

**FACT SHEET FOR NPDES PERMIT WA0037061**  
**LOTT ALLIANCE**  
**BUDD INLET WASTEWATER TREATMENT PLANT**

**SUMMARY**

This National Pollutant Discharge Elimination System (NPDES) and reclaimed water permit and fact sheet covers the LOTT Alliance Budd Inlet Wastewater Treatment Plant. The discharge to Budd Inlet and the use of reclaimed water that is produced at the Budd Inlet plant is covered by this permit. The reclaimed water section of this permit replaces State Waste Discharge Permit ST 6159. Other reclaimed water permits will be issued to the LOTT Alliance to cover the planned satellite facilities. The first Class A reuse satellite facility, the Hawks Prairie Reclamation plant, which started construction in 2004, will be permitted under a separate reclaimed water permit. Some aspects of the permitted LOTT system, such as pretreatment, will only be covered by this permit, and referenced in the reclaimed water permits.

The LOTT Alliance has requested that the Department of Ecology (Department) increase the limit for winter time (November through March) discharge to Budd Inlet from 22 MGD to 28 MGD. The Department has determined that LOTT has shown that an increase in discharge during the winter time non-critical season would not negatively impact the 303(d) listed Budd Inlet during the impaired season. This evidence to show that water quality would not get worse was developed in the Budd Inlet Scientific Study and demonstrated with the Budd Inlet model. The Department is allowing the modeled increased non-critical season discharge in this permit.

The Department is also imposing a decrease in the summer critical season pollutant discharges in this permit. The pollutants will be limited by new loading limits. The summer time (April through October) discharges of Biochemical Oxygen Demand (BOD) will be decreased from the present 3670 pounds/day to the interim loading level of 1050 pounds/day for June through September. After 2006, when the 2 MGD Hawks Prairie Reclaimed Water Satellite Plant should be on line, the loading limits for the Budd Inlet Plant will decrease to 900 pounds/day in the Spring and Fall, and 671 pounds/day in the Summer. These final limits are performance based limits that were determined per Ecology guidance on setting limits on impaired waterbodies where a Total Maximum Daily Load (TMDL) process has started.

A TMDL is underway for the Deschutes River/Capital Lake/Budd Inlet system. Depending on the outcome of the TMDL, the waste load allowed to be discharged into Budd Inlet from LOTT will change in this permit. The final water quality based limits determined by the TMDL will likely differ from the estimated final limits in this permit. These water quality based final limits cannot be determined until the TMDL is completed. Once the TMDL is complete, this permit will be modified or reissued to incorporate the new waste load limits. The Department is committed to a timely update to this permit once the TMDL is complete.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**TABLE OF CONTENTS**

INTRODUCTION .....	1
BACKGROUND INFORMATION .....	2
DESCRIPTION OF THE FACILITY .....	2
History .....	2
Collection System Status .....	3
Treatment Processes .....	5
Discharge Outfall .....	5
Residual Solids .....	6
PERMIT STATUS .....	7
SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT .....	7
WASTEWATER CHARACTERIZATION .....	7
SEPA COMPLIANCE .....	8
PROPOSED PERMIT LIMITATIONS .....	8
DESIGN CRITERIA .....	9
TECHNOLOGY-BASED EFFLUENT LIMITATIONS .....	9
SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS .....	10
Numerical Criteria for the Protection of Aquatic Life .....	10
Numerical Criteria for the Protection of Human Health .....	10
Narrative Criteria .....	10
Antidegradation .....	10
Critical Conditions .....	11
Mixing Zones .....	11
Description of the Receiving Water .....	11
Surface Water Quality Criteria .....	11
Consideration of Surface Water Quality-Based Limits for Numeric Criteria .....	12
Whole Effluent Toxicity .....	16
Human Health .....	17
Sediment Quality .....	17
GROUND WATER QUALITY LIMITATIONS .....	18
COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED	
DECEMBER 17, 1993 .....	18
MONITORING REQUIREMENTS .....	20
LAB ACCREDITATION .....	20
OTHER PERMIT CONDITIONS .....	23
REPORTING AND RECORDKEEPING .....	23
PREVENTION OF FACILITY OVERLOADING .....	23
OPERATION AND MAINTENANCE (O&M) .....	23
RESIDUAL SOLIDS HANDLING .....	23
PRETREATMENT .....	24
Annual Submittal of List of Industrial Users .....	24
Duty to Enforce Discharge Prohibitions .....	23
SPILL PLAN .....	25
EFFLUENT MIXING STUDY .....	25
COMBINED SEWER OVERFLOWS .....	25
OUTFALL EVALUATION .....	25

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

CONTRIBUTING JURISDICTIONS .....	25
GENERAL CONDITIONS .....	25
RECLAIMED WATER (R) CONDITIONS .....	26
DESCRIPTION OF THE RECLAMATION TREATMENT AND DISTRIBUTION SYSTEM .....	26
Treatment Processes .....	26
Distribution System and Use Area.....	27
GROUNDWATER .....	27
WATER RIGHTS STATUS .....	27
PROPOSED PERMIT LIMITATIONS (R1) .....	27
TECHNOLOGY-BASED EFFLUENT LIMITATIONS .....	28
MONITORING REQUIREMENTS (R2).....	29
RECLAIMED WATER MONITORING .....	29
REPORTING AND RECORDKEEPING (R3).....	29
RECLAIMED WATER DISTRIBUTION AND USE (R4).....	29
OPERATIONS AND MAINTENANCE (R5) .....	29
PERMIT ISSUANCE PROCEDURES .....	29
PERMIT MODIFICATIONS .....	29
RECOMMENDATION FOR PERMIT ISSUANCE .....	29
REFERENCES FOR TEXT AND APPENDICES .....	31
APPENDIX A--PUBLIC INVOLVEMENT INFORMATION .....	33
APPENDIX B--GLOSSARY .....	34
APPENDIX C--TECHNICAL CALCULATIONS .....	39
APPENDIX D--RESPONSE TO COMMENTS .....	40

*FACT SHEET FOR NPDES PERMIT WA0037061  
LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**INTRODUCTION**

The Federal Clean Water Act (FCWA, 1972, and later modifications, 1977, 1981, and 1987) established water quality goals for the navigable (surface) waters of the United States. One of the mechanisms for achieving the goals of the Clean Water Act is the NPDES permits, which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the state of Washington on the basis of Chapter 90.48 Revised Code of Washington (RCW) which defines the Department of Ecology's (Department) authority and obligations in administering the wastewater discharge permit program.

The regulations adopted by the state include procedures for issuing permits [Chapter 173-220 Washington Administrative Code (WAC)], technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC), water quality criteria for surface and ground waters (Chapters 173-201A and 200 WAC), and sediment management standards (Chapter 173-204 WAC). These regulations require that a permit be issued before discharge of wastewater to waters of the state is allowed. The regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit. One of the requirements (WAC 173-220-060) for issuing a permit under the NPDES permit program is the preparation of a draft permit and an accompanying fact sheet. Public notice of the availability of the draft permit is required at least 30 days before the permit is issued (WAC 173-220-050). The fact sheet and draft permit are available for review (see [Appendix A--Public Involvement](#) of the fact sheet for more detail on the Public Notice procedures).

The fact sheet and draft permit have been reviewed by the Permittee. Errors and omissions identified in this review have been corrected before going to public notice. After the public comment period has closed, the Department will summarize the substantive comments and the response to each comment. The summary and response to comments will become part of the file on the permit and parties submitting comments will receive a copy of the Department's response. The fact sheet will not be revised. Comments and the resultant changes to the permit will be summarized in Appendix D--Response to Comments.

<b><u>GENERAL INFORMATION</u></b>					
Applicant	LOTT Alliance 111 Market Street NE, Suite 250 Olympia, WA 98501				
Contributing Jurisdictions	<table><tr><td>City of Lacey P.O. Box 3400 Lacey, WA 98509-3400</td><td>City of Olympia P.O. Box 1967 900 Plum Street SE Olympia, WA 98507-1967</td></tr><tr><td>City of Tumwater 555 Israel Road SW Tumwater, WA 98501</td><td>Thurston County 2000 Lakeridge Drive SW Olympia, WA 98502-6045</td></tr></table>	City of Lacey P.O. Box 3400 Lacey, WA 98509-3400	City of Olympia P.O. Box 1967 900 Plum Street SE Olympia, WA 98507-1967	City of Tumwater 555 Israel Road SW Tumwater, WA 98501	Thurston County 2000 Lakeridge Drive SW Olympia, WA 98502-6045
City of Lacey P.O. Box 3400 Lacey, WA 98509-3400	City of Olympia P.O. Box 1967 900 Plum Street SE Olympia, WA 98507-1967				
City of Tumwater 555 Israel Road SW Tumwater, WA 98501	Thurston County 2000 Lakeridge Drive SW Olympia, WA 98502-6045				
Facility Name and Address	LOTT Alliance Budd Inlet Treatment Plant 500 Adams Street NE Olympia, WA 98501				
Type of Treatment:	Activated Sludge/Advanced Treatment				
Discharge Location	North Outfall to Budd Inlet Latitude: 47° 03' 34" N      Longitude: 122° 54' 16" W.				
Water Body ID Number	1224026474620 (390KRD) – Lower Budd Inlet				

## **BACKGROUND INFORMATION**

### *DESCRIPTION OF THE FACILITY*

#### **HISTORY**

The LOTT Alliance's Budd Inlet Treatment Plant is a regional facility serving portions of the cities of Lacey, Olympia, Tumwater, and Thurston County. The Budd Inlet secondary treatment facility was largely completed and on-line in August of 1982. Prior to that time a primary treatment facility served the area. The Budd Inlet facility currently provides advanced treatment, more specifically nitrogen removal. Starting in 2006, satellite reuse treatment plants will be added to the system.

