

## Deschutes River, Capitol Lake, and Budd Inlet TMDL Advisory Group Meeting

Thursday, August 25, 2011 -- 9:05 a.m. to 11:35 a.m.  
Tumwater Fire Department, 300 Israel Rd. SW, Tumwater

### Attendees

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#### Black Hills Audubon Society

- Sue Danver

#### Citizen

- Debra Jaqua

#### Deschutes Estuary Restoration Team (DERT)

- Dave Peeler

#### Ecology, WA State Dept. of

- Betsy Dickes
- Dave Dougherty
- Brett Raunig
- Lydia Wagner

#### Environmental Protection Agency (EPA)

- Dave Ragsdale

#### General Administration (GA), WA Dept. of

- Carrie Martin

#### LOTT Clean Water Alliance

- Lisa Dennis-Perez
- Laurie Pierce

#### Olympia, City of

- Laura Keehan
- Patricia Pyle

#### Olympia, Port of

- Robert Zinkevich

#### Olympia Yacht Club

- Jim Lengenfelder

#### Thurston County Environmental Health

- Sue Davis

#### Thurston County Water Resource Program

- Rich Doenges

#### Thurston Public Utilities District

- Chris Stearns

#### Washington State University Extension Office

- Bob Simmons

### Septic Systems and Water Quality

*Sue Davis, Senior Environmental Health Specialist, Thurston County Environmental Health*

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Sue provided an overview of septic systems including how they work, fail, and the public health and water quality issues associated with them. The focus was on urban areas.

A trend occurring in this watershed is the increase in nitrates. Many surface waters have an excess of nutrients, as seen in areas with algae blooms. The EPA and Ecology are documenting the higher levels of nutrients in the Puget Sound area. Density can help control nitrogen input.

Some interesting points:

- Approximately 5,000 septic systems within the city limits of Olympia, Lacey, and Tumwater
- Approximately 70,000 septic systems in Thurston County
- 9,000 within the Urban Growth Areas (UGAs)
- This means there are 3 million gallons per day (mgd) of sewage going directly into the ground every day from septic systems in the urban areas.
- Olympia area – High densities of septic systems on the prairie soils along Yelm Highway above the Deschutes and in the northeast along South Bay

- Tumwater area – A lot of septic systems east of the Olympia Airport and east of Black Lake in an area with fairly shallow groundwater and sandy soil
- Approximately 13% of failing septic systems on marine shorelines

Many neighborhoods developed in the 1950s and 1960s are densely populated. This results in a lot of sewage going into the ground within a relatively small geographic area. This occurred because platting and septic system regulations were not in place yet. Multi-family use units such as apartments, duplexes, and four-plexes, located on small lots, result in higher volumes of septic effluent.

There are large community septic systems which can serve whole neighborhoods. For example, 100 apartment units and 100 homes could generate more than 36,000 gallons per day (gpd) of sewage. This sewage would be disposed of into a large drain field on a parcel less than 5 acres and could be located in a critical aquifer recharge area.

Small lots have their own challenges. If the septic system is failing, it could affect neighbors or discharge to the street. This would depend on the location of the drain field. The property may have had an area originally designated as auxiliary space for drain field repairs. Over time, property owners often convert these areas to other uses such as decking or storage.

It is expensive to get properties from septic systems connected to sewer systems. There is no current funding source to help pay for this conversion. She provided an example of an existing effort in the Henderson Watershed Protection Area.

Contact information:

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Thurston County Septic Help Line  
 360-867-2669

Failing Systems  
 360-867-2673

Thurston County website links:

- **Public Health and Social Services:** <http://www.co.thurston.wa.us/health/ehoss/index.html>
- **Septic System Operation & Maintenance:** <http://www.co.thurston.wa.us/health/ehoss/maintenance.html>
- **Henderson Watershed Protection Area:** <http://www.co.thurston.wa.us/health/ehrp/henderson.html>

Sue's presentation slides are available online at

<http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/advgrp.html/082511-DeschutesAdvMtg-Septics-SDavis.pdf>.

## Focus on Nitrogen Removal & LOTT's Impact on Budd Inlet Presentation

Laurie Pierce, Operations & Facility Director, LOTT Clean Water Alliance

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As a reminder, she stated the LOTT Clean Water Alliance is a not-for-profit corporation representing the cities of Lacey, Olympia, and Tumwater, and Thurston County. She focused her presentation today on issues related to Budd Inlet (BI).

*The following notes are highlights from her presentation slides.*

**Slide 2:** The Budd Inlet Treatment Plant (BITP) is LOTT's main treatment facility, located at the base of the Port of Olympia peninsula and discharging into Budd Inlet (BI) at the southernmost end of the Puget Sound. The BITP treats an average of 11 million gallons a day (mgd) of wastewater to "advanced secondary" standards. Most of the treated water is discharged into BI. A portion of the plant effluent, up to 1 mgd, is treated to Class A Reclaimed Water standards.

