



Chehalis Basin TMDL & NPS Updates

To: Kirsten Harma, Chehalis Basin Partnership Coordinator

From: Southwest Regional Office, Water Quality Program

Contact: Devan Rostorfer, TMDL Lead | dros461@ecy.wa.gov | 360-409-6693

Date: January 2021

Purpose: The purpose of this memo is to respond to questions provided in an email from Kirsten Harma, the Chehalis Basin Partnership Coordinator, on December 10, 2020. If there are additional questions, contact Devan Rostorfer, TMDL Lead for Ecology's Southwest Regional Office.

1. What can/will happen through the TMDL process to address water quality impairments in the basin?

Ecology's Southwest Regional Office has four TMDL Leads. Currently, there is one TMDL Lead assigned to WRIAs 22 to 29, and two nonpoint positions (one nonpoint position is currently vacant).

In 2020, Ecology's TMDL Lead developed the [Draft TMDL Alternative Restoration Plan for East Fork Lewis River watershed](#), using the [East Fork Lewis River Source Assessment](#) as the technical foundation. A [Source Assessment for the Burnt Bridge Creek watershed](#) was also published in 2020. In 2021, staff will develop a TMDL Alternative Restoration Plan for the Burnt Bridge Creek watershed, and a Source Assessment for Lacamas Creek is scheduled for 2021 to 2023. Beginning in 2023, TMDL staff will develop a TMDL Alternative for the Lacamas Creek watershed with completion in 2024.

Nonpoint staff also have priority watersheds for implementation. Nonpoint priorities usually align with Ecology's TMDL priorities. In addition to the watersheds listed above, the Newaukum subwatershed in the Chehalis Basin was also a priority for Ecology's nonpoint program.

A summary of Ecology's TMDL priorities was provided in the annual TMDL prioritization webinar in October 2020. This webinar provides an opportunity for public comment on Ecology's TMDL priorities. The next TMDL prioritization webinar will be in October 2021.

Future possibilities for Chehalis Basin

If the Chehalis Basin was prioritized for future TMDL work, the water quality tool that would most likely be used is a TMDL Alternative Restoration Plan. TMDL Alternative Restoration Plans provide a strategy to address nonpoint source pollution and improve water quality in watersheds where pollutant challenges are mostly nonpoint, land uses are mostly rural, and point source impacts are minimal. Implementation priorities in the Chehalis Basin may include addressing water quality impacts from agriculture, septic systems, and stormwater, and increasing riparian restoration and streamflow restoration activities in the watershed.

TMDL Alternatives must meet the Environmental Protection Agency's nine minimum elements for watershed planning. To meet the minimum elements TMDL Alternatives should:

1. Identify causes of water quality impairments and pollutant sources.
2. Estimate load reductions needed.
3. Describe the nonpoint source implementation to achieve load reductions.
4. Estimate technical and financial assistance needed.
5. Develop information and education component.
6. Develop implementation schedule.
7. Develop milestones and targets.
8. Develop criteria to measure progress.
9. Monitor to evaluate effectiveness of implementation efforts.



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It is undetermined if future Source Assessment and TMDL Alternative work is needed in the Chehalis basin, or if the existing approved TMDL and other resources (such as the recent ASRP, Streamflow Restoration Plan, EIS, WDFW Thermalscape, Newaukum River Effectiveness Monitoring, Ecology’s long-term ambient and continuous water quality monitoring, USGS studies, and Ecology streamflow work) would be sufficient to meet technical needs for developing an updated water quality implementation plan. Updating the implementation plan for the existing Chehalis TMDL might be the most efficient opportunity for water quality planning in the basin. Dedicated TMDL and nonpoint resources are likely unavailable until 2024.

2. What are the ongoing requirements on load sources in the Basin?

The Chehalis Basin is on Washington State’s Polluted Waters list (303d list) for fecal coliform bacteria, dissolved oxygen, and temperature impairments. Keeping the watershed clean is important to support the watersheds beneficial uses. Specific stream segments with water quality listings can be identified using [Washington State’s Water Quality Atlas](#). An updated [water quality assessment and 303\(d\) list](#) is expected in 2021.

Applicable water quality criteria for the Chehalis Basin is based on the river’s beneficial uses. Temperature and dissolved oxygen criteria is determined based on [aquatic life uses](#). Portions of the upper and lower Chehalis also have [supplemental spawning and incubation criteria for protection of salmonid species](#). These water quality standards are the target Ecology uses in its temperature TMDL work.