The existing permit was issued in December 1993. LOTT has maintained good compliance with this permit. The previous permit was issued in September 1987. That permit included a compliance schedule for construction of advanced treatment (nitrogen removal) facilities and the elimination of the Fiddlehead discharge point. An engineering report addressing hydraulic improvements was approved October 12, 1990. The engineering report addressing nitrogen removal processes was approved February 13, 1990.

Under LOTT's 1987 NPDES Permit, LOTT was required to develop and submit to the Department an interlocal agreement and industrial waste survey. These were preliminary actions to enable the Department to determine whether LOTT would need to establish a pretreatment program. The Department made the determination that LOTT was required to develop a pretreatment program in February 1993. LOTT now maintains an approved pretreatment program in accordance with 40 Code of Federal Regulations (CFR) Section 403.8(b).

LOTT began a comprehensive long-range planning process in September 1995. In November 1998, LOTT completed the *LOTT Wastewater Resource Management Plan*. This plan evaluates alternatives for LOTT to handle future growth. The highly managed alternative was chosen as the preferred option. This option includes building reclaimed water satellite plants. The first satellite plant, the Hawks Prairie plant started construction in 2004. It will start as a 2 MGD Class A reuse plant with potential to be enlarged to 5 MGD. A ground water recharge site is also being built. The Plan calls for later satellite plants to be built in Chambers Prairie and the Tumwater area, following the same pattern as the first plant. Separate reclaimed water permits will be issued for these plants as they are built.

The *Wastewater Resource Management Plan* was approved as a facility plan by the Department in 2004. One reason the Department delayed to approve the plan was that the preferred option included increasing discharges to Budd Inlet during the winter from the Budd Inlet plant. LOTT determined the August 1998 *Budd Inlet Scientific Study Final Report* and subsequent information submitted with the NPDES permit application justified the increase in discharge. The Department evaluation of the information provided has just recently concurred with the LOTT position. The Department is therefore issuing the NPDES permit with an allowance for increase discharges to Budd Inlet during the winter. The Department was also able to approve the whole Management Plan.

The approval of the increase in winter time discharge was a long process that required a lot of scientific study on the part of the Permittee and lengthy review by the Department. The Permittee completed the Budd Inlet Study and developed a sophisticated model in order to show that increasing the winter time flows would not impact the critical season. The dissolved oxygen (DO) levels in Budd Inlet remain rather high during the winter, and then fall off during the summer. The DO levels can drop below the 5.0 mg/l

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

water quality standard at times, mostly in September of each year. The Permittee used their model to show the DO response in Budd Inlet to increased winter time discharges by the Permittee. The Department has carefully reviewed the results of this effort.

The Department first reviewed the model and the model calibration to confirm they were appropriate. This task was complicated as the Permittee changed the calibration due to model code errors without keeping the Department up to date on the calibration changes. After much information exchange between the parties, the Department approved of the model and calibration at a meeting on May 8, 2003. The Permittee was then requested to run a new model run that would show just the impact of the winter time discharges, while holding all other factors constant. Review of the previous model runs had been complicated by conflicting model run descriptions provided by the Permittee. The Department had trouble confirming what data was actually run through the model and also questioned the reporting of the model results. The Permittee finally clarified what the model runs included and ran the new run requested. The Permittee also supplied more raw data from the runs, which did not include as much averaging as the previous data. The initial reports included too many average results that did not represent the spatial and temporal distribution of DO drops.

After receiving all the information requested, the Department was able to determine that based on the model, increasing the winter time discharge will not have an impact on the critical season. The department therefore was able to approve of the increase and include it in this draft permit.

#### COLLECTION SYSTEM STATUS

Each jurisdiction is responsible for their respective collection systems. Several major interceptors are identified as LOTT facilities and are owned and maintained by LOTT. As a part of the LOTT planning process, each jurisdiction has produced general sewer plans. At present, the jurisdictions are updating their plans. The following is a list of previously submitted documents.

- LOTT Comprehensive Report: Proposed General Sewer Plan and Treatment Plant Hydraulic Improvements Engineering Report, August 1990 Revision, Approved October 12, 1990.
- City of Olympia - Sanitary Sewer Comprehensive Plan, April 1989, Conditionally Approved October 12, 1990, Conditions completed and verified April 14, 1992.
- City of Lacey - Comprehensive Sanitary Sewer Plan, June 1989, Approved October 12, 1990.
- City of Tumwater - Comprehensive Sanitary Sewer Plan Part B, September 1989, Approved October 12, 1990.
- Thurston County - Sewerage General Plan, April 17, 1990, Approved March 5, 1992.
- City of Tumwater – Sewer Plan Update, June 1996.
- City of Olympia – Sewer Master Plan, September 1997
- City of Lacey – Wastewater Comprehensive Plan, October 1998

Thurston County currently has no collection lines that discharge into the LOTT sewer system. The City of Lacey is served primarily by a conventional collection system including 15 pump stations, over 309,500 linear feet of gravity flow sewer lines serving approximately 12 square miles. Portions of the

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

Lacey sewer system have been designated to be served by Septic Tank Effluent Pumping (STEP) systems. The City of Tumwater is served by a conventional sewer system including over 223,894 feet of gravity sewer lines serving approximately 8 square miles. It also includes 15 wastewater pumping stations. The City of Olympia is served primarily by a conventional sewer system serving approximately 18 square miles. The system consists of over 698,212 feet of sewer pipe. The system has 51 lift stations. The system is primarily a separate sewer system; however, approximately 600 acres of the downtown area is served by a combined sewer system.

Since the downtown area within the City of Olympia is served by a combined sewer system, during major storm events the potential exists for a raw sewage overflow. The number of overflow events at CSO locations has remained under one per year, however overflows from manholes and pump stations, have been a continual problem for Olympia during periods of heavy rain.

A combined sewer overflow event occurs at the treatment plant when the equalization basins are full and influent pumps are at capacity. Wastewater is directly discharged to the Fiddlehead outfall. The Department Administrative Order DE 87-S213 required submittal of a Combined Sewer Overflow Reduction Plan. A plan, entitled LOTT Combined Sewer Overflow Reduction Plan "CSO Plan to Plan," was submitted September 29, 1988. The Department comments were dated December 22, 1988. This process was never finalized.

The 1987 permit required submittal of a CSO monitoring plan. This plan was submitted December 15, 1987. During overflow events the operator conducts hourly sampling and estimates the volume. Monitoring and testing has been limited to discharge volumes, frequency, BOD, TSS, and fecal coliforms.

There are two remaining potential combined sewer overflow points within the collection system. Chestnut Street designated as (003) and Water Street (004). The Chestnut Street overflow point consists of a flapper gate and a high level alarm switch located in a manhole above the 42-inch sanitary trunk line descending State Street. At high flows the alarm is triggered and if flow increases it will spill into the flapper gate and drop into the 72-inch Moxlie Creek stormwater discharge pipe. The Water Street pump station overflow consists of two flapper gates located upstream of the pump station bar screens. Discharges would occur into Budd Inlet at Percival Landing. A high level alarm sounds when flow reaches a preset limit. When total plant pumping capacity is exceeded both become combined sewer overflows. Chestnut Street overflowed once in a major storm event in 1990. No evidence exists that an overflow has occurred at the Water Street location.

On September 16, 1991, the LOTT partners entered into an interlocal agreement to study the Infiltration and Inflow (I/I) within the LOTT system. The agreement required the LOTT partners to adopt standards for determining acceptable levels of I/I into the LOTT system which would apply to most areas within the system. These standards were adopted. Procedures were established to measure compliance with those standards, with those measurements to be repeated every 10 years. Each partner's sewer system must conform to those standards by January 1, 2010, or by the time the LOTT facility reaches 85 percent of full capacity. If the systems do not conform the partner must compensate the LOTT partnership for the estimated flows in excess of adopted standards.

The partners contracted for an engineering study to determine and describe the combined sewer area served which would result in no process upsets, no plant bypasses or combined sewer overflows at the LOTT treatment plant. In addition, the engineering study evaluated existing and new information, as necessary, in order to recommend a program of collection system improvements to remove I/I from facilities which exceed the adopted standards. This study estimated that approximately 53 percent of all

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

the I/I in the LOTT system from the combined sewer area. Cost effectiveness criteria was developed for I/I removal and monitors were placed.

LOTT has a variety of commercial and small industrial dischargers into the system and a few potential dischargers currently outside the LOTT service area.

**TREATMENT PROCESSES**

The headworks of the Budd Inlet facility consists of four mechanically cleaned bar screens, two aerated grit removal channels, and five equalization basins (2.25 million gallons) used for storage during storm events. The plant has seven rectangular primary sedimentation tanks and an air scrubber for odor control. Covered activated sludge basins provide secondary treatment. The biological nutrient removal system uses the four-stage Bardenpho process operated to target nitrogen removal. To help the process work, methanol is fed into the system as a readily biodegradable carbon source. The four-stage Bardenpho process includes alternating anoxic and aerobic basins in series which allows the aerobic and anoxic microbiological processes to occur. Ammonia and nitrate/nitrite forms of nitrogen are converted to nitrogen gas. The process requires a very high internal recycle ratio (approximately 4:1) for the process to work. The process consists of the first anoxic basin, the first aeration basin, the second anoxic basin and the second aeration basin. When the biological nitrogen removal process is not in operation (November 1, through March 31), the first and second anoxic basins and the second aeration basin are bypassed. Clarification is provided by four secondary clarifiers. Secondary effluent is disinfected with an ultraviolet (UV) system.

