City of Newberg
TDML Implementation Plan

Annual Report – 2014 Activity

Some pages in this document have been purposely skipped or blank pages inserted so that this document will correctly print or copy when in duplex mode.

City Manager
503.537.1207

City Manager's Fax
503.538.5013

City of Newberg

414 East First Street
PO Box 970
Newberg, OR 97132

March 31, 2015

Ms. Nancy Gramlich
DEQ Western Region - Salem
750 Front Street NE, Suite 120
Salem, OR 97301-1039

RE: Willamette TMDL Implementation Plan for the City of Newberg
Annual Report for January 2014 to December 2014

Dear Nancy,

Enclosed is the annual report for the City of Newberg's Willamette TMDL Implementation Plan. This report, covering the time period between January 2014 and December 2014, fulfills the obligations of the City of Newberg under Oregon Administrative Rule (OAR) 340-042-0080(3).

Please contact me if you have any questions.

Sincerely,

Sonja Johnson
City of Newberg, TMDL Program
414 E. First Street, Box 970
Newberg, OR 97132
sonja.johnson@newbergoregon.gov
503.537.1282

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TABLES

DEFINITIONS

ACWA	-	Association of Clean Water Agencies
APWA	-	American Public Works Association
ASCE	-	American Society of Civil Engineers
AWWA	-	American Water Works Association
BMP	-	Best Management Practice
CESCL	-	Certified Sediment and Erosion Control Lead
CRRC	-	Citizen's Rate Review Committee
City	-	City municipal staff of Newberg, Oregon
DEQ	-	Oregon Department of Environmental Quality
ESC	-	Erosion and Sediment Control
EWRI	-	Environmental and Water Resources Institute
FFA	-	Future Farmers of America
FOG	-	Fats, Oil, and Grease
GFU	-	George Fox University
GYWC	-	Greater Yamhill Watershed Council
IDDE	-	Illicit Discharge Detection and Elimination
NORP	-	Northwest Oregon Restoration Partnership
OSU	-	Oregon State University
PW	-	Public Works
SSO	-	Sanitary Sewer Overflow
TMDL	-	Total Maximum Daily Load
YCSW	-	Yamhill County Solid Waste

EXECUTIVE SUMMARY

In 2014, the City maintained 16 webpages with stormwater information; sponsored or provided 5 presentations and 5 field events; sponsored or staffed 8 event booths; included information in the Water Quality Report, and marked 260 storm drains in high profile areas. The City's public education program has increased from a utility bill insert in 2009 to a program that encompasses pre-K to adult stormwater education.

The City's stormwater fee was reviewed by the CRRC in 2014; a fee of $7.96 was adopted by City Council for 2014 and $8.67 for 2015. A project with multiple partners was funded through a watershed grant to restore 240 ft of riparian habitat and provide educational events. A link for reporting stormwater concerns was put on the City's website.

A program for illicit discharges was developed and implemented by the City in 2014. There were 7 responses to spills; and spill response kits are kept on 2 city vehicles. In 2014, the YCSW and Newberg-Dundee Police Department collected 16.3 tons of hazardous waste, 24.8 tons of paint-related waste, and 705 pounds of drugs during the hazardous waste collection events. While the City did not have an illicit discharge program before 2009, it now has municipal code, policies, and procedures in place to complement the hazardous waste collection.

The City developed and implemented an ESC program for construction sites less than 1 acre in 2014. There were 2 complaints regarding ESC. While the City did not have an ESC program in 2009, it currently has municipal code, a construction manual, inspection procedures, and 3 certified ESC inspectors.

Staff updated the stormwater design standards to conform with the stormwater management code in March 2014 and include more green infrastructure. College Street underwent a renovation that included a 0.5-mile stretch with 12 filtration planters; and a bioswale on the GFU campus joins several others that infiltrate runoff from a 2.5" storm event. There were 3 pre-construction conferences in 2014 but no stormwater facility inspections due to staff time constraints. Since 2009, the City has adopted and implemented municipal code, updated the design manual, and included green infrastructure in its educational projects and some of its capital improvement projects.

In 2014, 47 catch basins were cleaned and 12,137 feet of stormline was inspected, cleaned or replaced. Streets were cleaned on a 5-week rotation with 1.4 cubic yards of debris collected per curb mile. The City did not update policies and procedures for the pollution prevention in municipal operations measure due to staff time constraints.

A riparian property was annexed and the stream corridor overlay was modified to include the additional riparian habitat in 2014. The City provided 45 groundcovers, 379 shrubs, and 240 trees to property owners to increase canopy cover, reduce stormwater volume, and mitigate temperature. While the City protected its stream corridor from development before 2009, it has since given away over 1,500 plants through its riparian program, protected streambank vegetation through municipal code, completed a stream assessment of Hess Creek, and started a watershed grant program to encourage restoration of floodplain connectivity, reduce erosion, remove invasive species, and increase educational efforts.

The City has implemented 71% of the required strategies and 72% of the required goals of the implementation matrix. The temperature measure and 3 of the 6 minimum measures have seen a substantial completion of their goals and strategies. Tthe City continues to work on implementing the remaining strategies and measurable goals while recognizing the progress that has occurred within its watersheds.

STRATEGY AND MEASURABLE GOAL STATUS

The number of required measureable goals that were completed or placed on an on-going status increased from 68% in 2013 to 72% in 2014 (see Table 1) when goals with future deadlines are removed from the calculation. The Temperature and Construction Site Stormwater Runoff Control measures saw the most improvement (see Table 2). The required measurable goals within the temperature requirement and three of the 6 minimum measures have been substantially incorporated into City policies and procedures.

Table 1. Status of Measurable Goals, December 2014

	Measurable Goals					
Measure	**Completed**	**Ongoing**	**Incomplete But Started**	**Not Implemented**	**Delayed**	**Added or Not Due**
Public Education	0	5	0	0	0	1
Public Involvement	0	4	0	0	0	1
Illicit Discharge Detection and Elimination	3	5	2	0	0	1
Construction Site Stormwater Runoff Control	1	4	0	0	0	0
Post-Construction Stormwater Runoff Control	1	4	2	2	0	1
Pollution Prevention in Municipal Operations	0	6	0	8	0	0
Temperature	0	3	0	0	0	3
Totals	**5**	**31**	**4**	**10**	**0**	**7**
Percentage of Required Goals	10%	62%	8%	20%	0%	NA

NA: Not Applicable as these are goals that have a deadline after December 2014

On a broader outlook, the City has completed or incorporated 71% of the required strategies in its TMDL Implementation Plan (see Table 2). Required strategies for the temperature requirement and 3 of the 6 minimum measures have been substantially incorporated into City policies and procedures.

In summary, the City incorporated an additional 4% of the measurable goals in 2014. The percentage of incorporated strategies increased from 64% in 2013 to 71% in 2014.

Table 2. Status of Goals and Strategies with Deadlines before January 2015

Measure	Strategies				Measurable Goals		
	Completed	Percent	Change*		Completed	Percent	Change*
Public Education	5/5	100%	+14%		5/5	100%	+14%
Public Involvement	3/3	100%	0%		4/4	100%	0%
Illicit Discharge Detection and Elimination	4/6	67%	+7%		8/10	80%	+13%
Construction Site Stormwater Runoff Control	3/3	100%	+50%		5/5	100%	+27%
Post-Construction Stormwater Runoff Control	1/5	20%	+20%		5/9	56%	-2%
Pollution Prevention in Municipal Operations	5/9	56%	0%		6/14	43%	-7%
Temperature	3/3	100%	+33%		3/3	100%	+33%
Total	**24/34**	**71%**	**+7%**		**36/50**	**72%**	**+4%**

* Change in number of measurable goals or strategies completed or placed in an on-going status from 2013 to 2014

MEASURE 1 – PUBLIC EDUCATION

Overview

The Public Education measure has three components: stormwater, watershed, and infrastructure education. Stormwater education includes providing information on the city website, event booths, public presentations, and information in the water quality report. The watershed component includes signage at stream crossings or stormwater facilities and classroom education. Infrastructure education provides markers at stormdrains located throughout the city. The signage is due in 2017; all other measures require an ongoing effort by city staff.

2014 Tasks Completed

PE-1 Stormwater Education (Figure 1)

There were 16 stormwater web pages covering information on runoff, riparian vegetation, water quality and the TMDL program. Annual reports are uploaded and available on the website after comments are received from DEQ.

A local civic group, Leadership Newberg, attended a PW Operations presentation on stormwater-related volunteer opportunities, our riparian planting program, water conservation program, FOG program, and compost program in March. The approximately 15 participants were also given a tour of the wastewater treatment plant.

A local Boy Scout troop chose to clean up Renne Park in March as a neighborhood cleanup. Approximately 50 people attended the event picking up 35 pounds of trash.

In April, PW Operations staff was at the first Newberg Earth Day Fair with approximately 200 people attending the event. The booth provided information on rain gardens, composting, and natural gardening. A booth was also set up at the city library with similar information.

The City sponsored and co-staffed a booth with the GYWC at the Camellia Festival in April. Attendance was over 2,000 people and we spoke with many people about water quality and riparian ecology while providing native plants and trees. Free packets of information on riparian vegetation, native plants, and water-efficient landscaping were also available to the public.

In June, as part of Public Works Day, the City provided an area for kids to plant groundcovers and distribute ladybugs for natural pest control. Several hundred people attend the event. The Water Quality Report was sent out to residents of the city in June and contained information on volunteer opportunities, illicit discharges, riparian revegetation, and Mad Science presentations.

PW Operations staff staffed a Newberg Farmers Market booth in July that provided information on streambank erosion. The City also sponsored 2 booths for the YCSW to promote recycling and proper hazardous waste removal. The average weekly attendance at the Farmers Market is 600-800 people.

In summary, the City updated information on its website, posted the annual report on its website, staffed or hosted 8 events, provided presentations at 1 event, and provided stream-

related water quality information in its Water Quality report (see Figure 1). Partnerships included working with the YCSW, GYWC, NORP, and a local Boy Scout troop.

PE-2 Watershed Education

In April, the City sponsored a Learn-to-Build class on bioswales. After the class, the 10 participants planted a bioswale designed to infiltrate a 2.5 inch storm event. The bioswale has been functioned as designed throughout 2014.

The City partnered with the Newberg School District and GFU to sponsor World Water Monitoring event for over 200 8th-grade students in April. PW Operations staff provided presentations on stream ecology and water quality to the students regarding stream ecology and water quality. The following week, students were brought to Hess Creek on the GFU campus where they collected water samples, completed water-quality analyses, tested soils, and learned about the stream ecology along Hess Creek. After the field day, students worked with their teachers on reports summarizing their work.

In May, the City sponsored a Mad Science presentation to 5th grade students on the consequences of individual actions on streams and watersheds. In addition, the City loaned a watershed model (Enviroscape) to the GYWC for its watershed education events.

In August, the GYWC and the City started a restoration and watershed education project along Hess Creek. Approximately 36 participants, including 30 students from GFU's Serve Day, learned about erosion and stream ecology as they pulled invasive blackberries from the property. In October and November, the City in partnership with the GYWC and the Newberg School District provided 6 after-school workshops for approximately 20 middle school students. Classroom presentations on invasive plants, watersheds, stream ecology, and permaculture were conducted by teachers, the GYWC, PW Operations staff, and the property owner. Three field days were included in the series to map the site, remove invasive plants, and plant native trees and groundcovers.

The City continued to attend GYWC meetings in 2014 but officially resigned from the Council in December (see Appendix 2).

In summary, the City provided or sponsored 4 classroom presentations for elementary students, middle school students, university students, and the public; and 5 field events for middle school students, university students, and the public. Partnerships included working with the GYWC, GFU, Green Girl Land Development Solutions, NORP, Mad Science, the Newberg School District, and a property owner. Signage is not scheduled to be implemented until 2017.

PE-3 Infrastructure Education

The City had 260 stormdrains marked by volunteers in 2014. The markers were placed at stormdrains near Mountain View Middle School, Newberg High School, and George Fox University.

Effectiveness Summary (January 2013 to December 2014)

Stormwater Education (PE-1)

We had 16 pages on our website with stormwater, riparian vegetation, and water quality information in 2013. Most were static with only a couple pages, such as the local classes and

events page, updated regularly. In 2014, two pages were merged into one page and one page was added for a zero net effect.

The City included basic stormwater education and volunteer opportunity information in our annual Water Quality Report in 2013 and 2014. On Public Works Day in 2013 and 2014, the City included an area where children planted groundcovers and populated the area with ladybugs.

In 2013 and 2014, the City sponsored a booth with the GYWC at the Camellia Festival that is attended by over 2,000 people. Working together, the GYWC and the City spoke with many landowners in the area about riparian habitat and the effect of restoration on water quality. We provided trees and other plants to the public.

In 2013, PW Operations staffed 2 booths at the Newberg Farmers Market and sponsored 1 booth for the GYWC; one booth was staffed by PW Operations in 2014 and 2 booths were staffed by YCSW. The booths included information about natural gardening, erosion control, bioswales, water quality, recycling, and hazardous waste disposal. An estimated 600-800 people attend the Farmers Market each week.

In 2013, the City sponsored a booth with the GYWC and the Yamhill County Solid Waste at the 4-day Newberg Old-Fashioned Festival which attracts approximately 10,000 people each year. We spoke with many people about fish habitat, water quality, natural gardening, and recycling. In 2013 and 2014, the City loaned a watershed model to the GYWC for their education efforts at various events.

Watershed Education (PE-2)

The City continued to work closely with the Greater Yamhill Watershed Council to provide watershed education to the public. We provided a $1,000 donation in 2013 and helped them find projects for 200 plants. The City attended monthly meetings in 2013 and 2014 and helped reconnect them in 2013 with the Northwest Oregon Restoration Partnership which provides low-cost plants for stream restoration purposes. In 2014, the City resigned from the GYWC in order to work more closely with them on local projects.

In 2014, we started a 0.5 acre restoration project with the GYWC which resulted in a 6-week after-school ecology class for middle school students, and volunteer projects for 30 George Fox University students and a local church group.

We sponsored a Mad Science presentation to 5th graders in 2013 and 2014 with a focus on the effect of individual decisions on water quality locally and downstream. In March 2013 PW Operations staff provided a presentation to an FFA group on water efficiency and water quality.

The City continued to work in 2013 and 2014 with the Newberg School District to hold World Water Monitoring events with 200 middle school students. PW Operations staff presented information about stream ecology and water quality one day and helped students collect water samples and analyze them for physical and chemical constituents on a second day. In 2013, we moved the event to Hess Creek on the George Fox University campus and an ecology tour was added to the event. In 2014, a soil testing component was added to the water sampling, analyses, and ecology tours that take place during the field day.

Working with George Fox University and Green Girl Land Development Solutions, we sponsored classes in 2013 and 2014 for the public to learn about rain gardens. After the classes,

the participants built bioswales. The bioswales were designed to infiltrate a 2.5" storm event and have been functioning well since they were built.

Signage is not scheduled to be implemented until 2017.

Infrastructure Education (PE-3)

The City marked 260 stormdrains in 2014 but was unable to mark any in 2013. The marked areas include drains around the high school, a middle school, and the university.

Effectiveness Summary (November 2008 to December 2012)

Stormwater Education (PE-1)

The City staffed 1 booth at local event in 2009 and increased the number to 6 events in 2012. Attendance varied from 500 to 2,000 people at each event. A stormwater flyer was included with the utility bill for 2009 and 2010. In 2011, we started including an educational section in our annual water quality report instead of using the utility bills. We have expanded our website coverage of stormwater information from 2 webpages in 2009 to 15 in 2012.

The City had one news release published in the local paper. We have sponsored 2 Neighborhood Cleanup events with high school students, 1 World Water Monitoring event for middle school students, 3 public classes on bioswales and low impact development, and 3 presentations on stormwater. In 2012, we started working with Mad Science to bring a stormwater-focused presentation to elementary students. In 2012, the City worked with George Fox University's civil engineering students regarding stream ecology and green infrastructure.

