	86.6	147	4	134	<0.05	0.05	1.2	0.21	14	70	7.6	172.1
#27 Rowe Middle School SE Lake Rd.	1/14/21	N	Routine	9.6	18	10.8	6.5	1.50	10	111	406	0.09	0.14	1.5	5.3	7.5	0.13	1.28	32.82	10.1	70.1	69.5	136	8	108	<0.025	0.03	2.2	0.58	20	54	7.3	129.6
#27 Rowe Middle School SE Lake Rd.	3/10/21	N	Routine	9.0	18	11.7	6.5	1.20	10	28	406	0.06	0.14	0.8	7.0	10.2	0.03	1.84	47.15	5.9	92.6	91.8	134	2	136	<0.05	<0.025	1.0	0.13	12	75	7.7	180.7
#27 Rowe Middle School SE Lake Rd.	4/15/21	N	Routine	13.8	18	13.2	6.5	1.10	10	166	406	0.09	0.14	0.7	8.3	12.4	<0.02	2.30	58.97	<2.0	110.1	109.2	186	8	142	<0.01	0.03	1.0	0.17	9	92	8.3	203.0
#27 Rowe Middle School SE Lake Rd.	6/23/21	N	Routine	19.4	18	8.8	6.5	1.10	10	260	406	0.1	0.14	0.6	8.0	11.8	0.03	2.16	55.48	3.0	105.0	104.1	176	2	156	<0.03	0.09	0.9	0.45	7	87	7.8	203.0
Median [4]				12.6		9.5		1.10		324		0.10		0.8			0.03			3.6			167	5	139	0.025	0.07	1.0	0.21	9	83	7.8	191.9
Maximum [4]				19.9		13.2		1.50		727		0.14		1.9			0.13			12.9			202	8	168	0.000	0.09	2.6	0.58	20	92	8.3	214.0
Minimum [4]				7.8		6.8		1.05		28		0.06		0.6			<0.02			<2.0			101	1	108	<0.01	<0.025	0.8	0.13	6	54	7.3	129.6
Water Quality Exceedance (number of samples)				3		0		0		4		1																					
#27 Rowe Middle School SE Lake Rd.	2/23/21	Y[8]	Routine	8.8	18	11.2	6.5	0.98	10	91	406	0.07	0.14	1.1	5.6	8.0	0.08	1.38	35.52	11.9	74.5	73.9	116	2	114	<0.025	<0.025	1.7	0.40	20	58	7.1	137.7
#27 Rowe Middle School SE Lake Rd.	5/4/21	Y[8]	Routine	14.4	18	9.1	6.5	0.96	10	261	406	0.13	0.14	1.0	7.7	11.4	<0.02	2.08	53.39	3.9	101.9	101.1	162	5	145	0.035	0.07	1.5	0.22	14	84	7.6	192.1
Water Quality Exceedance (number of samples)				0		0		0		0		0																					

Notes

General: Red font indicates that the dissolved values are higher than the total. Potential QA/QC need.
NM = Not Measured

1) WQ Standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.
2) No DO TMDL for the Willamette River; 6.5 mg/L selected as target minimum DO concentration for cool water habitat.
3) Table 20 - Protection of human health for water and fish ingestion.
4) Non-detects were replaced with one half the detection limit for statistical calculations. *E. coli* values greater than the EPA's *Ambient Water Quality for Bacteria* (1986) single sample maximum value were replaced with the single sample maximum value for statistical calculations.
5) WQ Standard of 0.14 mg/L selected based on the load allocation referenced in the Tualatin TMDL for most sources downstream of Dairy Creek.
6) Acute and chronic water quality standards for metals based on hardness only. The current copper WQ standards now reflect use of the biotic ligand model (BLM), but was not evaluated for this report.
7) Ideal pH range is between 6.5 and 8.5.
8) Summary statistics were not calculated for rain events due to the small sample size (two events). Storm events are defined as > 0.1" precipitation during or up to 24-hours prior to the sampling event.