Some of the secondary effluent is directed to the reclaimed water system to produce class A reuse water. The reclaimed water facility at the Budd Inlet treatment plant is designed to have a firm capacity of 700 gallons per minute (about 1 MGD) with a peak capacity of approximately 1000 gpm (1.5 MGD). The reclaimed water facility is within the footprint of the Budd Inlet plant. The facility completed construction was brought on-line in 2004. The facility is described in the approved engineering report *Budd Inlet Reclaimed Water Production Facilities Engineering Report* (November 2000).

The reclaimed water facility will start with final effluent from the Budd Inlet treatment plant. This effluent will have undergone UV disinfection prior to transfer to the reclaimed water filters. Three filter feed pumps will transfer the treated Budd Inlet effluent to the new continuous back wash counter current up flow filters. Polymer will be added to the water prior to filtration. Sodium hypochlorite solution will be used for supplementary disinfection and residual control after the filtration. After the disinfection contact basins, the reclaimed water will be stored in a 140,000 gallon tank before reuse. Filter backwash is returned to the plant influent for treatment. The reclaimed water system will be operated as needed to supply reclaimed water to users. At first, most uses will either be in plant uses or irrigations uses.

Plans and Specifications for the Hawks Prairie reclaimed water satellite plant have been approved. It is planned to be a membrane filtration plant. The flow will be taken from the Martin Way pump station. Screening of the wastewater will be completed at the pump station. Then at the satellite plant, treatment will consist of grit tanks, RAS anoxic channel, RAS mixing box, Aeration basin, membrane tanks, and disinfection. The effluent will then be pumped to wetland ponds and recharge basins. The system will be controlled from the Budd Inlet plant. The reclaimed water produced will be covered under a separate reclaimed water permit.

**DISCHARGE OUTFALL**

Treated and disinfected effluent is discharged from the Budd Inlet facility into Budd Inlet. Effluent is discharged via the north outfall line (Outfall 001), except in emergencies when the Fiddlehead outfall



*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

(Outfall 002) is used. Outfall 001 (North) is a 48-inch line that extends 953 feet off of the shoreline with a 250-foot diffuser section with 55 ports. The 4.625-inch diameter ports are spaced 4.5 feet apart on center. Outfall 002 (Fiddlehead) is a 48-inch open-ended pipe located at the Fiddlehead Marina. Improvements to the North outfall were completed in March of 1992. The North line is capable of handling 65 MGD at mean higher high water. Any excess flows are discharged via the 48-inch Fiddlehead line. The Fiddlehead discharge events will generally not occur, or if they do they would be restricted to the months of November through February when Olympia experiences its heaviest rainfall events. Events outside of those months should not occur, and events during those months will only occur during extreme rainfall events.

The Fiddlehead outfall line, in addition to handling CSO events, serves one stormwater line within the Olympia system. Water quality data obtained by the Thurston County Health Department and by LOTT treatment plant staff have shown high fecal coliform counts associated with this discharge on occasion. Plant records indicate adequate disinfection was occurring during those high fecal events and samples taken at the North outfall did not have high fecal counts. This information indicates that the source of the high fecal counts is likely due to an illegal connection into the Olympia stormwater system. Recent investigation has discovered buildings in Olympia that have their sanitary sewers connected into the stormwater system. Corrective action is planned to disconnect these buildings from the storm sewer.

The Port of Olympia operates a groundwater extraction and treatment facility on the Cascade Pole Company site. This facility discharges treated effluent into the LOTT North outfall line. A sample port was installed in the line prior to final tie-in to the LOTT outfall line. A NPDES permit for this facility was issued. The expected flow rate for this facility is approximately 30 gpm or .04 mgd. Effluent limits for the pollutants of concern were based upon meeting water quality criteria at the point of discharge into the LOTT outfall line. The estimated treatment system effluent concentrations presented in the permit application are below acute marine criteria.

#### RESIDUAL SOLIDS

The Budd Inlet treatment facilities remove solids during the treatment of the wastewater at the headworks (grit and screenings), and at the primary and secondary clarifiers, in addition to incidental solids (rags, scum, and other debris) removed as part of the routine maintenance of the equipment. Grit, rags, scum and screenings are drained and disposed of as solid waste at the local solid waste transfer station. Solids removed from the clarifiers are treated by dissolved air floatation for thickening, anaerobic digestion for stabilization, and centrifuge dewatering for final moisture reduction. Process biosolids are hauled from the plant and land applied.

Solids from the satellite plants will be returned to the sewer system for removal by the Budd Inlet plant. While the satellite plants are planned to produce high quality reuse water, they will not process or stabilize separated solids. A reduced percent of the solids influent to the satellite facilities will be directed to the Budd Inlet Plant. The present influent loading limits of the Budd Inlet plant would eventually be exceeded as satellite plants are built. Because of this, a re-rate of the capacity of the Budd Inlet Plant or new solid handling capacity elsewhere in the system will eventually be required. The *LOTT Wastewater Resource Management Plan* (November 1998) does not cover the future solids processing and stabilization facilities in detail since the additional capacity needed is thought to be outside the 20 year planning window. The outcome of the planned TMDL for Budd Inlet may impact the allowable loading for the Budd Inlet Plant and therefore require reconsideration of solids processing and stabilization facilities within the next 20 years.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

*PERMIT STATUS*

The previous permit for this facility was issued on December 17, 1993. The previous permit placed effluent limitations on 5-day Biochemical Oxygen Demand (BOD<sub>5</sub>), Total Suspended Solids (TSS), pH, Fecal Coliform bacteria, Total Inorganic Nitrogen (TIN), and Total Ammonia.

Applications for permit renewal were submitted to the Department on December 19, 1996, September 7, 2001, and on April 30, 2002, and accepted by the Department on August 20, 2002.

*SUMMARY OF COMPLIANCE WITH THE PREVIOUS PERMIT*

The facility received its last inspection on May 2, 2002.

During the history of the previous permit, the Permittee has remained in compliance, based on Discharge Monitoring Reports (DMRs) submitted to the Department and inspections conducted by the Department. The Permittee exceeded the maximum monthly permitted discharge of 22 MGD (23.2 MGD) in February 1999, along with some other exceedances in 1999, but the Permittee has been in compliance since.

*WASTEWATER CHARACTERIZATION*

The concentration of pollutants in the discharge was reported in the NPDES application and in discharge monitoring reports. From the application the effluent is characterized as follows:

**Wastewater Characterization**

<u>Parameter</u>	<u>Average Concentration (1998)</u>	<u>Average Concentration (1999)</u>	<u>Average Concentration (2000)</u>
pH	6.5-7.3	6.3-7.6	6.8-7.5
Flow	12.1 MGD	13.4 MGD	10.8 MGD
Temperature (Winter)	14 °C	14 °C	16 °C
Temperature (Summer)	17 °C	19 °C	20 °C
Biochemical Oxygen Demand (BOD <sub>5</sub> )	5.9 mg/L	8.1 mg/L	5.9 mg/L
Fecal Coliform	10 organisms/100 ml	13 organisms/100 ml	6 organisms/100 ml
Total Suspended Solids (TSS)	8.5 mg/L	9.1 mg/L	6.5 mg/L
Ammonia (as N)	0.211 mg/L	0.952 mg/L	0.987 mg/L
Dissolved Oxygen	7.0 mg/L	7.7 mg/L	7.4 mg/L
Total Kjeldahl Nitrogen (TKN)	1.89 mg/L	3.91 mg/L	3.86 mg/L
Nitrate Plus Nitrite Nitrogen	3.07 mg/L	1.75 mg/L	2.04 mg/L
Oil and Grease	5.5 mg/L	5.9 mg/L	6 mg/L
Phosphorus	3.24 mg/L	2.36 mg/L	2.46 mg/L
Cadmium	0.128 µg/L	0.06 µg/L	0.20 µg/L
Chromium	1.28 µg/L	0.62 µg/L	<6.8 µg/L
Copper	19.9 µg/L	17.2µg/L	12.5 µg/L
Lead	1.40 µg/L	1.72 µg/L	7.34µg/L
Nickel	1.60 µg/L	1.59 µg/L	1.56 µg/L
Silver	0.300 µg/L	0.17 µg/L	0.51 µg/L
Zinc	67.2 µg/L	70.3 µg/L	61.0 µg/L
Cyanide	<5 µg/L	<5 µg/L	<0.05 µg/L
Total Phenolic Compounds	<5 µg/L	<5 µg/L	<0.07 µg/L

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

Besides the above parameters, organic compound data was submitted with the permit application. All the data is at acceptable levels. Toxic pollutants do not appear in toxic amounts. Toxicity testing and pretreatment data also do not indicate any problems.

The concentration of pollutants in the reclaimed water is expected to meet Class A standards.

*SEPA COMPLIANCE*

The LOTT Alliance is in compliance with State Environmental Policy Act (SEPA) in their planning. An EIS was completed and included with the *LOTT Wastewater Resource Management Plan* (November 1998).