Watershed Education (PE-2)

The City provided an annual donation of $1,000 to the GYWC and attended 60-73% of the meetings. We provided laboratory services for a 2009-2010 GWYC monitoring project on upper Chehalem Creek, participated in several sub-committees, attended regular meetings, and otherwise provided assistance to the GYWC.

Infrastructure Education (PE-3)

The City marked an average of 50 catch basins from 2008 to 2012.

2015 Adaptive Management

Specific revisions proposed by the City for Public Education are shown in Appendix 1. The City proposes to clarify some of the requirements.

MEASURE 2 – PUBLIC INVOLVEMENT

Overview

The strategies required for Public Involvement include reviewing the stormwater fee; providing funds for stream restoration and stormwater education projects; providing an avenue for responding to the public on illicit discharge, erosion, and stormwater issues; and a public survey

on stormwater. All of the strategies require an ongoing effort with the exception of the public survey which is a BMP accomplishment due in 2015.

2014 Tasks Completed

PI-1 Stormwater Utility Fee

The Citizens Rate Review Committee (CRRC) meets every two years to review the stormwater utility fee. It met to review stormwater rates in February 2014. A town hall to discuss the utility fee was held in February 2014 however no one from the public attended the meeting. In May 2014, the CRRC and staff discussed the proposed rates with the City Council who adopted them. The monthly stormwater rates will increase from $7.30 in 2013 to $7.96 in 2014 and $8.67 in 2015. Minutes from the CRRC meetings and town hall are available on the website.

PI-2 Public Participation in Stormwater Management

In 2014, the City provided $1,000 to a GYWC project with multiple partners including the Newberg School District, Yamhill Watershed Stewardship Fund, and NORP. When finished, the project will result in restoration of 240 ft of Hess Creek riparian habitat and 0.6 acres of native trees, shrubs, and groundcovers.

PI-3 Public Participation in Reporting Stormwater Issues

In 2014, PW Maintenance staff provided a weblink (YourGov) for citizens to report stormwater issues. YourGov can be accessed through our website, smartphones, or tablets.

Numerous complaints of street flooding were received PW Maintenance staff. Code Enforcement received a complaint involving an Oregon Drainage Law violation and 2 ESC complaints and followed up on both of them.

A complaint of an illicit discharge was received by the Fire Department and followed up by the Fire Department, DEQ, and PW Operations regarding a spill from a metal fabricator. Code Enforcement received an illicit discharge complaint regarding a broken wastewater line and followed up on it. PW Operations staff responded to an illicit discharge complaint regarding an outfall and followed up on it.

PI-4 Public Participation in Educational Focus

The public survey required in this BMP is due in December 2015.

Effectiveness Summary (January 2013 to December 2014)

Stormwater Utility Fee (PI-1)

The Citizen's Rate Review Committee (CRRC) meets every two years to review the stormwater utility fee. The CRRC met in 2014 to discuss stormwater rates. A town hall was held in February however no one from the public attended the meeting. During the May 2014 City Council meeting, the CRRC's proposed monthly stormwater rates were adopted and increased from $7.30 in 2013 to $7.96 in 2014 and $8.67 in 2015.

Public Participation in Stormwater Management (PI-2)

As part of its watershed grant program, the City provided $1,000 in 2014 for a stream restoration project with multiple partners including the Newberg School District, GYWC,

Yamhill Watershed Stewardship Fund, and NORP. When finished, the project will have restored 240 ft of Hess Creek stream frontage and replanted 0.6 acres with native trees, shrubs, and groundcovers.

Public Concerns with Stormwater (PI-3 and PI-4)

In 2014, PW Maintenance staff provided a weblink (YourGov) for citizens to report stormwater issues. YourGov can be accessed through our website, smartphones, or tablets.

Complaints of street flooding were received in 2014 by PW Maintenance staff. Code Enforcement received a complaint involving an Oregon Drainage Law violation and followed up on it. In 2013, PW Maintenance reported no stormwater complaints received via the website.

Code Enforcement received 2 complaints on ESC and followed up on both of them in 2014.

In 2014, a complaint of an illicit discharge was received by the Fire Department and followed up by the Fire Department, DEQ, and PW Operations regarding a spill from a metal fabricator. Code Enforcement received an illicit discharge complaint regarding a broken wastewater line and followed up on it. PW Operations staff responded to an illicit discharge complaint regarding an outfall and followed up on it.

In 2013, there were 2 illicit discharge complaints received by PW staff and 4 complaints received by Code Enforcement. The public survey is due in December 2015.

Effectiveness Summary (November 2008 to December 2012)

Stormwater Utility Fee (PI-1)

The Citizen's Rate Review Committee was started in 1992 as an agreement reached between the City and ratepayers in lieu of a proposed ballot measure on rate increases. The committee consists of volunteers who meet every two years to review utility rates proposed by staff. After review by the committee, the rates are placed on the City Council agenda for approval. In 2009, the stormwater rate was $3.80 per EDU (2,877 sq ft). The rate increased to $5.29 for 2012.

Ordinance and Program Development (PI-2)

In May 2011, the Stormwater Ad-Hoc Committee was formed to assist staff with creating municipal code for illicit discharges, erosion and sediment control, and stormwater management. Meeting every two weeks with staff, the committee revised and refined the proposed municipal code and gave final approval in October 2011. Two workshops and 3 public hearings were held by the Planning Commission and the City Council before adoption at the June 2012 public hearing. The effective date for the ordinances was July 18, 2012. All meetings, workshops, and public hearings were open to the public.

Public Concerns with Stormwater (PI-3 and PI-4)

The City provided information on its website and in some of its utility bills that instruct people to call PW Maintenance with stormwater complaints. The City tried a computer application that resulted in few stormwater reports so it discontinued the application. There is no formal training for PW Maintenance staff on responding to public complaints about stormwater.

Various methods have been used for citizens to report stormwater complaints. In 2009, citizens were instructed to call Public Works Maintenance. In 2010, an email address was added to the

telephone number with calls to 911 forwarded to Maintenance staff. In 2011, citizens were instructed to use a 3rd-party website to report any concerns. In 2012, the 3rd-party website was discontinued and the public were instructed to email Public Works Maintenance except on the utility bill which instructs the public to call Public Works Maintenance.

No information was reported for call volume in 2009 and 2010. There were 7 reports in 2011 and 28 reports in 2012.

2015 Adaptive Management

Specific revisions proposed by the City for Public Involvement are shown in Appendix 1. The City proposes to clarify some of the performance measures.

MEASURE 3 – ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE)

Overview

The matrix for the IDDE measure requires development and implementation of a program for controlling illicit discharges, providing training to staff on illicit discharge investigations, investigating and documenting stormwater outfalls, cleaning up illegal dumps, responding to spills, providing spill kits for municipal trucks, and providing an avenue for citizens to dispose of hazardous waste properly. The IDDE Plan is a BMP accomplishment; the remaining goals require an ongoing effort by the City.

2014 Tasks Completed

ID-1 Develop IDDE Plan

The Newberg IDDE Plan was completed in 2014 (see Appendix 3). Within the Plan, PW Maintenance staff is instructed to look for cross-connections and illicit discharges while completing regular maintenance on stormwater infrastructure. During pre-treatment inspections, PW Operations staff is instructed to look for situations such as uncovered material storage and other potential spill hazards. Staff is instructed to look for illicit discharges when completing stream assessments. Tracking worksheets, inspection procedures, and sampling procedures are included in the plan.

ID-2 Train Staff to Implement IDDE

Each department or division within the City is responsible for their own employee training. A PW Operations person attended a session on creating and implementing an IDDE program at the ACWA stormwater summit in May.

ID-3 Implement IDDE Plan

The City has not field-screened outfalls since they inventoried them in 2009 for the TMDL's first implementation phase. They are scheduled to be field-screened again in 2015. There were no illegal dumps reported in 2014.

Table 3 provides information on the City's spill response efforts in 2014. Fire Department staff responded to one spill regarding a metal fabricator in March 2014. The spill reached Chehalem Creek. PW Maintenance reported 1 spill response effort that reached Hess Creek. Three SSOs in 2014 were previously reported to DEQ.

Table 3. Illicit Discharges in 2014

Type	Date	Cause	Water Samples Taken	Response Effort	Resolution
Industrial Metal Fabricator	3/18/14	Waste discharged from a pipe to outside.	4	Fire Department and PW Operations	Area of discharge on property was cleaned up, the outlet pipe was plugged, uncovered drums in the material storage area were removed, and the catchbasin was cleaned. Warning letter written.
Industrial Utility	7/2/14	Failed flow diverter from composter	1	PW Operations	Pipe re-plugged with concrete and flow properly diverted.
Residential Wastewater	9/17/14	Homeowner wastewater line broke	0	Code Enforcement	Wastewater cleaned up and water shut off. Discharge did not reach stream.
Commercial Restaurant	10/7/14	Insufficient grease trap	0	Code Enforcement	Grease trap replaced. Warning letter written. Discharge did not reach stream.
Industrial Metal Fabricator	12/4/14	Outfall with red staining	2	PW Operations	Iron precipitate. No action taken.
Wastewater	N/A	Private sanitary system	0	PW Maintenance	Spill cleaned up by discharger. No action taken.

N/A = Not Available

PW Maintenance staff responded to garbage dumped by garbage trucks. The location and date were not reported, however PW Maintenance stated that the garbage was removed by the responsible party. No citations were issued.

Basic spill kits are kept on 2 PW Maintenance emergency response vehicles. Other vehicles contain spill absorbent pads. The number of spill kits used was not reported.

ID-4 Hazardous Waste Collection

YCSW has continued to sponsor the hazardous waste collection events in Newberg (May) and McMinnville (October). In May, the event collected 3.6 tons of hazardous waste, 17.8 tons of paint and paint-related waste, 700 pounds of batteries, 300 pounds of fluorescent lights, and 100 pounds of propane cylinders (see Table 4). At October's event, 9.6 tons of hazardous waste, 14.7 tons of paint and paint-related waste, 800 pounds of batteries, 500 pounds of fluorescent lights, and 100 pounds of propane cylinders were collected in McMinnville. The City sponsored

2 Newberg Farmer's Market booths for the YCSW in August for them to promote the collection events, recycling, and their Master Recycler program.

As part of the National Drug Take-Back program, the Newberg-Dundee police department maintains a drug drop-off box in the Public Safety Building and was present at the YCSW hazardous waste collection event in Newberg. They collected 234 pounds at the May hazardous waste collection event and 471 pounds from the Public Safety drop-off box in 2014.

Table 4. Household Hazardous Waste Collected from 2009 to 2014

		Newberg			McMinnville	
Year		Hazardous Waste (tons)	Paint (tons)		Hazardous Waste (tons)	Paint (tons)
2009		8.6	13.1		6.8	10.5
2010		8.9	40.1		13.6	8.7
2011		4.5	1.3		9.7	8.4
2012		11.1	7.3		7.0	5.3
2013		9.5	13.7		5.0	7.3
2014		3.6	17.8		9.6	14.7
Average		**7.7**	**15.6**		**8.6**	**9.2**

Effectiveness Summary (January 2013 to December 2014)

IDDE Plan (ID-1)

The IDDE Plan was completed in 2014 and was created to economize staff time in the field. Staff is instructed to report cross-connections and illicit discharges while completing regular maintenance on stormwater infrastructure; situations such as uncovered material storage and other potential spill hazards while completing pre-treatment inspections; and illicit discharges when completing stream assessments. If the public reports a problem, staff are instructed to determine whether the area is safe, stop the discharge, complete water sampling if the discharge reaches the stormwater system or a stream, and complete an IDDE investigation. Tracking worksheets, investigation procedures, and sampling protocols are included in the plan.

Staff Training (ID-2)

One PW Operations person attended a session on IDDE Plan development and implementation during the ACWA stormwater summit in May 2014. One PW Operations person completed a course on industrial stormwater permits in December 2013.

IDDE Plan Implementation (ID-3)

PW Operations staff responded to 4 illicit discharge complaints in 2014 and 3 complaints in 2013. Discharges were halted. Four warning letters were written however no citations were issued.

PW Maintenance staff responded to 1 dumping incident and 1 illicit discharge in 2014. Neither spill was reported to have reached the stormwater system or stream.

Fire Department staff responded to no reportable spills in 2013 and 1 reportable spill in 2014.

There were 2 SSOs in 2013 and 3 SSOs in 2014 which were documented and previously reported to DEQ.

Hazardous Waste Collection (ID-4)

In 2013 and 2014, the Yamhill County Solid Waste Department collected 13.1 tons of hazardous waste in Newberg and 14.6 tons of hazardous waste in McMinnville. Even with the PaintCare program, people continue to bring paint and paint-related waste to the hazardous waste events resulting in 31.5 tons of waste collected in Newberg and 22 tons of waste in McMinnville from 2013 to 2014. Since 2009, an average 16.3 tons of hazardous waste and 24.8 tons of paint or paint-related waste have been kept out of landfills each year.

In 2014, the City sponsored 2 Newberg Farmers Market booths for the YCSW. In 2013, the City sponsored 2 Newberg Farmers Market booths and co-staffed 1 booth at the Newberg Old-Fashioned Festival for the YCSW to promote recycling and information about hazardous waste.

Effectiveness Summary (November 2008 to December 2012)

IDDE Ordinance and Plan (ID-1)

Municipal code addressing non-stormwater discharges was adopted by the City Council in July 2012. PW staff created a stormwater outfall map in 2009.

IDDE Training (ID-2)

Each department or division within the City is responsible for their own employee training. PW Maintenance staff was trained in illicit discharge detection during their annual training in 2009 and 2010. One person from PW Operations was trained in illicit discharge investigations in 2011. No training was completed for illicit discharges in 2012.

IDDE Plan Implementation (ID-3)

The Fire Department did not respond to any incidents that resulted in a reportable spill during the 2009-2012 timeframe. There was 1 SSO in 2012 which was documented and previously reported to DEQ.

PW Maintenance staff was inspecting stormline in 2011 and discovered concrete spoils in the stormwater system. The affected stormline was replaced.

There were 4 reports by the public in 2009, 2 reports in 2010, 10 reports in 2011, and 3 reports in 2012. One of the complaints in 2012 resulted in a citation.

Hazardous Waste Collection (ID-4)

YCSW provides 2 well-attended events every year to collect hazardous waste in the county. The event is held in Newberg in May and in McMinnville in October; both events are open to anyone living in the county. The average annual amount of hazardous waste collected from 2009 to 2012 was 17.6 tons and the average annual amount of paint and paint-related waste was 23.7 tons. The City advertises the collection events and its Master Recycler program on its website.

In 2012, the City provided a Newberg Farmers Market booth for the YCSW to promote recycling and information about hazardous waste.

2015 Adaptive Management

Specific revisions proposed by the City for the IDDE measure are shown in Appendix 1. The City proposes to clarify some of the performance measures.

MEASURE 4 – CONSTRUCTION SITE STORMWATER RUNOFF CONTROL

Overview

In Measure 4 (Construction Site Stormwater Runoff Control), the City is required to develop and implement an erosion control program, train staff in erosion control practices, conduct plan reviews and site inspections, and enforce the ordinance. Creating the ESC program is a BMP accomplishment; all other strategies require an ongoing effort for the City.

2014 Tasks Completed

CS-1 Develop Erosion and Sediment Control Program

PW Operations and Engineering Services staff worked together to complete an ESC manual which is being implemented for all construction sites less than 1 acre. Sites greater than 1 acre are still covered under DEQ's 1200-C program. The City implemented an ESC fee to cover expenses incurred by plan reviews and inspections. It is $150 for projects less than 5,000 sq ft and $350 for projects between 5,000 sq ft and 1 acre.

CS-2 Train Staff in Erosion and Sediment Control

Each department or division within the City is responsible for their own employee training. Two staff from Engineering Services became certified inspectors in 2014.

CS-3 Implement Erosion and Sediment Control Program

There were at least 4 projects with erosion control inspections (see Table 5). Documentation of additional inspection forms are not available as they were kept in a software program that has since been removed. One notice of non-compliance was completed with the issue resolved. The location was not reported.