Table A-2. WES (CCSD #1) Stormwater Monitoring Results (2020-2021)

Mt Scott Creek (Lower) - Stormwater Outfall Monitoring - Mixed Use

			Water Quality Standard Comparison														Additional Parameters of Concern									Supporting Parameters		
WES ID and Location	Date	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Copper, Total (ug/L)	WQ Criteria (ug/L)[5]	Lead, Total (ug/L)	WQ Criteria (ug/L)[5]	Zinc, Total (ug/L)	WQ Criteria (ug/L)[5]	Total Solids (mg/L)	Total Suspended Solids[5] (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Total Phosphorus (mg/L)	Ortho-phosphate (mg/L)	Copper, Dissolved (ug/L)	Lead, Dissolved (ug/L)	Zinc, Dissolved (ug/L)	Hardness (mg/L)	pH[5]	Conductivity (uS/cm)
#101 SE Pheasant Ct. Outfall	1/12/21	Storm	10.5	18	10.5	6.5	0.066	10	326	406	5.1	20	1.85	15	55	120	44	8	27	<0.025	0.12	<0.125	1.0	0.03	27	7	7.1	20.2
#101 SE Pheasant Ct .Outfall	3/24/21	Storm	9	18	4.7	6.5	0.55	10	30	406	4.4	20	1.43	15	152	120	73	12	53	0.14	0.07	<0.025	2.4	0.04	108	27	6.8	78.8
#101 SE Pheasant Ct. Outfall	5/27/21	Storm	14.3	18	9.4	6.5	0.19	10	1990	406	12.8	20	4.26	15	99	120	55	18	27	0.07	0.12	0.04	8.8	0.25	66	11	6.6	36.4
Median[4]			10.5		9.4		0.19		326		5.1		1.85		99		55	12	27	0.07	0.12	0.04	2.4	0.04	66	11	6.8	36.4
Maximum[4]			14.3		10.5		0.55		1990		12.8		4.26		152		73	18	53	0.14	0.12	0.04	8.8	0.25	108	27	7.1	78.8
Minimum[4]			9.0		4.7		0.07		30		4.4		1.43		55		44	8	27	<0.025	0.07	<0.125	1.0	0.03	27	7	6.6	20.2
WQ Exceedance (number of samples)			0		1		0		1		0		0		1													

Kellogg Creek (Upstream) - Stormwater Outfall Monitoring - Residential

			Water Quality Standard Comparison														Additional Parameters of Concern									Supporting Parameters		
WES ID and Location	Date	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Copper, Total (ug/L)	WQ Criteria (ug/L)[5]	Lead, Total (ug/L)	WQ Criteria (ug/L)[5]	Zinc, Total (ug/L)	WQ Criteria (ug/L)[5]	Total Solids (mg/L)	Total Suspended Solids[5] (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Total Phosphorus (mg/L)	Ortho-phosphate (mg/L)	Copper, Dissolved (ug/L)	Lead, Dissolved (ug/L)	Zinc, Dissolved (ug/L)	Hardness (mg/L)	pH[5]	Conductivity (uS/cm)
#102 SE Webster Rd. Outfall	1/12/21	Storm	10.7	18	10.5	6.5	0.58	10	326	406	3.0	20	0.93	15	44	120	39	21	33	<0.025	0.10	<0.025	1.2	0.05	25	16	7.2	39.1
#102 SE Webster Rd. Outfall	3/24/21	Storm	9.2	18	11	6.5	1.5	10	28	406	10.3	20	1.80	15	206	120	97	19	69	<0.05	0.14	<0.025	4.6	0.20	135	33	7.3	100.3
#102 SE Webster Rd. Outfall	5/27/21	Storm	14.1	18	9.5	6.5	0.58	10	1730	406	4.9	20	0.38	15	39	120	54	2	20	0.04	0.08	0.04	6.9	0.15	56	17	7.1	37.6
Median[4]			10.7		10.5		0.58		326		4.9		0.93		44		54	19	33	0.03	0.10	0.01	4.6	0.15	56	17	7.2	39.1
Maximum[4]			14.1		11.0		1.50		1730		10.3		1.80		206		97	21	69	0.04	0.14	0.04	6.9	0.20	135	33	7.3	100.3
Minimum[4]			9.2		9.5		0.58		28		3.0		0.38		39		39	2	20	<0.025	0.08	<0.025	1.2	0.05	25	16	7.1	37.6
WQ Exceedance (number of samples)			0		0		0		1		0		0		1													

