

**Tributaries to Totten, Eld and Little  
Skookum Inlets  
Fecal Coliform Bacteria and Temperature  
Total Maximum Daily Load**

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**Water Quality Implementation Plan**



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Fecal Coliform Bacteria and Temperature  
Total Maximum Daily Load**

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**Water Quality Implementation Plan**

*Developed by  
The Technical Advisory Group for the Totten, Eld, and Little Skookum TMDL*

*Written by  
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# Executive Summary

The federal Clean Water Act requires states to produce a list every other year of water bodies that fail to meet water quality standards. It's called Washington's Water Quality Assessment or the 303(d) List. The Clean Water Act also requires states to see that those "impaired" water bodies are returned to healthy quality. The process typically used to improve water quality is called a TMDL, or total maximum daily load, process.

Healthy water bodies are able to support their important uses including recreation, shellfish harvest, and providing habitat for aquatic species such as salmon. A TMDL determines how much of a pollutant a water body can tolerate and still remain healthy to support these uses.

<p><b><u>Need to reduce bacteria</u></b></p> <ul style="list-style-type: none"> <li>▪ McLane Creek (including Swift Creek)</li> <li>▪ Perry Creek</li> <li>▪ Schneider Creek</li> <li>▪ Kennedy Creek</li> <li>▪ Pierre Creek</li> <li>▪ Burns Creek</li> <li>▪ Skookum Creek</li> </ul> <p><b><u>Need to reduce temperature</u></b></p> <ul style="list-style-type: none"> <li>▪ Skookum Creek</li> </ul>
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The Department of Ecology (Ecology) published *Tributaries to Totten, Eld, and Little Skookum Inlets: Fecal Coliform Bacteria and Temperature Total Maximum Daily Load – Water Quality Improvement Report* in March 2006. The report is based on more than ten years of data from Ecology, the Squaxin Island Tribe, Thurston County, and Mason County. Analysis determined that fecal coliform bacteria concentrations need to be reduced in seven creeks, and the water temperatures need to be reduced in one creek (see text box above). The report is available online at <http://www.ecy.wa.gov/biblio/0603007.html>

## Summary of bacteria load reduction targets

Creeks and tributaries	Target reduction (%)	Critical period
Kennedy Creek, 125 meters above Old Olympic Hwy bridge	73	Aug-Sept
Schneider Creek, end of Pneumonia Gulch Rd	73	July-Sept
Burns Creek, at mouth	99	May-June
Pierre Creek, 80 m upstream of beach	96	May-June
McLane Creek, below Delphi Rd bridge	95	August
Swift Creek, near mouth, above Delphi Rd bridge	77	June-Oct
Perry Creek, above Perry Creek Rd	46	August
Skookum Creek (SKOK5) at Highway 108 (RM 6.0)	35	May-Oct
Hurley Creek (HUR1) at Eich Rd culvert (mouth at RM 4.3)	75	May-Oct
Skookum Creek (SKOK4) at Eich Rd bridge (RM 4.2)	72	May-Oct
Skookum Creek (SKOK3) at Highway 108 (RM 2.2)	51	May-Oct
Clary Creek (CLA1) at railroad crossing (mouth at RM 1)	67	May-Oct

Based on existing 90th percentile concentrations at average flow for the critical period.

Note: "Critical period" is the time of year when the problem tends to be worst.

A technical advisory group began meeting in the spring of 2006 to develop this plan to improve water quality. The plan is based on the findings of the TMDL analysis, information in Washington Department of Health's *2004 Shoreline Survey of the Eld Inlet Shellfish Growing Area and Totten, Eld, and Little Skookum*, and local knowledge of the area.

Pollution in this watershed comes from many small sources scattered throughout the watershed. Fecal coliform bacteria come from the waste of warm blooded animals like humans, livestock, pets, and wildlife. Cleanup of bacteria pollution will focus first on controllable, human-related sources. The main elements of the cleanup strategy are:

- Investigation to find sources of pollution, including field surveys and water quality sampling. Additional investigation, such as microbial source tracking, sediment testing, septic system dye testing, or other methods may become necessary.
- Technical assistance to help landowners improve management practices and reduce runoff to creeks.
- Outreach to raise awareness on topics that can help improve water quality like pasture management, operation and maintenance of septic systems, native plants and riparian vegetation, and managing stormwater. May include methods such as community workshops, written materials, and newspaper articles.
- Provide incentives to help landowners with the cost of improved land management.
- Provide low-interest loans to help landowners with the cost of repairing or replacing failing septic systems.
- Monitor to evaluate progress and effectiveness of cleanup actions, and adjust the cleanup strategy as needed.

The intention is to help landowners to voluntarily change practices that can degrade water quality. However, if voluntary efforts are not successful, enforcement may be used.

The only permit-regulated source in the watershed is Washington State Department of Transportation stormwater discharge from state highways. Where stormwater discharge is identified as part of the pollution problem, WSDOT will improve management practices to correct the problem. TMDL requirements are incorporated into the WSDOT stormwater permit during each permit cycle. Ecology is responsible for overseeing compliance with that permit.

Analysis of temperature issues on Skookum Creek determined that additional stream flow would slightly improve the water temperature, but the main problem is lack of shade. There are a number of reaches on this creek that need almost twice the shade they now have in order to meet temperature standards and many others where substantial improvement in shade is needed.

The approach to improving the temperature of Skookum Creek will be to provide technical and financial assistance to landowners to help them restore vegetation along the stream corridor.



Structural improvements, including additional channel complexity, large woody debris, and gravel bars will also help cool the creek.

There is a strong commitment to the success of this cleanup effort. Many watershed residents are concerned about restoring and protecting water quality. The Squaxin Tribe, local governments, and conservation districts have active water quality programs. In addition, several of the participating agencies received grants through Ecology and are already putting necessary actions into practice.

There are also challenges. Considerable growth is expected throughout the Puget Sound area in the next two decades, and it will be important to consider land use and development carefully. In addition, both Thurston and Mason counties have several other important water quality issues. It will be necessary to prioritize limited resources on an area-wide basis.





# Introduction

The Technical Advisory Group for the Totten, Eld, and Little Skookum TMDL (total maximum daily load, or water cleanup process) developed this plan to improve and protect water quality in this watershed. This plan:

- ~ identifies, prioritizes and assigns cleanup actions, and
- ~ details how participating groups will monitor and measure progress toward the goal of clean water.

In the spring of 2006, the Washington Department of Ecology (Ecology) finished analysis of ten years of water quality data from seven creeks. The analysis found that McLane, Perry, Schneider, Kennedy, Pierre, Burns, and Skookum Creeks have fecal coliform bacteria concentrations that indicate a potential health risk for people who play, swim, or fish in the water. In addition, Skookum Creek is too warm to support healthy populations of plants and animals. Salmon are especially sensitive to warm water temperatures.

These creeks drain to Eld, Totten, and Little Skookum Inlets. Shellfish harvest is important to residents and businesses in these inlets, but high bacteria concentrations indicate potential health risks for people who eat shellfish from contaminated areas.

Eld Inlet had problems with bacteria concentrations during the mid 1980s. As a result, the Washington Department of Health restricted commercial shellfish harvest. After considerable work by Thurston County, Thurston Conservation District, and local landowners to improve management of septic systems and livestock, 450 acres of harvest area were restored in the late 1990s. But lately, concentrations rose again in the southerly part of the Inlet.

While Totten and Little Skookum Inlets remain relatively clean, there is concern about bacteria concentrations in the tributaries, the temperature of Skookum Creek, and the increasing pressure from development. Green Diamond Resource Company already has a habitat conservation plan in place to address elevated temperatures in Kennedy Creek.

Most of the bacteria pollution in this watershed comes from scattered, small sources. Animal waste in pastures, yards, and roadsides, and leakage from failing or failed septic systems all contribute to the bacteria problems. Wildlife also contributes bacteria pollution. Stream heating is mainly caused by a lack of streamside shade.

*Water quality improvement ultimately depends on small changes made by many landowners.*

## Technical Advisory Group

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*Taylor Shellfish*

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### **Kirsten Workman, facilitator**

*WSU Extension/Mason Conservation District*



# Watershed Description

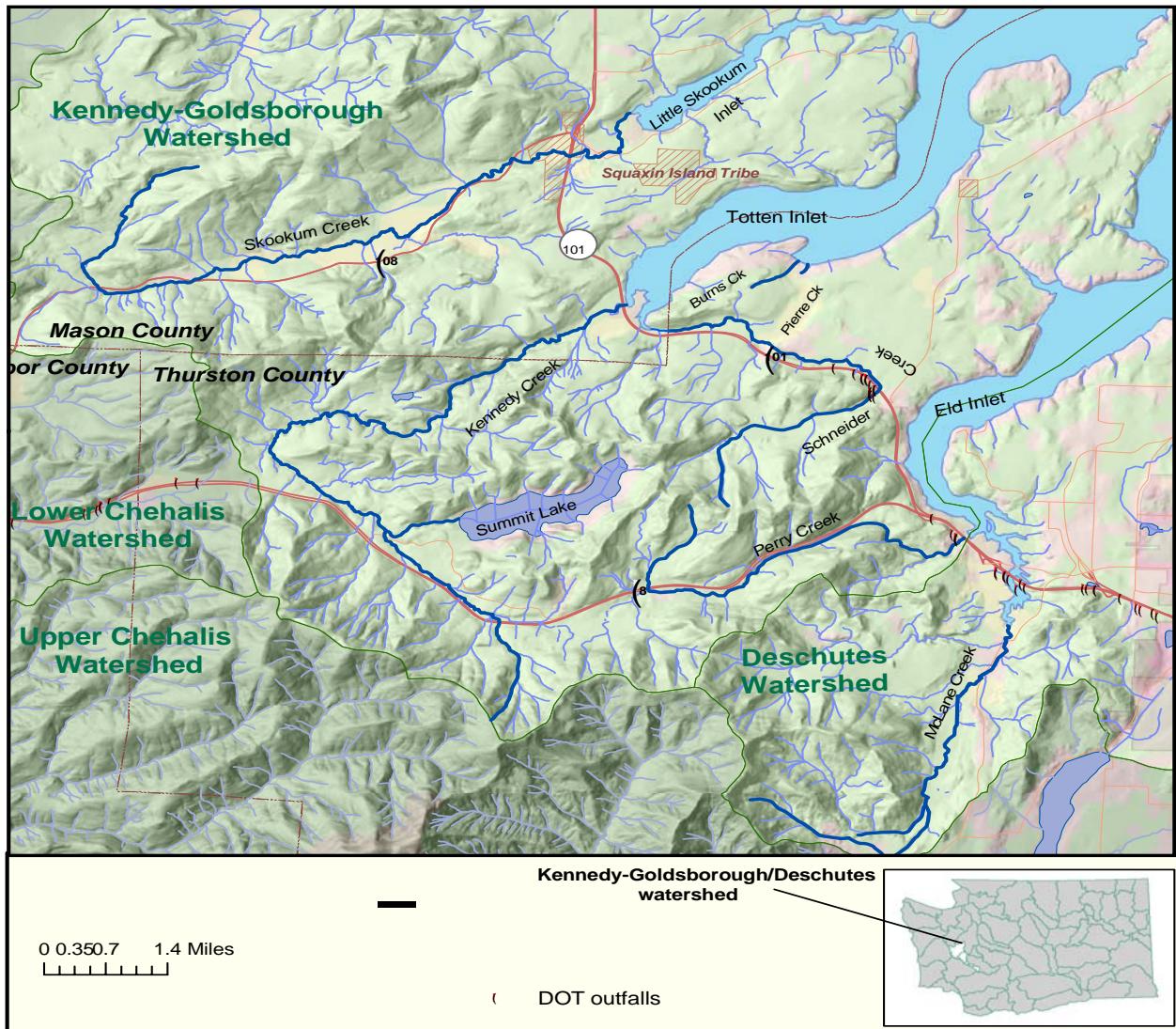


Figure 1: Tributaries to Totten, Eld, and Little Skookum Inlets

## Tributaries to Totten Inlet

Totten Inlet is located on the boundary of Mason and Thurston counties. The mouths of Kennedy and Schneider creeks are located in Mason County, while the rest of Kennedy and Schneider creeks and all of Burns and Pierre Creeks are located in Thurston County. The total Totten Inlet watershed area is approximately 69.2 square miles.

**Kennedy Creek** basin has a drainage area of 15.43 square miles. Approximately 9.6 miles long, this is by far the largest tributary to Totten Inlet. The creek originates in the Black Hills and descends gradually to lowlands. With the exception of a series of falls, cascades, and log jams at

river mile 2.5, the rest of the creek is rather gentle in slope. Almost half of the watershed is used for forestry. Much of the rest is undeveloped, except for the area around Summit Lake.