**PROPOSED PERMIT LIMITATIONS**

Federal and state regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations for municipal discharges are set by regulation (40 CFR 133, and Chapters 173-220 and 173-221 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (Chapter 173-201A WAC), Ground Water Standards (Chapter 173-200 WAC), Sediment Quality Standards (Chapter 173-204 WAC) or the National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992.) The most stringent of these types of limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

The limits in this permit are based in part on information received in the application. The effluent constituents in the application were evaluated on a technology- and water quality-basis. The limits necessary to meet the rules and regulations of the state of Washington were determined and included in this permit. The permit includes both interim and final limits. The Department does not develop effluent limits for all pollutants that may be reported on the application as present in the effluent. Some pollutants are not treatable at the concentrations reported, are not controllable at the source, are not listed in regulation, and do not have a reasonable potential to cause a water quality violation. Effluent limits are not always developed for pollutants that may be in the discharge but not reported as present in the application. In those circumstances the permit does not authorize discharge of the non-reported pollutants. Effluent discharge conditions may change from the conditions reported in the permit application. If significant changes occur in any constituent, as described in 40 CFR 122.42(a), the Permittee is required to notify the Department. The Permittee may be in violation of the permit until the permit is modified to reflect additional discharge of pollutants.

The Reclaimed Water Act, Chapter 90.46 RCW requires that reclaimed water be adequately and reliably treated prior to distribution and beneficial use. State regulations require that limitations set forth in a permit issued under Chapter 90.48 RCW must be either technology- or water quality-based. Municipal wastewater must also be treated using all known, available, and reasonable treatment (AKART) and not pollute the waters of the state. The minimum criteria to demonstrate compliance with these requirements are derived from the *Water Reclamation and Reuse Standards* and Chapter 173-221 Washington Administrative Code (WAC).

The permit also includes limitations on the quantity and quality of the reclaimed water that have been determined to protect the quality of the ground water. The approved engineering report includes specific design criteria for this facility. Water quality-based limitations are based upon compliance with the Ground Water Recharge Criteria (RCW 90.46.080) which are the drinking water standards for the parameters noted and the Ground Water Quality Standards (Chapter 173-200 WAC) for other parameters that require regulation.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

*DESIGN CRITERIA*

In accordance with WAC 173-220-150 (1)(g), flows or waste loadings shall not exceed approved design criteria.

The design criteria for this treatment facility are taken from the previous NPDES permit and *LOTT Wastewater Resource Management Plan* (November 1998) prepared by Brown and Caldwell and Associated Firms and are as follows:

**Design Standards for LOTT Budd Inlet WWTP.**

Parameter	Design Quantity
Monthly average flow (max. month)	28 MGD
Maximum day	55 MGD
Peak hourly flow	64 MGD
BOD <sub>5</sub> influent loading (max. month)	37,600 lb./day
TSS influent loading (max. month)	35,100 lb./day
Nitrogen influent loading (max. month)	6,420 lb./day

*TECHNOLOGY-BASED EFFLUENT LIMITATIONS*

Municipal wastewater treatment plants are a category of discharger for which technology-based effluent limits have been promulgated by federal and state regulations. These effluent limitations are given in the Code of Federal Regulations (CFR) 40 CFR Part 133 (federal) and in Chapter 173-221 WAC (state). These regulations are performance standards that constitute all known available and reasonable methods of prevention, control, and treatment for municipal wastewater.

The following technology-based limits for pH, fecal coliform, BOD<sub>5</sub>, and TSS are taken from Chapter 173-221 WAC are:

**Technology-based Limits.**

Parameter	Limit
pH:	shall be within the range of 6 to 9 standard units.
Fecal Coliform Bacteria	Monthly Geometric Mean = 200 organisms/100 mL Weekly Geometric Mean = 400 organisms/100 mL
BOD <sub>5</sub> (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L
TSS (concentration)	Average Monthly Limit is the most stringent of the following: - 30 mg/L - may not exceed fifteen percent (15%) of the average influent concentration Average Weekly Limit = 45 mg/L

*FACT SHEET FOR NPDES PERMIT WA0037061  
LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

The following technology-based mass limits are based on WAC 173-220-130(3)(b) and 173-221-030(11)(b).

Winter Season (November – March) BOD<sub>5</sub> monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly influent design loadings (37600 lbs/day) x 0.15 = mass limit 5640 lbs/ day.

The Winter Season BOD<sub>5</sub> weekly average effluent mass loading is calculated as 1.5 x monthly loading = 8460 lbs/day.

TSS Monthly effluent mass loadings (lbs/day) were calculated as the maximum monthly influent design loading (35100 lbs/day) x 0.15 = 5265 lbs/day.

The TSS weekly average effluent mass loading is calculated as 1.5 x monthly loading = 7898 lbs/day.

*SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS*

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (Chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state. Water quality-based effluent limitations may be based on an individual waste load allocation (WLA) or on a WLA developed during a basin-wide total maximum daily loading study (TMDL). When the TMDL is complete, this permit will include water quality-based limitations.

*NUMERICAL CRITERIA FOR THE PROTECTION OF AQUATIC LIFE*

"Numerical" water quality criteria are numerical values set forth in the state of Washington's Water Quality Standards for Surface Waters (Chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

*NUMERICAL CRITERIA FOR THE PROTECTION OF HUMAN HEALTH*

The state was issued 91 numeric water quality criteria for the protection of human health by the U.S. EPA (EPA 1992). These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

*NARRATIVE CRITERIA*

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the state of Washington.

*ANTIDEGRADATION*

The state of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

The Department has reviewed existing records and was able to determine that ambient water quality is lower than the designated classification criteria given in Chapter 173-201A WAC. Inner Budd Inlet in the area of the outfall is listed on the 303(d) list of impaired water bodies. Inner Budd Inlet is a class B water body that is listed as impaired for low dissolved oxygen, pH, some metals, some organics, and PCBs. The discharges authorized by this proposed permit should not cause a loss of beneficial uses.

#### CRITICAL CONDITIONS

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

#### MIXING ZONES

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention, control and treatment (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule (EPA, 1992) allows the chronic mixing zone to be used to meet human health criteria.

#### DESCRIPTION OF THE RECEIVING WATER

The facility discharges to Budd Inlet which is designated as a Class B marine receiving water in the vicinity of the outfall. North of latitude 47° 04'N, (just south of Priest Point Park) Budd Inlet is a Class A water body. Other nearby point source outfalls include the Tamoshan, Seashore Villa, and Boston Harbor wastewater treatment plants on outer Budd Inlet. Significant nearby non-point sources of pollutants include Capitol Lake and Moxlie Creek on inner Budd Inlet. Characteristic uses include the following:

Class B (Good); water supply (industrial, agricultural); stock watering; fish migration; fish and shellfish rearing, spawning and harvesting; wildlife habitat; secondary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for most uses.

#### SURFACE WATER QUALITY CRITERIA

Applicable criteria are defined in Chapter 173-201A WAC for aquatic biota. In addition, U.S. EPA has promulgated human health criteria for toxic pollutants (EPA 1992). Criteria for this discharge are summarized below:

Fecal Coliforms	100 colonies/100 mL maximum geometric mean and not more than 10 percent of all samples exceeding 200 colonies/100 mL
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*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

Dissolved Oxygen	5.0 mg/L minimum (When natural conditions cause levels near or below 5.0, then the natural levels may be degraded by up to 0.2 mg/L by human-caused activities.)
Temperature	19.0 degrees Celsius maximum or incremental increases above background
pH	7.0 to 8.5 standard units
Turbidity	less than 10 NTUs above background
Toxics	No toxics in toxic amounts (see Appendix C for numeric criteria for toxics of concern for this discharge)

The receiving water in the vicinity of the outfall has been studied extensively. LOTT completed the *Budd Inlet Scientific Study Final Report* in August 1998. This study has extensive data on the quality of the receiving water. Information on critical conditions, ambient monitoring, bioassays, and sediments are all available. Budd Inlet has had low dissolved oxygen, often reaching the lowest reading in September. Algae blooms, the extent of which are limited by the availability of nutrients in the critical period, often cause the low dissolved oxygen. Since Budd Inlet appears to have no capacity to accept additional nutrients during the critical period, LOTT has a restrictive seasonal limit on nutrient discharges (nitrogen).

Most of Budd Inlet is closed to shellfish harvest. The receiving water is also listed on the 303(d) list of impaired water bodies. The following listings are in the 1998 303(d) list for inner Budd Inlet: 2-Methylnaphthalene, Acenaphthene, Acenaphthylene, Anthracene, Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluorine, Benzo(b,k)fluoranthenes, Benzo(ghi)perylene, Benzo(k)fluorine, Bis(2-ethylhexyl) phthalate, Butylbenzyl phthalate, Chromium, Chrysene, Copper, Dibenz(a,h)anthracene, Dibenzofuran, Dissolved Oxygen, Fluoranthene, Fluorene, Indeno(1,2,3-cd)pyrene, Mercury, Naphthalene, PAHs, pH, Phenanthrene, Pyrene, Sediment Bioassay, Total PCBs, and Zinc. The following listings are in the 1998 list for outer Budd Inlet: Dissolved Oxygen, and pH. The cause of many of the organic and metal listings is the Cascade Pole site. The dissolved oxygen listing is about the only one that LOTT may impact, and the permit therefore has limits that protect the dissolved oxygen in the Inlet.

A TMDL has started for this waterbody. The TMDL will cover the Deschutes River, Capitol Lake, and Budd Inlet. It will cover listings for fecal coliform bacteria, temperature, dissolved oxygen, nutrients, pH, and fine sediment. In 2003 the TMDL effort verified some listings, updated datasets, did recon field studies, and scoped further studies. In 2004 the primary field studies were being done. In 2005 analyses and modeling will be done. Reports will follow. Following completion and approval of the TMDL, the waste load allocations developed by the TMDL will be incorporated into the permit. These final water quality based limits may decrease the allowed summer time flows and loadings. These decreases may lower the permitted discharge levels during the critical season, but the actual extent of the decrease cannot be determined until the TMDL is complete.