Past TMDL work has established shade targets for the Chehalis basin to prioritize where riparian shade is needed to help meet temperature water quality standards. If water temperatures exceed criteria, then the river is not meeting temperature standards and is considered a category 5 water that is prioritized for implementation of water quality best management practices (BMPs) to help lower warm water temperatures.

Table 7: Shade Targets for Upper Chehalis Basin Stream Reaches

Stream Reach	Percent Vegetative Shade		
	Load Allocation	Estimated Existing Shade	Additional Shade Needed
Chehalis River – Headquarters to Elk Creek	49%	53%	0%
Chehalis River – Elk Creek to Newaukum River	48%	18%	30%
Chehalis River – Newaukum River to Skookumchuck R.	64%	22%	42%
Chehalis River – Skookumchuck R. to Scatter Creek	43%	16%	27%
Chehalis River – Scatter Creek to Town of Porter	44%	16%	28%
South Fork Chehalis	74%	52%	22%
Newaukum River	78%	43%	35%
Dillenbaugh Creek	85%	64%	21%
Salzer Creek	81%	68%	13%
Skookumchuck R.	79%	59%	20%
Lincoln Creek	78%	59%	19%
Scatter Creek	81%	69%	12%
Black River	68%	37%	31%



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To protect recreational uses, TMDL work often establishes bacteria load reductions needed to meet water quality standards. Ecology recently adopted a new E.coli water quality standard. Fecal coliform is still used as an indicator to assess water quality for rivers that contribute to downstream shellfish areas. To meet bacteria standards for bacteria, the following water quality criteria is applicable.

Water Quality Parameter	Criteria
Bacteria (E.coli)	Geometric Mean 100 cfu/100 ml 10% not to exceed: 320 cfu/100 ml
Bacteria (Fecal coliform)	Geometric Mean: 100 cfu/100mL 10% not to exceed: 200 cfu/100 ml

In the Chehalis, the bacteria load reductions recommended by past TMDL work are shown in the table below.

Table 6. Fecal coliform concentrations at CBP monitoring stations and corresponding TMD concentrations for the Upper Chehalis River basin (WRIA 23).

Station descriptions in bold text indicate a critical month for sampling was identified in the TMDL.

CBP ID	Station Locations Station Description	TMDL		CBP		Percent reduction needed
		GM	90 th %tile	GM	90 th %tile	
1141	Chehalis R. at Prather	231	1475	4.5	6.3	86
1142	Chehalis R. at Ind. Rd.	168	935	7.2	14.8	79
1181	Chehalis R. at Mellen St.	139	763	5.5	10.6	74
1206	S. Fork Chehalis R. at Lv	117	481	6.6	13.6	0
1211	Newaukum R. at Shorey Rd.	78	625	5.2	9.9	0
1217	Skookumchuck R. at mouth¹	115	960	4.6	7.4	79
1309	Stearns Cr. at Twin Oaks Rd.	77	443	5.3	10.7	0
1320	Salzer Cr. at Salzer Cr. Rd.	61	460	5.7	10.3	0
1326	Lincoln Cr. at L.C. Rd. ¹	201	1240	9.4	29.7	0
2333	Scatter Cr. at Case Rd.	68	406	16.5	35.7	0
2334	Scatter Cr. at Tenino	124	1045	19.9	52.1	0
2375	Beaver Cr. at Porter Cr. Rd.	169	735	6.6	16	0
3145	Chehalis R. at Porter	95	563	10.1	25.2	0
NS	Chehalis R. at Dryad²	52	280	20.3	86	29
NS	Allen Creek at mouth	116	436	-	-	54
NS	Dempsey Creek at Delphi Rd.	439	2964	-	-	93
NS	Lincoln Creek ¹ at RM 8.8	96	546	-	-	63
NS	Lincoln Creek ¹ at RM 10	244	683	-	-	70
NS	Dillenbaugh Cr. at mouth	133	1532	-	-	87
NS	Dillenbaugh Cr. above Berwick	68	313	-	-	36
NS	Berwick Creek at mouth	228	1500	-	-	87
NS	Bunker Creek at mouth	71	286	-	-	30
NS	Deep Creek	136	1348	-	-	85
NS	Lake Cr. at Curtis Hill Road	74	320	-	-	40
NS	Lost Cr. at Lost Valley Bridge	56	462	-	-	57

¹ Extraordinary Primary Contact geomean 50 cells/100 mL and 90th percentile 100 cells/100 mL.

² Geomean and 90th percentile calculated (2009-2010) from Ecology's ambient monitoring station at Dryad.



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3. Are there any municipalities/industrial NPDES point source discharges that have discharge limitations for temperature?