Sieben Creek - Stormwater Outfall Monitoring - Commercial

			Water Quality Standard Comparison														Additional Parameters of Concern									Supporting Parameters		
WES ID and Location	Date	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Copper, Total (ug/L)	WQ Criteria (ug/L)[5]	Lead, Total (ug/L)	WQ Criteria (ug/L)[5]	Zinc, Total (ug/L)	WQ Criteria (ug/L)[5]	Total Solids (mg/L)	Total Suspended Solids[5] (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Total Phosphorus (mg/L)	Ortho-phosphate (mg/L)	Copper, Dissolved (ug/L)	Lead, Dissolved (ug/L)	Zinc, Dissolved (ug/L)	Hardness (mg/L)	pH[5]	Conductivity (uS/cm)
#103 SE Oregon Trail Dr. Outfall	1/12/21	Storm	11	18	10.1	6.5	0.27	10	11	406	2.1	20	0.33	15	70	120	36	<5.0	38	<0.025	0.05	<0.025	1.1	0.03	56	16	6.0	56.3
#103 SE Oregon Trail Dr. Outfall	3/24/21	Storm	11.8	18	9.1	6.5	0.47	10	<1	406	2.7	20	0.19	15	585	120	114	2	98	<0.05	0.03	<0.025	1.7	<0.02	559	57	6.6	185.5
#103 SE Oregon Trail Dr. Outfall	5/27/21	Storm	13.6	18	8.3	6.5	0.3	10	488	406	4.3	20	0.44	15	138	120	70	2	56	0.07	0.03	<0.025	3.7	0.06	124	28	6.5	77.3
Median[4]			11.8		9.1		0.30		11		2.7		0.33		138		70	2	56	0.03	0.03	0.0125	1.7	0.03	124	28	6.5	77.3
Maximum[4]			13.6		10.1		0.47		488		4.3		0.44		585		114	2	98	0.07	0.05	<0.025	3.7	0.06	559	57	6.6	185.5
Minimum[4]			11.0		8.3		0.27		<1		2.1		0.19		70		36	2	37.5	<0.025	0.03	<0.025	1.1	<0.02	56	16	6.0	56.3
WQ Exceedance (number of samples)			0		0		0		1		0		0		2													

Sieben Creek - Stormwater Outfall Monitoring - Multi-Family Residential

			Water Quality Standard Comparison														Additional Parameters of Concern									Supporting Parameters		
WES ID and Location	Date	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Copper, Total (ug/L)	WQ Criteria (ug/L)[5]	Lead, Total (ug/L)	WQ Criteria (ug/L)[5]	Zinc, Total (ug/L)	WQ Criteria (ug/L)[5]	Total Solids (mg/L)	Total Suspended Solids[5] (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Total Phosphorus (mg/L)	Ortho-phosphate (mg/L)	Copper, Dissolved (ug/L)	Lead, Dissolved (ug/L)	Zinc, Dissolved (ug/L)	Hardness (mg/L)	pH[5]	Conductivity (uS/cm)
#105 Sunnyside Village @ Pond	1/12/21	Storm	11.2	18	9.7	6.5	0.24	10	548	406	2.4	20	0.41	15	38	120	41	<5.0	35	<0.025	0.07	0.04	1.2	0.03	26	15	6.9	46
#105 Sunnyside Village @ Pond	3/24/21	Storm	11.2	18	9.5	6.5	0.6	10	2	406	8.2	20	0.13	15	20	120	82	5	72	<0.05	0.05	<0.025	5.7	<0.02	13	34	7.0	151
#105 Sunnyside Village @ Pond	5/27/21	Storm	13.5	18	8.3	6.5	0.22	10	>2420	406	8.0	20	0.35	15	18	120	56	4	32	0.06	0.09	0.05	6.3	0.03	16	20	6.5	48.7
Median[4]			11.2		9.5		0.24		548		8.0		0.35		20		56	4	35	0.03	0.07	0.04	5.7	0.03	16	20	6.9	48.7
Maximum[4]			13.5		9.7		0.60		>2420		8.2		0.41		38		82	5	72	0.06	0.09	0.05	6.3	0.03	26	34	7.0	151.0
Minimum[4]			11.2		8.3		0.22		2		2.4		0.13		18		41	4	32	<0.025	0.05	<0.025	1.2	<0.02	13	15	6.5	46.0
WQ Exceedance (number of samples)			0		0		0		2		0		0		0													