Code Enforcement received one ESC complaint for a project at 1405 Second Street. Contractors removed the sediment from the street and spread straw on disturbed soil at the project. Code Enforcement received a complaint of compost in the street at 617 Ironwood Dr. Compost was removed by the homeowner. No citations were issued.

Table 5. Construction Site Stormwater Management for 2013 and 2014

Name	Acres	Land Use	Affected Watershed	ESC Inspections 2013	2014
Church St 18-Unit Apartment Complex		Residential	Hess Creek	Undocumented	
Deskin Commons 56-Unit Apartment Complex	3.3	1200-C Residential	Springbrook Creek	16	15
Edgewood Estates Subdivision	1.58	1200-C Residential	Chehalem Creek	Construction not started	35
George Fox Athletic Stadium	4.4	Institutional	Hess Creek	18	12
Highlands at Hess Creek 16-Lot Subdivision	2.5	1200-C Residential	Hess Creek	32	20
Heritage Meadows Subdivision	0.7	Residential	Chehalem Creek	23	
Homes at Creekside 5-Unit PUD	0.55	Residential	Chehalem Creek	Undocumented	
Oak Grove 84-Unit Apartment Complex	12.6	Residential	Springbrook Creek	Undocumented	
Terra Estates 44-lot Subdivision	7.9	Residential	Chehalem Creek	Construction not started in 2013	
Chehalem Cultural Center Forecourt	0.33	Institutional	Chehalem Creek	Undocumented	
Marquis Assisted Living 54-Bed Facility	3.01	Institutional	Springbrook Creek	Undocumented	

Effectiveness Summary (January 2013 to December 2014)

ESC Plan Development (CS-1)

PW Operations and Engineering Services staff worked together to complete an ESC manual which is being implemented for all construction sites less than 1 acre. Sites greater than 1 acre are still covered under DEQ's 1200-C program. The City implemented an ESC fee to cover expenses incurred by plan reviews and inspections. It is $150 for projects less than 5,000 sq ft and $350 for projects between 5,000 sq ft and 1 acre.

ESC Staff Training (CS-2)

Each department or division within the City is responsible for their own employee training. Two staff from Engineering Services became certified inspectors in 2014. No training was completed in 2013.

ESC Plan Implementation (CS-3)

Four projects were inspected during 2013 (see Table 5). Three of those projects continued into 2014 with a fourth project started in 2014. All inspected projects were larger than 1 acre.

In 2014, Engineering issued one notice of non-compliance with the issue resolved; the location was not reported. In 2014, Code Enforcement received 1 ESC complaint at 1405 Second Street. Contractors removed the sediment from the street and spread straw on the disturbed soil at the project. A compost pile was reported to Code Enforcement and removed from the street.

In 2013, a public complaint was received by the Engineering Services Department regarding sediment-laden stormwater entering the stormwater system from a WWTP project along Wynooski Road. Code Enforcement and Engineering Services investigated a complaint regarding erosion in a bioswale owned by a homeowners association. No citations were issued. DEQ forwarded a public complaint regarding dirt being tracked onto Highway 217 from the ODOT 99W Bypass construction project in 2013. The City notified DEQ that the project was on county land and not within the city boundaries; no further action was taken by the City.

PW Maintenance used bio bales, silt fence, and straw wattles on 3 projects in 2013.

Effectiveness Summary (November 2008 to December 2012)

ESC Ordinance and Plan (CS-1)

The ESC ordinance was adopted by Council in July 2012. More detail regarding the adoption process is provided in the public involvement section of this report.

ESC Training (CS-2)

Each department or division within the city is responsible for their own employee training. A PW Operations staff was certified as a CESCL in 2012.

ESC Plan Implementation (CS-3)

There were no procedures in place for documenting ESC plan reviews or inspections in 2009. In 2010, there were 4 construction sites that were required to provide ESC measures. No ESC inspections were completed in 2011 and 2012.

In 2010 there were 3 public complaints regarding erosion or sediment from construction sites. A complaint was received by DEQ in 2011 regarding a city construction project and Code Enforcement recorded 4 public reports regarding sediment in 2011. No public reports were recorded by Engineering Services in 2012. No citations were issued from 2009 to 2012.

2015 Adaptive Management

Specific revisions proposed by the City for the Construction Stormwater Runoff Control measure are shown in Appendix 1. The City proposes to clarify a goal and some of the performance measures.

MEASURE 5 – POST-CONSTRUCTION RUNOFF CONTROL

Overview

The strategies in Measure 5 of the TMDL Implementation Plan require the City to update its design standards, providing training, require stormwater management for development and

redevelopment, conduct pre-construction meetings and plan reviews, evaluate areas for retrofit opportunities, inspect stormwater facilities, and implement a monitoring program. The design standards update is a BMP accomplishment; the remaining goals require an ongoing effort.

2014 Tasks Completed

DS-1 Develop Stormwater Management Program

Staff updated the stormwater design standards to conform with the stormwater management code in March 2014. It includes more green infrastructure.

DS-2 Train Staff in Stormwater Management

Each department or division within the City is responsible for their own employee training. In PW Operations, one staff person attended presentations on green infrastructure design, creating retrofit programs, implementing stream restoration, and determining whether stormwater analyses using HEC-RAS were conducted properly at the ASCE-EWRI Conference held in Portland.

One staff person from PW Operations and one staff person from Planning attended a workshop on urban forestry's effect on stormwater volume.

No staff was available for training in stormwater facility inspections in 2014.

DS-3 Implement Stormwater Management Program

The number of plan submittals; plan reviews; and project type, size, and location was not reported for 2014; the permitting software was disabled before this report was due. The number and type of stormwater facilities required for construction projects is shown in Table 6. There were 3 pre-construction conferences.

In 2014, College Street underwent a renovation that included a 0.5-mile section with 12 filtration planters to manage stormwater. Previously, the area was prone to flooding. In 2013 and 2014, staff worked with George Fox University, Green Girl Land Development Solutions, and volunteers to create 2 bioswales on the GFU campus that can infiltrate the runoff from a 2.5"storm event from the adjacent buildings.

There were no stormwater facilities inspected in 2014 due to time constraints.

Effectiveness Summary (January 2013 to December 2014)

Stormwater Management Program Development (DS-1)

Staff updated the stormwater design standards to conform with the stormwater management code in March 2014 and include more green infrastructure.

Stormwater Staff Training (DS-2)

Each department or division within the City is responsible for their own employee training. In 2013, a PW Operation person attended webcasts on retrofitting techniques and BMP selection for achieving TMDL goals and 2 presentations on creating and implementing a stormwater retrofit program. A PW Operations person attended presentations on green infrastructure

design, stream restoration, and HEC-RAS analyses at the 2014 ASCE-EWRI Conference and the AWWA Sustainable Water Management Conference in Portland in 2014.

Table 6. Post-Construction Stormwater Management 2013 and 2014

Name	Acres	Land Use	Affected Watershed	Stormwater Facilities
Chehalem Cultural Center Forecourt	0.33	Institutional	Chehalem Creek	1 Bioswale, 1 Parking lot with pervious pavers
Deskin Commons Apartment Complex	3.3	Residential	Chehalem Creek	Underground detention pipe with filter cartridges, bioswale
Edgewood Estates Subdivision	1.58	Residential	Chehalem Creek	Underground detention pipe with flow control outlet
Heritage Meadows Subdivision	0.7	Residential	Chehalem Creek	Unreported
Homes at Creekside 5-Unit PUD	0.55	Residential	Chehalem Creek	None
Terra Estates 44-lot Subdivision	7.9	Residential	Chehalem Creek	1 Detention Pond
Church St 18-Unit Apartment Complex		Residential	Hess Creek	Unreported
George Fox Athletic Complex	4.4	Institutional	Hess Creek	Underground detention pipe with flow control outlet, 2 filtration planters, and 2 bioswales
Highlands at Hess Creek 16-Lot Subdivision	2.5	Residential	Hess Creek	Detention pond
Oak Grove 84-Unit Apartment Complex	12.6	Residential	Springbrook Creek	None
Marquis Assisted Living 54-Bed Facility	3.01	Institutional	Springbrook Creek	None

Stormwater Management Program Implementation (DS-3)

There were 26 projects submitted for plan review in 2013; none were reported for 2014 due to the disabling of the +permitting software. There were 5 stormwater facilities required for 11 projects; 3 were constructed in 2013 (see Table 6). There were 3 pre-construction conferences in 2014 and 1 in 2013. In 2014, a College St renovation included a 0.5-mile stretch that incorporated 12 filtration planters. Between 2013 and 2014, staff worked with GFU and Green Girl Land Development Solutions to create 2 bioswales that infiltrate a 2.5" rain event.

Stormwater facility inspections were not completed in 2013 and 2014 due to staff time constraints.

Effectiveness Summary (November 2008 to December 2012)

Stormwater Ordinance and Design Manual Development (DS-1)

The City adopted municipal code concerning stormwater management in 2012. More information about the code adoption is available in the Public Involvement section of this report.

Stormwater Training (DS-2)

Each department or division within the city is responsible for their own employee training. One person took advantage of opportunities to attend national conferences held in Oregon and 1 to 2 people attended stormwater management classes sponsored by OSU Sea Grant. One staff person attended ASCE stormwater symposiums in 2010 and 2012. APWA provides fall and spring classes in maintenance of stormwater infrastructure every year that have been attended by staff. At least one staff person has attended the ACWA Stormwater Summit each year.

Stormwater Program Implementation (DS-3)

There were 6 pre-application conferences, 2 plan reviews, and 15 pre-construction meetings reported by Engineering Services and the Planning Department for 2009 to 2012. There were 12 stormwater facilities reported by Engineering Services and the Planning Department as being required for project approval.

2015 Adaptive Management

The City is not proposing any adaptive management for this minimum measure.

MEASURE 6 – POLLUTION PREVENTION IN MUNICIPAL OPERATIONS

Overview

Measure 6 requires the City to modify procedures and policies to preserve water quality in our streams. Other requirements are to maintain stormwater infrastructure, train staff, and sweep streets. Other than the modification of procedures and policies, all strategies require an ongoing effort.

2014 Tasks Completed

OM-1 Operations and Maintenance Manuals

PW Maintenance neither reviewed nor modified their operations and maintenance manual, catchbasin cleaning program, or street sweeping program due to lack of available staff.

OM-2 Operations and Maintenance Staff Training

Seven staff attended a stormwater class in 2014.

OM-3 Stormwater Infrastructure Maintenance

PW Maintenance reported the following for stormwater infrastructure maintenance:

- 47 Catch Basins cleaned
- 0 new trash rack installed
- 1,859 feet of stormwater line inspected
- 10,163 feet of stormline cleaned
- 115 feet of stormline replaced
- 0 feet of stormline installed

- 0 culverts repaired
- 0 culverts installed

It is estimated that less than 5% of major inlets have trash racks. PW Maintenance did not report the location of the stormline that was replaced.

The City cleans streets on a 5-week rotation. PW Maintenance reported 1,022 curb miles swept with 1.4 cubic yards of debris collected per curb mile. Debris was sent to the landfill. No analyses were completed on the debris.

Effectiveness Summary (January 2013 to December 2014)

Operations and Maintenance Manuals (OM-1)

PW Maintenance neither reviewed nor modified their operations and maintenance manual, catchbasin cleaning program, and street sweeping program due to lack of available staff.

Operations & Maintenance Training (OM-2)

Seven staff attended a stormwater class in 2014. There was no stormwater training reported for 2013.

Stormwater Infrastructure Maintenance (OM-3)

Maintenance for the stormwater system is shown in Table 7. An average 24 catch basins were cleaned in 2013 and 2014. An average 1,180 feet of stormline was inspected and 5,277 feet of stormline was cleaned in 2013 to 2014. PW Maintenance replaced 196 feet between 2013 and 2014; the amount of stormwater line repaired was not reported.

PW Maintenance sweeps streets on a 5-week rotation. An average 0.88 cubic yards of debris was collected per curb mile in 2013 and 2014.

Effectiveness Summary (November 2008 to December 2012)

Operations and Maintenance Manual (OM-1)

The stormwater operations and maintenance manual followed by PW Maintenance is the Stormwater Toolbox completed in June 1998 by Woodward Clyde/Brown and Caldwell. PW Maintenance neither reviewed nor modified their operations and maintenance manual from November 2008 to December 2012. PW Maintenance uses the checklist from the Stormwater Toolbox as their catchbasin cleaning program. PW Maintenance neither evaluated nor modified their street sweeping program from November 2008 to December 2012.

Operations & Maintenance Training (OM-2)

Each department or division within the City is responsible for their own employee training. One person from PW Maintenance was trained in stream protection during construction in 2011. Two PW Maintenance staff was trained in flood damage reduction and stormwater maintenance in 2012. Five PW Maintenance staff attended a 2012 APWA conference and attended 10 to 15 hours of stormwater training.

Table 7. Stormwater Infrastructure and Street Maintenance for 2009-2014

Component	2009	2010	2011	2012	2013	2014	Average (2009 to 2014)
Catch Basins Cleaned	78	339	106	264	-	47	139
Stormline Inspected, feet	5,691	1,844	4,853	325	500	1,859	2,512
Stormline Cleaned, feet	18,807	4,581	4,961	3,718	391	10,163	7,104
Stormline Repaired, feet	-	-	17	13	Not reported	Not reported	5
Stormline Replaced, feet	80	-	305	42	81	115	104
Street Sweeping, curb miles	5,242	3,192	4,382	3,704	3109	1,022	3,442
Street Debris, cubic yards	1,342	659	897	1,067	1,131	1,436	1,089
Debris per Curb Mile, cubic yards	0.26	0.21	0.20	0.29	0.36	1.40	0.45

Stormwater Infrastructure Maintenance (OM-3)

An average 197 catch basins were cleaned from 2009 to 2012. An average of 3,178 feet of stormline was inspected and 8,017 feet of stormline was cleaned between 2009 to 2012. PW Maintenance repaired 30 feet of stormline and replaced 427 feet between 2009 and 2012.

PW Maintenance sweeps streets on a 5-week rotation. An average 0.24 cubic yards of debris was collected per curb mile from 2009 to 2012.

2015 Adaptive Management

Specific revisions proposed for the Pollution Prevention in Municipal Operations measure are shown in Appendix 1. The City proposes to clarify a performance measures.

TEMPERATURE

Overview

The tributaries to the Willamette River within the City boundaries have been designated as rearing and migration corridors for salmon and trout; in addition, the Willamette River in the Newberg area is designated as a migration corridor for steelhead and salmon. In the City's original TMDL Implementation Plan, BMPs to stabilize and decrease stream temperatures were discussed, however no timelines were determined and no BMPs or strategies were specified for the implementation matrix. In 2012, the City responded to DEQ comments regarding the lack of measureable goals and strategies by adding 3 temperature BMPs to the implementation matrix. The strategies are to maintain stream vegetation, increase canopy cover along streams, and complete stream assessments. All require an ongoing effort by the City.

2014 Tasks Completed

T-1 Maintain Existing Stream Vegetation

There were no new ordinances adopted that affected streams in 2014. A property at 2716 Wynooski Rd with stream frontage was annexed by the City in 2014 and the stream corridor overlay was extended to encompass the area of Hess Creek on the property.

To provide understory and help with stormwater volume, 379 shrubs and 45 groundcovers were planted along streams and in bioswales through the Trees for Streams program.

T-2 Increase Effective Shade

The City continued its partnership with NORP to provide trees to homeowners with riparian property. In 2014, 240 trees were planted along streams to increase shade and decrease stream temperatures.

T-3 Stream Assessment

Only 0.25 stream miles, Chehalem Creek tributary from Sunnycrest Road to Sheridan Road, were assessed in 2014.

Effectiveness Summary (January 2013 to December 2014)

Maintain Existing Stream Vegetation (T-1)

To provide understory and help with stormwater volume, 379 shrubs and 45 groundcovers were planted in 2014 along streams and in bioswales through the City's partnership with NORP. Approximately 325 shrubs and groundcovers were planted for streambank stabilization and to reduce stormwater volume in 2013 through partnerships with NORP, GYWC, and the Yamhill County Soil and Water Conservation District.