**Slide 3:** Identifies the two outfalls of the BITP. The North outfall is located near the KGY Radio station and the other is to the west at Fiddlehead Marina. The Fiddlehead Outfall is used only in emergencies or when they exercise their Combined Sewer Overflow pumps twice yearly. In the last five years, and due to excessively heavy rainfall events, LOTT has only needed to use the Fiddlehead Outfall for emergencies on two occasions: December 3, 2007 and January 7, 2009.

LOTT and the city of Olympia share the Fiddlehead Outfall line. Some of Olympia's downtown storm drains flow into the 48" line and discharge into Budd Inlet. In 2003, an extensive inspection was completed on some of the storm lines. It identified several cross-connections where sewer lines from some downtown buildings were accidentally connected to the Fiddlehead Outfall. This resulted in raw sewage flowing into Budd Inlet. The inspection identified and corrected similar conditions on the line carrying Moxlie/Indian Creek flow discharging into the East Bay of Budd Inlet.

LOTT's National Pollutant Discharge Elimination System (NPDES) Waste Discharge and Reclaimed Water Permit No. WA0037061, requires them to inspect their outfalls and perform a mixing zone study once during the permit cycle.

*What is a Mixing Zone?* It is an area in a body of water where pollutants from a point source discharge are mixed with cleaner water, usually by natural means. In the mixing zone, the level of toxic pollutants is allowed to be higher than the acceptable concentration for the general water body. The mixing zone is an area where the higher concentration is diluted to legal limits for water quality. Outside the mixing zone, the pollutant levels must meet water quality standards. A typical mixing zone consists of two parts: the *acute* mixing zone where initial dilution takes place (typically near the outfall), and the *chronic* mixing zone which is the area from the acute zone out to where water quality criteria are met.

One concern raised about LOTT's impact on water quality in Budd Inlet is the issue of "reflux" – which is basically how much and how long LOTT's effluent remains in Budd Inlet even after the tide has changed. The Budd Inlet scientific study, conducted in May 2005 by Cosmopolitan Engineering, showed that Budd Inlet actually "flushes" fairly efficiently (once every 8-12 days) in the shipping channel and along the east

shoreline in somewhat of a swirling pattern. The area that gets the least amount of flushing is the southeast finger of the bay.

*What information does the study provide?* First, it assures LOTT and Ecology the outfall is in good condition and functioning properly. Secondly, it gives better information about the size and location of the mixing zones and amount of “reflux” taking place.

**Slide 5:** This was a short video clip taken during the previously mentioned inspection. Evaluations are done by visual inspection, dye testing, sampling and analysis. They sample for conductivity, temperature, water depth, tidal current rate and direction, and dilution factor.

*What happens with the information collected?* It is used in a modeling program which simulates how the dye will disperse under different flow and tidal conditions. This determines how much flow LOTT can safely discharge through the outfall and its diffusers while continuing to meet water quality standards.

**Slide 6:** Explains how the secondary treatment process for the Budd Inlet Treatment Plant works.

**Slide 7:** The upgrade to nitrogen removal cost LOTT approximately \$45.9 million in 1992 (equal to over \$72 million today). The plant in its current configuration is one of the largest power consumers in Thurston County. Their annual power bill is in excess of \$1.3 million to run all LOTT facilities. They sized this process to accommodate potential future brewery loadings. The configuration of the existing de-nitrification system is excessive for current needs. Plans are underway to streamline this process.

**Slide 8:** This information comes from the Budd Inlet Scientific Study conducted by Evans-Hamilton and Aura Nova Consulting Engineers from 1996 – 1998.

**Slide 9:** Ecology reissued LOTT’s NPDES permit in 2005 and included a loadings-based nitrogen limit. They currently still operate with these limits. The “shoulder season” is April, May, and October. The loadings-based permit structure also impacts how much flow LOTT can discharge into Budd Inlet. The cleaner get the water, the more LOTT can discharge. The Total Inorganic Nitrogen (TIN) limits in the permit are some of the most stringent in the country, especially for plants with marine discharges. The results of the TMDL implementation effort will very likely have a significant impact on the permit limits and the way LOTT will manage wastewater in the future.

**Slide 11:** This slide shows a comparison between LOTT and other treatment facilities that discharge in the waters of Puget Sound. A few statistics:

- 280 pounds/day: Average daily total inorganic loading to Budd Inlet from LOTT
- 10.85 mgd: Average flow
- 332 pounds/day: Average over the last 17 years
- 3.08 mg/L: 2010 annual average TIN concentration in LOTT’s BITP effluent
- 4.5 mg/L: 2010 annual average concentration in Class A Reclaimed Water from the Martin Way Reclaimed Water Plant

**Slide 12:** The potential impacts of continuing the “business as usual” approach would have had disastrous results for Budd Inlet and the fish and wildlife who depend on it for their habitat. Challenges ahead include planning for build out without knowing the impacts of the Deschutes, Budd Inlet, and Capitol Lake TMDL; reclaimed water rule; potential new NPDES permit limits; difficulty in acquiring new land; and land use permitting issues.