Information on NPDES permits can be obtained through [Ecology's Water Quality Permitting and Reporting Information System](#) (PARIS) and by accessing Ecology's Water Quality Atlas. [Washington State's Water Quality Atlas](#).

Dischargers are considered in compliance if their discharges do not influence water quality over the anthropogenic (human) allowance. For temperature, discharges are not permitted to increase water temperatures over an average seven-day maximum of 0.3 degree Celsius in the mixing zone of their discharge. For dissolved oxygen, human actions may not decrease dissolved oxygen concentration more than 0.2 mg/L below natural conditions.

The following are permitted dischargers in the Chehalis watershed with relationship to the Chehalis River water quality impairments and TMDLs. More information is available at the links below.

- [Municipal NPDES IP – Pe Ell STP \(Pollutants: Bacteria and Temperature\)](#)
- [Municipal NPDES IP – City of Chehalis \(Pollutants: Bacteria, BOD5, Ammonia-N, Dissolved Oxygen, Temperature, TSS\)](#)
- [Industrial NPDES IP – West Farm Foods – \(Pollutants: Bacteria, BOD5, Ammonia-N, Dissolved Oxygen, TSS\)](#)
- [Municipal NPDES IP – Lewis County \(Pollutants: Bacteria, Temperature\)](#)
- [Municipal NPDES IP – City of Centralia \(Pollutants: Bacteria, BOD5, Ammonia-N, Dissolved Oxygen, Temperature, TSS\)](#)
- [Municipal NPDES IP – Thurston County \(Pollutants: Bacteria, Temperature\)](#)
- [Upland Fish Hatchery GP – Skookumchuck Rearing Ponds \(Pollutants: Fine Sediment, Temperature, Total PCB\)](#)

4. Are those permit sources going to have more/new additional load reduction requirements?

TMDL Alternatives develop a strategy to address nonpoint source pollution and provide *recommendations* for NPDES permit implementation. TMDL Alternatives do not establish waste load allocations for point source dischargers or permits, but may provide recommendations relevant to permit reissuance.

5. How can non-point sources that impact temperature be further reduced?

Ecology's nonpoint staff have worked actively in the Chehalis Basin for many years. Most recently, nonpoint staff have regularly attended Grays Harbor and Lewis Conservation District meetings, and have actively participated in the Chehalis Basin Lead Entity's Habitat Work Group. They have also worked with the Chehalis Tribe and the Washington Department of Agriculture to address nonpoint source pollution in Stearns Creek.



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Listed below is a summary of nonpoint work in the Chehalis Basin.

1. Nonpoint staff conducted proactive nonpoint source investigation and outreach in the Newaukum watershed. Some landowners addressed issues, and there may be future opportunities to utilize water quality monitoring to continue working with landowners. One challenge with conducting environmental outreach in the Chehalis basin is being clear with communication to landowners since there are multiple organizations working in the basin with different objectives.
2. Ecology also responded to ERTS complaints in the watershed.
3. Chehalis Basin Lead Entity's Habitat Work Group – One nonpoint staff served as Ecology's representative on the Chehalis Habitat workgroup for 2.5 years. In this role, nonpoint staff completed site visits and evaluated salmon recovery grant proposals. Many of these projects were fish barrier removal projects located on agricultural property. Ecology staff provided nonpoint source perspective and helped identify restoration opportunities to address nonpoint pollution. It is undetermined who will be Ecology's representative on the Chehalis Basin Lead Entity's Habitat Work Group with the recent nonpoint vacancy.

Temperature opportunities

Opportunities for nonpoint source implementation to address temperature include continuing to work with private landowners to enhance riparian vegetation and implement water quality BMPs. The [Voluntary Clean Water Guidance for Agriculture](#) is the best technical resource for landowners to reference when considering BMPs for implementation.

Other important non-point strategies to address temperature include implementing streamflow restoration priorities, and best practices for local water use; implementing thermal refuge assessment work to identify areas to enhance cold-water refugia, gaining reaches, and areas where there is hyporheic exchange; restoring large wood and engineered logjams; and implementing wetland restoration, and floodplain reconnection projects. Efforts to restore natural watershed processes such as sediment delivery, channel geomorphology, and reducing erosion of streambanks are also important. Nonpoint staff often look for and consider these restoration opportunities when completing site visits and working in the field with landowner.

Funding sources available to address nonpoint sources of pollution include Ecology's Water Quality Combined Funding Program; USDA's NRCS Regional Conservation Partnership Program, EQIP, and CREP program; and other sources. In certain situations, Ecology's Streamflow Restoration Funding and RCO's Salmon Recovery funding may also be used for projects that generate benefits to water quality, salmon recovery, and streamflow restoration.