Green Diamond timberland on Kennedy Creek extends from the public fish viewing area (about a mile upstream of the mouth of Kennedy Creek) to just below the mouth of the tributary that drains Summit Lake into Kennedy Creek. Water quality issues related to forest practices on Green Diamond timberland are covered by a habitat conservation plan.

There are scattered residential development and small commercial areas in the upper watershed above Green Diamond timberland. There is sparse development below the Green Diamond timberland near the mouth of the creek. Summit Lake discharges to Kennedy Creek, although the discharge usually stops in late summer. There is recreational use throughout the watershed. Kennedy Creek is one of the highest chum producing streams in Washington State (Washington Department of Fish and Wildlife 2000). The creek discharges to the head of Totten Inlet.

**Schneider Creek** is approximately 5.3 miles long and the next largest tributary to Totten Inlet. It originates in Schneider Prairie and flows north-northeast and then follows Highway 101 to the head of Totten Inlet. The terrain is flat with pastures and forest land, and the stream gradient is gentle throughout its length. Schneider Creek basin has a drainage area of 8.2 square miles. About a quarter of the watershed is in forestry, with the rest sparsely developed as rural agricultural.

**Burns and Pierre Creeks** drain 0.26 and 0.16 square miles, respectively. Land use is primarily rural residential/agricultural. Both creeks have very small flow, and are typically dry by late spring.

## Tributaries to Eld Inlet

The two major tributaries to Eld Inlet are McLane Creek and Perry Creek. Both are entirely in Thurston County and both drain into Mud Bay, at the southern end of Eld Inlet. The total area of Eld Inlet watershed is approximately 35.8 square miles.

**McLane Creek**, the largest tributary, is 14.5 miles long and drains 11.41 square miles. McLane Creek originates in the Alpine Hills area and flows through fairly level terrain, including wooded areas and open pastures. Swift Creek enters McLane Creek in the lower part of the subbasin. Residential developments on Swift Creel and above McLane Creek Natural Area drain to McLane Creek. The rest of McLane Creek's drainage area is largely rural residential or undeveloped. There are beaver ponds in several areas and a small resident elk herd (approximately 18 head).

**Perry Creek** is 4.5 miles long. It originates in wetlands and winds through a gentle, rolling, largely undeveloped rural/residential area, and then drops through wooded ravines into Eld Inlet near Highway 101.



## Tributaries to Little Skookum Inlet

The Little Skookum Inlet watershed encompasses a small finger inlet branching from the northwest side of Totten Inlet in southeastern Mason County. Total watershed area is approximately 30.78 square miles. **Skookum Creek**, with nine miles of mainstem length, is the largest tributary and represents the most significant freshwater input to this inlet.

The drainage area for the Skookum Creek basin is 23.6 square miles. Hurley Creek, Little Creek and Clary Creek comprise the primary sub-basins.

Skookum Creek originates from perennial springs near Stimson Station close to the Mason County line and from wetlands on the ridge top of the north side of the valley. Most of mainstem Skookum Creek meanders in a northeasterly direction through a wide, alluvial valley. The channel appears to be incised in several places and may have been rerouted at some time. There is a well-developed estuary at the mouth of the creek, offering good habitat for juvenile salmon and other aquatic organisms. Approximately 76 acres of this estuary are incorporated into a Natural Area Preserve managed by the Washington Department of Natural Resources.

Land use in the Little Skookum Inlet watershed is dominated by commercial forestry, with smaller areas dedicated to marine aquaculture and small agricultural operations. Lands owned by the Squaxin Island Tribe lie both in Kamilche Valley and in the uplands above the inlet. A tribal casino, trading post, and resort area including a commercial strip along Highway 101 constitute the most concentrated commercial areas in the watershed. There is a resident elk herd of approximately 100 animals.

The Washington Administrative Code (WAC), Chapter 173-514-030, establishes a minimum instream flow of 3.0 cubic feet per second (cfs) for Skookum Creek between July 15 and October 1, although this standard is seldom met. As a result, Ecology has closed Skookum Creek watershed for further surface water appropriation from May 1 through October 31 as specified in WAC 173-514-030(2).





# What Will be Done?

## Implementation strategy

Cleanup actions for bacteria will focus on human-related sources of bacteria:

- ~ Source investigation, including:
  - o water quality monitoring
  - o visual surveys and records review of septic systems
  - o visual surveys of land use and management practices
  - o additional investigation such as microbial source tracking, sediment analysis, and dye testing of septic systems may become necessary.
- ~ Technical assistance and, when possible, financial assistance (low interest loans, cost-share) to landowners.
- ~ Informational workshops and other outreach aimed at helping landowners improve management of septic systems and land use practices.
- ~ Washington State Departments of Ecology and Agriculture will respond to agricultural water quality complaints. Ecology and Agriculture will make referrals to Mason or Thurston Conservation Districts for technical assistance when risk to water quality is identified through complaint response and investigations. If formal enforcement is deemed necessary the agencies will work together on an appropriate response. Ecology's Southwest regional office complaint number is (360) 407-6300. Ecology's website address for agricultural complaints is:  
[http://www.ecy.wa.gov/programs/spills/forms/nerts\\_online/SWRO\\_nerts\\_online.html](http://www.ecy.wa.gov/programs/spills/forms/nerts_online/SWRO_nerts_online.html)
- ~ Water quality monitoring to assess effectiveness of cleanup actions, monitor progress towards water quality goals, and (ultimately), demonstrate compliance with water quality standards.

Table 1 describes specific actions.

Most of the sources of bacteria are “nonpoint” sources, meaning that they are small sources scattered throughout the watershed. They include poorly maintained or failing septic systems, livestock, pet, and wildlife waste carried by rain water from pastures, yards and roadsides.

In the Totten, Eld, and Little Skookum watersheds stormwater from roads is the only potential pollution source regulated by permit. Washington Department of Transportation (WSDOT) is

***Fecal coliform bacteria*** come from the feces of warm blooded animals like humans, livestock, pets, and wildlife. Their presence indicates that other bacteria and viruses (pathogens) found in feces may also be present. Higher bacteria concentrations mean a greater health risk to people exposed to the contaminated water.

*You can be exposed through small cuts, or by swallowing contaminated water. Health effects can be minor, such as an unexplained rash or ear ache. They can also be quite serious, such as hepatitis.*



responsible for stormwater management along these roads. Roads themselves are not a source of bacteria pollution, but associated runoff can transport bacteria and concentrate pollution at discharge points. Highway 101 traverses the lower part of this watershed, crossing McLane, Perry, Schneider, Kennedy and Skookum Creeks. One area where Highway 101 is parallel to Schneider Creek was identified as causing problems by creating sheet flow across an animal keeping area. Highway 8 parallels Kennedy Creek in the upper watershed and Highway 108 parallels Skookum Creek for much of its length. Potential water quality impacts from these roads have yet to be investigated.

Table 1 summarizes specific actions that the Technical Advisory Group identified as needed to improve water quality. Many of the actions are already underway, and are listed as Priority 1 in the table.



**Table 1: Cleanup Actions**

\*Priority of actions was determined by the technical advisory group based on source areas identified in the water quality study and observed land use. Priority 1 actions are either underway or are highest priority for identifying a funding source so action can proceed. Priority 2 and 3 actions lack a funding source and/or sponsor, are considered less immediately important, or are conditioned by previous actions.

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
<i>Bacteria</i>					
<i>Area-wide Actions</i>					
<i>General Outreach</i>	Workshops, materials, and other outreach for area residents on relevant water quality issues and land management practices such as septic system operations and maintenance, the importance of maintaining streamside vegetation, and erosion control.	1	WSU Extension, Conservation Districts (CDs)	Funded	On-going.
	Outreach on water quality issues to youth through schools and 4H.	1	WSU Extension	Funded	On-going. Funded through January 2009
	Articles and (as necessary) advertisements in area newspapers to help raise	1	WSU Extension	Funded	On-going. Funded through January 2009

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
	awareness and involvement.				
<i>Agriculture and other land use</i>	Develop informational materials and conduct workshops and farm tours focusing on BMPs for horse farm owners, horse clubs (youth and leaders), and commercial stables.	1	Thurston/Mason CDs	Funded	In process. Project to be complete by March 2009.
	Farm inventory in the watershed.	1	Mason/Thurston CDs	Funded	In progress
	Evaluate status of BMPs installed during the 1990s.	1	Mason/Thurston CDs	Funded	In progress
	Conservation plans for agricultural operations.	1	Thurston/Mason CDs	Funded	In progress. Project to be complete by March 2009.
	Provide cost-share to private and commercial horse operations to assist with BMP implementation.	1	Thurston/Mason CDs	Current funding ends March 2009	In process. Current grant ends March 2009.
	Provide cost-share for agricultural operations and other land use.	1	Thurston/Mason CDs	Partially funded by grants	
	Respond to animal feeding operations or pasture based water quality complaints. Referral to conservation district if there is no	3	WA Depts. of Ag and Ecology	Funded	As needed. Complaint number is (360) 407-6300. Ecology's website address for agricultural complaints is:

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
	immediate impact or potential for impact to water of the state. State enforcement action in cases with an immediate impact or potential for impact to water of the state.				<a href="http://www.ecy.wa.gov/programs/spills/forms/nerts_online/SWRO_nerts_online.html">http://www.ecy.wa.gov/programs/spills/forms/nerts_online/SWRO_nerts_online.html</a>
<i>On-site septic systems</i>	Outreach/education on septic system operation and maintenance.	1	Thurston/Mason counties, SeaGrant, WSU	Mostly funded	Various funding sources. Ongoing effort.
	Implement septic system repair and replacement.	1	Mason/Thurston counties	Financial assistance available to landowners	Funding programs vary by county.
<i>Additional investigation</i>	Study of late summer high bacteria concentrations (regional).	1	Ecology, Squaxin Island Tribe, Puget Sound Partnership	Funding needed	Proposed, region-wide
	Microbial source tracking study.	3			Location and need to be determined
	Source monitoring.	2	Various		Some source monitoring is in progress (see below). Additional needs may be identified as cleanup progresses.

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
	Effectiveness monitoring (area-wide).	1	Ecology	Funded	In approximately five years Ecology will evaluate progress towards water quality goals.
<i>Stormwater</i>	WSDOT will implement pollution-prevention measures contained in its Storm Water Management Plan to ensure that the drainage from Highways 101, 108, and 8 does not convey excessive bacteria to adjacent water bodies.	1	WSDOT	Funded?	
	Outreach to area residents on stormwater BMPs, including ditch maintenance.	1	WSU Extension		WSU will be conducting workshops in the future.
<i>Adaptive management</i>	Involved entities continue to meet to coordinate actions and funding and make needed adjustments to cleanup strategy.	1	Ecology lead, all implementers involved		Currently meeting every other month.
<i>Enforcement</i>	Enforcement will be used where identified pollution sources are not addressed through voluntary measures.	1	Lead agency varies depending on situation	Partially funded	Ongoing, as needed.
<b><i>McLane Creek</i></b>					

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
<i>Outreach</i>	See area-wide actions (first section of this matrix).				
	Stream walks.	3	Stream Team?	Funding needed	Citizen volunteers needed
<i>Agriculture</i>	See area-wide actions (first section of this matrix).				
<i>On-site septic systems</i>	See area-wide actions (first section of this matrix).				
	Create map of septic systems on streamside properties – distance from stream.	2	Thurston County	Funding needed	
<i>Additional investigation</i>	See area-wide actions (first section of this matrix).				
	Segmented water quality monitoring to narrow down pollution source areas (including wildlife areas).	1	Thurston County  ----- Squaxin Tribe	Funded  ----- Funded	Sampling began 8/2/06, various sites, 10 dry season sampling events, ending in summer 07  ----- 2006-07 wet season, 6 sites near mouth
<i>Stormwater</i>	See area-wide actions (first section of this matrix).				
<i>Adaptive</i>	See area-wide actions (first				

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
<i>management</i>	section of this matrix).				
<b>Schneider Creek</b>					
<i>Outreach</i>					
<i>Agriculture</i>	See area-wide actions (first section of this matrix).				
<i>On-site septic systems</i>					
	Investigate septic situation in commercial area near Steamboat Island interchange.	2	Thurston County	Funding needed	
<i>Additional investigation</i>	See area-wide actions (first section of this matrix)				
	Add monitoring site above Hwy 101 to compare to downstream site.	1	Thurston County	Funded	Sampling began 12/11/06
<i>Stormwater</i>	See area-wide actions (first section of this matrix).				
	Address drainage issues affecting Schneider Creek.	1	WSDOT, with Thurston CD, NRCS, and Ecology	Funding needed	WSDOT is working with the technical advisory group to address identified drainage issues along Schneider Creek and Highway 101.
	Evaluate effectiveness of stormwater facilities at	2	WSDOT	?	Status unknown. WSDOT may have monitoring data for this