Notes

General: Red font indicates that the dissolved values are higher than the total. Potential QA/QC need. NM = Not Measured

1) WQ Standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.
2) No DO TMDL for the Willamette River; 6.5 mg/L selected as target minimum DO concentration for cool water habitat.
3) Table 20 - Protection of human health for water and fish ingestion.
4) Non-detects were replaced with one half the detection limit for statistical calculations. *E. coli* values greater than the EPA's *Ambient Water Quality for Bacteria* (1986) single sample maximum value were replaced with the single sample maximum value for statistical calculations.
5) Water quality criteria values based on the stormwater discharge benchmarks in the current 1200-Z permit. The benchmark for TSS is 100 mg/L. The benchmark for pH is 5.5 to 9.0.

Table A-3. WES (SWMACC) Instream Water Quality Monitoring Results (2020-2021)

Pecan Creek

				Water Quality Standard Comparison																	Additional Parameters of Concern									Supporting Parameters			
WES ID and Location	Date	Rain Event (Y/N)	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Total Phosphorus (mg/L)[5]	WQ Std (mg/L)	Copper, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Lead, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Zinc, Dissolved (ug/L)[6]	WQ Std (Chronic) (ug/L)	WQ Std (Acute) (ug/L)	Total Solids (mg/L)	Total Suspended Solids (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Ortho-phosphate (mg/L)	Copper, Total (ug/L)	Lead, Total (ug/L)	Zinc, Total (ug/L)	Hardness (mg/L)	pH[7]	Conductivity (uS/cm)
#11 Pecan Creek at SW Mossy Brae Rd.	7/16/20	N	Routine	16.1	18	8.8	6.5	1.00	10	1120	406	0.09	0.14	0.8	5.1	7.3	0.02	1.23	31.48	1.0	67.9	67.3	145	6	122	<0.05	0.08	1.2	0.38	4	52	7.3	149.7
#11 Pecan Creek at SW Mossy Brae Rd.	8/10/20	N	Routine	14.9	18	7.6	6.5	0.82	10	488	406	0.10	0.14	0.6	5.7	8.2	<0.02	1.41	36.20	<2.0	75.6	74.9	115	3	118	<0.05	0.08	0.8	0.06	<2.0	59	7.5	161.2
#11 Pecan Creek at SW Mossy Brae Rd.	9/23/20	N	Routine	15.6	18	5.2	6.5	0.71	10	1550	406	0.12	0.14	0.8	5.4	7.7	<0.02	1.31	33.49	<2.0	71.2	70.6	138	11	126	<0.05	0.07	1.3	0.19	3	55	7.3	126.9