There were no municipal code changes in 2013 or 2014 that affected stream health.

T-2 Increase Effective Shade

In 2014, approximately 240 trees were planted along streams through the Trees for Streams program and NORP partnership. In 2013, the program provided 135 trees to homeowners to plant along streams.

T-3 Stream Assessment

In 2014, the City assessed streambank vegetation, channel characteristics, and canopy cover for 0.25 stream miles along Chehalem Creek. Approximately 2 stream miles along Hess Creek were assessed in 2013.

Effectiveness Summary (November 2008 to December 2012)

Stream Health Education (T-1)

The City has educated citizens about stream health at the Newberg Farmer's Market since 2010 and at the Camellia Festival since 2011. The Farmer's Market averages 600-800 visitors each week and the Camellia Festival attracts more than a thousand people. Ladybugs, compost samples, and education have been offered at the Public Works Day event each year.

Three classes on sustainable stormwater management were offered to the public in 2010.

Maintain Existing Stream Vegetation (T-2)

The municipal code adopted by the City Council in June 2012 requires streambanks to be kept free of debris and trash; it also requires property owners to maintain streambanks with native vegetation. The Stream Corridor Overlay limits development in the floodplain. The City offers a 10% credit on the stormwater fee for citizens who plant trees on their property and request the credit.

Increase Effective Shade (T-3)

In 2011 and 2012, the City's Trees for Streams program provided over 400 native trees and shrubs to homeowners for planting along the streambanks on their properties.

2015 Adaptive Management

Specific revisions proposed by the City for Public Education are shown in Appendix 1. The City proposes to clarify some performance measures.

SUMMARY

For its 2014 public education effort, the City maintained 16 webpages with stormwater information; sponsored or provided 5 presentations and 5 field events; sponsored or staffed 8 event booths; included stormwater information in the Water Quality Report, and marked 260 storm drains in high profile areas. New events included a presentation to a local leadership group, an Earth Day event, and a restoration project with several partners. Continuing events included a Mad Science presentation, Water Monitoring Day, Learn-to-Build class, Camellia Festival, Newberg Farmers Market, Public Works Day, neighborhood cleanups, and storm drain markers placed by volunteers. The City's public education program for stormwater has grown from a single insert in a utility bill in 2009 to a program that educates at all levels from pre-K to adult.

The Public Involvement measure requires the City to have its stormwater fee increases reviewed by the CRRC; provide funds for watershed restoration or stormwater education; respond to public complaints involving stormwater, erosion control, and illicit discharges; and conduct a public survey on stormwater issues. The City had its stormwater fee reviewed by the CRRC in February 2014 with increases approved by the Council. The stormwater fee will be $7.96 in 2014 to $8.67 in 2015. A project with multiple partners was provided with $1,000 to restore 0.6 acres and 240 ft of riparian habitat. The project also provided educational events for middle school students, university students, and adults. A new link for reporting stormwater concerns was put on the City's website; it can be accessed through the website, smartphones, or tablets. Two complaints involving erosion control, and 3 reports of illicit discharges were reported by the public. Since 2009, the Public Involvement measure has seen several changes as the City tries different methods for the public to voice stormwater concerns. The CRRC continues to be an effective method for making utility fee increases transparent and a new watershed grant program shows promise for encouraging streambank restoration and educating the public while conserving staff time.

A program for illicit discharges was developed and implemented by the City in 2014. It utilizes staff time spent completing normal infrastructure maintenance, pre-treatment inspections, and stream assessments by instructing staff to report any illicit discharges or potential situations in the course of their day. Investigative forms and procedures were created for the Plan. One person completed training on illicit discharges in 2014. There were 7 responses to spills and 1 response to garbage in the street; spill response kits are kept on 2 city vehicles. Two warning letters were issued due to discharges but there were no citations. The hazardous waste collection events in 2014 kept 16.3 tons of hazardous waste, 24.8 tons of paint-related waste, and 705 pounds of drugs out of the landfills and wastewater through efforts by the YCSW and the Newberg-Dundee police department. The City did not have an illicit discharge program in place before the first phase of the TMDL Implementation Plan started in 2009. It now has municipal code, policies, and procedures in place and has seen a rise in illicit discharge notifications because of its stormwater education efforts. The YCSW and Newberg-Dundee police department continue to be instrumental in removing hazardous wastes and prescription medications from the waste stream since 2009.

The City developed and implemented an ESC program and fee in 2014 for construction sites less than 1 acre with larger sites required to obtain a 1200-C permit. An ESC fee was adopted to cover the additional staff time needed for plan review and inspections. Two people were certified as ESC inspectors in 2014. There were 2 complaints regarding ESC that were resolved by the responsible parties cleaning up their sites. No citations were issued. Documentation of

inspections and plan reviews was not available due to displacement of the permitting software. The City did not have an ESC program in place in 2009 and now has municipal code, a construction manual, inspection procedures, and 3 certified ESC inspectors.

Staff updated the stormwater design standards to conform with the stormwater management code in March 2014 and include more green infrastructure. There were 3 pre-construction conferences in 2014. During the College Street renovation, a 0.5 mile stretch was retrofitted with 12 filtration planters. Staff worked with GFU, a consultant, and volunteers to complete a bioswale that infiltrates the runoff from a 2.5" storm event for the adjacent building. One person attended webcasts and a conference on stormwater management. Two people attended a workshop on urban forestry. There were no stormwater facilities inspected due to staff time constraints. Since 2009, the City has adopted and implemented municipal code and updated the design manual to encourage more green infrastructure.

Seven people were present at a stormwater infrastructure class in 2014. There were 47 catch basins cleaned; 12,137 feet of stormline inspected, cleaned or replaced; no trash racks installed; and no culverts repaired or installed. Streets were cleaned on a 5-week rotation with 1.4 cubic yards of debris collected per curb mile. The City was not able to update its policies and procedures in regard to pollution prevention in municipal operations.

A riparian property was annexed into the City and the stream corridor overlay was extended to encompass the additional habitat. In 2014, the City provided 45 groundcovers, 379 shrubs, and 240 trees to riparian property owners to increase canopy cover, reduce stormwater volume, and mitigate temperature increases. Staff assessed 0.25 stream miles in 2014.

The Temperature measure initially had neither strategies nor goals with deadlines. In response to DEQ comments in 2012, the City created goals and strategies to mitigate temperature that incorporated the effects of a riparian planting program started in 2011 and the streambank protection afforded by the illicit discharge municipal code adopted in 2012. A 2012-2013 stream assessment of Hess Creek indicated that much of the vegetation along the stream was invasive, streambanks were unstable, and stormwater was contributing to loss of floodplain connectivity. A watershed grant program started by the City in the last year is aimed at changing these conditions and increasing education efforts while economizing staff time.

The City has fully implemented 71% of the current strategies in its TMDL Implementation Plan. It has fully implemented 72% of the required 2014 measurable goals which is an increase of 4% from 2013. The City continues to work on implementing the remaining strategies and measurable goals while recognizing the progress that has occurred within its watersheds.

APPENDIX 1 TMDL IMPLEMENTATION MATRIX

TMDL Implementation Plan Matrix 2013 to 2017

Best Management Practice or Activity	Source	Strategy	Measurable Goal	Performance Measure	Expected Implementation Timeline	2014 Status	Pollutant				
							Nutrients	Bacteria	Total Suspended Solids	Mercury	Temperature*
Measure No. 1 - Public Education											
PE-1 Stormwater Education	All	Website Education	Provide stormwater information on the city website	Provide links to webpages and post annual TMDL reports.	Ongoing	Ongoing	X	X	X	X	X
		Educate Citizen Groups	Present stormwater information to interested citizen groups or at local venues	Track number of presentations and events, program messages, and number participating	Ongoing	Ongoing	X	X	X	X	X
		Water Quality Report	Provide stormwater education in the annual Water Quality Report	Provide link to WQ report; track article message	June 2014 and annually	Ongoing	X	X	X	X	X
PE-2 Watershed Education		Watershed Education	Provide signage at stream crossings or green infrastructure	Track number of signs and ~~messages~~ locations	October, 2017	Not Due	X	X	X	X	X
		Classroom Education	Provide stormwater education in the classroom	Track number of presentations, program messages, and number participating	December 2013 and ongoing	Ongoing	X	X	X	X	X
PE-3 Infrastructure Education	Spills and illicit discharges	Mark storm drains in high profile areas	Mark 50 catch basins a year until all are marked	Track number of catch basins marked per year. Provide GIS map showing coverage.	Ongoing	Ongoing	X	X	X	X	X
Measure No. 2 - Public Involvement											
PI-1 Stormwater Utility Fee	All	Participate in Citizen Rate Review Committee meetings.	Present funding needs to committee	Document meeting attendance, adopted rates, and effective dates of rate changes.	Ongoing	Ongoing	X	X	X	X	X
PI-2 Public Participation in Stormwater Management	Post-Construction Runoff	Provide funds for projects by public groups or citizens that increase water quality or watershed awareness	Provide a minimum of $2,000 in a grant program to fund ~~citizen~~ non-profit projects that fulfill goals of the TMDL Plan.	Track number of funded projects, amount disbursed per project, stream affected, and ~~drainage area~~ either number of stream miles affected or number of participants.	January, 2014 and ongoing	Ongoing	X	X	X	X	X
PI-3 Public Participation in Reporting Stormwater Issues	All	Provide mechanism for public to report stormwater, illicit discharge, and erosion control issues	Provide methods for citizens to report concerns during and after business hours. Notify public on a recurring basis.	Document methods.	Ongoing	Ongoing	X	X	X	X	X

							Pollutant				
Best Management Practice or Activity	**Source**	**Strategy**	**Measurable Goal**	**Performance Measure**	**Expected Implementation Timeline**	**2014 Status**	**Nutrients**	**Bacteria**	**Total Suspended Solids**	**Mercury**	**Temperature***
			Respond to public concerns	Document number of flooding complaints reported by citizens. Document number of erosion complaints reported by citizens. Document number of illicit discharge complaints reported by citizens.	July, 2013 and ongoing	Ongoing	X	X	X	X	X
PI-4 Public Participation in Educational Focus	All	Determine focus of educational messages	Conduct survey to revise and refine educational message	Provide copy or link to survey and report results of survey	December, 2015	Not Due	X	X	X	X	X
Measure No. 3 - Illicit Discharge Detection and Elimination (IDDE)											
ID-1 Develop IDDE Plan	Spills and illicit discharges	Develop plan to detect illicit discharges	Develop procedures to address non-stormwater discharges	Document procedures	December, 2013	Completed (Original deadline 2010)	X	X	X	X	X
			Develop investigative sampling and monitoring plan	Document plan.	December, 2013	Completed (Original deadline 2010)	X	X	X	X	X
			Develop worksheets for inspections	Document worksheets.	December, 2013	Completed (Original deadline 2010)	X	X	X	X	X
ID-2 Train Staff to Implement IDDE	Spills and illicit discharges	Train employees in illicit discharge investigation and spill response.	Train staff who are new to illicit discharge investigation and spill response. Provide training in some aspect of illicit discharge investigation and spill response every 5 years for all applicable staff.	Track type of training (webcast, class, certification, etc.), number of employees trained, and the training subject (maintenance, response, investigation, sampling, etc).	Ongoing	Ongoing	X	X	X	X	X
ID-3 Implement IDDE plan	Spills and illicit discharges	Conduct illicit discharge inspections	Fieldscreen outfalls	Inventory type, size, and location of public and private outfalls. Link to GIS.	November, 2015	Not Due	X	X	X	X	X
			Investigate outfalls for illicit discharges	Document location, number of samples taken, ~~test results,~~ date, ~~cause~~, and resolution	November, 2015	Incomplete but started (Original deadline 2010)	X	X	X	X	X
		Respond to illegal dumps	Clean up illegal dumps	Track number of citations issued and resolution.	Ongoing	Ongoing	X	X	X	X	X

							Pollutant				
Best Management Practice or Activity	**Source**	**Strategy**	**Measurable Goal**	**Performance Measure**	**Expected Implementation Timeline**	**2014 Status**	**Nutrients**	**Bacteria**	**Total Suspended Solids**	**Mercury**	**Temperature***
		Respond to spills	Fire Department Spill Response	Track date and cause ~~location~~ of spills that occur and ~~the substance that was spilled~~. Document whether the spill reached the stormwater system or a stream and if water sampling was conducted. Document response resolution.	Ongoing	Ongoing	X	X	X	X	X
			Public Works Spill Response	Track date and cause ~~location~~ of spills that occur and ~~the substance that was spilled~~. Document whether the spill reached the stormwater system or a stream and if water sampling was conducted. Document response resolution.	Ongoing	Ongoing	X	X	X	X	X
			Provide spill response cards and spill response kits on municipal trucks and sweepers.	Track number of municipal trucks and sweepers with spill response cards and spill kits. Document the number of spill kits used in response to spills.	December 2014 and Ongoing	Incomplete but started	X	X	X	X	X
ID-4 Hazardous Waste Collection	Illicit discharges	Provide opportunity for residents to dispose of hazardous waste	Offer free hazardous waste collection service twice per year to city residents.	Track volume of waste received during collection events.	Ongoing	Ongoing	X	X	X	X	
Measure No. 4 - Construction Site Stormwater Runoff Control											
CS-1 Develop Erosion and Sediment Control Program	Construction Site Runoff	Develop ESC Manual	Develop and approve an ESC Manual. Post on website.	Provide link to ESC Manual.	June, 2013	Completed (Original deadline 2009)	X	X	X	X	X

							Pollutant				
Best Management Practice or Activity	**Source**	**Strategy**	**Measurable Goal**	**Performance Measure**	**Expected Implementation Timeline**	**2014 Status**	**Nutrients**	**Bacteria**	**Total Suspended Solids**	**Mercury**	**Temperature***
CS-2 Train Staff in Erosion and Sediment Control	Construction Site Runoff	Train staff in plan review, inspection, and enforcement of ESC program	Train staff whose responsibilities change to include erosion and sediment control plan review, inspections, and enforcement. Provide refresher training to all staff involved in ESC ~~inspections~~ every 3 years. ~~Provide refresher training to all staff involved in ESC plan review and enforcement every 5 years.~~	Document number of staff trained and type of training (recertification or new certification)	Ongoing	Ongoing	X	X	X	X	X
CS-3 Implement Erosion and Sediment Control Program	Construction Site Runoff	Implement ESC program	Conduct plan review	Document location and size of all construction projects. Document which projects were required to have a 1200-C permit.	Ongoing	Ongoing	X	X	X	X	X
			Conduct site inspections at least once during active construction by trained or experienced staff.	Provide ~~link or copy~~ number of ESC inspections for each project ~~report~~. Document location and size of construction project.	Ongoing	Ongoing	X	X	X	X	X
			Enforce ordinance	Report number of warning letters or non-compliance citations by project ~~location~~, and resolution.	Ongoing	Ongoing	X	X	X	X	X
Measure No. 5 - Post-Construction Stormwater Runoff Control											
DS-1 Develop Stormwater Management Program	Development and Redevelopment	Update Development Manuals and Plans	Update design standards manual and notify development community of new requirements.	Provide summary of changes and link to new design standards when complete.	May, 2013	Incomplete but started (Original deadline 2010)	X	X	X	X	X
DS-2 Train Staff in Stormwater Management	Development, Infrastructure, Redevelopment, and Watershed Management	Train staff with stormwater runoff responsibilities in watershed and stormwater management	Provide training opportunities for staff	Track type of training (webcast, class, certification, etc.), number of employees trained, and the training subject (plan review, inspection, enforcement, etc.)	Ongoing	Ongoing	X	X	X	X	X
			Train staff who are new to stormwater facility inspections. Provide refresher training for all staff every 3 years.	Track type of training (webcast, class, certification, etc.), number of employees trained, and the training subject (plan review, inspection, enforcement, etc.)	June, 2014 and ongoing	Not completed	X	X	X	X	X