	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
	Steamboat Island interchange.				facility.
<i>Adaptive management</i>	See area-wide actions (first section of this matrix).				
<b><i>Kennedy Creek</i></b>					
<i>Outreach</i>	See area-wide actions (first section of this matrix).				
	Provide bacteria related materials at salmon viewing area and as part of curriculum to visiting students.	1	Mason CD will talk with advisory committee representatives	Funding needed	
<i>Agriculture</i>	See area-wide actions (first section of this matrix).				
<i>On-site septic systems</i>					
<i>Additional investigation</i>		Segmented water quality sampling above Green Diamond to evaluate potential sources.	1	Ecology	Funded
	Respond as indicated by water quality sampling.	2	To be determined by sampling	Funding needed	
<i>Stormwater</i>	See area-wide actions (first				

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
<i>Adaptive management</i>	section of this matrix)				
<b>Perry Creek</b>					
<i>Outreach</i>	See area-wide actions (first section of this matrix).				
<i>Agriculture</i>					
<i>On-site septic systems</i>					
	Evaluate records from septic system inspections conducted in the 1990's, and follow up as needed.	1	Thurston County	Funding needed	As time allows
<i>Research</i>	See area-wide actions (first section of this matrix).				
<i>Stormwater</i>					
<i>Adaptive management</i>					
<b>Pierre &amp; Burns Cks</b>					
<i>Outreach</i>	See area-wide actions (first section of this matrix).				
<i>Agriculture</i>					
<i>On-site septic systems</i>					
<i>Additional investigation</i>		Segmented sampling to assess	1	Ecology	Funded

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
	progress from land use management changes.				
	Respond as indicated by water quality sampling.	2	To be determined by sampling	Funding needed	
<i>Stormwater</i>	See area-wide actions (first section of this matrix)				
<i>Adaptive management</i>					
<b>Skookum Creek</b>					
<i>Outreach</i>	See area-wide actions (first section of this matrix).				
	Provide septic system workshops.	1	Mason County and WSU Extension	Funded	On-going, can be requested
<i>Agriculture</i>	See area-wide actions (first section of this matrix).				
	Investigate terms of conservation easement on Wetlands Reserve Program property.	1	Mason CD will check with NRCS	No funding needed	
<i>On-site septic systems</i>	Evaluate records to identify high risk systems.	1	Mason County	Funded	Winter 2007
<i>Additional</i>	Source tracking monitoring.	1	Squaxin Tribe	Funded	Winter 2007

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
<i>investigation</i>					
<i>Stormwater</i>	See area-wide actions (first section of this matrix).				
<i>Adaptive management</i>					
<b><i>Hurley Creek</i></b>					
<i>Outreach</i>	See area-wide actions (first section of this matrix).				
<i>Agriculture</i>					
<i>On-site septic systems</i>					
	Investigate multi-unit septic system.	1	Mason County		In process
	Evaluate records to identify high risk septic systems.	1	Mason County		
<i>Additional investigation</i>	Source tracking monitoring.	1	Mason County	Funded	Beginning winter 2007
<i>Stormwater</i>					
<i>Adaptive management</i>	See area-wide actions (first section of this matrix).				
<b><i>Eld Inlet</i></b>					
<i>Outreach</i>	See area-wide actions (first				

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
<i>Ag and on-site septic systems</i>	section of this matrix).				
	Investigate and use local codes to correct problems identified in DOH's 2004 <i>Shoreline Survey of the Eld Inlet Shellfish Growing Area and Totten, Eld, and Little Skookum TMDL</i> .	1	Thurston County	Funded	In process
<i>Additional investigation</i>	See area-wide actions (first section of this matrix).				
<i>Stormwater</i>					
	Provide a portable toilet at the Park-n-Ride at the William Cannon trailhead during fishing season.	2	WADFW?	Unfunded	
<i>Planning</i>	Watershed characterization.	3	Thurston County	Funding requested	Needed for long-term management and protection of watershed
<i>Adaptive management</i>	See area-wide actions (first section of this matrix).				
<b><i>Totten Inlet</i></b>					
	No actions identified at this time.				
<b><i>Temperature</i></b>					
<b>Skookum</b>					

	<b>Action</b>	<b>Priority</b> *	<b>Lead</b>	<b>Funding status</b>	<b>Implementation status</b>
<b>Creek</b>					
<i>Stream function</i>	Restore riparian vegetation along central valley of Skookum Creek.	1	Squaxin Tribe, Mason CD	Partially funded	
	Work with landowners to restore riparian vegetation along Hurley Creek.	1	Mason CD	Funded	
	Create gravel bars to improve stream channel geometry to cool water.	1	Squaxin Tribe, Mason CD		
	Add LWD (large woody debris) in area of power lines (vegetation restricted).	1	Squaxin Tribe	Funded	Completed summer 2007
	Purchase of critical riparian corridor along Creek.	1	Squaxin Tribe	Pending	
<i>Additional investigation</i>	Continue summer temperature monitoring.	1	Squaxin Tribe	Funded	On-going

## Adaptive implementation

This plan describes the approach, key actions, and implementing organizations that will be used to address the issues identified in the technical analysis.

Improving water quality is a dynamic process. Implementing partners will meet regularly to monitor progress, evaluate successes, obstacles, and changing needs, and make adjustments to the cleanup strategy as needed. Table 1 will be our guide, and partners may add to or subtract from the table as needed.

The technical advisory group anticipates achieving fecal coliform bacteria reductions by 2014 (i.e., eight years following completion of the *Water Quality Improvement Plan*). Fifty percent reduction is anticipated by 2010.

Achieving temperature reductions is a long-term goal, requiring time for streamside plantings to mature. Within three years of completing this plan, implementing agencies anticipate 85 percent restoration of degraded riparian areas (replanting as necessary for plant mortality). Temperature goals are anticipated to be achieved when tree height reaches 30 meters, estimated as approximately 50 years.

It is ultimately Ecology's responsibility to assure that cleanup is being actively pursued and water quality standards are achieved.





## Funding Opportunities

Ecology will work with stakeholders to identify funding sources and prepare appropriate scopes of work that will help implement this plan. The following table identifies some of the primary funding sources, but partners will work to find other sources.

**Table 2: Potential funding sources**

Sponsoring Entity	Funding Source	Uses to be Made of Funds
Department of Ecology	Centennial Clean Water Fund, Section 319, and State Revolving Fund <a href="http://www.ecy.wa.gov/programs/wq/funding/">http://www.ecy.wa.gov/programs/wq/funding/</a>	Facilities and water pollution control-related activities; implementation, design, acquisition, construction, and improvement of water pollution control.  Priorities include: implementing water cleanup plans; keeping pollution out of streams and aquifers; modernizing aging wastewater treatment facilities; reclaiming and reusing waste water.
Puget Sound Partnership	Public Involvement and Education grants <a href="http://www.psat.wa.gov/Programs/PieEd/round_14/02_intro_funding.htm">http://www.psat.wa.gov/Programs/PieEd/round_14/02_intro_funding.htm</a>	Project priorities include: reduce harmful impacts from stormwater; prevent contamination from public/private sewer systems and other nonpoint sources.
Thurston and Mason County Conservation Districts	Federal Conservation Reserve Enhancement Program <a href="http://www.scc.wa.gov/programs/crep/">http://www.scc.wa.gov/programs/crep/</a>	Conservation easements; cost-share for implementing agricultural/riparian best management practices (BMPs).
Natural Resources Conservation Service	Environmental Quality Incentive Program <a href="http://www.nrcs.usda.gov/programs/eqip/">http://www.nrcs.usda.gov/programs/eqip/</a>	Voluntary conservation program for farmers and ranchers that promotes agricultural production and environmental quality as compatible national goals; includes cost-share funds for farm BMPs.
Natural Resources Conservation Service	Emergency Watershed Protection <a href="http://www.nrcs.usda.gov/programs/ewp/index.html">http://www.nrcs.usda.gov/programs/ewp/index.html</a>	NRCS purchases land vulnerable to flooding to ease flooding impacts.
Natural Resources Conservation Service	Wetland Reserve Program <a href="http://www.wa.nrcs.usda.gov/programs/wrp/wrp.html">http://www.wa.nrcs.usda.gov/programs/wrp/wrp.html</a>	Landowners may receive incentives to enhance wetlands in exchange for retiring marginal agricultural land.
Thurston County	State Revolving Fund Contact Thurston County Environmental Health: 360-754-4111	Low interest grants and loans for repair and replacement of on-site septic systems.

Sponsoring Entity	Funding Source	Uses to be Made of Funds
Department of Ecology, SEA	Coastal Zone Protection Fund	Some funding is available through a program that taps into penalty monies collected by the WQP.
Office of Interagency Committee, Salmon Recovery Board	Salmon Recovery Funding Board <a href="http://www.iac.wa.gov/srfb/grants.asp">http://www.iac.wa.gov/srfb/grants.asp</a>	Provides grants for habitat restoration, land acquisition, riparian area protection, and habitat assessment.
ShoreBank Enterprise Cascadia	Foundations and state appropriation. <a href="http://www.sbseptic.com">www.sbseptic.com</a> 360-427-2875	Low interest loans for septic system repairs or replacement. Available to all Mason County residents.

# Measuring Progress toward Goals

## Targets and interim goals

Load reductions for pollution problems caused by “nonpoint” sources of pollution (i.e., small sources of pollution scattered throughout the watershed) are a general guide to help direct cleanup efforts. Cleanup is defined as meeting water quality standards, not as achieving a specific bacteria reduction or percentage of effective shade.

Table 3 shows approximately how much the bacteria must be reduced at key locations in order to meet water quality standards. The Technical Advisory Group anticipates achieving fecal coliform bacteria reductions by 2014 (i.e., eight years following completion of the *Water Quality Improvement Plan*). Fifty percent reduction is anticipated by 2010.

**Table 3. Summary of target load reductions for bacteria**

Creeks and tributaries	Existing load <sup>1</sup> (cfu/day)	Loading capacity <sup>2</sup> (cfu/day)	Target reduction (%)	Critical period
<b>Totten Inlet</b>				
Kennedy Creek, 125 m above Old Olympic Highway bridge	$5.4 \times 10^{10}$	$1.5 \times 10^{10}$	73	Aug-Sept
Schneider Creek, end of Pneumonia Gulch Rd	$8.9 \times 10^9$	$2.4 \times 10^9$	73	July-Sept
Burns Creek, at mouth	$1.9 \times 10^{10}$	$1.5 \times 10^8$	99	May-
Pierre Creek, 80 m upstream of beach	$1.9 \times 10^9$	$8.2 \times 10^7$	96	May-
<b>Eld Inlet</b>				
McLane Creek, below Delphi Rd bridge	$4.1 \times 10^{11}$	$1.9 \times 10^{10}$	95	August
Swift Creek, near mouth, above Delphi Rd bridge	$4.3 \times 10^{10}$	$9.8 \times 10^9$	77	June-Oct
Perry Creek, above Perry Creek Rd	$1.2 \times 10^{10}$	$6.4 \times 10^9$	46	August
<b>Little Skookum Inlet</b>				
Skookum Creek (SKOK5) at Highway 108 (RM 6.0)	$1.2 \times 10^{10}$	$7.9 \times 10^9$	35	May-Oct
Hurley Creek (HUR1) at Eich Rd culvert (mouth at RM 6.0)	$4.3 \times 10^9$	$1.1 \times 10^9$	75	May-Oct
Skookum Creek (SKOK4) at Eich Rd bridge (RM 4.2)	$4.8 \times 10^{10}$	$1.3 \times 10^{10}$	72	May-Oct
Skookum Creek (SKOK3) at Highway 108 (RM 2.2)	$2.9 \times 10^{10}$	$1.4 \times 10^{10}$	51	May-Oct
Clary Creek (CLA1) at railroad crossing (mouth at RM 1)	$4.5 \times 10^8$	$1.5 \times 10^8$	67	May-Oct

1. Existing load is based on existing 90<sup>th</sup> percentile concentrations at average flow for the critical period

2. Loading capacity is based on meeting the 90<sup>th</sup> percentile criteria at average flows for the critical period

Temperature in Skookum Creek will be improved by restoring vegetation to the stream banks so that the water is shaded. Participating groups will work with landowners to improve streamside conditions. The following table shows estimates of the amount of shade needed to cool the water to healthy temperatures.