#### CONSIDERATION OF SURFACE WATER QUALITY-BASED LIMITS FOR NUMERIC CRITERIA

Pollutant concentrations in the proposed discharge exceed water quality criteria with technology-based controls which the Department has determined to be AKART. A mixing zone is authorized in accordance with the geometric configuration, flow restriction, and other restrictions for mixing zones in Chapter 173-201A WAC and are defined as follows for the North Outfall:

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

The chronic mixing zone extends 213.5 feet from the last discharge port at both ends of the diffuser section and 215 feet from the centerline of the diffuser section. The acute zone extends 21.4 feet from the ends of the diffuser and 21.5 feet from the centerline of the diffuser pipe.

The dilution factors of effluent to receiving water that occur within these zones have been determined to be 22:1. The permit requires that a mixing study be completed based on present conditions (including the new flow rates) to determine these factors at the critical condition by the use of models and/or dye studies.

Pollutants in an effluent may affect the aquatic environment near the point of discharge (near field) or at a considerable distance from the point of discharge (far field). Toxic pollutants, for example, are near-field pollutants--their adverse effects diminish rapidly with mixing in the receiving water. Conversely, a pollutant such as BOD is a far-field pollutant whose adverse effect occurs away from the discharge even after dilution has occurred. Thus, the method of calculating water quality-based effluent limits varies with the point at which the pollutant has its maximum effect.

The derivation of water quality-based limits also takes into account the variability of the pollutant concentrations in both the effluent and the receiving water.

The ambient background data used for this permit includes the following from 2002 Budd Inlet sample study, for a sample point north of the outfall (Site 3):

Parameter	Value used
Depth	19 feet MLLW
Temperature	8.2 – 18.4° C
Thermocline Depth	2.1 – 11.3 feet
pH (high)	8.2
Dissolved Oxygen	2.8 – 14.6 mg/L
Total Ammonia-N	0.000 – 0.294 mg/L
Fecal Coliform	<1 - 45/100 mL
Conductivity	19.9 – 61.4 mS/cm
Salinity	17.6 – 41.1
Halocline Depth	2.1 – 12 feet
Secchi Depth	4.5 – 16.0 feet
Ortho-Phosphate	0.032 – 0.074 mg/L
NO <sub>3</sub>	0.012 – 0.419 mg/L - N
NO <sub>2</sub>	0.001 – 0.017 mg/L - N
Chlorophyll	<DL – 27.7 mg/m <sup>3</sup>
Pheophytin a	<DL – 4.24 mg/m <sup>3</sup>

The impacts of dissolved oxygen deficiency, temperature, pH, fecal coliform, ammonia, metals, and other toxics were determined as shown below.



*FACT SHEET FOR NPDES PERMIT WA0037061  
LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

BOD<sub>5</sub>--Under critical conditions there was a prediction of a violation of the dissolved oxygen criterion for the receiving water. As discussed elsewhere in this Fact Sheet, a TMDL for dissolved oxygen in Budd Inlet is underway. In cases like this, it is the Department's practice not to permit any increases in loading to an impaired waterbody that may exacerbate the impairment. Under this guidance, found in the Water Quality Program Permit Writer's Manual (92-109, revised July 2002) Chapter VI, Section 3.3.11, past discharge data from the plant is used to derive a "performance limit" which represents the existing loadings.

In the case of Budd Inlet, the dissolved oxygen impairment is seasonal and therefore the performance limits will be imposed only during the periods where the Department believes it is necessary to prevent a worsening of the existing impairment for dissolved oxygen. During the non-critical (winter) season the technology-based limit for BOD will be imposed.

The process of setting performance limits requires the permit writer to examine historical discharge data for the facility. The specific limit derived depends on the historical data ranges that are used and how the data is sorted by season. In selecting the appropriate ranges of data for use in deriving the performance limits, several factors were considered, including: LOTT's on-going work to reduce dry weather flows through water conservation, and the changes in the characteristics of LOTT's influent due to shutdown of the Miller Brewery. A summary of data used is in Appendix C.

In addition, LOTT is in the process of constructing the Hawks Prairie Reclaimed Water Plant. It is anticipated that that plant will be on-line by April 1, 2006. Once on-line, this facility will be able to remove up to 2 MGD from the collection system for treatment and reuse, therefore reducing the loading to Budd Inlet.

In imposing performance-based limits for BOD for this facility, the Department has taken a phased approach to allow time for LOTT to better understand process control impacts from loss of the brewery influent and time to complete construction of the Hawks Prairie plant. The performance-based limits will be imposed as interim and final limits. The final limits will be modified to water quality based limits when the TMDL is completed. Details on the derivation of the performance limits are given below:

Interim Spring/Fall Season (April, May, & October) BOD<sub>5</sub> monthly effluent mass loadings (lbs/day) are based on the historically achievable pollutant concentrations 10 mg/L and were calculated as the old dry season maximum monthly design flow (15 MGD) x Concentration limit (10 mg/L) x 8.34 (conversion factor) = mass limit 1251 lbs/day.

Interim Spring/Fall Season (April, May, & October) BOD<sub>5</sub> weekly average effluent mass loading is calculated as 1.5 x monthly loading = 1876 lbs/day.

Interim Summer Season (June – September) BOD<sub>5</sub> monthly effluent mass loadings (lbs/day) are based on historically achievable pollutant concentrations of 9 mg/l and a flow of 14 MGD. The loadings were calculated as (14 MGD) x Concentration limit (9 mg/L) x 8.34 (conversion factor) = mass limit 1050 lbs/day.

Interim Summer Season (June – September) BOD<sub>5</sub> weekly average effluent mass loading is calculated as 1.5 x monthly loading = 1576 lbs/day.

Final Spring/Fall Season (April, May, & October) BOD<sub>5</sub> monthly effluent mass loadings (lbs/day) are based on historically achievable pollutant concentrations of 8 mg/l and a flow of 13.5 MGD. The loadings were calculated as the monthly flow (13.5 MGD) x Concentration limit (8 mg/L) x 8.34 (conversion factor) = mass limit 900 lbs/day. This is a 28% decrease from the interim limits and a 75% decrease from the previous permit limits (3670 lbs/day).

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

Final Spring/Fall Season (April, May, & October) BOD<sub>5</sub> weekly average effluent mass loading is calculated as 1.5 x monthly loading = 1350 lbs/day.

Final Summer Season (June – September) BOD<sub>5</sub> monthly effluent mass loadings (lbs/day) are based on historically achievable pollutant concentrations of 7 mg/l and a flow of 11.5 MGD. The loadings were calculated as (11.5 MGD) x Concentration limit (7 mg/L) x 8.34 (conversion factor) = mass limit 671 lbs/day. This is a 36% decrease from the interim limits and an 82% decrease from the previous permit limits (3670 lbs/day).

Final Summer Season (June – September) BOD<sub>5</sub> weekly average effluent mass loading is calculated as 1.5 x monthly loading = 1006 lbs/day.

More precise final water quality-based limits for BOD will be identified through the waste load allocation process as part of the TMDL. Once waste load allocations are available, the Department will in a timely manner modify this permit to incorporate those limits.

Nitrogen--The impact of nitrogen in the discharge on the receiving water is being reduced. The previous permit had a critical season concentration limit of 3 mg/L for Total Inorganic Nitrogen (TIN) that applied from April – October. TIN is the sum of the inorganic forms of nitrogen (nitrate, nitrite, and ammonia).

Interim Spring/Fall Season (April, May, & October) TIN monthly effluent mass loadings (lbs/day) are based on the previous permit's critical season concentration limit (3 mg/L) and were calculated as the old dry season maximum monthly design flow (15 MGD) x Concentration limit (3 mg/L) x 8.34 (conversion factor) = mass limit 375 lbs/day.

Interim Summer Season (June – September) TIN monthly effluent mass loadings (lbs/day) are based on the previous permit's critical season concentration limit (3 mg/L) and a flow of 14 MGD. The loadings were calculated as (14 MGD) x Concentration limit (3 mg/L) x 8.34 (conversion factor) = mass limit 350 lbs/day.

Final Spring/Fall Season (April, May, & October) TIN monthly effluent mass loadings (lbs/day) are based on the previous permit's critical season concentration limit (3 mg/L) and a flow of 13.5 MGD and were calculated as the monthly flow (13.5 MGD) x Concentration limit (3 mg/L) x 8.34 (conversion factor) = mass limit 338 lbs/day.

Final Summer Season (June – September) TIN monthly effluent mass loadings (lbs/day) are based on the previous permit's critical season concentration limit (3 mg/L) and a flow of 11.5 MGD. The loadings were calculated as (11.5 MGD) x Concentration limit (3 mg/L) x 8.34 (conversion factor) = mass limit 288 lbs/day.

Temperature--The impact of the discharge on the temperature of the receiving water was modeled by simple mixing analysis at critical condition. The receiving water temperature at the critical condition is 18°C and the effluent temperature is 22°C. The predicted resultant temperature at the boundary of the chronic mixing zone is 18°C and the incremental rise is 0.018°C.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters. Therefore, no effluent limitation for temperature was placed in the proposed permit.

pH--Because of the high buffering capacity of marine water, compliance with the technology-based limits of 6 to 9 will assure compliance with the Water Quality Standards for Surface Waters.

Fecal coliform--The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 216.

*FACT SHEET FOR NPDES PERMIT WA0037061  
LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

Toxic Pollutants--Federal regulations (40 CFR 122.44) require NPDES permits to contain effluent limits for toxic chemicals in an effluent whenever there is a reasonable potential for those chemicals to exceed the surface water quality criteria. This process occurs concurrently with the derivation of technology-based effluent limits. Facilities with technology-based effluent limits defined in regulation are not exempted from meeting the Water Quality Standards for Surface Waters or from having surface water quality-based effluent limits.