#11 Pecan Creek at SW Mossy Brae Rd.	10/22/20	N	Routine	7.1	18	10.4	6.5	0.81	10	219	406	0.17	0.14	0.6	4.7	6.6	<0.02	1.10	28.13	<2.0	62.3	61.8	147	19	103	<0.05	0.07	1.9	0.67	9	47	7.4	139.0
#11 Pecan Creek at SW Mossy Brae Rd.	11/17/20	N	Routine	9.3	18	10.9	6.5	1.10	10	125	406	0.05	0.14	1.1	3.7	5.0	0.06	0.79	20.25	2.3	48.5	48.1	86	33	138	<0.05	0.03	1.3	0.17	3	35	7.0	119.6
#11 Pecan Creek at SW Mossy Brae Rd.	12/2/20	N	Routine	6.4	18	9.4	6.5	0.90	10	75	406	0.04	0.14	0.8	3.5	4.7	0.04	0.74	18.96	<2.0	46.2	45.8	103	4	96	<0.05	0.03	1.0	0.12	3	33	7.2	113.9
#11 Pecan Creek at SW Mossy Brae Rd.	1/14/21	N	Routine	8.8	18	11.2	6.5	1.40	10	38	406	0.15	0.14	1.0	3.1	4.2	0.10	0.64	16.40	2.8	41.4	41.1	202	62	78	<0.025	0.04	1.9	0.54	8	29	6.8	86.2
#11 Pecan Creek at SW Mossy Brae Rd.	3/10/21	N	Routine	6.8	18	11.4	6.5	0.98	10	20	406	0.04	0.14	0.6	3.4	4.6	0.03	0.71	18.32	<2.0	45.0	44.6	55	1	84	<0.05	<0.025	0.7	0.08	<2.0	32	7.2	105.9
#11 Pecan Creek at SW Mossy Brae Rd.	4/15/21	N	Routine	7.7	18	11.2	6.5	0.98	10	122	406	0.04	0.14	0.6	4.3	5.9	<0.02	0.97	24.82	<2.0	56.6	56.2	112	2	88	<0.01	<0.025	0.6	0.07	<2.0	42	6.8	118.0
#11 Pecan Creek at SW Mossy Brae Rd.	6/23/21	N	Routine	16.2	18	8.4	6.5	0.95	10	>2420	406	0.61	0.14	0.8	5.0	7.1	0.01	1.20	30.81	1.0	66.8	66.2	123	1	9	<0.03	0.06	0.9	0.41	1	51	7.2	147.1
Median [4]				9.1		9.9		0.97		172		0.10		0.8			0.02			1.0			119	5	100	0.025	0.05	1.1	0.18	3	45	7.2	123.3
Maximum [4]				16.2		11.4		1.40		>2420		0.61		1.1			0.10			2.8			202	62	138	<0.05	0.08	1.9	0.67	9	59	7.5	161.2
Minimum [4]				6.4		5.2		0.71		20		0.04		0.6			<0.02			<2.0			55	1	9	<0.01	<0.025	0.6	0.06	1	29	6.8	86.2
Water Quality Exceedance (number of samples)				0		1		0		4		3																					
#11 Pecan Creek at SW Mossy Brae Rd.	2/23/21	Y[8]	Routine	7.1	18	11.8	6.5	1.10	10	38	406	0.13	0.14	0.6	3.4	4.6	0.07	0.71	18.32	<2.0	45.0	44.6	123	57	81	<0.025	<0.025	1.6	0.61	10	32	7.1	94.9
#11 Pecan Creek at SW Mossy Brae Rd.	5/4/21	Y[8]	Routine	12.0	18	9.6	6.5	0.90	10	166	406	0.06	0.14	0.7	4.4	6.2	<0.02	1.02	26.14	<2.0	58.9	58.4	113	4	104	<0.05	0.04	0.9	0.06	2	44	7.6	137.0
Water Quality Exceedance (number of samples)				0		0		0		0		0																					

Notes

General: Red font indicates that the dissolved values are higher than the total. Potential QA/QC need.