**Table 4: Estimated shade needed for Skookum Creek to achieve temperature standards.**

Stations and Landmarks	Upstream	Downstream	Average Target Effective Shade (%)	
	(km)	(km)	Potential	Deficit
S9, below confluence of N and S forks	13.35	12.95	90%	20%
	12.95	12.55	90%	40%
	12.55	12.15	90%	20%
	12.15	11.75	90%	40%
S8, upstream of upper Hwy 108 bridge	11.75	11.35	80%	30%
	11.35	10.95	90%	25%
	10.95	10.55	90%	20%
	10.55	10.15	90%	50%
	10.15	9.75	80%	50%
	9.75	9.35	90%	5%
	9.35	8.95	90%	30%
	8.95	8.55	90%	40%
	8.55	8.15	85%	30%
	8.15	7.75	80%	50%
	7.75	7.35	80%	35%
	7.35	6.95	80%	40%
S5, below Eich Road bridge	6.95	6.55	90%	30%
	6.55	6.15	90%	40%
	6.15	5.75	90%	35%
	5.75	5.35	90%	40%
S4, bridge at Stohr driveway	5.35	4.95	90%	20%
	4.95	4.55	90%	40%
	4.55	4.15	85%	40%
	4.15	3.75	90%	50%
S3, upstream of lower Hwy 108 bridge	3.75	3.35	90%	40%
	3.35	2.95	80%	30%

Achieving temperature reductions is a long-term goal, requiring time for plantings to become mature. Within three years of completion of this plan, implementing agencies anticipate restoring vegetation along 85 percent of degraded riparian areas (replanting as necessary for mortalities). Temperature goals are anticipated to be achieved when tree height reaches 30 meters, estimated as approximately 50 years.



Partners will jointly oversee implementation of this plan. In the early stages of cleanup, partners will meet quarterly to evaluate progress on cleanup actions and monitoring results and adjust cleanup actions as needed. Meetings may become less frequent as cleanup progresses. Ecology

is ultimately responsible for determining that bacteria and temperature levels in these creeks meet water quality standards.

## **Effectiveness monitoring plan**

In addition to the source identification and other monitoring described in Table 1, there will be a need to know if the overall cleanup plan is achieving its goal. Ecology is ultimately responsible for determining the effectiveness of the cleanup plan.

Ecology will evaluate progress toward water quality goals for bacteria approximately five years after implementation begins.

The interim target for temperature improvements is to have 85 percent of the needed streambank areas replanted within three years. This target will be evaluated by field surveys. The compliance target is to restore healthy water temperatures when trees reach site potential height in approximately 50 years. Ecology will reevaluate shade on the creek approximately five to ten years after completion of this plan, and may conduct water sampling at that time. They will conduct that evaluation at approximately five year intervals until water quality standards are achieved. Compliance will be determined by in-stream measurements.



## Reasonable Assurances

The goal of this Water Quality Improvement Plan is for the waters in the basin to meet the state's water quality standards. Education, outreach, technical and financial assistance, permit administration, and enforcement may all be used to ensure that the goals of this water clean up plan are met.

### *Bacteria*

Watershed residents are interested in protecting human health and local economic resources and, once they become aware of the issues and resources, are largely willing to “do the right thing.” The Tribe, counties, conservation districts, and other implementing partners have demonstrated their commitment to water quality. They have effective water quality programs.

Some of the most needed cleanup actions are already underway to reduce bacteria pollution, funded by a grant through Ecology's Centennial Clean Water Fund. They add to the assurance that McLane, Perry, Schneider, Kennedy, Pierre, Burns, and Skookum Creeks will achieve compliance with state water quality standards. This assumes that the activities, described below, are continued and maintained:

- Thurston County is investigating pollution sources identified in the TMDL water quality study and in Department of Health's *2004 Shoreline Survey of the Eld Inlet Shellfish Growing Area*. They use education and local health codes to address sources they locate.
- Thurston and Mason Conservation Districts are evaluating the status of agricultural best management practices that were installed during cleanup efforts in the 1990s.
- Mason and Thurston Conservation Districts are helping landowners develop conservation plans and implement updated best management practices that are tailored to each property and each landowner's needs.
- Washington State University Extension and others conduct educational workshops and develop educational materials to help landowners become more aware of practices that protect water quality.
- Mason and Thurston counties, WSU Extension, and Washington SeaGrant conduct on-site septic system workshops to help landowners with proper operations and maintenance.

For a more detailed description of actions planned and underway, please see Table 1.

There are also challenges to reducing bacteria pollution:

- Mason County Environmental Health, which has responsibility for on-site regulation in the Skookum Creek drainage, is currently responding to high-profile environmental issues in Hood Canal and Oakland Bay. Skookum Creek is not the most immediate priority for limited resources.
- Thurston County also has multiple challenges, with TMDLs being conducted in every major watershed in the county. They will necessarily evaluate and prioritize response activities on a county-wide basis.
- This area, like much of Puget Sound, is under pressure from growth. According to Thurston Regional Planning Council (<http://www.trpc.org/programs/estimates+and+forecasts/demographics/the+profile.htm>), the current Thurston County population of 224,100 is projected to increase to 334,260 by 2025. Mason County will have similar pressure. Bacteria pollution typically increases as the number of septic systems and the amount of impervious surface from roads, driveways, roofs, and yards increases.

### *Temperature*

The Squaxin Tribe has a strong interest in protecting and enhancing the salmon run in Skookum Creek. They are investing resources in efforts to restore healthy stream function, which will improve stream temperatures. Mason Conservation District is working with local landowners. A number of actions are already underway. For details, please see Table 1.



# Public Involvement

This report was developed by a technical advisory group that began meeting in spring of 2006. Members of the group represent implementing partners or communities in sub-watersheds.

Outreach to watershed residents included:

- ~ A website that provides access to all background documents and other project-related information. The website includes contact information for technical advisory group members.  
[http://www.ecy.wa.gov/programs/wq/tmdl/totten\\_eld/index.html](http://www.ecy.wa.gov/programs/wq/tmdl/totten_eld/index.html)
- ~ Citizen representatives talked with residents in their areas. The McLane Creek representative sent three update letters to McLane and Swift Creek residents.
- ~ Ecology briefed the Griffin Neighborhood Association.
- ~ WSU Extension held informational workshops that included information about the cleanup process and the development of the cleanup plan.
- ~ A public review and comment period was conducted as part of finalizing this plan. Public notice included:
  - o Direct mail to riparian landowners
  - o Ads in Olympia and Shelton newspapers
  - o Document placed for review on Ecology's website and in Olympia and Shelton Timberland Libraries
  - o Offer to brief interested groups on request (no requests were received).
- ~ Ecology has included all public comments in Appendix C, along with a response to the comment. We will mail a copy of the final document to commenters who supplied a mailing address. The final document will be posted on the website cited above.

## Technical Advisory Group

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*Seattle Shellfish, watershed resident*

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*Citizen representative Totten Inlet, Cooper Point, Adams Cove*

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### **John Konovsky**

*Squaxin Island Tribe*

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*Thurston Conservation District*

### **Kirsten Workman, facilitator**

*WSU Extension Mason County/Mason Conservation District*



# Appendices



## Appendix A. TMDL Information

### What is a total maximum daily load (TMDL)?

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#### **Federal Clean Water Act requirements**

The Clean Water Act established a process to identify and clean up polluted waters. Under the Clean Water Act, each state is required to have its own water quality standards designed to protect, restore, and preserve water quality. Water quality standards consist of designated uses for protection, such as cold water biota and drinking water supply, and criteria, usually numeric criteria, to achieve those uses.

Every two years, states are required to prepare a list of water bodies - lakes, rivers, streams, or marine waters - that do not meet water quality standards. This list is called the 303(d) list which is a part of the water quality assessment. To develop the list, Ecology compiles its own water quality data along with data submitted by local state and federal governments, tribes, industries, and citizen monitoring groups. All data are reviewed to ensure that they were collected using appropriate scientific methods before they are used to develop the 303(d) list.

#### **TMDL process overview**

The Clean Water Act requires that a total maximum daily load or TMDL be developed for each of the water bodies on the 303(d) list. A TMDL identifies how much pollution needs to be reduced or eliminated to achieve clean water. Then Ecology works with the local community to develop a strategy to control the pollution and a monitoring plan to assess effectiveness of the water quality improvement activities.

#### **Elements required in a TMDL**

The goal of a TMDL is to ensure the impaired water will attain water quality standards. A TMDL includes a written, quantitative assessment of water quality problems and of the pollutant sources that cause the problem. The TMDL determines the amount of a given pollutant that can be discharged to the water body and still meet standards (the loading capacity) and allocates that load among the various sources.

If the pollutant comes from a discrete source (referred to as a point source) such as a municipal or industrial facility's discharge pipe, that facility's share of the loading capacity is called a wasteload allocation. If it comes from a set of diffuse sources (referred to as a nonpoint source) such as general urban, residential, or farm runoff, the cumulative share is called a load allocation.

The TMDL must also consider seasonal variations and include a margin of safety that takes into account any lack of knowledge about the causes of the water quality problem or its loading capacity. A reserve capacity for future loads from growth pressures is sometimes included as well. The sum of the wasteload and load allocations, the margin of safety and any reserve capacity must be equal to or less than the loading capacity.

TMDL = Loading Capacity = sum of all Wasteload Allocations + sum of all Load Allocations + Margin of Safety

### **Water quality assessment / Categories 1-5**

The Water Quality Assessment is a list that tells a more complete story about the condition of Washington's water. A section of the Water Quality Assessment - 303d list - identifies polluted waters in Washington. This list divides water bodies into one of five categories:

- Category 1 – Meets tested standards for clean water.
- Category 2 – Waters of concern.
- Category 3 – Waters where no data is available
- Category 4 – Polluted waters that do not require a TMDL because:
  - 4a – Has a TMDL approved and its being implemented
  - 4b – Has a pollution control plan in place that should solve the problem
  - 4c – Impaired by a problem (non-pollutant) such as low water flow, dams, culverts
- Category 5 – Polluted waters that require a TMDL – or the 303d list.

### **Total maximum daily load analyses: loading capacity**

Identification of the contaminant loading capacity for a water body is an important step in developing a TMDL. EPA defines the loading capacity as “the greatest amount of loading that a water body can receive without violating water quality standards” (EPA, 2001). The loading capacity provides a reference for calculating the amount of pollution reduction needed to bring a water body into compliance with standards. The portion of the receiving water's loading capacity assigned to a particular source is a load or wasteload allocation. By definition, a TMDL is the sum of the allocations, which must not exceed the loading capacity.

## Why is Ecology conducting a TMDL study in this watershed?

### Overview

Seven creeks that flow into Totten, Eld, and Little Skookum Inlets have bacteria concentrations high enough to pose potential health risks to recreational users. These creeks are also contributing bacteria to marine areas that support shellfish harvest. In addition, Skookum and Kennedy Creeks are too warm to be healthy for aquatic organisms. These creeks are considered “impaired” on Washington State’s Water Quality Assessment, also called the 303(d) List.

Tributaries to Totten, Eld, and Little Skookum inlets on the 2004 303(d) list for fecal coliform bacteria and temperature.

Inlets	Tributaries	Listing <sup>a</sup> Parameter	Location on the Creek	Township	Range	Section	Listing ID
Totten	Pierre Creek	FC	Near mouth	19N	3W	27	40958 <sup>b</sup>
	Burns Creek	FC	Near mouth	19N	3W	27	40605 <sup>c</sup>
	Kennedy Creek	Temp	125m above Old Olympic Hwy bridge	19N	3W	32	23545
		FC					41736
Schneider Creek	FC	Near mouth, RM 0.3	19N	3W	33	12583	
Eld	McLane Creek	FC	RM 0.2	18N	3W	24	12581
				18N	2W	19	41707
	Perry Creek	FC	RM 1	18N	3W	13	12582
Little Skookum	Skookum Creek	Temp	RM 1.0 @ Hwy 101	19N	3W	19	23758
		FC	RM 2.2 @ Hwy 108				7601

<sup>a</sup> FC = fecal coliform; Temp = temperature

<sup>b</sup> the 2004 303(d) list contains other FC listing IDs which will be consolidated to a single listing ID of 40958

<sup>c</sup> the 2004 303(d) list contains other FC listing IDs which will be consolidated to a single listing ID of 40605

### Background

Local jurisdictions, the Squaxin Tribe, landowners, and citizens groups have been working to protect and restore these areas since the 1980’s. Watershed Action Plans were completed for Totten/Little Skookum and Eld Inlets in 1989. These plans have helped guide a variety of water quality improvement actions including:

- ~ Dye testing of septic systems
- ~ Availability of low-interest loans for septic system repair
- ~ Conservation planning and management practices for individual properties
- ~ Education and outreach
- ~ Restoring streamside plants, and
- ~ Water quality monitoring.