The following toxics were determined to be present in the discharge: ammonia, and heavy metals. A reasonable potential analysis (See Appendix C) was conducted on these parameters to determine whether or not effluent limitations would be required in this permit.

The determination of the reasonable potential for ammonia and heavy metals to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The critical condition in this case occurs during summer.

No valid ambient background data was available for heavy metals. A determination of reasonable potential using zero for background resulted in no reasonable potential. Water quality criteria for metals in Chapter 173-201A WAC are based on the dissolved fraction of the metal.

Valid ambient background data was available for ammonia. Calculations using all applicable data resulted in a determination that there is no reasonable potential for this discharge to cause a violation of water quality standards. This determination assumes that the Permittee meets the other effluent limits of this permit.

#### WHOLE EFFLUENT TOXICITY

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

Accredited WET testing laboratories have the proper WET testing protocols, data requirements, and reporting format. Accredited laboratories are knowledgeable about WET testing and capable of calculating an NOEC, LC<sub>50</sub>, EC<sub>50</sub>, IC<sub>25</sub>, etc. All accredited labs have been provided the most recent version of the Department of Ecology Publication # WQ-R-95-80, *Laboratory Guidance and Whole Effluent Toxicity Test Review Criteria* which is referenced in the permit. Any Permittee interested in receiving a copy of this publication may call the Ecology Publications Distribution Center 360-407-7472

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

for a copy. The Department recommends that Permittees send a copy of the acute or chronic toxicity sections(s) of their permits to their laboratory of choice.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water acute toxicity, and the Permittee will not be given an acute WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that acute toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

The WET tests during effluent characterization indicate that no reasonable potential exists to cause receiving water chronic toxicity, and the Permittee will not be given a chronic WET limit and will only be required to retest the effluent prior to application for permit renewal in order to demonstrate that chronic toxicity has not increased in the effluent.

If the Permittee makes process or material changes which, in the Department's opinion, results in an increased potential for effluent toxicity, then the Department may require additional effluent characterization in a regulatory order, by permit modification, or in the permit renewal. Toxicity is assumed to have increased if WET testing conducted for submission with a permit application fails to meet the performance standards in WAC 173-205-020, "whole effluent toxicity performance standard." The Permittee may demonstrate to the Department that changes have not increased effluent toxicity by performing additional WET testing after the time the process or material changes have been made.

#### HUMAN HEALTH

Washington's water quality standards now include 91 numeric health-based criteria that must be considered in NPDES permits. These criteria were promulgated for the state by the U.S. EPA in its National Toxics Rule (Federal Register, Volume 57, No. 246, Tuesday, December 22, 1992).

The Department has determined that the effluent is likely to have chemicals of concern for human health. The discharger's high priority status is based on the discharger's status as a major discharger, and the applicant discharges to a waterbody that is 303(d) listed for a regulated chemical.

A determination of the discharge's potential to cause an exceedance of the water quality standards was conducted as required by 40 CFR 122.44(d). The reasonable potential determination was evaluated with procedures given in the Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) and the Department's Permit Writer's Manual (Ecology Publication 92-109, July, 1994). The determination indicated that the discharge has no reasonable potential to cause a violation of water quality standards, thus an effluent limit is not warranted.

#### SEDIMENT QUALITY

The Department has promulgated aquatic sediment standards (Chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that the Department may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

*FACT SHEET FOR NPDES PERMIT WA0037061  
LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

The Department has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

*GROUND WATER QUALITY LIMITATIONS*

The Department has promulgated Ground Water Quality Standards (Chapter 173-200 WAC) to protect uses of ground water. Permits issued by the Department shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

This Permittee has not had a discharge to ground and therefore no limitations have been required based on potential effects to ground water. The class A reclaimed water produced at the Budd Inlet plant will be used for irrigation at appropriate hydraulic loading rates only. The Department believes the Permittee's irrigation use of this water has no potential to cause a violation of the Ground Water Quality Standards.

*COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING PERMIT ISSUED DECEMBER 17, 1993*

Parameter	Existing Limits	Proposed Limits
Flow	22 mgd winter (November through March); 15 mgd summer (April through October)	28 mgd maximum month average flow
BOD <sub>5</sub> (November through March)	30 mg/L, 5504 lbs/day monthly average; 45 mg/L, 8256 lbs/day weekly average	30 mg/L, 5640 lbs/day monthly average; 45 mg/L, 8460 lbs/day weekly average
Seasonal BOD <sub>5</sub> (April through October)	20 mg/L, 3670 lbs/day monthly average; 30 mg/L, 5504 lbs/day weekly average	N/A
Spring/Fall Season BOD <sub>5</sub> (April, May, & October)	N/A	Interim: 10 mg/L, 1251 lbs/day monthly average; 15 mg/L, 1876 lbs/day weekly average Final: 8 mg/L, 900 lbs/day monthly average; 12 mg/L, 1350 lbs/day weekly average
Summer Season BOD <sub>5</sub> (June – September)	N/A	Interim: 9 mg/L, 1050 lbs/day monthly average; 13.5 mg/L, 1576 lbs/day weekly average Final: 7 mg/L, 671 lbs/day monthly average; 10.5 mg/L, 1006 lbs/day weekly average
TSS	30 mg/L, 5265 lbs/day monthly average; 45 mg/L, 7898 lbs/day weekly average	30 mg/L, 5265 lbs/day monthly average; 45 mg/L, 7898 lbs/day weekly average
Fecal Coliform Bacteria	200/100 ml monthly average; 400/100 ml weekly average	200/100 ml monthly average; 400/100 ml weekly average

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

Parameter	Existing Limits	Proposed Limits
pH	Shall not be outside the range of 6.0 to 9.0	Shall not be outside the range of 6.0 to 9.0
Total Ammonia (as NH <sub>3</sub> -N) at North Outfall	26 mg/L monthly average; 36 mg/L daily maximum, applies November through March	26 mg/L monthly average; 36 mg/L daily maximum, applies November through March
Total Inorganic Nitrogen (TIN)	3 mg/L monthly average, applies April through October	3 mg/L monthly average, applies April through October Interim: Spring/Fall loading 375 lbs/day, Summer loading 350 lbs/day Final: Spring/Fall loading 338 lbs/day, Summer loading 288 lbs/day
Total Ammonia (as NH <sub>3</sub> -N) at Fiddlehead	22 mg/L monthly average; 31 mg/L daily maximum, applies November through March	22 mg/L monthly average; 31 mg/L daily maximum, applies November through March
Total Recoverable Copper at Fiddlehead	6 µg/L monthly average; 7.5 daily maximum	6 µg/L monthly average; 7.5 daily maximum
Flow of Reclaimed Water	N/A	1.5 mgd monthly average
D. O. of Reclaimed Water	N/A	Shall be measurably present
Turbidity of Reclaimed Water	N/A	2 NTU monthly average, 5 NTU sample maximum
Total Nitrate of Reclaimed Water	N/A	10 mg/L monthly average, applies April 1 <sup>st</sup> through October 31st
Total Coliform in Reclaimed Water	N/A	2.2 MPN/100 ml 7-day median; 23 MPN/100 ml sample maximum
pH of Reclaimed Water	N/A	Shall be between 6 and 9 at all times
Chlorine Residual in Reclaimed Water Distribution System	N/A	0.5 mg/L minimum daily

The changes in the limits are mainly due to the addition of reclaimed water limits, the increase in wintertime flows, and the decrease in summer time flows. Final water quality-based permit limits will be determined when the Budd Inlet TMDL is completed.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**MONITORING REQUIREMENTS**

Monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved. Monitoring is also required to demonstrate that the discharge is not affecting the biota or sediments.

Monitoring of sludge quantity and quality is necessary to determine the appropriate uses of the sludge. Sludge monitoring is required by the current state and local solid waste management program and also by EPA under 40 CFR 503.

The monitoring schedule is detailed in the proposed permit under Condition S.2 and R.2. Specified monitoring frequencies take into account the quantity and variability of discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring. The required monitoring frequency is consistent with agency guidance given in the current version of the Department's *Permit Writer's Manual* (July 1994) for activated sludge plants of greater than 5.0 MGD average design flow that discharge to surface water.

The permit also requires monitoring of the Class A reclaimed water that matches the requirements for Class A reclaimed water in the Washington State Water Reclamation and Reuse Standards. Continued monitoring of the receiving water is required, though at a reduced frequency as compared to the existing permit. Receiving water monitoring is continued partly because of the approval for increasing wintertime discharges. This requirement may someday be removed from the permit once information is gathered on the impact of increasing the discharge and after a TMDL is completed for the waterbody.

As a pretreatment POTW, LOTT is required to have influent, final effluent, and sludge sampled for toxic pollutants in order to characterize the industrial input. Sampling is also done to determine if pollutants interfere with the treatment process or pass through the plant to the sludge or the receiving water. The monitoring data can be used by LOTT to develop updated local limits which commercial and industrial users must meet.