One challenge related to funding riparian restoration in the Chehalis watershed is decreased lease payments within the CREP program. The financial incentives for landowners to implement riparian buffers has decreased, which has ultimately decreased landowner willingness.



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Stearns Creek Pollution Identification and Correction

In addition to temperature work, Ecology's nonpoint staff have been implementing pollution identification and correction (PIC) strategies in the Chehalis Basin.

Fecal coliform (FC) bacteria from nonpoint sources caused violations of state water quality standards in Stearns Creek, a tributary to the Upper Chehalis River. The Chehalis Tribe identified the bacteria exceedances in Stearns Creek starting in 2017, and shared their data with nonpoint staff in 2019. The data collected over a two-year period indicated that Stearns Creek contained the highest concentrations of bacteria when compared to all other streams in the watershed. This prompted Ecology staff to develop a pollution identification and correction project for this tributary to trace the possible sources of pollution contributing to the water quality exceedances.

In 2019, Ecology staff worked closely with local property owners to establish bracket-sampling locations, collect weekly samples, and review new data results. During this effort, a collaborative approach to achieve voluntary implementation of best management practices was developed that dramatically improved water quality in Stearns Creek in a short period of time at low cost.

From 2017 to 2019, the data showed that bacterial concentrations were lower by 75 percent in Stearns Creek once the pollution identification and correction project was implemented in the watershed. Nonpoint staff planned to continue to receive data from the Chehalis tribe to track progress in Stearns Creek. However, due to staffing limitations and the COVID 19 pandemic sampling data has not been consistently collected in 2020.

6. Are there possibilities for temperature trading/nutrient trading? (ala Oregon model)

If water quality trading were of interest to stakeholders in the Chehalis Basin, the feasibility of implementing this type of program in the Chehalis Basin would need to be discussed with Ecology's policy and permit planners.



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Appendix: *Washington State Department of Ecology Chehalis Basin publications.*

There have been multiple reports and studies published on the Chehalis River Basin. A list of Ecology publications in the Chehalis basin is below.

- [Quality Assurance Project Plan: Newaukum River Monitoring of the Effectiveness of Best Management Practices \(BMPs\) for Sediment and Nutrient Reduction](#), March 2019
- [Humptulips River Temperature Monitoring 2010](#), May 2011
- [Upper Chehalis River Watershed Multi-Parameter Total Maximum Daily Load: Water Quality Data Review](#), November 2010
- [Quality Assurance Project Plan: Humptulips River Temperature Monitoring](#), June 2010
- [The Chehalis Basin Partnership Watershed Management Plan Detailed Implementation Plan](#), June 2009
- [Upper Chehalis River Fecal Coliform Bacteria Total Maximum Daily Load: Submittal Report](#), May 2004
- [Upper Chehalis River Fecal Coliform Bacteria Total Maximum Daily Load Recommendations](#), April 2004
- [The Chehalis / Grays Harbor Watershed Dissolved Oxygen, Temperature, and Fecal Coliform Bacteria TMDL: Detailed Implementation \(Cleanup\) Plan](#), December 2004
- [Amendment to Grays Harbor/Chehalis Watershed Fecal Coliform Bacteria Total Maximum Daily Load Submittal Report](#), December 2003
- [Upper Chehalis River Basin Temperature Total Maximum Daily Load](#), July 2001
- [Simpson Northwest Timberlands Temperature Total Maximum Daily Load -- Submittal Report](#), July 2000
- [Revised -- Upper Chehalis River Basin Dissolved Oxygen Total Maximum Daily Load Submittal Report](#), March 2000
- [Pollutant Loading Capacity for the Black River, Chehalis River System, Washington. Article in the Journal of the American Water Resources Assn, Vol. 33, No. 2, April 1997.](#), January 1997
- [Upper Chehalis River Basin: Evaluation of Total Maximum Daily Loads Summary Report](#), September 1994
- [Black River Dissolved Oxygen and Phosphorus Total Maximum Daily Load Study](#), June 1994
- [Upper Chehalis River Dry Season Total Maximum Daily Load Study](#), June 1994
- [Chehalis River TMDL, Ground Water Reconnaissance and Estimated Inflows](#), June 1993
- [Chehalis River TMDL, Ground Water Reconnaissance and Estimated Inflows.](#), June 1993
- [Chehalis River Basin Class II Inspections at Eight NPDES Permitted Dischargers, August 1991-August 1992](#), December 1993
- [Chehalis River Basin Water Quality Screening, January and March 1991](#), July 1992
- [Historical Data Sources and Water Quality Problems in the Chehalis River Basin - First Interim Report for the Chehalis River TMDL](#), June 1992