### *Eld Inlet*

Changes in bacteria levels in Eld Inlet, in particular, have affected commercial shellfish harvest. In 1983, the state Department of Health downgraded shellfish growing areas in the south end of the inlet from *Approved* to *Conditionally Approved*. Major sources of bacteria were identified as on-site septic systems and poor livestock keeping practices.

Since 1993, Thurston County has adopted a nonpoint pollution control ordinance, set rural residential density at 1 unit per five acres in most areas, and revised its on-site sewage code. In the mid-1990s, Thurston County Health District staff conducted detailed inspections of on-site sewage systems along the marine shoreline. Thurston Conservation District focused efforts on livestock sources in Eld Inlet watershed in the mid-1990's, conducting surveys and outreach, developing conservation plans, and installing BMPs. These efforts, with the support of landowners, resulted in the upgrade of 450 acres of growing area in 1998. Lately, however, there have been signs of declining water quality in Eld Inlet.

Grant funding to support much of the work of Thurston Conservation District and Thurston County ended in the late 1990s. In 2002, areas of Eld Inlet were placed back on Department of Health's *Threatened* list. Data from 1999 to 2004 show increasing fecal coliform levels at the three most southerly stations. (Sargeant, DOH, email communication, 9/9/2005) Thurston Conservation District continues to provide technical assistance to landowners in the area, upon request.

### *Totten and Little Skookum Inlets*

Historically, water quality has been good in Totten and Little Skookum Inlets. In 1993, the Totten-Little Skookum Shellfish Protection Area (more commonly called a Clean Water District) was formed. As a result, Mason County received funding to extensively dye test septic systems in the area. The dye testing and repair goals were accomplished by the mid-1990s. During this same period, Thurston and Mason Conservation Districts were working with livestock owners in the watershed, evaluating properties, and prioritizing potential water quality impacts. Guided by these priorities, they worked with landowners to provide technical assistance, develop farm plans, and design and implement best management practices (BMPs). Since grant funding to support this work ended, water quality improvement work in this area has been greatly reduced.



## Appendix B.: Who's going to participate?

The people who live in and use the Totten/Eld watershed will ultimately be responsible for improving water quality. However, several entities will be working to provide information and other resources to foster the necessary changes. Following is a description of the responsibilities, authorities, and existing programs of groups that will be part of the effort to help landowners recognize and accomplish needed changes.

### Environmental Protection Agency (EPA)

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While authority and responsibility has been delegated to the Department of Ecology in Washington State, EPA is ultimately responsible for seeing that the federal Clean Water Act is implemented and water quality is restored. EPA must approve TMDL technical analyses. They also provide water quality-related funding.

### Mason Conservation District (MCD)

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Mason Conservation District, under the authority of Ch. 89.08 RCW, develops farm plans to protect water quality by providing education and technical assistance to residents. Their work is non-regulatory.

They work with landowners to develop BMPs that realize maximum productivity while protecting the quality of both surface and underground water resources. The Mason Conservation District is able to provide financial support for BMPs to some landowners through cost share programs which are funded by state and federal agencies. When developing farm plans, the district uses guidance and specifications from the U.S. Natural Resource Conservation Service.

The Mason County Board of Commissioners established a special assessment under RCW 89.08.400 for natural resource protection. Through an inter-local agreement, this assessment provides funding to both the Conservation District and Mason County Health Services and gives them the responsibility to conduct programs and activities to address resource protection issues. The district also receives grants from the Conservation Commission, Ecology, the Salmon Recovery Funding Board, and others.

Landowners may receive a Notice of Correction from Ecology if management practices on their land could potentially pollute water bodies (for instance, livestock in the creek or lack of vegetation along a streambank). Typically, the notice will refer the landowner to Mason Conservation District for assistance.

### Mason County

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The Mason County Department of Community Development regulates land use and development in the Totten and Little Skookum watersheds through the Mason County Comprehensive Plan, Mason County Development Regulations, and the Mason County Resource Ordinance in

compliance with Washington State's Growth Management Act, Ch. 36.70A. The fish and wildlife habitat conservation chapter of the resource ordinance addresses buffers widths for streams, lakes, and saltwater shorelines. These regulations apply to development activities in Mason County.

Mason County water quality improvement programs are funded through an intergovernmental agreement between the Mason Conservation District and Mason County Health Services (MCHS). The intergovernmental agreement gives the county responsibility to monitor surface and groundwater by and near assessed parcels and to investigate water quality complaints.

In accordance with the intergovernmental agreement, Mason County Health Services maintains a water quality resource protection program that includes a county-wide surface water monitoring program. Long-term ambient monitoring data are collected for 36 major streams. In any given month, an additional 30 to 50 sites may be selectively monitored to help provide more in-depth assessment of specific water quality issues. This level of sampling is short term only and fluctuates according to need, funding, and staff availability.

Mason County currently monitors Kennedy Creek, Skookum Creek, and a tributary to Schneider Creek as part of the ambient monitoring program. Monitoring is for pH, turbidity, dissolved oxygen, temperature, conductivity, and fecal coliform. The county may undertake dye tracing of septic systems that are believed to be related to poor water quality.

Minimum on-site septic system requirements are established by Washington Department of Health (DOH) in Chapter 246-272A WAC. Mason County has established further requirements under Mason County Code Chapter 6.76. Code requires that an operations and maintenance (O&M) report of every septic system be submitted to Mason County Health Services at least once every five years as part of a county-wide septic system O&M program. On-site staff investigate on-site septic system complaints and unsatisfactory septic O&M reports. They use appropriate enforcement action as outlined in MCHS on-site policies as needed. The on-site program and O& M programs are fee supported.

## [Natural Resources Conservation Service \(NRCS\)](#)

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The NRCS works in partnership with Mason and Thurston Conservation Districts to improve water quality and conservation. Resources are targeted to address water quality priorities identified through watershed planning, Washington Department of Health surveys, TMDLs, and other planning processes. The NRCS administers all of the programs in the 2002 Farm Bill, including:

- Conservation of Private Grazing Land Initiative
- Conservation Security Program
- Conservation Technical Assistance
- Environmental Quality Incentives Program
- Emergency Watershed Protection Program
- Farm and Ranch Lands Protection Program

- Grassland Reserve Program
- Plant Material Program
- Resource Conservation and Development Program
- Snow Survey and Water Supply Forecasts Program
- Soil Survey Programs
- Technical Service Providers
- Wetlands Reserve Program
- Wildlife Habitat Incentives Program

These programs are available to landowners in both Mason and Thurston counties. Several of the programs provide cost-share incentives to landowners who commit to implementing certain conservation practices. For more information on Farm Bill programs, go to [www.wa.nrcs.usda.gov/programs/index.html](http://www.wa.nrcs.usda.gov/programs/index.html).

In addition to these programmatic resources, the NRCS provides staff time and technical expertise to support restoration efforts.

## Puget Sound Partnership

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The Puget Sound Water Quality Action Team, under authority of Chapter 90.71 RCW, works with governments and organizations across the region to carry out the Puget Sound Water Quality Management Plan. Under different parts of the plan, agencies and governments provide technical and financial assistance to control pollution from septic systems, farm animal wastes and stormwater runoff. Support staff of the Action Team assist directly with programs to protect and restore shellfish harvesting in Puget Sound. The Action Team also administers grant funds for public involvement and education projects.

## Squaxin Island Tribe

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The Tribe has monitored water quality in this watershed since 1998. Using EPA Tribal grants, they track water quality, streamflows, shellfish health, and salmon productivity at key locations to identify emerging problems. They have monitored water quality in Skookum Creek since 1998. They are currently developing a set of water quality standards for tribal lands that will meet or exceed Washington State water quality standards. The Tribe is active in shellfish and salmon habitat protection and restoration throughout South Puget Sound. They implement projects to improve water quality and benefit the Squaxin Island Tribe and the area's natural resources.

The Tribe has funding available to support riparian restoration.

## Thurston Conservation District (TCD)

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Thurston Conservation District under authority of Ch. 89.08 RCW, works in a non-regulatory way to provide education and technical assistance to residents, develop conservation plans, and assist with design and installation of best management practices. When developing conservation plans, the district uses guidance and specifications from the U.S. Natural Resources Conservation Service. Landowners in Thurston County who receive a Notice of Correction from Ecology will normally be referred to Thurston Conservation District for assistance.

Thurston Conservation District is funded by a county-wide district assessment, in accordance with Chapter 89.08.400 RCW. The district regularly receives funding from the Conservation Commission, and grant funding from Ecology, the Salmon Recovery Funding Board, and others.

The conservation district conducts a yearly native plant sale, and provides funding for South Sound GREEN. South Sound GREEN is a student-based volunteer monitoring and education program. In addition to monitoring, students sometimes participate in restoration and planting activities and other water quality related activities. Funding to the Thurston Conservation District for South Sound GREEN is provided by the local jurisdictions (cities of Olympia, Lacey, and Tumwater, and Thurston County).

## Thurston County

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Thurston County has maintained a county-wide ambient surface water monitoring program for over 15 years. Focused mostly on the more urbanized north part of the county, the program includes approximately 20 sites, and tracks flow, macroinvertebrates, and ambient water quality. Site selection is part of an inter-jurisdictional local agreement, and is reviewed yearly and amended as appropriate, based on issues, needs, and funding. Urban areas of Thurston County are regulated under the Clean Water Act Phase II NPDES stormwater permit.

The county regulates land use in unincorporated areas through zoning regulations and a Critical Areas Ordinance (CAO) (Ch. 18E.60.050), in accordance with Washington State's Growth Management Act, Ch. 36.70A. The ordinance is currently undergoing an update. The update proposes a significant increase to riparian and wetland buffer requirements along all classes of streams and wetlands, as well as along marine shorelines. Thurston County is currently reviewing all comments received during the public comment and hearing process, and will report any proposed changes and updates to the draft CAO.

The county has created a low impact development advisory committee to investigate the feasibility of developing low impact development regulations and standards. The county was one of the jurisdictions chosen by the Puget Sound Action Team to receive technical and planning assistance from a consultant. The advisory committee is currently waiting for the consultant to provide the information necessary to move on to developing code revision language.

Minimum on-site requirements are established by Washington Department of Health (DOH) in Chapter 246-272A WAC, and the county has established further standards under Article IV of

the Thurston County Sanitary Code. County compliance staff deal with on-site failures, usually in response to complaints. In addition, the health department conducts on-site investigations. These investigations are usually grant-funded, and conducted in response to known problems with specific geographic focus. Thurston County maintains a low-interest loan fund for repair of on-site septic systems, or to correct failing on-site sewage systems by connection to municipal sewer service where available.

Environmental Health educators conduct an on-going education program consisting of workshops, newspaper articles, displays with information racks, brochures, and a website. Each year eight "Septic Sense" workshops are held at community meeting locations throughout the county. The workshops are free to the homeowner. Typically, 200 residents attend each year. Educational brochures are mailed with operational certificate renewals and to new residents.

Article VI, 4.2, of Thurston County Sanitary Code, requires landowners to prevent domestic animal waste from being washed into surface water, requires that manure be applied at agronomic rates, and prohibits intentional dumping of pet waste that will affect surface or storm water. Compliance with the ordinance is achieved through education, referrals to the Thurston Conservation District for technical assistance, and finally through legal action when necessary. A review and update of this ordinance is underway in 2007. The county also provides educational brochures to Animal Services to be mailed with annual animal licenses.

## [Washington Department of Agriculture](#)

Under RCW 90.64, Washington Department of Agriculture Livestock Nutrient Management Program is responsible for regulating nutrient management activities related to all dairy, combined animal feeding operations (CAFOs), and animal feeding operations (AFOs) in Washington State. The goal of the Livestock Nutrient Management Program is to work with producers and stakeholders to protect water quality, promptly respond to complaints and concerns related to dairy, CAFO and AFO livestock operations, and promote a healthy dairy and livestock industry.

When the Department of Agriculture Livestock Nutrient Management Program confirms that poor farm management practices on dairies and CAFO livestock operations are likely to be adversely affecting surface waters, landowners are referred to local conservation districts for technical assistance. If necessary, the Nutrient Management Program can require specific actions under the Water Pollution Control Act (Ch. 90.48 RCW), such as implementation of an approved Nutrient Management Plan, updates to existing Nutrient Management Plans, Notices of Violation, Administrative Orders, and Penalties to correct problems that impact water quality.

## [Washington Department of Ecology \(Ecology\)](#)

Washington Department of Ecology has been delegated responsibility under the federal Clean Water Act by the U.S. Environmental Protection Agency to establish water quality standards, coordinate water quality improvement projects (TMDLs) on water bodies that fail to meet water quality standards, and enforce water quality regulations under the Water Pollution Control Act,

Chapter 90.48 RCW. In addition to this regulatory role, Ecology provides financial assistance to local governments, tribes, conservation districts, and citizens groups for water quality projects.