1) WQ Standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.
2) No instream monitoring locations specifically referenced in the Tualatin River TMDL - 6.5 mg/L selected as target minimum DO concentration for cool water habitat.
3) Table 20 - Protection of human health for water and fish ingestion.
4) Non-detects were replaced with one half the detection limit for statistical calculations. *E. coli* values greater than the EPA's *Ambient Water Quality for Bacteria* (1986) single sample maximum value were replaced with the single sample maximum value for statistical calculations.
5) WQ Standard of 0.14 mg/L selected based on the load allocation referenced in the Tualatin TMDL for all sources downstream of Dairy Creek.
6) Acute and chronic water quality standards for metals based on hardness only. The current copper WQ standards now reflect use of the biotic ligand model (BLM), but was not evaluated for this report.
7) Ideal pH range is between 6.5 and 8.5.
8) Summary statistics were not calculated for rain events due to the small sample size (two events).Storm events are defined as > 0.1" precipitation during or up to 24-hours prior to the sampling event.

Table A-4. WES (SWMACC) Stormwater Monitoring Results (2020-2021)

Direct to Tualatin River - Stormwater Outfall Monitoring - Residential

			Water Quality Standard Comparison														Additional Parameters of Concern									Supporting Parameters		
WES ID and Location	Date	Visit Type (Routine/ Storm)	Temp (C)	WQ Std[1] (C)	DO (mg/L)	WQ Std[2] (mg/L)	Nitrate-Nitrite (mg/L)	WQ Std[3] (mg/L)	*E.coli* (MPN per 100ml)	WQ Std (MPN per 100ml)	Copper, Total (ug/L)	WQ Criteria (ug/L)[5]	Lead, Total (ug/L)	WQ Criteria (ug/L)[5]	Zinc, Total (ug/L)	WQ Criteria (ug/L)[5]	Total Solids (mg/L)	Total Suspended Solids[5] (mg/L)	Total Dissolved Solids (mg/L)	Ammonia (mg/L)	Total Phosphorus (mg/L)	Ortho-phosphate (mg/L)	Copper, Dissolved (ug/L)	Lead, Dissolved (ug/L)	Zinc, Dissolved (ug/L)	Hardness (mg/L)	pH[5]	Conductivity (uS/cm)
#203 Rivergrove Boat Ramp	1/12/21	Storm	11.3	18	8.3	6.5	2.10	10	1200	406	2.4	20	0.30	15	23	120	171	<5.0	91	<0.025	0.11	0.06	1.7	0.08	18	40	6.3	245.0
#203 Rivergrove Boat Ramp	3/24/21	Storm	9.1	18	8.7	6.5	2.00	10	260	406	3.2	20	0.27	15	31	120	131	1	116	<0.05	0.08	0.04	1.9	<0.02	16	68	6.5	219.0
#203 Rivergrove Boat Ramp	5/27/21	Storm	15.1	18	7.9	6.5	0.79	10	461	406	5.5	20	0.45	15	36	120	121	3	104	0.047	0.13	0.05	4.0	0.04	27	57	6.7	74.7
Median[4]			11.3		8.3		2.00		461		3.2		0.30		31		131	3	104	0.03	0.11	0.05	1.9	0.04	18	57	6.5	219.0
Maximum[4]			15.1		8.7		2.10		1200		5.5		0.45		36		171	3	116	0.05	0.13	0.06	4.0	0.08	27	68	6.7	245.0
Minimum[4]			9.1		7.9		0.79		260		2.4		0.27		23		121	1	91	<0.025	0.08	0.04	1.7	<0.02	16	40	6.3	74.7
WQ Exceedance (number of samples)			0		0		0		1		0		0		0													

Notes

General: Red font indicates that the dissolved values are higher than the total. Potential QA/QC need.
NM = Not Measured

1) WQ Standard of 18 C per DEQ's Temperature Water Quality Standard Implementation IMD 2008 for salmon and trout rearing and migration.
2) 6.5 mg/L selected as the standard for the direct discharge to Tualatin River.
3) Table 20 - Protection of human health for water and fish ingestion.
4) Non-detects were replaced with one half the detection limit for statistical calculations. *E. coli* values greater than the EPA's *Ambient Water Quality for Bacteria* (1986) single sample maximum value were replaced with the single sample maximum value for statistical calculations.
5) Water quality criteria values based on the stormwater discharge benchmarks in the current 1200-Z permit. The benchmark for TSS is 100 mg/L. The benchmark for pH is 5.5 to 9.0.