							Pollutant				
Best Management Practice or Activity	**Source**	**Strategy**	**Measurable Goal**	**Performance Measure**	**Expected Implementation Timeline**	**2014 Status**	**Nutrients**	**Bacteria**	**Total Suspended Solids**	**Mercury**	**Temperature***
DS-3 Implement Stormwater Management Program	Development, Redevelopment, and Watershed Management	Require Stormwater Management for Development and Redevelopment	Require plan submittals, conduct plan reviews	Document number of plan submittals, plan reviews, project type (commercial, institutional,residential, etc), size, and location.	Ongoing	Ongoing	X	X	X	X	X
			Require stormwater management for development	Document number and type (detention basin, flow dissipater, raingarden, filtration swale, etc.) of stormwater facilities required for each project.	Ongoing	Ongoing	X	X	X	X	X
			Conduct pre-construction conferences	Document number of pre-construction conferences, project type (commercial, institutional, residential, etc), size, and location.	Ongoing	Ongoing	X	X	X	X	X
		Improve Watershed Management	Evaluate Retrofit Opportunities	Summarize hierarchy used for screening. Document location and number of sites reviewed, drainage area, and result of evaluation.	May, 2014 and ongoing	Incomplete but started (Original deadline 2010)	X	X	X	X	X
			Implement Retrofit Program	Document number of projects including location, size, type (GI, traditional, etc), and drainage area.	May, 2014 and ongoing	Incomplete but started (Original deadline 2011)	X	X	X	X	X
		Optimize Water Quality	Inspect stormwater facilities	Document number of inspections, type of facility (detention basin, raingarden, porous pavement, swale, etc.) and whether facilities were categorized as excellent, fair, or poor condition.	July, 2014 and ongoing	Not completed	X	X	X	X	X
			Implement monitoring program	Document sampling locations, dates, parameters, and results	January, 2016 and ongoing	Not Due	X	X	X	X	X
Measure No. 6 - Pollution Prevention in Municipal Operations											
OM-1 Operations and Maintenance Manual	Public Operations and Maintenance Practices	Update Policies	Review existing operation and maintenance practices	Document current procedures	July, 2013	Not completed (Original deadline 2009)	X	X	X	X	X
			Update O&M manual to optimize water quality	Document modifications to manual.	April, 2014	Not completed (Original deadline 2009)	X	X	X	X	X
		Update Infrastructure Procedures	Update catch basin cleaning program	Document current procedures and modifications to optimize water quality.	December, 2014	Not completed (Original deadline 2009)	X	X	X	X	X

							Pollutant				
Best Management Practice or Activity	**Source**	**Strategy**	**Measurable Goal**	**Performance Measure**	**Expected Implementation Timeline**	**2014 Status**	**Nutrients**	**Bacteria**	**Total Suspended Solids**	**Mercury**	**Temperature***
			Implement revised catch basin cleaning program	Track progress.	June, 2015	Not completed (Original deadline 2010)	X	X	X	X	X
		Update Street Sweeping Procedures	Evaluate street sweeping program and revise as necessary to optimize water quality	Document current procedures and modifications to optimize water quality.	March, 2016	Not completed (Original deadline 2009)	X	X	X	X	X
			Implement revised street sweeping program	Track progress.	July, 2016	Not completed (Original deadline 2009)	X	X	X	X	X
Om-2 Operations and Maintenance Training	Public Operations and Maintenance Practices	Train staff in infrastructure and street sweeping procedures that optimize water quality	Train staff new to stormwater maintenance duties in O&M procedures	Track type of training (webcast, class, certification, etc.), number of employees trained, and the training subject (inspections, maintenance, repair, construction, etc.)	Ongoing	Ongoing	X	X	X	X	X
			Train all staff in revised O&M procedures	Track type of training (webcast, class, certification, etc.), number of employees trained, and the training subject (inspections, maintenance, repair, construction, etc.)	July, 2014	Not Completed	X	X	X	X	X
			Train staff in maintenance procedures that maximize water quality.	Track training events.	Ongoing	Not Completed	X	X	X	X	X
OM-3 Stormwater Infrastructure Maintenance	Development and Redevelopment	Catch Basins	Clean catch basins	Track number of unique* catch basins cleaned per year.	Ongoing	Ongoing	X	X	X	X	X
		Inlets	Place trash racks over major inlets	Track number and percentage of major inlets installed with trash racks.	Ongoing	Ongoing	X	X	X	X	X
		Stormline	Inspect, clean, repair, replace, and install stormline	Track length of stormline inspected. Document length of stormline cleaned. Document length and location of stormline repaired or replaced. Track length, diameter, and location of stormline installed	Ongoing	Ongoing	X	X	X	X	X

							Pollutant				
Best Management Practice or Activity	**Source**	**Strategy**	**Measurable Goal**	**Performance Measure**	**Expected Implementation Timeline**	**2014 Status**	**Nutrients**	**Bacteria**	**Total Suspended Solids**	**Mercury**	**Temperature***
		Culverts	Inspect, repair, and replaceculverts	Document location of repaired and replaced culverts and reason for repair or replacement. For newly installed culverts, document new culvert size, material, and elevation from culvert bottom to stream bottom.	Ongoing	Ongoing	X	X	X	X	X
	Street Debris	Remove debris from streets	Sweep streets every 4 to 6 weeks	Track curb miles swept and debris collected per curb mile each year. Document disposal method.	Ongoing	Ongoing	X	X	X	X	X
Temperature											
T-1 Maintain Existing Stream Vegetation	Development, Redevelopment, and Watershed Management	Use enforcement and other measures to maintain stream vegetation	~~Determine~~ Update city code that can affect stream health	~~Track number of~~ Update ordinances that affect stream vegetation	December, 2015	Ongoing	X	X	X	X	X
			Update Stream Corridor Overlay	~~Update~~ Document changes to Stream Corridor Overlay map and code based on wetland inventory and property annexations	December, 2017	Not Due	X	X	X	X	X
T-2 Increase Effective Shade	Development, Redevelopment, and Watershed Management	Increase shade along city streams	Provide incentives for citizens to plant trees	Document ~~location~~ watershed and number of native trees planted per year	Ongoing	Ongoing	X	X	X	X	X
T-3 Stream Assessment	Development, Redevelopment, and Watershed Management	Assess stream health and canopy coverage to focus restoration efforts.	Assess at least 2 stream miles annually for vegetative cover, stream channel configuration, and canopy coverage.	Document results of assessment	November, 2013 and ongoing	Ongoing	X	X	X	X	X
			Complete a wetland inventory that encompasses the Urban Reserve areas	Track Progress. Provide link to wetland inventory and map.	December, 2016 and ongoing.	Not Due	X	X	X	X	X

APPENDIX 2 PUBLIC EDUCATION – GREATER YAMHILL WATERSHED COUNCIL

Approved: _____ _____

Date Authorized Signer

Board Meeting Minutes

Greater Yamhill Watershed Council Board of Directors Meeting

Thursday, January 9, 2014 **City of McMinnville Water Reclamation Center**

Directors	Present
Erik Grimstad	■
Dave Hanson	☐
Marci Humlie	☐
Sonja Johnson	☐
JL Liddane	■

Directors	Present
David Riedman	■
Leonard A. Rydell	■
Bruce Sigloh	■
Steve Wegner	■

Staff	Present
Luke Westphal	■

Other/Guests	Present

1) Call to Order:

JL Liddane called the meeting to order at 6:09pm.

2) Board Meeting Minutes:

Supporting Literature A1: Draft September 2013 Board Meeting Minutes

Erik G. noted an error in the September 2013 draft minutes: Page 1 of 8, #2 – Voting table for Draft June & July Board Meeting Minutes shows Erik and Marci both motioning and no one seconding.

☐ **Vote Record – Approval of Draft September 2013 Board Meeting Minutes**					
	Yes/Aye	**No/Nay**	**Abstain**	**Motion**	**2nd**
Erik Grimstad	■	☐	☐	☐	■
Dave Hanson	☐	☐	☐	☐	☐
Marci Humlie	☐	☐	☐	☐	☐
Sonja Johnson	☐	☐	☐	☐	☐
J. L. Liddane	■	☐	☐	☐	☐
David Riedman	■	☐	☐	☐	☐
Leonard A. Rydell	☐	☐	☐	☐	☐
Bruce Sigloh	■	☐	☐	■	☐
Steve Wegner	■	☐	☐	☐	☐
Comments: Motion/Seconded/Voted/Accepted: Approval of September 2013 Board Meeting Minutes as amended. Leonard R. not arrived yet.					

Approved: _____ _____

Date Authorized Signer

Board Meeting Minutes

Greater Yamhill Watershed Council Board of Directors Meeting

Thursday, March 13, 2014 City of McMinnville Water Reclamation Center

Directors	Present
Erik Grimstad	■
Dave Hanson	☐
Marci Humlie	■
Sonja Johnson	■
JL Liddane	☐

Directors	Present
David Riedman	■
Leonard A. Rydell	☐
Bruce Sigloh	■
Steve Wegner	■

Staff	Present
Luke Westphal	■

Other/Guests	Present

1) Call to Order:

Steve W., acting Board Chair for the meeting, called the meeting to order at 6:07pm. Board Chair JL L. is out of town until March 18th.

2) Board Meeting Minutes:

Supporting Literature A1: Draft January 2014 Board Meeting Minutes

☐ Vote Record – Approval of Draft January 2014 Board Meeting Minutes					
	Yes/Aye	**No/Nay**	**Abstain**	**Motion**	**2nd**
Erik Grimstad	■	☐	☐	■	☐
Dave Hanson	☐	☐	☐	☐	☐
Marci Humlie	■	☐	☐	☐	☐
Sonja Johnson	■	☐	☐	☐	☐
J. L. Liddane	☐	☐	☐	☐	☐
David Riedman	■	☐	☐	☐	☐
Leonard A. Rydell	☐	☐	☐	☐	☐
Bruce Sigloh	■	☐	☐	■	☐
Steve Wegner	■	☐	☐	☐	☐
Comments: Motion/Seconded/Voted/Accepted: Approval of January 2014 Board Meeting Minutes.					

Approved: _____ _____

Date Authorized Signer

DRAFT Board Meeting Minutes

Greater Yamhill Watershed Council Board of Directors Meeting

Thursday, April 10, 2014 **City of McMinnville Water Reclamation Center**

Directors	Present
Erik Grimstad	■
Dave Hanson	☐
Marci Humlie	■
Sonja Johnson	■
JL Liddane	■

Directors	Present
David Riedman	■
Leonard A. Rydell	■
Bruce Sigloh	☐
Steve Wegner	■

Staff	Present
Luke Westphal	■

Other/Guests	Present

1) Call to Order:

JL L. called the meeting to order at 6:13pm.

2) Board Meeting Minutes:

Supporting Literature A1: Draft March 2014 Board Meeting Minutes

☐ **Vote Record – Approval of Draft March 2014 Board Meeting Minutes**					
	Yes/Aye	**No/Nay**	**Abstain**	**Motion**	**2nd**
Erik Grimstad	■	☐	☐	■	☐
Dave Hanson	☐	☐	☐	☐	☐
Marci Humlie	■	☐	☐	☐	■
Sonja Johnson	■	☐	☐	☐	☐
J. L. Liddane	■	☐	☐	☐	☐
David Riedman	■	☐	☐	☐	☐
Leonard A. Rydell	■	☐	☐	☐	☐
Bruce Sigloh	☐	☐	☐	☐	☐
Steve Wegner	■	☐	☐	☐	☐
Comments: Motion/Seconded/Voted/Accepted: Approval of March 2014 Board Meeting Minutes.					

Approved: _____ _____

Date Authorized Signer

Board Meeting Minutes

Greater Yamhill Watershed Council Board of Directors Meeting

Thursday, July 10, 2014 West Wortman Park, McMinnville, OR

Directors	Present
Erik Grimstad	■
Dave Hanson	☐
Marci Humlie	■
Sonja Johnson	■
J. L. Liddane	■

Directors	Present
David Riedman	■
Leonard A. Rydell	■
Bruce Sigloh	■
Steve Wegner	■

Staff	Present
Luke Westphal	■

Other/Guests	Present
James Riedman	■

1) Call to Order

JL Liddane called the meeting to order at 6:15pm.

2) Board Meeting Minutes: Review and Approve Previous Minutes

April 2014 Board Meeting Minutes

☐ **Vote Record – Approval of April 2014 Board Meeting Minutes**					
	Yes/Aye	**No/Nay**	**Abstain**	**Motion**	**Second**
Erik Grimstad	■	☐	☐	☐	☐
Dave Hanson	☐	☐	☐	☐	☐
Marci Humlie	■	☐	☐	☐	☐
Sonja Johnson	■	☐	☐	☐	☐
J. L. Liddane	■	☐	☐	☐	☐
David Riedman	■	☐	☐	☐	☐
Leonard A. Rydell	■	☐	☐	■	☐
Bruce Sigloh	☐	☐	☐	☐	☐
Steve Wegner	■	☐	☐	☐	■
Comments: Motion/Seconded/Voted/Accepted: Approval of April 2014 Board Meeting Minutes as written.					

Approved: _____ _____

Date Authorized Signer

Board Meeting Minutes

Greater Yamhill Watershed Council Board of Directors Meeting

Thursday, September 18, 2014 McMinnville Water Reclamation Facility, McMinnville, OR

Directors	Present
Erik Grimstad	■
Marci Humlie	■
Sonja Johnson	■
J. L. Liddane	☐

Directors	Present
David Riedman	■
Leonard A. Rydell	■
Bruce Sigloh	■
Steve Wegner	☐

Staff	Present
Luke Westphal	■

Other/Guests	Present
James Riedman	■
Roland Troncin	■
Yuka Tomizawa	■

1) Call to Order

Erik Grimstad called the meeting to order at 6:18 pm.

2) Board Meeting Minutes: Review and Approve Previous Minutes

Vote Record – Approval of July 2014 Board Meeting Minutes					
	Yes/Aye	No/Nay	Abstain	Motion	Second
Erik Grimstad	■	☐	☐	☐	☐
Marci Humlie	■	☐	☐	☐	☐
Sonja Johnson	■	☐	☐	☐	■
J. L. Liddane	☐	☐	☐	☐	☐
David Riedman	■	☐	☐	■	☐
Leonard A. Rydell	■	☐	☐	☐	☐
Bruce Sigloh	■	☐	☐	☐	☐
Steve Wegner	☐	☐	☐	☐	☐

3) Fiscal Report: Review and Approve Fiscal Report

Vote Record – Approval of Board Fiscal Report					
	Yes/Aye	No/Nay	Abstain	Motion	Second
Erik Grimstad	■	☐	☐	☐	☐
Marci Humlie	■	☐	☐	■	☐
Sonja Johnson	■	☐	☐	☐	☐
J. L. Liddane	☐	☐	☐	☐	☐
David Riedman	■	☐	☐	☐	■
Leonard A. Rydell	■	☐	☐	☐	☐
Bruce Sigloh	■	☐	☐	☐	☐
Steve Wegner	☐	☐	☐	☐	☐

Approved: _____ _____

Date Authorized Signer

Board Meeting Minutes

Greater Yamhill Watershed Council Board of Directors Meeting

Thursday, October 23, 2014 McMinnville Water Reclamation Facility, McMinnville, OR

Directors	Present
Erik Grimstad	■
Marci Humlie	■
Sonja Johnson	■
J. L. Liddane	☐
David Riedman	■

Directors	Present
James Riedman	■
Leonard A. Rydell	☐
Bruce Sigloh	■
Steve Wegner	■

Staff	Present
Luke Westphal	■

Other/Guests	Present
Amanda Greene	■
Larry Ojua	■
Ruby Troncin	■
Yuka Tomizawa	■

1) Call to Order

Erik Grimstad called the meeting to order at 6:03 pm. Introductions were made for guests.