LOTT anticipates full build out of the Urban Growth Areas by 2053. Their Capitol Plan covers property acquisition, capacity development, repairs, replacements, and improvements to their systems. They would like to avoid the large rate increases seen across the nation. They are planning far enough into the future to make small and incremental rate changes now. They do this so as technology, regulations, and the economy change, they will have sufficient funding to adapt to those changes.

**Slide 13:** This slide is a map of their long-range Wastewater Resource Management Plan (WRMP), based on providing satellite treatment facilities throughout the service area just in time to meet capacity needs. The map includes urban growth areas (UGAs), plant sites, and potential recharge sites. The WRMP includes:

- Build a system of 3 satellites – decentralization
- Small increments, just in time
- Produce the highest quality, Class A, reclaimed water
- Groundwater recharge

Community values identified during the development of the WRMP:

- Be good stewards of ratepayer money
- Utilize existing facilities to the fullest capabilities
- Meet current and future wastewater needs
- Consider plant “products” as valuable resources
- Control costs
- Provide maximum environmental benefit
- Conduct open and proactive planning processes

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Laurie’s presentation slides are available online at

<http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/advgrp.html/082511-DeschutesAdvMtg-NitrogenRemoval-LOTT-LPierce.pdf>.

Website links:

- LOTT Clean Water Alliance website: [www.lottcleanwater.org](http://www.lottcleanwater.org)
- Department of Ecology, LOTT Clean Water Alliance Draft NPDES Permit No. WA0037061: [http://www.ecy.wa.gov/programs/wq/permits/permit\\_pdfs/lott\\_wwtp/lottpermit.pdf](http://www.ecy.wa.gov/programs/wq/permits/permit_pdfs/lott_wwtp/lottpermit.pdf)

- Department of Ecology, Fact Sheet for NPDES Permit WA0037061, LOTT Alliance Budd Inlet Wastewater Treatment Plant:  
[http://www.ecy.wa.gov/programs/wq/permits/permit\\_pdfs/lott\\_wwtp/lott\\_fs.pdf](http://www.ecy.wa.gov/programs/wq/permits/permit_pdfs/lott_wwtp/lott_fs.pdf)
- Department of Ecology, Addendum to the Fact Sheet for NPDES Permit WA0037061:  
[http://www.ecy.wa.gov/programs/wq/permits/permit\\_pdfs/lott\\_wwtp/lottfactsheetaddendum.pdf](http://www.ecy.wa.gov/programs/wq/permits/permit_pdfs/lott_wwtp/lottfactsheetaddendum.pdf)
- Department of Ecology, Reclaimed Water main page:  
<http://www.ecy.wa.gov/programs/wq/reclaim/index.html>

#### Discussion following presentations:

- Fiddlehead Outfall is near the shoreline. *Does LOTT have any plans to move it?*
  - Response: No, this is a dredging and navigation channel and is only rarely used.
- *What kind of planning has LOTT done to address potential earthquakes since downtown Olympia is built on fill?*
  - LOTT conducts routine drills and emergency preparedness training. Their facilities were built to withstand earthquakes. They are incrementally bringing older structures up to current earthquake standards.
- LOTT is doing an exemplary job with nitrogen removal.
- Discharge at the mixing zones must meet water quality standards.
- We need to reduce existing pollutant loads and address legacy problems. *How do we achieve these goals?*
- We can't fix one problem and create another one somewhere else.
- *What about the other wastewater treatment plants operated by Thurston County?*
  - All of them are fairly new and one was upgraded. Collectively they discharge a small amount of nitrogen.
- All of the Puget Sound contributes eventually to Budd Inlet waters. *Wouldn't we be better off if all wastewater treatment plants treated for nitrogen removal?*
- Let's ask Mindy Roberts, Ecology, about seasonal and non-seasonal removal options. *When is the critical time? Will the South Puget Sound Dissolved Oxygen TMDL set limits for small wastewater treatment plants?*
- We need to include reducing septic systems as a recommendation in the Deschutes TMDL.

#### Open Comment

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EPA asked about the status on Ecology's timeline to complete this cleanup plan (TMDL).

Response: Ecology continues to work with the advisory group as outlined in the timeline presented at the July 28, 2011 meeting. Ecology has committed to EPA they will submit a completed and final Technical Report by December 2011. They have also committed to EPA to submit the multi-parameter TMDL by January 2013 (*or earlier if progress on issues outlined in the timeline take less time than expected*). The draft timeline is available at <http://www.ecy.wa.gov/programs/wq/tmdl/deschutes/advisorycomm/072811-DeschutesAdvMtg-tmdl-timeline.pdf>.

**Next meeting**

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Date: Thursday, September 22, 2011  
Time: 9:00 a.m. – 12:00 noon  
Place: Tumwater Fire Department, 300 Israel Rd. SW, Tumwater  
Agenda: Capitol Lake Modeling