**LAB ACCREDITATION**

With the exception of certain parameters the permit requires all monitoring data to be prepared by a laboratory registered or accredited under the provisions of Chapter 173-50 WAC, *Accreditation of Environmental Laboratories*. The laboratory at this facility is accredited for:

<b>CHEM I (GENERAL CHEM)</b>			
<b>parameter name</b>	<b>method</b>	<b>reference</b>	
Ammonia	4500-NH3 H	SM	
Biochemical Oxygen Demand, BOD/CBOD	5210 B	SM	
Chemical Oxygen Demand (COD)	5220 D	SM	
Chlorophyll	10200 H(2)	SM	

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

Dissolved Oxygen	4500-O G	SM	
Nitrate	4500-NO3 F	SM	
Nitrate + Nitrite	4500-NO3 F	SM	
Nitrite	4500-NO2 B	SM	
Nitrogen, Total Kjeldahl	A002047	Alpke	
Orthophosphate	4500-P F	SM	
pH	4500-H	SM	
Phosphorus, Total Persulfate	4500-P F	SM	
Solids, Total	2540 B	SM	
Solids, Total Suspended	2540 D	SM	
Solids, Total Volatile	2540 E	SM	
Specific Conductance	2510 B	SM	
Turbidity	2130 B	SM	
<b>MICROBIOLOGY</b>			
<b>parameter name</b>	<b>method</b>	<b>reference</b>	
Fecal Coliforms (m-FC)	9222 D	SM 18	
Heterotrophic Plate Count	9215 B	SM	
Total Coliforms/E. coli (Colilert)	9223 B(2)	SM 20	
Total Coliforms/E. coli (Colisure)	9223 B(2)	SM 20	

**OTHER PERMIT CONDITIONS**

*REPORTING AND RECORDKEEPING*



*FACT SHEET FOR NPDES PERMIT WA0037061  
LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

The conditions of S3 are based on the authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-220-210).

*PREVENTION OF FACILITY OVERLOADING*

Overloading of the treatment plant is a violation of the terms and conditions of the permit. To prevent this from occurring, RCW 90.48.110 and WAC 173-220-150 require the Permittee to take the actions detailed in proposed permit requirement S.4 to plan expansions or modifications before existing capacity is reached and to report and correct conditions that could result in new or increased discharges of pollutants. Condition S.4 restricts the amount of flow.

*OPERATION AND MAINTENANCE (O&M)*

The proposed permit contains Condition S.5 as authorized under RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture and treatment. The proposed permit requires submission of an updated O&M Manual due to the addition of reclaimed water capability to the plant.

*RESIDUAL SOLIDS HANDLING*

To prevent water quality problems the Permittee is required in permit Condition S.7 to store and handle all residual solids (grit, screenings, scum, sludge, and other solid waste) in accordance with the requirements of RCW 90.48.080 and State Water Quality Standards.

The final use and disposal of sewage sludge from this facility is regulated by U.S. EPA under 40 CFR 503. The disposal of other solid waste is under the jurisdiction of the Thurston County Health Department.

Requirements for monitoring sewage sludge and recordkeeping are included in this permit. This information will be used to update local limits and is also required under 40 CFR 503.

*PRETREATMENT*

To provide more direct and effective control of pollutants discharged, LOTT has been delegated permitting, monitoring and enforcement authority for industrial users discharging to their treatment system. The Department oversees the delegated Industrial Pretreatment Program to assure compliance with federal pretreatment regulations (40 CFR Part 403) and categorical standards and state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC).

An industrial user survey may be required to determine the extent of compliance of all industrial users of the sanitary sewer and wastewater treatment facility with federal pretreatment regulations (40 CFR Part 403 and Sections 307(b) and 308 of the Clean Water Act), with state regulations (Chapter 90.48 RCW and Chapter 173-216 WAC), and with local ordinances.

As sufficient data becomes available, the Permittee shall, in consultation with the Department, reevaluate its local limits in order to prevent pass through or interference. Upon determination by the Department that any pollutant present causes pass through or interference, or exceeds established sludge standards, the Permittee shall establish new local limits or revise existing local limits as required by 40 CFR 403.5. In addition, the Department may require revision or establishment of local limits for any pollutant that causes an exceedance of the Water Quality Standards or established effluent limits, or that causes whole effluent toxicity. The determination by the Department shall be in the form of an Administrative Order.

*FACT SHEET FOR NPDES PERMIT WA0037061  
LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

In order to develop these local limits, the Department will provide environmental criteria or limits for the various pollutants of concern.

The Department may modify this permit to incorporate additional requirements relating to the establishment and enforcement of local limits for pollutants of concern. Any permit modification is subject to formal due process procedures pursuant to state and federal law and regulation.

*Annual Submittal of List of Industrial Users*

This provision requires the POTW to submit annually a list of existing and proposed SIUs and PSIUs. This requirement is intended to update the Department on an annual basis of the status of industrial users in the POTW's service area, without requiring the POTW to go through the process of performing a formal Industrial User Survey. Although this permit does not require performance of an Industrial User Survey, the Permittee is nevertheless required under the previous section, to take adequate continuous routine measures to identify existing and new industrial discharges.

*Duty to Enforce Discharge Prohibitions*

The POTW is prohibited from authorizing or permitting an industrial discharger to discharge certain types of waste into the sanitary sewer. Prohibited is acceptance of pollutants which cause pass through or interference. The definitions of pass through and interference are in Appendix B of the fact sheet.

The POTW is prohibited from accepting certain specific types of wastes, namely those which are explosive, flammable, excessively acidic, basic, otherwise corrosive, or obstructive to the system. In addition wastes with excessive BOD, petroleum based oils, or which result in toxic gases are prohibited to be discharged. The regulatory basis for these prohibitions is 40 CFR Part 403, with the exception of the pH provisions which are based on WAC 173-216-060.

Also prohibited are certain types of discharges unless the POTW receives prior authorization from the Department. The discharges include cooling water in significant volumes, stormwater and other direct inflow sources, and wastewaters significantly affecting system hydraulic loading, which do not require treatment.

*SPILL PLAN*

The Department has determined that the Permittee stores a quantity of chemicals that have the potential to cause water pollution if accidentally released. The Department has the authority to require the Permittee to develop best management plans to prevent this accidental release under section 402(a)(1) of the Federal Water Pollution Control Act (FWPCA) and RCW 90.48.080.

The Permittee has developed a plan for preventing the accidental release of pollutants to state waters and for minimizing damages if such a spill occurs. The proposed permit requires the Permittee to update this plan and submit it to the Department.

*EFFLUENT MIXING STUDY*

The Department has estimated the amount of mixing of the discharge within the authorized mixing zone to determine the potential for violations of the Water Quality Standards for Surface Waters (Chapter 173-201A WAC). Condition S.9 of this permit requires the Permittee to more accurately determine the mixing characteristics of the discharge. Mixing will be measured or modeled under conditions specified in the permit to assess whether assumptions made about dilution will protect the receiving water quality outside the allotted dilution zone boundary.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

*COMBINED SEWER OVERFLOWS*

In accordance with RCW 90.48.480 and Chapter 173-245 WAC, proposed permit Condition S.13 requires the Permittee to submit an annual Combined Sewer Overflow (CSO) report. The Permittee has not had a CSO discharge since 1991 and should not have any in the future.

*OUTFALL EVALUATION*

Proposed permit condition S.14 requires the Permittee to conduct an outfall inspection and submit a report detailing the findings of that inspection. The purpose of the inspection is to determine the condition of the discharge pipe and diffusers and to determine if sediment is accumulating in the vicinity of the outfall.

*CONTRIBUTING JURISDICTIONS*

Proposed permit Condition S.15 applies to the contributing jurisdictions of LOTT, namely Lacey, Olympia, Tumwater, and Thurston County. The contributing jurisdictions have pretreatment, reporting, loading, and operation and maintenance requirements in the permit. Each jurisdiction must properly operate and maintain their respective collection systems, and responsibly respond to and report spills.

*GENERAL CONDITIONS*

General Conditions are based directly on state and federal law and regulations and have been standardized for all individual municipal NPDES permits issued by the Department.

**RECLAIMED WATER (R) CONDITIONS**

The Reclaimed Water Act, Chapter 90.46 RCW, authorized the development of Water Reclamation and Reuse Standards for the beneficial use of reclaimed water. These standards were completed in 1997. All reclaimed water permits issued by the Department must specify conditions demonstrating that the wastewater has been adequately and reliably treated to meet the requirements in the Water Reclamation and Reuse Standards, 1997, appropriate for the use. In addition to meeting the water quality limitations, the standards require specific treatment and disinfection requirements beyond those of most conventional wastewater treatment facilities. The standards also require automated alarms, redundancy of treatment units, emergency storage, stringent operator training requirements and public notification of reclaimed water use.

Under RCW 90.46.040, a permit is required for land application of reclaimed water. The permit is issued to the generator of the reclaimed water who may then distribute the water subject to the permitted provisions governing the location, rate, water quality and purposes of use. The permit is issued by the Department under the authority of Chapter 90.48 RCW which requires that a permit be issued before any discharge of pollutants to waters of the state is allowed (RCW 90.48.080 and 90.48.162). RCW 90.46.030 states that the Department of Health may issue a permit for industrial and commercial uses of reclaimed water and that the permits will govern the location, rate, water quality and purposes of use. Per memorandum of agreement between the Department of Ecology and the Department of Health, DOH requirements are included in a single permit issued by the Department.

In addition to the Water Reclamation and Reuse Standards, regulations adopted by the state include procedures for issuing permits (Chapter 173-216 WAC), technical criteria for discharges from municipal wastewater treatment facilities (Chapter 173-221 WAC) and water quality criteria for ground waters (Chapter 173-200 WAC). The Reclaimed Water Act, the Water Reclamation and Reuse Standards and these regulations also establish the basis for effluent limitations and other requirements which are to be included in the permit.

## **DESCRIPTION OF THE RECLAMATION TREATMENT AND DISTRIBUTION SYSTEM**

### *Treatment Processes*

The reclaimed water facility at the Budd Inlet treatment plant is designed to have a firm capacity of 700 gallons per minute (about 1 MGD) with a peak capacity of approximately 1000 gpm (1.5 MGD). The reclaimed water facility is within the footprint of the Budd Inlet plant. The facility has completed construction and came on line in 2004. The facility is described in the approved engineering report *Budd Inlet Reclaimed Water Production Facilities Engineering Report* (November 2000).