2) Board Meeting Minutes: Review and Approve Previous Minutes

Copies of minutes for the September 2014 Board meeting were distributed. Marci noted that the minutes stated the Board approved April 2014 minutes, which should have been July 2014 minutes. Erik noted that comments about flex time were whether it was legal to have flex time across multiple work weeks rather than within one work week. Erik also noted that it would be good to write out acronyms in the minutes, such as RCPP – Regional Conservation Partnership Program.

Vote Record – Approval of September 2014 Board Meeting Minutes					
	Yes/Aye	No/Nay	Abstain	Motion	Second
Erik Grimstad	■	☐	☐	☐	☐
Marci Humlie	■	☐	☐	☐	☐
Sonja Johnson	■	☐	☐	☐	■
J. L. Liddane	☐	☐	☐	☐	☐
James Riedman	■	☐	☐	☐	☐
David Riedman	■	☐	☐	☐	☐
Leonard A. Rydell	☐	☐	☐	☐	☐
Bruce Sigloh	■	☐	☐	■	☐
Steve Wegner	■	☐	☐	☐	☐

Approved: _____ _____

Date Authorized Signer

Board Meeting Minutes

Greater Yamhill Watershed Council Board of Directors Meeting

Friday, November 14, 2014 GYWC Conference Room, McMinnville, OR

Directors	Present
Erik Grimstad	■
Marci Humlie	■
Sonja Johnson	☐
J. L. Liddane	☐

Directors	Present
James Riedman	■
Leonard A. Rydell	☐
Bruce Sigloh	■
Steve Wegner	■

Staff	Present
Luke Westphal	■

Other/Guests	Present

1) Call to Order

Eric Grimstad called the meeting to order at 1:08 pm.

2) Board Meeting Minutes: Review and Approve Previous Minutes

Eric mentioned that in the Rapid Bioassessment, it was mentioned that it was important to have the statement of scalability be prevalent. Luke will note this in the minutes.

Vote Record – Approval of October 2014 Board Meeting Minutes with revision					
	Yes/Aye	No/Nay	Abstain	Motion	Second
Erik Grimstad	■	☐	☐	☐	☐
Marci Humlie	■	☐	☐	☐	☐
Sonja Johnson	☐	☐	☐	☐	☐
J. L. Liddane	☐	☐	☐	☐	☐
James Reidman	■	☐	☐	☐	☐
Leonard A. Rydell	☐	☐	☐	☐	☐
Bruce Sigloh	■	☐	☐	■	☐
Steve Wegner	■	☐	☐	☐	■

3) Fiscal Report: Review and Approve Fiscal Report

Luke mentioned that in addition to the $25,000 grant from Oregon Department of Agriculture (ODA) to fund the Pesticide collection, GYWC received an additional $4000 from Marion County Soil and Water Conservation District, $5000 from Clackamas County, and $2000 from Yamhill/ Polk Counties.

Vote Record – Approval of Board Fiscal Report					
	Yes/Aye	No/Nay	Abstain	Motion	Second
Erik Grimstad	■	☐	☐	☐	☐
Marci Humlie	■	☐	☐	☐	☐
Sonja Johnson	☐	☐	☐	☐	☐

Approved: _____ _____

Date Authorized Signer

Board Meeting Minutes

Greater Yamhill Watershed Council Board of Directors Meeting

Friday, December 17, 2014 GYWC Conference Room, McMinnville, OR

Directors	Present
Erik Grimstad	■
Marci Humlie	■
Sonja Johnson	■
J. L. Liddane	☐

Directors	Present
James Riedman	■
Leonard A. Rydell	■
Steve Wegner	☐

Staff	Present
Luke Westphal	■

Other/Guests	Present
Laura McMasters	■
Theresa Crain	■

1) Call to Order

Erik Grimstad called the meeting to order at 6:10 pm.

2) Board Meeting Minutes: Review and Approve Previous Minutes

Vote Record – Approval of November 2014 Board Meeting Minutes					
	Yes/Aye	No/Nay	Abstain	Motion	Second
Erik Grimstad	■	☐	☐	■	☐
Marci Humlie	■	☐	☐	☐	☐
Sonja Johnson	■	☐	☐	☐	☐
J. L. Liddane	☐	☐	☐	☐	☐
James Riedman	■	☐	☐	☐	■
Leonard A. Rydell	■	☐	☐	☐	☐
Steve Wegner	☐	☐	☐	☐	☐

3) Fiscal Report: Review and Approve Fiscal Report

Vote Record – Approval of Board Fiscal Report					
	Yes/Aye	No/Nay	Abstain	Motion	Second
Erik Grimstad	■	☐	☐	☐	☐
Marci Humlie	■	☐	☐	☐	☐
Sonja Johnson	■	☐	☐	☐	☐
J. L. Liddane	☐	☐	☐	☐	☐
James Riedman	■	☐	☐	■	☐
Leonard A. Rydell	■	☐	☐	☐	■
Steve Wegner	☐	☐	☐	☐	☐

City Manager
503.537.1207

City Manager's Fax
503.538.5013

City of Newberg

414 East First Street
PO Box 970
Newberg, OR 97132

December 22, 2014

Greater Yamhill Watershed Council
800 NE 2nd St
McMinnville, OR 97128

Dear Fellow Council Members,

Due to changes in job responsibilities and regulatory requirements, I will no longer be participating in council meetings and the City will no longer be a board member of the GYWC. I have enjoyed the 5 years that we were a part of the council and intend to continue partnering with you on projects that affect the Chehalem Creek, Hess Creek, and Spring Brook Creek watersheds.

Luke Westphal has been a great Executive Director for the GYWC and I expect to continue to see the upward trend of the council profile and the good work that you do in Yamhill County.

Sincerely,

Sonja Johnson
TMDL/ Stormwater Programs
City of Newberg
2301 Wynooski Rd
Newberg, OR 97132

APPENDIX 3 IDDE PLAN

ILLICIT DISCHARGE DETECTION and ELIMINATION (IDDE) PLAN

2014

Some pages in this document have been purposely skipped or blank pages inserted so that this document will correctly print or copy when in duplex mode.

CONTENTS

GENERAL

PURPOSE

The City of Newberg's TMDL Implementation Plan for the Willamette River requires that the City adopt a policy and a plan to detect and address non-stormwater discharges to the stormwater system including illegal dumping. The Newberg City Council adopted municipal code on June 20, 2012 (Ordinance 2012-2754) to enforce the policy.

The procedures incorporated in this Illicit Discharge and Detection (IDDE) Plan (hereafter known as "the Plan") address scheduled and unscheduled inspections of illicit discharges and illegal dumping. It utilizes actions resulting from public complaints, normal maintenance activities, regular business inspections, and stream assessments to provide a systematic and comprehensive picture of the stormwater system.

SAFETY

Field crews of at least 2 people, with current confined space training, will investigate sites that are, or could be considered, confined space. Staff will follow approved City procedures regarding confined spaces when entering areas that are, or could be considered, confined spaces.

Staff will wear **powder-free** nitrile gloves and properly-fitted hip or chest waders when sampling discharges. Cell phones must be accessible and staff is required to call 911 immediately in the event of an emergency. Staff should call their supervisor after calling 911. Staff investigating illicit discharge activities will have current First Aid and CPR certifications.

When working in traffic areas, staff is required to wear reflective safety vests, work in crews of at least 2 people, and use traffic cones and other safety equipment in accordance with the safety risk. Staff will be provided the safety equipment and clothing necessary to adhere to applicable OSHA regulations when working with stormwater issues.

PUBLIC NOTIFICATION

During unscheduled investigations, staff will present city employee identification and business cards and explain the reason for their visit. Regular notification procedures for business inspections shall apply in the event of a scheduled inspection. **Public Notification Letters (see Appendix 1)** sent to affected riparian property owners prior to stream and outfall assessments will suffice as proper notification.

UNSCHEDULED INVESTIGATIONS

PUBLIC COMPLAINTS

After receiving notice of an illicit or illegal discharge to the stormwater system, staff will:

1. Document the complainant's name and contact information (phone or email) in an **IDDE Investigation Report (see Appendix 2).**
2. Document the discharge date, time of phone call, discharge address, and the citizen's description of the discharge.
3. After arrival, determine if an illicit discharge or illegal dumping took place at the address. If a discharge took place or is taking place:
   a. Notify the City TMDL Program Coordinator and Code Enforcement Officer of the discharge address and description.
   b. In unsafe environments, immediately call 911 or dispatch. Cordon off the area.
   c. In safe work environments, follow procedures outlined in this Plan.
4. If there are no visible signs of a discharge, fill out the remaining applicable sections of the **IDDE Investigation Report** and send it to the City TMDL Program Coordinator within 5 business days.

STAFF DISCOVERY

If city staff discovers an illicit discharge or illegal dumping, they should determine if the site is safe for a response team and, if not, call 911 or dispatch. If the site is safe for a response team, staff should follow procedures outlined in this Plan and stop any discharges from reaching watercourses (as defined by NMC §13.25) or the stormwater system. The City TMDL Program Coordinator and Code Enforcement Officer should be notified about the illicit discharge or illegal dumping as soon as possible or the next business day. To document the incident, staff will use their name and business phone number for the complainant name and contact information in the **IDDE Investigation Report**.

INVESTIGATIONS

Documentation

Non-Reportable Discharges

As soon as possible after arriving at a site, the illicit discharge or illegal dumping should be documented with photos that include a date/time stamp. At a minimum, photos should be taken upgradient/upstream showing the source, the discharge into

the infrastructure or stream, and downgradient/downstream. Other helpful photos include landmarks and street signs to help reconstruct an incident.

If an illicit discharge or illegal dumping is neither reportable nor a wastewater overflow, staff will follow the procedures in this Plan and complete an **IDDE Investigation Report (see Appendix 2)**.

Reportable Spills and Non-Wastewater Discharges

If a spill enters the stormwater system or waterways, DEQ must be contacted at 503.378.8240. After normal business hours, contact OERS (800.452.0311).

If a spill (1) enters the stormwater system or waterways or (2) contains material in such a quantity that it becomes reportable, a **DEQ Spill Release Report** will be completed by staff and submitted to DEQ. A copy will be sent to the City TMDL Program Coordinator within 3 business days.

A reportable spill is defined under Oregon Statute as:

1. All oil spills that enter natural waterways including all tidal and nontidal bays, intermittent streams, constantly flowing streams, lakes, wetlands, and other bodies of water;
2. Oil spills in excess of 42 gallons of oil on land; or
3. Hazardous material equal to or greater than the amount in **40 CFR 302.4.**

Wastewater Overflows

All public wastewater overflows that reach the stormwater system or a watercourse, as defined by NMC §13.25, must be reported to OERS and DEQ within 24 hours. A written **SSO Report** will be sent to DEQ within 5 days of the overflow. A copy of the SSO report will be sent to the City TMDL Program Coordinator within 3 business days of submission to DEQ.

Overflows from private sources are considered an illicit discharge and are subject to enforcement procedures detailed in NMC §13.25.

Procedures

Known Sources

Document field observations with photos that contain a date:time stamp. Stop the discharge and use a spill kit to clean up any material before it reaches the stormwater infrastructure or watercourse.

If the discharge has reached the stormwater infrastructure, remove as much of the contaminated material as possible from the system. Conduct sampling upstream and downstream of the affected outfall within 24 hours, according to **Sampling Procedures (see Appendix 3)**, to determine water quality impacts to the stream.

If a discharge has reached or is highly likely to reach a watercourse based on the amount and type of the discharge, conduct immediate sampling of the affected watercourse at locations upstream and downstream of the discharge according to **Sampling Procedures**.

Depending on the severity of the discharge and conduct of the offender, provide a verbal warning, written warning, or contact the City TMDL Program Coordinator. Confirm within 24 hours that the discharge has stopped and resample to determine whether the spill is still affecting water quality of the stream. If the discharge has not stopped, contact the City TMDL Program Coordinator for further action.

Submit an IDDE Investigation Report to the City TMDL Program Coordinator within 5 business days of contacting the offender.

Unknown Sources

Document field observations with photos that contain a date:time stamp. Sample the discharge, upstream of the discharge (if possible), and downstream of the discharge according to **Sampling Procedures** and conduct a **Source Investigation (See Appendix 4)**.

If a source is not readily found, complete the IDDE investigation sheet and provide a copy to the City TMDL Program Coordinator. The coordinator will monitor the site and investigate future discharges.

If the source is found, contact the City TMDL Program Coordinator. Confirm within 24 hours that the discharge has stopped and resample 24-36 hours later upstream and downstream of the discharge site to determine whether the spill is still affecting water quality of the stream. If the discharge has not stopped, contact the City TMDL Program Coordinator for further action.

Submit an IDDE Investigation Report to the City TMDL Program Coordinator within 5 business days of contacting the offender.

SCHEDULED INVESTIGATIONS

BUSINESS INVESTIGATIONS

Staff inspect businesses as part of the City's Pretreatment and FOG programs. Prior to a scheduled inspection, staff will check the stormwater system immediately upstream and downstream of the business for dry weather flows. If dry weather flows are not found, normal procedures will be followed for the inspection.

If dry weather flows are found downstream but not upstream of the business then staff will obtain a sample of the dry weather flow according to the **Sampling Procedures (see Appendix 3).** Staff will analyze the sampling results to determine if the business is potentially contributing to the dry weather flows.

If the business is a likely source of the discharge, staff will conduct dye tests as specified in **Source Investigations (see Appendix 4)**. Using phones to communicate, staff will determine if the business is the source of the discharge. If so, staff will provide educational material to the business and require that they cease the discharge and terminate the illegal connection. Staff will complete an **Illegal Connection Report** and send it to the City TMDL Program Coordinator within 3 business days.

The City TMDL Program Coordinator and Pretreatment Program Coordinator will conduct a subsequent business inspection to ensure that the business has ceased the discharge and eliminated the connection.

ROUTINE STORMWATER SYSTEM MAINTENANCE

During routine stormwater system maintenance, staff will check for potential illicit discharges and **Physical Indicators (see Appendix 5)**. If an illicit discharge or physical indicators are found, staff will conduct a **Source Investigation.**

If flows are found to be from a non-documented but legal connection, staff will provide GPS coordinates (or a detailed location description), invert elevation, size, and material to the GIS Analyst.

If the flow is from an illegal connection, staff will sample the discharge and, if possible, upstream and downstream of the discharge according to **Sampling Procedures.** Staff will educate the owner of the illegal connection and require them to eliminate it. Staff will complete an **Illegal Connection Report (see Appendix 2)** and send a copy to the City TMDL Program Coordinator within 3 business days.

If the **Source Investigation** indicates a dry but illegal connection, staff will notify the owner of the illegal connection and require them to eliminate it. Staff will complete an **Illegal Connection Report** and provide a copy to the City TMDL Program Coordinator within 3 business days.

All illegal connections or illicit discharges will be subject to subsequent inspections by staff to ensure that they have been disconnected and stopped. Staff will contact the City TMDL Program Coordinator if:

1. The business or homeowner has ceased their discharge based on a staff inspection but a discharge still exists in the system, or
2. The business or homeowner has not ceased their discharge.

FIELDSCREEN INVESTIGATIONS

Schedule

During the wet weather season, staff will determine areas of the stormwater system that will be investigated for the following dry season. To optimize staff time, the City TMDL Program Coordinator will contact the GIS Analyst to determine any data needs they may have within the area chosen for field investigations. At the end of the fieldscreening period, staff will send the requested data to the GIS Analyst.

Fieldscreen investigations will be scheduled during the optimum times when vegetative growth is at a minimum and a rain event has not occurred for at least 48 hours. All investigations will include observations of **Physical Indicators (See Appendix 5)**. All dry weather flows encountered during the investigation will be sampled and analyzed based on the surrounding land use.

Dry Weather Flows

For dry weather flows, staff will photo-document the site, measure or estimate the discharge, and conduct an initial **Source Investigation (see Appendix 4).** If the source is easily found, staff will require that the owner stop the discharge. If a source is not easily found, staff will sample the discharge, upstream of the discharge (if possible), and downstream of the discharge point according to **Sampling Procedures (see Appendix 3)**. After receiving sample results, staff will conduct a more thorough **Source Investigation** using the analyses to narrow the list of potential sources. Regulatory action may be started depending on the source, type, and amount of flow. Subsequent site visits will be completed for any dry weather flows and the actions summarized in the appropriate **Fieldscreen Report**.