For agricultural problems other than dairies or confined animal feeding operations, farmers may be referred to conservation districts for technical assistance if Ecology confirms that poor farm management practices are likely to be polluting surface waters. If necessary, Ecology can require specific actions under Ch. 90.48 RCW, such as implementation of an approved farm plan, to correct the problem.

Ecology manages the stormwater municipal NPDES Phase I and II permits, and the related Department of Transportation stormwater permit. These permits cover nonpoint pollution in urbanizing areas.

## Washington Department of Health (DOH)

The Washington Department of Health (DOH), under authority of Ch. 43.70 RCW, regulates commercial shellfish harvest. As part of this program, they monitor marine water quality in commercial shellfish growing areas of the state including Totten, Eld, and Little Skookum inlets.

DOH establishes minimum on-site sewage system requirements in Chapter 246-272A WAC. DOH has recently revised this regulation. Different parts of the regulations are scheduled to take effect at different times. The majority of the revised sections will be in effect by July 1, 2007. One significant revision in WAC 246-272A-0015 requires local health jurisdictions in the Puget Sound region to develop comprehensive management plans for on-site systems by July 1, 2007. These management plans are expected to include, but are not limited to, requirements and activities related to operation and maintenance of on-site septic systems.

## Washington Department of Transportation (WSDOT)

WSDOT manages transportation systems and services that meet public needs. WSDOT manages storm water from state highways, including in this watershed:

- Highway 101, which crosses north-south over Perry, Schneider, Kennedy, and Skookum creeks. There are several roadside storm drains along Highway 101 (see Figure 1) that belong to Washington State Department of Transportation (WSDOT) that discharge to Schneider and Perry creeks.
- Highway 8, which runs east-west crossing Kennedy and Perry watersheds and connecting with Highway 101 near the mouth of Perry Creek.
- Highway 108, which runs northeast-southwest along Skookum Creek connecting with Highway 101 near the mouth of Skookum Creek.

## Washington Sea Grant Program

The mission of the Washington Sea Grant Program is to encourage the understanding, use, conservation, and enhancement of marine resources, and the marine environment through



research, education, outreach, and technology transfer. Washington Sea Grant works with individuals and groups to better understand and conserve marine and coastal resources. The program strives to meet the needs of ocean users while enhancing the environment and economy of the state, region, and nation. Washington Sea Grant Program extends its capabilities through partnerships with agencies, industries, and citizen groups.

A team of water quality education specialists provides technical assistance, public involvement and education programs and materials to local governments, tribes, industries, schools, and other water resource users in this community. Through its outreach efforts, the team takes an active role in reducing nutrient and pathogen water pollution from failing on-site sewage systems, stormwater, and other nonpoint pollution generators. The annual Kids' Day at OysterFest event brings to life nonpoint pollution education for 500 fourth grade students within Mason County each year.

## Washington State University (WSU) Extension

WSU water quality programs in Thurston and Mason counties work proactively to better protect water resources. Primary program efforts include:

- The WSU Water Resources Real Estate Professional Education program provides information to associates, brokers, developers, and appraisers about water resource issues. The purpose is to assist these real estate professionals and their clients to make sound decisions regarding modifying the landscape. Instruction by local experts covers the issues and related best available science, as well as regulatory and non-regulatory ways water resources can be protected. Courses provide clock hours towards professional license re-certification. A total of 220 participants have been involved during the past year.
- The Native Plant Salvage Project is directly affiliated with WSU Extension, however funding is provided by local jurisdictions, grants, state, and federal agencies. The program educates residents and developers about retaining vegetation to reduce stormwater, increase groundwater recharge, provide filtration and reduce pesticide use. The program has involved over 1200 individuals in its educational programs during the past year and has 250 volunteers.
- On a bi-monthly basis WSU convenes the Environmental Education Technical Advisory Committee, which serves to coordinate and foster collaborative efforts for the educational activities of the non-profits, jurisdictions, and agencies serving the region.
- WSU Extension provides “Country Living” workshops for residents in this watershed on topics directly related to protecting and improving water quality and reducing stormwater.





## Appendix C. Response to Comments

Ecology held a public comment period for the *Tributaries to Totten, Eld and Little Skookum Water Quality Implementation Plan* from August 27 through September 27, 2007. Public notice was mailed to riparian landowners along the subject streams, and display ads ran in The Olympian and Shelton-Mason County Journal. Ecology made the document available to the public on our website and placed hard copies at the Shelton and Olympia Timberland libraries.

Following are the comments received, and Ecology's response. **Please note: Comments are reprinted in entirety below. Only those parts of comments pertaining to the cleanup plan itself (which was the subject of the comment period) are addressed in the responses. Cleanup actions must occur within the context of existing regulations. Changes to the water quality standards or other regulations are conducted through other processes.**

### Comment #1 (8/25/07)

This email is a follow up to a publication titled *Tributaries to Totten, Little Skookum and Eld Inlets Water Quality Implementation*, which list Schneider Creek as having too much bacteria, fecal coliform.

#### Question #1

Is it the opinion of the Washington State Dept. of Ecology and anyone else involved like the Squaxin Tribe, Thurston and Mason Counties that the beavers which have dams in & have been living in the Schneider Creek, contribute to the level of fecal coliform ???

#### Question #2

OR has the Dept. of Ecology installed a new septic system for the Beavers?

#### Question #3

Since the word is Chum Salmon are bad jumpers has the Washington State Dept of Ecology bred new Chum Salmon that can jump over the Beaver damns when migrating up stream ??

#### Question #4

Does it seem a little strange to have lowered the Culvert, for Schneider Creek, after some local citizens expressed their concerns by probably less the height of a beaver damn, under the road going into Holiday Valley housing development but then require the Chum Salmon to jump over Beaver damns further up the river ?

## Question #5

Does some state agency have better resources for live trapping beaver and transporting them to a better location where they do not harm the salmon run, than Joe Citizen?

Will be looking forward to receiving answers to the above questions in a response email.

Best Regards  
Joe Citizen.

### **Response #1**

The beaver in Schneider Creek and elsewhere certainly contribute fecal coliform bacteria, as do other wildlife.

The state water quality standards are calculated to protect what we call the "beneficial uses" of a given water body. Beneficial uses are things like recreation. The bacteria standard is set at a level that minimizes the risk of illness to people exposed to the water. The question is "How much is safe?", not "Where do the bacteria come from." If safe is defined as 100 units of bacteria, and wildlife are contributing 75 units, human-related sources like livestock, pets, and septic systems can only contribute 25 additional units.

When bacteria concentrations are too high, we do look for places where wildlife concentrations might be dense due to human practices, for instance garbage management or feeding geese along a shoreline. We try to reduce those sources.

The Water Quality Implementation Plan does not address salmon management.

### **Comment #2** (9/25/07)

While we are in the process of implementing some Best Management Practices (BMPs) on our small farm in light of the fact that the McLane Creek has been placed on the federal 303d list for polluted waterways with too much fecal coliform, I would like to have on public record that I am still not convinced that the high readings on the McLane Creek during the summer and early fall are directly related to livestock sources, and as such, am a bit skeptical about the Ecology clean up plan. I could be very wrong of course, but what is clear is that the high fecal coliform readings are clearly a seasonal issue, that they occur when stormwater flows are at their lowest, and that they are naturally cleaned up each and every winter when high stormwater runoff enters into the equation. As such, the readings on the McLane Creek actually seem to indicate that high runoff during the late fall and winter from adjacent properties is precisely what cleans it up, rather than the other way around. I also believe that one surefire direct culprit for increased bacteria loading in Eld Inlet itself is most probably coming from sea gulls. When the tide is out, Mud Bay alone is often riddled with numerous sea gulls literally hopping around all over the sediments above the water line until the tide rolls back in. Their population in the Mud Bay area has also sky-rocketed since the Thurston County Landfill started sending its garbage to Eastern Washington.

While it is certainly possible that cows and horses on the McLane Creek are contributing to the high fecal coliform readings in the McLane Creek, it is not likely that they are the primary contributors precisely because they are not in the creek. Some have suggested that bacteria is running off agricultural fields during the winter, lays dormant, and then grows during the summer. I still find this scenario highly unlikely, especially when you consider the great upheavals that McLane Creek experiences each and every winter, and the cold rains which invariably inhibit bacteria growth. It is also true that most of our rains occur when nothing is growing and not conducive for bacterial growth. I was also disappointed to hear from both local officials in our own clean-up committee that microbial source tracking is actually far more limited and subjective than I realized when it comes to tracking actual fecal sources, which was also corroborated in an expensive book I read through called “Microbial Source Tracking.” I therefore suspect that we are on somewhat of a wild goose chase and am not convinced that we are going to get to the bottom of this alleged bacteria crisis on McLane Creek.

Furthermore, in light of our unusual weather patterns, a standard of a geometric mean of 100 cfu/100 ml with no more than 10% of the samples not to exceed 200, which does not seem to take into account seasonal variations, is perhaps not the best way to simply designate McLane Creek a polluted waterway. If McLane Creek is partially stagnant in many places behind numerous log jams during the summer and early fall, perhaps some variances of some sort to this standard should be considered to properly reflect what is going on in the creek? The TMDL process does allow for such considerations. Focusing on dry season sampling skews reality and also turns the exceptional months into something normative. The National Academy of Sciences mentions (in their booklet – *Assessing the TMDL Approach to Water Quality Management*) that many states have incorporated flow restrictions into water quality assessments, meaning that water quality standards must be maintained at all times, except at flows less than some specified low value. I do not know if Ecology has an allowance for this in Washington State, but I strongly believe that this needs to be a serious consideration for McLane Creek, which could also be easily incorporated precisely because our summers are so consistently dry. The low flow restriction thus could also be connected to seasonal variation, which the National Academy of Sciences also strongly recommended be taken seriously during the TMDL process. The more data I see actually leads me to believe that high bacteria counts are actually a natural phenomenon in southern Puget Sound each and every summer.

As such, I would also like to add that the seasonal variation of high fecal coliform readings on the McLane Creek during the summer and early fall is perhaps something which we should expect, with or without people, cows and horses, rather than be all shocked by it. Our weather patterns are highly peculiar compared to the rest of the country. In places east of the Mississippi they generally receive equal amounts of precipitation each and every month. The monthly variations are very small. Not so here, far from it. We go from one extreme in November, December, January and February, with tremendous amounts of rainfall during that time period, to the other extreme in summer when rainfall is very light and almost non-existent for about 3 months. In July and August Phoenix, Arizona receives more rain than Seattle does. June may be cool and cloudy with lots of marine push in the mornings, but it is still not a rainy month. September can go either way, and sometimes even October can be dry as well. What this means that is that the McLane Creek flows, like many other streams throughout western Washington not fed by melting snows or glaciers, are extremely low in the summer. Moreover, there can be no doubt that come July, any wild animal living anywhere in the vicinity of McLane Creek, is

going to have to go down to the creek to get water, everything from our resident elk herd, to the deer, to coyotes, to our bear family, not to mention all kinds of rodents, innumerable birds that leave their sign all over the place. There is simply no other place to get water during the summer months. The McLane Creek is thus a magnet for wildlife activity during the summer, but is not during all the other months because water is standing around all over the place, not to mention hibernation patterns. It should also not surprise us that the fecal coliform levels run higher the farther the creek flows downstream, for the simple reason that the stream is being used more and more as it goes along, especially on our property where there are no houses. As such, our small farm is actually a natural oasis for wildlife with less human activity. Is this not what environmentalists and conservationists really want?

All of this put together is also one of the primary reasons why states did not try to regulate us all prior to the 1972 Clean Water Act precisely because watershed analysis is very often an extremely complex operation and also very expensive, which becomes far more politically and economically complicated when private property issues are connected to it. As such, the states let it go, properly recognizing their limitations and the great consequences they would run into if they tried to micromanage such scenarios. Even the Environmental Protection Agency (EPA) recognized this for many years after the 1972 Clean Water Act was passed as they focused on industrial direct point source discharge pollutants – that is – until environmentalists started suing them for not regulating what private people do on their own private properties, which is otherwise known as nonpoint source pollution. Since that lawsuit in 1987, the EPA has switched gears and now is placing a premium on nonpoint source pollution, which defines pollution so broadly that virtually our entire society has been placed under environmental suspicion just for living in the modern world precisely because roofs, gutters, roads, lawns, barns, pastures, cars, septic tanks, drain fields, livestock and pets, all allegedly contribute small levels of pollutants off of various properties which supposedly collect, concentrate and eventually load up our waterways downstream.