Manholes

Staff will note whether the cover has a "Drains to Stream" manhole cover. All manholes without a "Drains to Stream" cover will be noted and a list compiled for Public Works Maintenance to replace the cover. If there is no dry weather flow, staff will assess the manhole for physical indicators. Staff will complete a **Fieldscreen Manhole Report (see Appendix 2)**.

Ditches

Ditches will be inspected for standing water, dry weather flows, and physical indicators in addition to bank characteristics. These characteristics will be documented in a **Fieldscreen Ditch Report (see Appendix 2)** in addition to other information.

Outfalls

Outfalls will be inspected for dry weather flows and physical evidence of illicit discharges. The location and characteristics, along with other information, will be documented in a **Fieldscreen Culvert and Outfall Report (see Appendix 2)**.

STREAM ASSESSMENTS

Staff will conduct an assessment of a pre-determined stream reach sometime between late spring to late fall. Stream assessments will start at either the upstream end of a previous year's assessment or the lower conjunction of the City boundaries with the stream and proceed upstream to either the upper conjunction of the City boundaries with the stream, the headwaters of the stream, or the outfall that substitutes for the headwaters of the stream. A **Public Notification Letter (see Appendix 1)** will be sent to property owners along the selected stream reaches prior to the fieldwork.

Stream characteristics, as detailed in the **Stream Assessment Report (see Appendix 2)**, will be documented at tributary confluences, locations of wet weather discharges that are causing erosion, and whenever an illicit discharge is occurring into the stream. At a minimum, characterization will occur every ¼ stream mile. Photos will be taken of the canopy cover, upstream, and downstream at all characterization sites.

For dry weather flows, staff will photo-document the discharge and surrounding area in addition to measuring or estimating the discharge. Staff will start a **Fieldscreen Stream Discharge Report (see Appendix 2)**; take samples upstream, downstream, and of the discharge according to **Sampling Procedures (see Appendix 3);** and conduct an initial **Source Investigation (See Appendix 4).** If the source is easily found, staff will fill out an **IDDE Investigation Report (see Appendix 2)** and require that the owner stop the

discharge**.** If a source is not easily found, staff will conduct a more thorough **Source Investigation** after the analyses are received and they can narrow the potential source possibilities. Follow-up site visits will be completed for any dry weather flows and actions added to the **IDDE Investigation Report**.

QUALITY ASSURANCE

FIELD ANALYSES

Before starting fieldwork, staff will calibrate meters and other equipment to ensure accuracy of the analyses. Care should be taken to use calibration standards that bracket the expected analytical results.

During unscheduled events, staff will calibrate the meters in the field or notify the City TMDL Program Coordinator who will ensure the meters are calibrated and taken to the site as soon as possible.

Bound field books will be used for all field investigations. Non-smudging ink such as found in ballpoint pens will be used for field books and sample bottle labels. Mistakes will be crossed out with a single line and initialed.

LABORATORIES

When determining which analytical methods to use, staff will work with an outside laboratory to ensure that minimum detection limits fall well below threshold limits and are EPA-approved methods. Outside laboratories will be required to have a Quality Assurance/Quality Control Plan and provide a copy of their QA/QC procedures manual to the City upon request. Quality control procedures for analyses performed at the City of Newberg WWTP Laboratory shall conform to the City's Laboratory QA/QC Manual.

Because most analytical methods require that samples be kept at 4°C, staff will use a cooler with ice in the field to store the samples as soon as possible after the sampling event. Putting samples from the same sampling site in one or two gallon-size Ziploc bags will reduce cross-contamination and confine any spillage or breakage that may occur.

All samples must be documented in the Sample Log Book of the WWTP laboratory. Chain-of-custody forms will be used to document sample handling for outside laboratory analyses.

DUPLICATES AND BLANKS

At least 1 duplicate sample will be taken each sampling day to provide quality assurance of the data. If more than 10 samples are taken during the day, then 10% of the samples will have duplicate samples attached to them. At least once per stream assessment season, a field blank will be submitted for analyses.

ACRONYMS

CFR	Code of Federal Regulations
CPR	Cardio-Pulmonary Resuscitation
DEQ	Oregon Department of Environmental Quality
EPA	US Environmental Protection Agency
FOG	Fats, Oil, and Grease
IDDE	Illicit Discharge Detection and Elimination
NMC	Newberg Municipal Code
OERS	Oregon Emergency Response System
OSHA	Occupational Safety and Health Administration
SSO	Sanitary Sewer Overflow
TMDL	Total Maximum Daily Load
WWTP	Wastewater Treatment Plant

APPENDIX 1. PUBLIC NOTIFICATION LETTER

www.newbergoregon.gov

Operations Division

2301 Wynooski Rd NE PO BOX 970 Newberg, OR 97132 Phone: 503-537-1252 Fax: 503-538-9113

<Date>

Mail merge names and addresses from property owners

Dear Property Owner,

As part of the City's stormwater management program, we are required by DEQ to locate and assess the condition of our stormwater outfalls and streams. One or two representative(s) of the City will be walking in **<Name>** Creek as it runs through your property to conduct these assessments. They will carry proper identification during the field work which will be conducted between 8am and 4pm. The assessment will begin in **<Date>** and continue through **<Date>**.

Photos of outfalls and streams must be taken for documentation purposes but will not include your home or occupants. On occasion, the representative(s) may walk along the streambank in order to bypass an obstruction; however they will minimize time spent out of the stream. Representative(s) will attempt to use stream drainages or roadside access points whenever possible at the beginning and end of each workday.

If you have any questions regarding this project, please contact us at 503.537.1282 or at sonja.johnson@newbergoregon.gov.

Sincerely,

Sonja Johnson
Stormwater Management Program
City of Newberg Public Works Operations
2301 Wynooski Road
Newberg, OR 97132

APPENDIX 2. FORMS

IDDE INVESTIGATION REPORT

Complainant Name and Contact Information: _____

Discharge Date: ___/___/___ **Time:** ___:___

Discharge Address: _____

Latitude: _____ **Longitude:** _____

DEQ Complaint # (if available): _____

Discharge Evident (Y or N): _____

Discharge Source and Description: _____

Discharge to: _____

Photo Documentation: Upstream ___:___ Downstream ___:___ Discharge ___:___

Field Observations (Y or N and description):

Surface Sheen/Suds	_____	Trash/Debris	_____
Staining	_____	Fungus/Algae	_____
FOG or Floatables	_____	Odor	_____
Excess Vegetation	_____		

Sample ID(if taken): _____ **Time:** _____

Precipitation last 48 hours, in: _____ **Weather:** _____

Flow, cfs: _____

Sample Results:						
	pH	_____	Temp (air)	_____	Temp(water)	_____
	Turbidity	_____	TSS	_____	Conductivity	_____
	Total P	_____	NH3	_____	NO3	_____
	E.Coli	_____	K	_____	Hardness	_____
	Boron	_____	Fluoride	_____	CL2	_____
	Detergents	_____	Oil/Grease	_____	Other	_____

Actions: (dates, statements with contact information, and mitigation and regulatory actions):

_____

_____

_____

Page ___ of ___ **Date** ___/___/___ _____

Investigator

ILLEGAL CONNECTION REPORT

Source: _____

Address: _____

Contact Name: _____

Contact Phone or email: _____

Discovery Date: ___/ /___ **Time:** ___:___

Discharge Location Description: _____

GPS Coordinates: 45° 122°

Dye Test: Y N

Photodocumentation **Upstream** ___:___ **Downstream:** ___:___

Discharge ___:___

Sample ID(if taken): _____ **Time:** _____

Precipitation last 48 hours, in: _____ **Weather:** _____

Flow, cfs: _____

Sample Results:	pH		Temp-air		Temp-water	
	Turbidity		TSS		Conductivity	
	Total P		NH3		NO3	
	E.Coli		K		Hardness	
	Boron		Fluoride		CL2	
	Detergent		Oil/Grease		Other	

Actions: (dates, statements with contact information, and mitigation and regulatory actions):

_____

_____

_____

Page ___ of ___ **Date** ___/ /___ _____

Investigator

FIELDSCREEN MANHOLE REPORT

Date: _____ **Time:** _____

Manhole ID M-_____ **Lat/Long:** 45° 122° _____

Closest Street Intersection: _____

"Drains to Stream" Manhole Cover: Y N If no, date new cover put on: / /

Stormline Junction Description:

Orientation:	N-S	E-W	SE-NW (or NE-SW)
Flowing? (Direction discharging from):			
Size, in			
Invert Elevation, in			
Material			
Damage			
Staining			
Algae presence and color			

Photodocumentation (flowing only):

Discharge _____ : _____ Upstream _____ : _____ Downstream _____ : _____

Sample ID(if taken): _____ **Time:** _____

Precipitation last 48 hours, in: _____ **Weather:** _____

Flow, cfs: _____

Sample Results:

pH	_____	Temp (air)	_____	Temp(water)	_____
Turbidity	_____	TSS	_____	Conductivity	_____
Total P	_____	NH3	_____	NO3	_____
E.Coli	_____	K	_____	Hardness	_____
Boron	_____	Fluoride	_____	CL2	_____
Detergents	_____	Oil/Grease	_____	Other	_____

*******add additional pages for more than 1 flow calculation and sample*****

Followup Visit: Dry-weather flows? _____ Resample? _____

Page ___ of ___ **Date** / / _____

Investigator

FIELDSCREEN DITCH REPORT

Location _____ **Lat/Long:** 45° 122°

Elevation: _____ **Orientation:** _____ **Land Use:** _____

Ditch	**Inlet:**	**N or W**	**S or E**	**Outlet:**	**N or W**	**S or E**
Bank	Height, in:					
	Slope, in:					
	Width, in:					
	Depth, in:					
	Mid-ditch depth, in					

Thalweg: _____ at _____ from _____ bank Thalweg _____ at ____ from ____ bank

Slumping: _____ Bank **Primary bottom material:** _____

Bank Condition: _____

Physical Indicators: _____ _____

Sheen: _____ **Suds:** _____ **Debris:** _____

Photos: upstream _____ : _____ downstream: _____ : _____

canopy cover photo _____ : _____ discharge area: _____ : _____

Streambank coverage, %: _____ **% Canopy Cover:** _____

Vegetation and Canopy Type: _____

Sample ID(if taken): _____ **Time:** _____

Precipitation last 48 hours, in: _____ **Weather:** _____

Flow, cfs: _____ **Repeat sample:** _____

Sample Results:						
	pH		Temp (air)		Temp(water)	
	Turbidity		TSS		Conductivity	
	Total P		NH3		NO3	
	E.Coli		K		Hardness	
	Boron		Fluoride		CL2	
	Detergents		Oil/Grease		Other	

Page ___ of ___ **Date** ___/___/_____

Investigator

FIELDSCREEN CULVERT AND OUTFALL REPORT

Location: _____ **Lat/Long:** 45° 122°

Elevation: _____ **Orientation:** _____ **Land Use:** _____

Culvert Dimensions:

Material: _____ **Shape** _____ **Multiple:** _____

Size (ft): _____ **Corrugations:** _____ spiral or straight

Apron Material: _____ **Apron Angle, deg** _____

Apron Dimensions, ft (height x length x width): _____

Damage or Stain: _____ **Algae**: _____

Drop to streambed , in: _____ **Sediment, inches (if submerged) :**

Distance to stream, ft: _____ **Angle/Slope, deg:** _____

Drop to Stream, ft: Initial: _____ Final: _____

	Start of Pool	**N or W**	**S or E**	**End of Pool:**	**N or W**	**S or E**
Bank	Height, in:			Height, in:		
	Slope, in:			Slope, in:		
	Width, in:			Width, in:		
	Depth, in:			Depth, in:		
	Mid-ditch depth, in			Mid-ditch depth, in		
Thalweg:	_____ at _____ from _____ bank			_____ at _____ from _____ bank		

Bank Condition: _____

Slumping: _____ Bank **Primary bottom material:** _____

Photos: upstream _____ : downstream: _____ : canopy cover: _____ :

Streambank coverage, %: _____ **% Canopy Cover:** _____

Vegetation and Canopy Type: _____

Sample ID(if taken): _____ **Time:** _____

Precipitation last 48 hours, in: _____ **Weather:** _____

Flow, cfs: _____ **Repeat sample:** _____

Sample Results:					
pH	_____	Temp (air)	_____	Temp(water)	_____
Turbidity	_____	TSS	_____	Conductivity	_____
Total P	_____	NH3	_____	NO3	_____
E.Coli	_____	K	_____	Hardness	_____
Boron	_____	Fluoride	_____	CL2	_____
Detergents	_____	Oil/Grease	_____	Other	_____

Page ___ of ____ **Date** ___/___/_____

Investigator

STREAM ASSESSMENT REPORT

Location _____ **Lat/Long:** 45° 122°

Orientation: _____ **Elevation** _____ **Land Use:** _____

Stream Channel Dimensions, ft:

		N or W	S or E
Bank	Height, in:		
	Slope, in:		
	Width, in:		
	Depth, in:		
	Mid-ditch depth, in		

Thalweg: _____ at _____ from _____ bank **Slumping:** _____ Bank

Primary bottom material: _____

Bank Condition: _____

Physical Indicators: _____

Sheen: _____ **Suds:** _____ **Debris:** _____

Photos: upstream : downstream : : canopy cover: :

Streambank coverage, %: _____ **% Canopy Cover:** _____

Vegetation and Canopy Type: _____

Sample ID(if taken): _____ **Time:** _____

Precipitation last 48 hours, in: _____ **Weather:** _____

Flow, cfs: _____ **Repeat sample:** _____

Sample Results:						
	pH		Temp-air		Temp-water	
	Turbidity		TSS		Conductivity	
	Total P		NH3		NO3	
	E.Coli		K		Hardness	
	Boron		Fluoride		CL2	
	Detergent		Oil/Grease		Other	

Page __ of ___ **Date** ___/___/___ _____

Investigator

FIELDSCREEN STREAM DISCHARGE REPORT

Name: _____ **Lat/Long:** 45° 122°

Elevation: _____ **Stream Orientation:** _____ **Land Use:** _____

Material: _____ **Shape:** _____ **Multiple:** _____

Dimensions (inches): _____ **Corrugations, inches:** _____ spiral or straight

Damage or Stain: _____ **Algae**: _____

Sheen: _____ **Suds:** _____ **Odor:** _____ **Debris:** _____

Distance to stream, ft: _____ (negative is a protrusion into stream)

Drop to Stream, ft: Initial: _____ Intermed: _____ Final: _____

Erosion/Undercutting of Banks from Discharge:

Discharge Area:	**N or W**	**S or E**	**Stream:**	**N or W**	**S or E**
Bank Height, in:			Bank Height, in:		
Bank Slope, in:			Bank Slope, in:		
Width, in:			Width, in:		
Depth, in:			Depth, in:		
Mid-ditch depth, in			Mid-ditch depth, in		
Thalweg: _____ at _____ from ____ bank			Thalweg: _____ at _____ from _____ bank		

Slumping: _____ Bank **Primary bottom material:** _____

Bank Condition: _____

Photos: upstream _____ : downstream: _____ :

canopy cover _____ : discharge area: _____ :

Streambank coverage, %: _____ **% Canopy Cover:** _____

Vegetation and Canopy Type: _____

Sample ID(if taken): _____ **Time:** _____

Precipitation last 48 hours, in: _____ **Weather:** _____

Flow, cfs: _____ **Repeat sample:** _____

Sample Results:					
pH	_____	Temp (air)	_____	Temp(water)	_____
Turbidity	_____	TSS	_____	Conductivity	_____
Total P	_____	NH3	_____	NO3	_____
E.Coli	_____	K	_____	Hardness	_____
Boron	_____	Fluoride	_____	CL2	_____
Detergents	_____	Oil/Grease	_____	Other	_____

Page __ of ___ **Date** ___/___/___ _____

Investigator

APPENDIX 3. SAMPLING PROCEDURES

SITE AND ANALYSES SELECTION

1. Determine types of analyses needed for the site:
   a. For residential and agricultural areas, obtain samples for field parameters (pH, specific conductivity, and water temperature), in-house laboratory tests (ammonia, turbidity, E.Coli), and outside laboratory analyses (potassium, chloride, MBAS, hardness, nitrate, and phosphorous) .
   b. For industrial areas, obtain samples for field parameters (pH, specific conductivity, and water temperature), in-house laboratory tests (ammonia, turbidity, E.Coli), and outside laboratory analyses (boron, potassium, chloride, fluoride, MBAS, hardness, nitrate, oil/grease, and phosphorous) .
   c. For commercial and institutional areas, obtain samples for field parameters (pH, specific conductivity, and water temperature), in-house laboratory tests (ammonia, turbidity, E.Coli), and outside laboratory analyses (potassium, chloride, MBAS, hardness, nitrate, oil/grease if suspected, and phosphorous).
   d. Staff may sample for other parameters depending on the suspected source and surrounding land use. For example, samples will be taken for a glycol analysis if the discharge has properties similar to antifreeze.
2. Obtain sample bottles and powder-free nitrile gloves from the City TMDL Program Coordinator.
3. Label bottles with the date, time, GPS location, site name, and analyses.
4. Determine sampling site.
   a. End-of-pipe or manhole discharges should be taken from the area with the most flow.
   b. Open surface water sampling should be from a well-mixed area with a majority of the flow. Downstream of a riffle is preferred to upstream of a riffle.