The upshot of nonpoint source pollution is that it makes us all polluters by definition, assumed guilty until proven innocent, the exact opposite of everything that our country used to stand for. In my opinion, this is a most dangerous trend fraught with all kinds of potential liability down the road where expensive lawyerism will rue the day, leaving the property owner with little recourse, looking like the proverbial dutch boy in reverse trying to control stormwater on his land. All of this goes way beyond just keeping livestock out of state waters anymore. Now a property owner's pastureland adjacent to the creek gets placed under environmental suspicion, but so does everyone else's dog, cat, roof, car, garage, parking area, septic tank and drain field as well as far as that goes. Our society is already chock full of all kinds of other potential unnecessary liability, and nonpoint source pollution only adds more fuel to the fire.

I cannot be told that a 100 mile long buffalo herd being followed by thousands of wolves along the way (based on actual eyewitness reports of the 1800's) walking along the banks of any river on the Great Plains did not naturally create high fecal coliform readings that would have been off the charts. Today, environmentalists often complain about 5,000 buffalo allegedly destroying Yellowstone Park's habitat. What would millions and millions of buffalo do to all the rivers and streams in the west, especially come summertime when the heat is on, and the water is scarce? They will all be following close to the streams and rivers for their very survival, tromping up the streambanks, and leaving all kinds of bacteria behind. What do you think giant hippos do in

lakes and rivers in Africa as they spend almost all their time in the water, not to mention elephants, rhinos, and millions of wildebeests, and other countless critters who need water but do not ask for a government permit to do so. Hikers are also everywhere warned when they go hiking in the pristine wilderness about the dangers of giardia.

More to the point, the natural world without people is not a paradise that needs to be returned to at all costs, and thus should never be used as a standard to strive for, especially where people must live and work, and thus “pollute” by definition, since nonpoint source pollution has become the standard to judge all Americans as guilty without trial. However, our farm, the McLane Creek, Eld Inlet and Puget Sound are not a state park for wildlife. Neither are shellfish farms, nor tribal lands. The federal government alone already owns 40% of the state of Washington, which is far more than enough land when it comes to preservation and conservation. As such, I can neither fathom the sense it makes for conservation groups to be buying up more and more land all the time. This is a frequent topic of discussion in our clean up committee, which strongly implies and suggests that the only real way to control bacterial pollution is to remove people from the land. This increasing anti-human attitude with a plethora of environmental regulations leading the way, specifically designed to restrict, micromanage, control and perhaps even remove people from land, is not a good harbinger of things to come for any free society. The cure will inevitably wind up being far worse than the disease it is allegedly trying to fix.

For thousands of years people on a worldwide scale have watered their domestic animals in streams, lakes and rivers, and now all of a sudden, within a matter of some 30 years, this widespread worldwide traditional practice has been essentially outlawed, thanks to the Clean Water Act. What would livestock drink from if we did not have modern infrastructure and wells to water them? Perhaps the Ecology department should take this into serious consideration as to how much worse the fecal coliform counts would be if this were not the case, rather than constantly blame people and farms all the time. When environmentalists look at cities, farms, houses and development, all they see is pollution. This is a very one sided and extremely narrow view of the world which all too often also has way too much regulatory authority, especially in the state of Washington.

When I sit in an Ecology clean up meeting, and the people involved complain about development and all the pollution that it invariably entails out of one side of their mouths, and then be excited about finding a new place to meet in, or anxiously wait a beautiful home that is about to close for them, I can only sit back and ponder such a congruence of attitudes all in the same breathe. Furthermore, when county and state officials complain that recreational swimmers in a given lake leaves too much bacteria behind when they are done, and then when I consider that one of the primary purposes of why we allegedly regulate water quality is to make them “swimmable,” I can only conclude that there is definitely something wrong with this picture. Regulating water quality for public use that virtually cannot be touched is not very helpful to society in any shape or form. It winds up being an abstract social feel good regulation with no individual benefit. Or as the old age says, it does no earthly good.

Sincerely concerned,

Mark Musser

## **Response #2**

Please see the response to comment #1 regarding contributions from wildlife and water quality standards. We do not know for sure if livestock, or septic systems for that matter, are the “main cause” fecal pollution in McLane Creek. But if they are contributing feces to the water that must be addressed in order to return water to safe bacteria levels. While winter rains “clean up” the bacteria in the sense that bacteria concentrations are diluted enough to no longer violate water quality standards, feces are still entering our waterways where they may be contaminating sediments and where they deplete oxygen when they decay.

The Environmental Protection Agency requires TMDL studies to evaluate the “critical period” which, in this case, is the low flow summer period. Since the water quality standard for bacteria is based on protecting people who play or fish in the water, some might think summer is the most important time to assure safe bacteria levels. However, the water quality standards are reviewed periodically and there are opportunities for public input. For this report, we must use the standards as currently set.

## **Comment #3** (9/26/07)

It seems to me that it is time to take strong measures to stop failing septic systems and animal waste from getting into our inlets. I live on Eld Inlet and raise oysters on my beach, I also own oyster beds that I lease. It is beyond me why we cannot have strong enforcement action against pollution of the inlets.

We do not need any more studies we need action. If corrective action is "not funded" as it appears to be for many situations, let's correct it now. The situation of increased development at the Steamboat Island Rd. intersection with 101 needs a serious look as well. Steamboat Square proposes to install a mega septic system in a hollow that is likely to cause problems for area wells and Eld Inlet.

Tom Honan

## **Response #3**

Enforcement is definitely an element of the cleanup plan when there is an identified pollution source and voluntary compliance has failed. To make that more clear a line has been added to Table 1 under *Area-wide Actions*.

Enforcement actions are most often generated in response to specific complaints. Known sites or septic system failures should be reported to Ecology or the county staffs. Agencies generally work with landowners to make sure they understand the problem and their responsibility under the law, and give them a chance to come into compliance.

With nonpoint pollution, identifying the source is often very difficult. Even when a water quality problem area is identified through sampling, it often takes extensive investigation to identify the source(s). Because bacteria comes from all warm blooded animals, tools are still

being developed that can help investigators determine what the source is. The “additional studies” proposed in the plan may be needed in order to figure out what the sources are.

New development is a different issue. If proposals meet all of the current zoning, development, and on-site sewage regulations, then the proposal is approved. There have been extensive public workshops and public involvement opportunities regarding zoning and development regulations in Thurston County in the past year, including meetings in the Steamboat interchange area.

We have been fortunate in this cleanup project that almost all of the known, high priority actions are funded and are in progress. Others actions will begin as need and funding sources are identified.

**Comment #4** (9/26/07)

I am so concerned about the Puget Sound. There is no reason that we should be in the mess we are in anymore. Please, the condition of the Sound is so serious. You need to make it a priority to clean it up. You are the only ones that can enforce the public to protect the Sound and in the meantime notify the public how disgusting it is and show them how to help protect our lovely resource.

Anne Buck Olympia, Wa.

**Response #4:**

Thank you for your concern and comment. As you probably know, a great deal of work is underway at all levels to restore Puget Sound.

**Comment #5** (9/26/07)

thanks for listening. my message is short. I know you are considering several options for the plan. please weigh me in for the options that afford the most protection against the degradation of our home, earth.

thanks again, dan kelly

**Response #5:**

Thank you for your concern and comment.

**Comment #6** (Sept. 27)

This is to urge the strongest possible actions to clean up these precious and vulnerable water bodies.

I am alarmed to learn that fecal coliforms have been found in these areas, and I believe this calls for more rigorous monitoring and enforcement of septic maintenance and of shoreline rules, so that vegetation is left in place (or reestablished where disrupted) to halt or slow the transport of such materials into the waterways.

I am the owner of residential property on the Eld Inlet shoreline, where I lived for 10 years. I now live on the shores of Budd Inlet, near downtown Olympia, where water quality is much more degraded. We need to muster the determination to see that water quality in Eld and Totten is restored and maintained.

Please convey my comments to the appropriate enforcement personnel at the DOE.

Thank you for your attention.

Peggy Bruton

**Response #6**

Please see Response #3. Most of the work of this cleanup plan (as reflected in Table 1) is focused on septic system maintenance and riparian (re)vegetation and other runoff management practices.

**Comment #7** (September 27, 2007)

I have been a participant in the study group and the drafting process for this TMDL study for Totten and Eld inlets for over a year, and I have been very impressed by the superlative job you and your staff and other associates have done. The science was excellent, the care, conscientiousness, and professionalism displayed by all agencies involved were outstanding.

This draft plan is encouraging. It's a beautiful product.

I especially approve of the plans to involve the public in the process of cleaning and maintaining these inlets in healthy ways, since the public are the ones causing the problem in the first place. Particularly on page 27, 'investigate and use local codes to correct problems identified in DOH's 2004 Survey...(of these areas under study). This is very encouraging. I would like to see more codes than these referred to, however, since I have seen that there are often odd gaps and inaccuracies in various agencies regulations. In my view, the more regulatory agencies scrutinizing the area, the better.

I must insist that education alone will not be enough to help these inlets achieve or maintain healthy water. I live on Totten Inlet. Everyone I've ever talked to, on or off the shoreline, knows that human and animal waste entering the sound is bad. Bad for wildlife, beach walkers, fishermen, swimmers, shellfish growers, people who are employed by growers, on and on and on...and just about everyone knows how the pollutants get there—via wetlands, seeps, streams, unnamed drainage, etc. Knowing this achieves nothing, if the knowledge produces no



action. I have already submitted a comment letter articulating my very firm position on this, and I will here briefly summarize that position rather than say it all again.

Pollution sources must be identified. This is still underway, and will be an exciting and challenging process, and one I'm sure will be successful, giving the expertise and ability of DOE staff. Once these sources are identified, firm and speedy action must be undertaken. Education might work, but if it does not, then the necessity for concrete, decisive action remains, by regulatory action firmly applied. Monitoring and enforcement and if necessary, regulatory action, are critical to the success of this plan.

I look forward greatly to the rest of the process and am very exciting to watch it progress. It is such a worthy and valuable and very necessary goal.

Thank you,

Gayle Broadbent  
Adams Cove Group

### **Response #7**

Please see Response #3 re enforcement. Enforcement could potentially fall to at least four of the involved agencies, as well as to different units of those agencies, making it very difficult to cite specific codes and regulations in the plan.

In many cases nonpoint pollution is the result of cumulative impacts from many small sources, none of which, in itself, violates water quality standards. Even larger nonpoint sources are typically very hard to track down. As a result education, technical assistance, and other kinds of support to landowners is frequently the most effective way of dealing with the pollution. For achieving long-term, sustainable behavior changes, education is the best way. But enforcement is certainly part of the cleanup picture where needed and possible.

### **Comment #8** (9/28/07)

Thank you for providing me with the opportunity to review the draft Tributaries to Totten, Eld and Little Skookum Inlets Water Quality Implementation Plan August 2007. Pub. No 07-10-071.

One of the terms used in the text is "human-related". This term is not defined in the glossary. I am confused as to whether this included livestock and pet waste or not. It would be helpful if the definition were included in the glossary of terms.

There are a couple of places where there are some consistency issues related to grammar. Non-point or nonpoint? Both are used in the text. When listing two counties, the word county starts with a lower case 'c'. This is currently represented in the document both ways.

On Page 1 and 27. Steve Bloomfield is missing from the TAG listing although he is listed on the official roster of TAC members distributed by Kirsten a few months back. I have attached the print out for reference. He is both a resident and Shellfish producer.

On page 5, third paragraph, “Approximately 76 acres of this estuary a incorporated into a Natural Area Preserve managed by the WDNR.” This statement should read ...are incorporated?

In paragraph 4 of the same page, the extensive resort that the tribe has created and the future golf course should be noted.

Starting with Table 1 there is a problem with formatting. Many of the words are missing or misaligned. I appreciate the challenges with table formatting and hope that you can rectify the problems for the final document. I like the mention of the overall actions within each sub action area. Under the on-site septic system element on page 10, Sea Grant is not currently funded for this work. In the Hurley creek section, I believe there is an alignment problem relative to Mason County’s investigation of the multi-unit system.

On page 19, under Funding Opportunities – missing is Shorebank Pacific’s low interest loan program. The program is available to all Mason County property owners.

Please let me know if you have any questions about my comments. Again, thank you for the opportunity to review this document. I look forward to working with you on implementing this plan for the bacterial and temperature attainment goals set for these tributaries.

Teri King  
WA Sea Grant

**Response #8**

Comments have all been addressed. Thank you.