GRAB SAMPLE PROCEDURES

1. Note date, time, location, weather, air temperature, and other field observations in field book. Use photos to document the discharge.
2. Put on powder-free nitrile gloves.
3. Open bottle with gloved hands and secure bottle to a sampling pole if necessary.
   a. Keep hands and fingers away from the bottle opening to avoid contamination.
   b. Do not contaminate the bottle lid by allowing it to touch the ground.

4. Rinse a sample bottle for field analyses three times with the discharge before filling with sample that will be analyzed by the field meters. If the sample bottle is filled and timed, it can be used to estimate illicit discharge flows.
5. Start pH, conductivity, and temperature analyses.
6. Fill sample bottles for other analyses taking care not to touch the lip of the bottle to the bottom of the stream or to the pipe. Follow any special sampling instructions from the laboratory.
7. Repeat steps 4 to 6 for a QA/QC sample suite at least once per sampling day or for 10% of all sampling sites if there are more than 10 sampling sites.
8. Place dry sample bottles in a re-closeable plastic bag, place in the cooler with ice, and transport back to the WWTP laboratory.
9. Log samples into the WWTP laboratory.
10. Fill out chain-of-custody form, place in a re-closeable plastic bag, and put it in the cooler with the samples. Notify the outside laboratory that samples have been collected and will be sent to them.
11. Complete in-house laboratory analyses within specified holding times and enter data in the appropriate logbook.
12. Send other sample bottles to the outside laboratory.

APPENDIX 4. SOURCE INVESTIGATIONS

When the public reports an illicit discharge, the source is usually already known and it can be easy for staff to find and document the discharge with a photo. For small discharges of a nontoxic nature, staff should educate the discharger and require them to stop the practice.

Once a discharge has been found during regular inspections, maintenance, or assessments, staff should determine the required analyses by noting the land use in the area. Staff should document any **Physical Indicators (see Appendix 5)**, record the current weather, note if measureable precipitation has occurred in the area recently (past 48 hours), and document other field observations in a field book.

Staff should inform the City TMDL Program Coordinator and the Code Enforcement Officer whenever an enforcement issue arises from the investigation. Staff should immediately inform the TMDL coordinator and the Code Enforcement Officer if the discharger has already been educated by staff and the discharger is a repeat offender.

CONTINUOUS DISCHARGES OR EASILY IDENTIFIED SOURCES

If a sample has an obvious source, e.g. a hot tub discharge or a maintenance building next to an oily discharge, staff should document the site, the source, and the connection between the two with photos that have the date and time on them. After taking samples, staff should speak to the discharger if possible, educate them regarding the illicit discharge, and ask that they stop the discharge. Analyses will be used to confirm the source of the discharge and for future enforcement use in the event that the discharge is a repeat offense.

If the source is not obvious, staff should sample the discharge if possible and use the results of the sample to narrow the list of potential sources:

1. If an industrial source is suspected, staff should work with the Pretreatment Program Coordinator to conduct a business inspection and dye test. Notify the WWTP Supervisor that you will be conducting a dye test. Station one person at a location that is downstream, close to the facility, and allows observation of the stormwater infrastructure. A second person will introduce dye into floor drains and representative fixtures such as sinks. Start testing on the ground floor and move to upper floors if necessary. Use plenty of water to flush the dye into the system.
2. If an illicit connection is suspected, staff should conduct a video inspection of the stormwater line to determine the source. Once the connection is found, contact the source, educate them regarding the illicit connection, and ask that they remove the connection and stop the discharge.

3. If the discharge is to a stream, staff should follow the discharge upslope to determine the type of pipe used and/or potential sources. If a source is found, staff will contact the source, educate them regarding the illicit discharge, and ask that they stop the discharge.

Followup investigations will be conducted for all known sources to determine if the discharge has stopped and the source is in compliance. If the discharge has not ceased, staff will notify the City TMDL Program Coordinator.

INTERMITTENT DISCHARGES

If an area has visual indicators but no discharge then it is most likely an intermittent discharge. If a culvert shows visual indicators, staff should investigate upstream for similar indicators from a dry pipe or tributary.

If the discharge is to the stormwater line and the manhole cover does not indicate it is part of the stormwater system, staff will replace the manhole cover with one that indicates that it is a stormwater line and not a sanitary line. Staff will notify the FOG and Pretreatment Program Coordinators of the incident to alert them of the possibility that illegal dumping occurred at the site and may be occurring elsewhere.

Until a source is determined, staff should inspect the area at different times of the day and year and take samples if a discharge is present. Results from the analyses and the timing of the discharge will narrow the list of potential sources for intermittent discharges with more imprecise origins. Depending on the toxicity of the discharge or dumping, continuous monitoring equipment may be installed at the suspected site.

Followup investigations should be conducted for all known sources to determine if the discharge has stopped and the source is in compliance. If education does not obtain appropriate results, staff will notify the City TMDL Program Coordinator for further action.

INDICATOR THRESHOLDS

Analyses will be used to narrow the list of potential sources of illicit discharges. The following thresholds will be used to determine if a suspected discharge is illicit or caused by inflow/infiltration. The type and number of analyses completed will be dependent on the type of discharge occurring in the system.

Indicator	Threshold	Notes
Ammonia	>1 mg/l	Completed in-house
Boron	>0.35 mg/l	
Chlorine	>0.25 mg/l	
Detergents	>0.25 mg/l	
E. Coli	>500 CFU/100 ml (dry weather) >5,000 CFU/100 ml (wet weather)	Wet weather is higher to account for wildlife sources. Completed in-house
Fluoride	>0.25 mg/l	
Hardness	<10 or >1,000 mg/l (as CaCO3)	
Nitrate	>1 mg/l	
Oil and Grease	10 mg/l	1200Z benchmark
pH	<6 or >8	Field parameter
Phosphorous, total	>0.5 mg/l	
Potassium	Ammonia:Potassium ratio > 1	
Specific Conductivity	>1,000 µS/cm	Field parameter
Temperature	Above ambient air temperature	Field parameter
Total Suspended Solids	100 mg/l	1200Z benchmark.
Turbidity	>50 NTU	Completed in-house

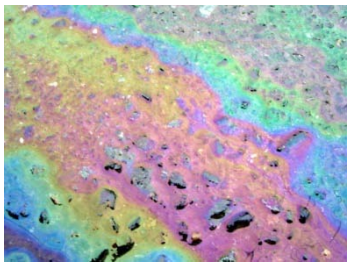
APPENDIX 5. PHYSICAL INDICATORS

PHYSICAL INDICATORS - VISUAL

Visual Indicator	Potential Sources	Photo Examples
Abnormal vegetation	**Pollution Sources:** Lush vegetation growth during dry weather – excess nutrients Dead vegetation with adjacent healthy vegetation - stormwater pollutant toxic to vegetation, herbicides	Dead vegetation (Photo Credit: City of Seattle)
Deposits and staining	**Pollution Sources:** Black or gray staining from a sanitary source Dark staining from petroleum hydrocarbons Orange-red staining from iron bacteria Powdery residues from chemicals **Natural Sources:** Iron bacteria can produce orange-red deposits or staining.	 Stained outfall pipe (Photo Credit: Herrera)  Iron bacteria (Photo Credit: Herrera)

Visual Indicator	Potential Sources	Photo Examples
Fish kills	**Pollution Sources:** Pesticides Pollutant toxic to aquatic organisms **Natural Sources:** Die off due to low oxygen levels or high temperatures	 Fish kill (Photo Credit: King County)
Floatables (toilet paper, other sanitary waste)	**Pollution Sources:** Sewage discharge Wind-blown surface litter	 Toilet paper and floatables in catch basin. (Photo Credit: City of Redmond)
Floatables (food waste)	**Pollution Sources:** Restaurants and dumpsters, warehouses, grocery stores, roadside fruit stands, commercial fruit processing facilities, or mobile food vendors	Soybeans spilled at warehouse (Photo Credit: City of Bellevue)
Fungus and algae (*Sphaerotilus natans*)	**Pollution Sources:** Sewage discharge White or grayish growth in flowing water is typically *Sphaerotilus natans*, a bacterium that "breaks up into nothing" when touched with a stick.	 White growth, likely *Sphaerotilus* bacterium, (Photo Credit: King County)

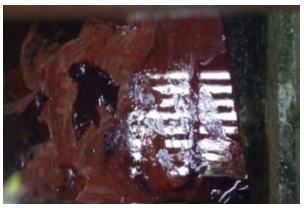
Visual Indicator	Potential Sources	Photo Examples
Fungus and algae (white mat-like growth residue)	Excessive nutrients Dried white mat-like growth residue is typically a combination of fungus, algae, organics, and detritus and is a dry, thin coating on solid surfaces	 Dried white mat-like residue (Photo Credit: King County)
Fungus and algae (algae blooms)	Excessive nutrients. Colors of algae include red, orange green, yellow, or brown. Green algae form long, coarse filaments in flowing water and can also form thick mats if excessive nutrients are present. Lighter green algae (*Spirogyra* or watersilk) feels silky and is found in still or stagnant water. Brown algae is formed by masses of diatoms that grow on rocks, sand, plant roots, and other surfaces and typically feels slimy when touched.	 Algae bloom (Photo Credit: Herrera)
Structural damage (spalling, chipping)	**Pollution Sources:** Corrosive discharges from industrial or commercial sites **Natural Sources:** Natural deterioration associated with old infrastructure is not considered to be from an illicit discharge	 Structural damage (Photo Credit: Herrera)

Visual Indicator	Potential Sources	Photo Examples
Surface sheen (petroleum sheen)	**Pollution Sources:** Gasoline, diesel fuel, motor oil, lubricating oil or hydraulic oil from construction equipment, or heating oil from underground or aboveground storage tanks Petroleum sheen typically has an iridescent rainbow pattern and does not separate when disturbed by poking; when pencil or stick is removed, petroleum sheen will quickly coalesce.	 Petroleum sheen (Photo Credit: Herrera)
	Natural Sources: Iron oxidizing bacteria typically produce an organic sheen in standing or stagnant waters Organic sheens separate into plates or sheets on the surface of still water when disturbed by poking. When the pencil or stick is removed, organic sheens typically don't coalesce quickly. Organic sheens will often be accompanied by organic or rusty looking water.	 Organic sheen (Photo Credit: Herrera)

Visual Indicator	Potential Sources	Photo Examples
Surface scum (bubbles or suds)	**Pollution Sources:** Washwater containing detergents or soaps Bubbles or suds from a washwater discharge contain a rainbow-like sheen on the surface of the bubbles. Natural foaming results from the natural die-off of aquatic plants that release oils. Natural foam often has a partial brownish tint and can include organic debris. **Natural Sources:** Natural foam from organic matter decomposition can increase after storm events and collect along shorelines or streambanks	 Washwater (Photo Credit: Herrera)  Natural foaming (Photo Credit: Herrera)
Surface scum (fats, grease, and oils)	**Pollution Sources:** Fats, grease, and oils from food waste, mobile food vendors, or restaurants	Restaurant grease (Photo Credit: City of Federal Way)
Trash and debris	**Pollution Sources:** Illegal dumping or wind-blown litter	 Cigarette butts in a catch basin (Photo Credit: City of Redmond)

PHYSICAL INDICATORS – COLOR

Color	Potential Sources	Photo Examples
Gray to milky white	**Pollution Sources:** Concrete washwater, dairy products, drywall compound, grease, lime, paint, phosphate fertilizer manufacturing, washwater from commercial/industrial or domestic sources	 Latex paint (Photo Credit: King County)
Tan to brown	**Pollution Sources:** Construction site runoff Sediment from soil erosion (sometimes a natural phenomenon)	 Sediment (Photo Credit: City of Federal Way)
Brown to reddish brown	**Pollution Sources:** Decomposing food or meat products, grain mill products, paint, rusting metal, stone, clay, glass, and concrete product manufacturing **Natural Sources:** Decomposition of organic matter	 Grocery store compactor leakage (Photo Credit: City of Redmond)
Brown to black	**Pollution Sources:** Automotive dealers, garden or building product suppliers, bakery products, fats and oils, decomposing food or dumpster liquids, metals, rubber, wood chemicals, and plastics manufacturing, paint, printing or publishing industry waste	 Restaurant grease (Photo Credit: City of Federal Way)

Color	Potential Sources	Photo Examples
Black	**Pollution Sources:** Paint , wastewater, sulfuric acid, turnover of hypoxic water	 Oil (Photo Credit: King County)
Orange-red	**Pollution Sources:** Paint, tracing dye **Natural Sources:** Most orange-red stains or deposits are from iron bacteria	Iron bacteria (Photo Credit: Herrera)
Dark red or purple	**Pollution Sources:** Blood from meat processing facilities, diesel fuel or hydraulic fluid, fabric dye, heating oil, paint, paper ink	 Heating oil discharge (Photo Credit: City of Kirkland)
Blue green/brown green	**Pollution Sources:** Algae blooms, fertilizer runoff, paint, portable toilet waste, tracing dye, vehicle wash water **Natural Sources:** Algae blooms	 Paint (Photo Credit: City of Redmond)  Brown green algae growth (Photo Credit: Herrera)

Color	Potential Sources	Photo Examples
Yellow to bright green	**Pollution Sources:** Algae blooms, chlorine, paint , anti-freeze, tracing dye **Natural Sources:** Algae blooms	 Radiator fluid (Photo Credit: City of Federal Way)  Non-toxic filamentous algae bloom (Photo Credit: City of Federal Way)

PHYSICAL INDICATORS - ODOR

Odor	Potential Sources
Sharp, foul, rotten, or fecal	Sewage
Musty	Partially treated sewage Livestock waste Algae
Pungent sweet/musty	Grain mill products Soaps, detergents, and cleaning products Phosphate fertilizers
Soapy/perfume	Commercial or home laundry discharge
Rotten egg, hydrogen sulfide, or natural gas	Raw sewage or stagnant water in pipes, ditches, or wetland Sulfuric acid
Rotten eggs, kerosene, or gasoline	Petroleum refining
Rotten egg or chlorine	Rubber and plastics manufacturing
Rotten/spoiled	Restaurant food waste or leaking dumpster
Chlorine	Broken drinking water line or swimming pool flushing Wastewater treatment plant or industrial discharge
Sharp, acrid, or pungent	Chemicals, pesticides, antifreeze, or solvents Paper or associated products manufacturing
Beer, wine, alcohol or yeast	Beverage production at wineries, breweries, or distilleries