# Appendix D. Letters of Concurrence



COUNTY COMMISSIONERS  
Cathy Wells  
District One  
Diane Olszewski  
District Two  
Robert N. Meekrod  
District Three

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'07 SEP 26 AIO 48

BOARD OF COUNTY COMMISSIONERS

WA STATE  
DEPARTMENT OF ECOLOGY  
SW REGIONAL OFFICE

Date: September 18, 2007

Ms. Chris Hempleman  
Department of Ecology  
PO Box 47600  
Olympia, WA 98504-7600

Re: Letter of Concurrence for the draft "Tributaries to Totten, Eld and Little Skookum Inlets - Fecal Coliform Bacteria and Temperature Total Maximum Daily Load - Water Quality Implementation Plan"

Dear Ms. Hempleman:

Thurston County has been a participant with agencies, tribes, organizations, property owners, and counties in the Totten, Eld, and Little Skookum watersheds in developing a Water Quality Implementation Plan. During this process certain actions have been identified for each of the participating organizations to implement that will improve water quality.

Thurston County has already implemented many of the actions identified in the plan that have helped improve water quality. We will continue those actions and proceed with others as our local priorities and resources allow.

Thank you for the important work that is necessary to improve the quality of Thurston County's waters.

Sincerely,

Chairman  
  
Vice-Chairman  
  
Commissioner

Building #1, Room 269, 2000 Lakeedge Drive SW, Olympia, Washington 98502-6045 (360) 785-5410  
Rel. Call: 360-785-5410 Fax: 360-785-5411 TDD: (360) 774-2933



Ecology Paper

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07 OCT 10 10:40

WASHINGTON STATE DEPARTMENT OF ECOLOGY  
3600 15TH AVENUE, SUITE 300  
OLYMPIA, WA 98504

11840 North Highway 101  
Shelton WA 98584  
(360)427-9670 x 682

October 4, 2007

Christine Hemplinger  
Toxics/Fish/Life Skookum TMDL  
Washington State Department of Ecology  
PO Box 476000  
Olympia WA 98504-7600

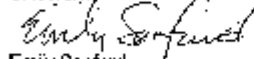
Dear Ms. Hemplinger,

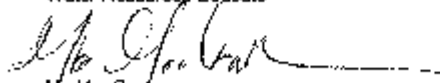
This letter is written on behalf of Washington State University Extension Mason County regarding the Tributaries to Totten, Eld and Little Skookum Inlets Water Quality Implementation Plan. WSU Mason County Extension has been a stakeholder in this planning process and agrees to take on the tasks assigned to us in the plan, depending on the availability of funding for these tasks.

We have reviewed the TMDL Improvement Report and the Water Quality Implementation Plan and concur with their findings and recommendations. We find the plan consistent with our goals of providing research-based water resources information and educational programs to the public to promote responsible land and water stewardship to protect aquifers, streams, rivers, wetlands, marine waters and the resources that these water bodies provide.

The tributaries and ultimately the Inlets involved in this implementation Plan serve many purposes within this community. We appreciate how this process has brought together an important array of stakeholders who have all offered invaluable knowledge on the status and sources of pollution as well as taken many steps to implement tasks from plan already. WSU Mason County Extension commends the participants in this workgroup for their efforts and looks forward to being a part of restoring the water quality in these tributaries to proper standards. WSU Mason County Extension will continue its efforts to foster a strong stewardship ethic by reaching out to the youth and landowners of this watershed.

Sincerely,

  
Emily Sanford  
Water Resources Educator

  
Ms. MacCracken  
Interim Director, WSU Mason County Extension

11840 N. Highway 101, Shelton, WA 98584-0701  
360-427-9670 Fax: 360-427-2754-671 Ext. 306 • Fax: 360-427-7261 • TDD: 360-427-1458 • <http://mason.wsu.edu>

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Conservation Planning • Habitat Restoration • Discharge Permitting • Soils Analysis • Conservation Education • Soc. & Econ. GREEN • Habitat Management

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October 15, 2007

07 OCT 17 4:01:18

Ms. Christine Hempleman  
Eld/Totten TMDL Coordinator  
Department of Ecology  
PO Box 47600  
Olympia, WA 98504-7600

WA STATE  
DEPARTMENT OF ECOLOGY  
SW REGIONAL OFFICE

Re: Letter of Concurrence for Eld/Totten Water Quality Implementation Plan

Dear Ms. Hempleman:

The board and staff of the Thurston Conservation District support and concur with the Eld/Totten Water Quality implementation Plan that has been developed through the Eld/Totten Technical Advisory Group. We have participated in this collaborative effort since it began and support the actions that have been developed in the plan. In fact, we're already working with local landowners to implement actions identified in the plan.

The District supports the efforts to improve water quality throughout Thurston County. Water quality protection and improvement is a high priority for the District and such work is part of our Long Range Plan. The District has been identified as one of the "leads" that will help implement several of the cleanup actions. Our work focuses on working with local landowners by providing technical assistance and education & outreach. Conservation Districts depend on individual responsibility and voluntary action to protect and conserve natural resources. We are a non-regulatory agency. Our role is to offer landowners/occupiers with information, technical assistance, education and resources necessary to practice good stewardship.

It is our expectation that the agencies with the authority and responsibility for enforcement of laws and regulations will utilize their ability to do so. This key action is periodically needed for success with a landowner who fails to comply with local laws and regulations.

If you have any questions or need additional information, please don't hesitate to contact me at [kwhalen@thurstoncd.com](mailto:kwhalen@thurstoncd.com) or 360-764-3588, ext. 114.

Sincerely,

Kathleen S. Whalen  
District Administrator

921 LeSourdway SW Suite 101 • Olympia, WA 98502-0004 • Fax (360) 736-6044 • Phone (360) 754-3588  
• website: [www.thurstoncd.com](http://www.thurstoncd.com) • Email: [tdc@thurstoncd.com](mailto:tdc@thurstoncd.com)



MASON COUNTY BOARD OF COMMISSIONERS

1st District LYNEA RING ERICKSON

2nd District TIM SHELDON

3rd District ROSS GALLAGHER

Mason County Building 1 411 North Fifth Street Shelton, WA 98584-3400 (360) 427-5670 ext. 419 (360) 275-4467 ext. 419 (360) 482-5269 ext. 419 Fax (360) 427-8437

October 23, 2007

Chris Hempleman Water Quality Program Washington State Department of Ecology SW Regional Office PO Box 47775 Olympia, WA 98504-7775

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07 OCT 29 110 55

WA STATE DEPARTMENT OF ECOLOGY SW REGIONAL OFFICE

Dear Ms Hempleman,

This letter is written on behalf of Mason County regarding the Tributaries to Totten, Eld and Little Skookum Inlets Fecal Coliform Bacteria and Temperature Total Maximum Daily Load (TMDL) Water Quality Implementation Plan. The county agrees to undertake the tasks assigned to Mason County in the plan providing funding is available for such work as outlined in the following paragraphs.

Mason County Public Health in conjunction with WSU Extension will conduct onsite septic system workshops to help landowners with proper operations and maintenance of their onsite septic systems. This education and outreach is an ongoing effort.

Records will be evaluated to identify high-risk septic systems and monitoring of surface water will be used as an investigation tool as funding is available. Homeowners will be assisted with septic system repair and replacement as necessary. Information on financial assistance programs such as the Shore Bank Cascadia model will be distributed to those seeking assistance.

The citizens and officials of Mason County value the importance of our natural resources, agricultural and recreational uses, and the importance of the shellfish industry in Totten and Little Skookum Inlets. The Mason County Board of County Commissioners supports the efforts of the TMDL plan to mitigate pollution sources affecting the tributaries to Totten and Little Skookum Inlets.

Sincerely,

BOARD OF MASON COUNTY COMMISSIONERS

Lynea Ring Erickson Tim Sheldon Ross Gallagher Chair Commissioner Commissioner



---

**Mason Conservation District**  
450 W. Business Park Road • Shelton, WA 98584  
Phone: (360) 427-9438 • FAX: (360) 427-4396

Ms. Chris Hempleman  
Water Quality Program  
Washington Department of Ecology  
P.O. Box 47775  
Olympia, WA 98504-7775

**SUBJECT:** Letter of Concurrence Totten/Eld Cleanup Plan

Dear Ms. Hempleman:

The Mason Conservation District has reviewed DOE's proposed Totten/Eld cleanup plan. The Conservation District supports the effort to develop and implement a strategy to reduce nutrients and pathogens in this watershed.

Therefore, the Conservation District concurs with the cleanup plan proposed by DOE and will work with the Department to reduce nutrients and pathogens in this watershed.

If you have questions or need additional information feel free to contact me at your convenience.

Best regards,

A handwritten signature in black ink that reads "John Bolender".

John Bolender, District Manager  
Mason Conservation District





## Appendix E. Glossary and Acronyms

**303(d) list:** Section 303(d) of the federal Clean Water Act requires Washington State periodically to prepare a list of all surface waters in the state for which beneficial uses of the water – such as for drinking, recreation, aquatic habitat, and industrial use – are impaired by pollutants. These are water quality limited estuaries, lakes, and streams that fall short of state surface water quality standards, and are not expected to improve within the next two years.

**Best Management Practices (BMPs):** Physical, structural, and/or operational practices that, when used singularly or in combination, prevent or reduce pollutant discharges.

**Clean Water Act (CWA):** Federal Act passed in 1972 that contains provisions to restore and maintain the quality of the nation’s waters. Section 303(d) of the CWA establishes the TMDL program.

**Designated Uses:** Those uses specified in Chapter 173-201A WAC (Water Quality Standards for Surface Waters of the State of Washington) for each water body or segment, regardless of whether or not the uses are currently attained.

**Effective Shade:** The fraction of incoming solar shortwave radiation that is blocked from reaching the surface of a stream or other defined area.

**Fecal Coliform (FC):** That portion of the coliform group of bacteria which is present in intestinal tracts and feces of warm-blooded animals as detected by the product of acid or gas from lactose in a suitable culture medium within twenty-four hours at 44.5 plus or minus 0.2 degrees Celsius. FC are “indicator” organisms that suggest the possible presence of disease-causing organisms. Concentrations are measured in colony forming units per 100 milliliters of water (cfu/100mL).

**Geometric Mean:** A mathematical expression of the central tendency (an average) of multiple sample values. A geometric mean, unlike an arithmetic mean, tends to dampen the effect of very high or low values, which might bias the mean if a straight average (arithmetic mean) were calculated. This is helpful when analyzing bacteria concentrations, because levels may vary anywhere from ten to 10,000 fold over a given period. The calculation is performed by either: 1) taking the nth root of a product of n factors, or 2) taking the antilogarithm of the arithmetic mean of the logarithms of the individual values.

**Human-related:** Having to do with actions or practices of humans (i.e., not naturally occurring). This includes land use practices like maintaining streamside vegetation; a range of animal keeping practices like manure management and streamside fencing, as well as managing pet waste; proper management of on-site sewage systems; and other practices such as sanitary habits in recreational situations.

**Load Allocation (LA):** The portion of a receiving waters’ loading capacity attributed to one or more of its existing or future sources of nonpoint pollution or to natural background sources.

**Loading Capacity:** The greatest amount of a substance that a water body can receive and still meet water quality standards.

**Margin of Safety (MOS):** Required component of TMDLs that accounts for uncertainty about the relationship between pollutant loads and quality of the receiving water body.

**Nonpoint Source:** Pollution that enters any waters of the state from any dispersed land-based or water-based activities, including but not limited to atmospheric deposition, surface water runoff from agricultural lands, urban areas, or forest lands, subsurface or underground sources, or discharges from boats or marine vessels not otherwise regulated under the National Pollutant Discharge Elimination System Program. Generally, any unconfined and diffuse source of contamination. Legally, any source of water pollution that does not meet the legal definition of “point source” in section 502(14) of the Clean Water Act.

**Pathogen:** Disease-causing microorganisms such as bacteria, protozoa, viruses.

**Point Source:** Sources of pollution that discharge at a specific location from pipes, outfalls, and conveyance channels to a surface water. Examples of point source discharges include municipal wastewater treatment plants, municipal, industrial, and construction stormwater discharges, and industrial waste treatment facilities.

**Pollution:** Such contamination, or other alteration of the physical, chemical, or biological properties, of any waters of the state, including change in temperature, taste, color, turbidity, or odor of the waters, or such discharge of any liquid, gaseous, solid, radioactive, or other substance into any waters of the state as will or is likely to create a nuisance or render such waters harmful, detrimental, or injurious to the public health, safety, or welfare, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish, or other aquatic life.

**Total Maximum Daily Load (TMDL):** A distribution of a substance in a water body designed to protect it from exceeding water quality standards. A TMDL is equal to the sum of all of the following: 1) individual wasteload allocations (WLAs) for point sources, 2) the load allocations (LAs) for nonpoint sources, 3) the contribution of natural sources, and 4) a Margin of Safety to allow for uncertainty in the wasteload determination. A reserve for future growth is also generally provided.

**Watershed:** A drainage area or basin in which all land and water areas drain or flow toward a central collector such as a stream, river, or lake at a lower elevation.