The reclaimed water facility starts with final effluent from the Budd Inlet treatment plant. Three filter feed pumps transfer the treated Budd Inlet effluent to the new continuous back wash counter current up flow filters. Polymer is added to the water prior to filtration. Sodium hypochlorite is used for disinfection after the filtration. After the disinfection contact basins, the reclaimed water is stored in a 140,000 gallon tank before reuse. The reclaimed water system will be operated as needed to supply reclaimed water to users. At first, most uses will either be in plant uses or irrigations uses.

The Water Reclamation and Reuse Standards require the generator of the reclaimed water to either have a Department delegated industrial wastewater treatment program or all industries discharging into the generator's wastewater collection system shall have current waste discharge permits issued by the Department. LOTT has a delegated pretreatment program.

The LOTT Budd Inlet treatment plant is a class 4 plant, so adding the reclaimed water facility does not change the overall classification of the plant.

### *Distribution System and Use Area*

The reclaimed water distribution pipeline is a 12-inch ductile iron pipe that was installed during the construction of the Southern Connection Pipeline Project. The distribution pipe goes through downtown Olympia to Heritage Park and Marathon Park. Most of the identified uses of reclaimed water are either in plant uses, for irrigation, or for limited commercial applications. Some of the potential uses of the class A reuse water listed in the engineering report include: LOTT wastewater treatment plant (peak day 131,443 gpd), Heritage Park/Deschutes Parkway irrigation (peak day 42,700 gpd), Marathon Park irrigation (peak day 8,145 gpd), Capitol Lake pump station (peak day 2,880 gpd), Capitol Campus irrigation (peak day 91,893 gpd), Capitol Campus steam plant (peak day 10,000 gpd), and Port of Olympia uses (peak day 48,610 gpd).

For all these uses, appropriate rates, setbacks, signs, and other controls will be in place for the use of class A reclaimed water per the *Washington State Water Reclamation and Reuse Standards* (September 1997).

## **GROUND WATER**

The reuse sites are mostly in areas of shallow ground water. The Budd Inlet plant, Heritage Park, Marathon Park, the pump station and the steam plant are all in areas with ground water approximately 2 to 5 feet below the ground surface. Vertical hydraulic conductivity is estimated at some of the sites to be 0.6 to 2 inches/hour. The soil types include Hoogdal and Xerothents. The Capitol Campus has Indianola and Skipopa soils and a vertical hydraulic conductivity of 6 to 20 inches/hour. All irrigation will be done at agronomic rates to prevent impacts to groundwater and to nearby surface water.

## **WATER RIGHTS STATUS**

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

The Permittee is considered the generator of the reclaimed water and RCW 90.46.120 gives the Permittee exclusive right to any water generated by the wastewater treatment facility. Use and distribution of reclaimed water is exempted from the water right permit requirements of RCW 90.03.250 and 90.44.060.

**PROPOSED PERMIT LIMITATIONS (R1)**

The Reclaimed Water Act, Chapter 90.46 RCW requires that reclaimed water be adequately and reliably treated prior to distribution and beneficial use. State regulations require that limitations set forth in a permit issued under Chapter 90.48 RCW must be either technology- or water quality-based. Municipal wastewater must also be treated using all known, available, and reasonable treatment (AKART) and not pollute the waters of the state. The minimum criteria to demonstrate compliance with these requirements are derived from the *Water Reclamation and Reuse Standards* and Chapter 173-221 WAC.

The permit also includes limitations on the quantity and quality of the reclaimed water that have been determined to protect the quality of the ground water. The approved engineering report includes specific design criteria for this facility. Water quality-based limitations are based upon compliance with the Ground Water Recharge Criteria (RCW 90.46.080) which are the drinking water standards for the parameters noted and the Ground Water Quality Standards (Chapter 173-200 WAC) for other parameters that require regulation.

The more stringent of the water quality-based or technology-based limits are applied to each of the parameters of concern. Each of these types of limits is described in more detail below.

**TECHNOLOGY-BASED EFFLUENT LIMITATIONS**

All waste discharge permits issued by the Department must specify conditions requiring all known available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110). All reclaimed water permits must assure that the effluent has been adequately and reliably treated so that as a result of that treatment, it is suitable for a beneficial use or controlled use that would not otherwise occur and is no longer considered a wastewater (RCW 90.46.010(40)).

The authority and duties for reclaimed water use are in addition to those already provided in law with regard to sewage and wastewater collection, treatment and disposal for the protection of public health and the safety of the state's waters. All waste discharge permits issued by the Department must specify conditions requiring all known available and reasonable methods of prevention, control, and treatment of discharges to waters of the state (WAC 173-216-110). For land application, the permit requires the reclaimed water to be applied at agronomic rates.

The Water Reclamation and Reuse Standards, 1997, outline the requirements for the additional level of treatment technology as well as water quality limits necessary for public health protection during the use of reclaimed water. The standards provide four classes of reclaimed water, Classes A, B, C, and D.

This facility produces Class A reclaimed water. Class A is the highest quality of reclaimed water and therefore provides the broadest range of reuse opportunities. Conversely, Class A reclaimed water requires the most stringent treatment and water quality limitations. The technology and water quality requirements for the production of Class A reclaimed water are as follows:

“Class A Reclaimed Water” is reclaimed water that had been adequately and reliably treated and, at a minimum is, at all times, an oxidized, coagulated, filtered and disinfected wastewater.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

1. Oxidized is defined as wastewater in which the organic matter has been stabilized such that the biochemical oxygen demand (BOD<sub>5</sub>) does not exceed 30 mg/L and total suspended solids (TSS) does not exceed 30 mg/L, is nonputrescible and contains dissolved oxygen.
2. Coagulated wastewater is defined as an oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated prior to filtration by the addition of chemicals or by an equally effective method.
3. Filtered wastewater is defined as an oxidized, coagulated wastewater which has been passed through natural undisturbed soils or filter media, such as sand or anthracite, so that the turbidity as determined by an approved laboratory method does not exceed an average operating turbidity of 2 nephelometric turbidity units (NTU), determined monthly, and does not exceed 5 NTU at any time.
4. Adequate disinfection is defined as the median number of total coliform organisms in the wastewater after disinfection does not exceed 2.2 per 100 milliliters, as determined from the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform organisms does not exceed 23 per 100 milliliters in any sample.
5. A 0.5 mg/L chlorine residual shall be maintained in the reclaimed water during conveyance from the reclamation facility to the use areas.

**MONITORING REQUIREMENTS (R2)**

Monitoring, recording, and reporting are specified to verify that the treatment process is functioning correctly, that ground water criteria are not violated, and that reclaimed water limitations are being achieved

*RECLAIMED WATER MONITORING*

The monitoring and testing schedule is detailed in the proposed permit under Condition R2. Specified monitoring frequencies take into account the quantity and variability of the reclaimed water, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

Monitoring for total nitrogen is being required to further characterize the reclaimed water. This pollutant could have a significant impact on the quality of the ground water.

**REPORTING AND RECORDKEEPING (R3)**

The conditions of R3 are based on the authority to specify appropriate reporting and recordkeeping requirements to prevent and control the distribution or use of inadequately treated wastewater.

**RECLAIMED WATER DISTRIBUTION AND USE (R4)**

These permit requirements are based on the Water Reclamation and Reuse Standards authorized in Chapter 90.46 RCW. The standards contain requirements to assure that distribution and use of reclaimed water are protective of public health and the environment at all times. These include prohibitions on bypass, alarms and storage or alternative disposal of substandard water, maintenance of operational records, cross connection control, use area restrictions and enforceable contracts and a local reclaimed water use ordinance.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**OPERATIONS AND MAINTENANCE (R5)**

The proposed permit contains Condition R.5 as authorized under the Water Reclamation and Reuse Standards and RCW 90.48.110, WAC 173-220-150, Chapter 173-230 WAC, and WAC 173-240-080. It is included to ensure proper operation and regular maintenance of equipment, and to ensure that adequate safeguards are taken so that constructed facilities are used to their optimum potential in terms of pollutant capture, treatment and protection of public health and the environment.

**PERMIT ISSUANCE PROCEDURES**

*PERMIT MODIFICATIONS*

The Department may modify this permit to impose numerical limitations, if necessary to meet Water Quality Standards, Sediment Quality Standards, or Ground Water Standards, based on new information obtained from sources such as inspections, effluent monitoring, outfall studies, and effluent mixing studies.

The Department may also modify this permit as a result of new or amended state or federal regulations.

*RECOMMENDATION FOR PERMIT ISSUANCE*

This proposed permit meets all statutory requirements for authorizing a wastewater discharge, including those limitations and conditions believed necessary to protect human health, aquatic life, and the beneficial uses of waters of the state of Washington. The Department proposes that this permit be issued for up to five years, with the clear intention that the effluent limits will be adjusted by permit modification once the Budd Inlet TMDL process is complete. If the TMDL drives significant changes to the permit, the permit may be revoked and a new permit issued instead.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**REFERENCES FOR TEXT AND APPENDICES**

Brown and Caldwell

- 1998. LOTT Wastewater Resource Management Plan
- 2000. LOTT Wastewater Alliance Budd Inlet Reclaimed Water Production Facilities Engineering Report
- 2002. NPDES Permit Number 003706 Renewal Application LOTT Wastewater Alliance – Budd Inlet Plant Further Response to November 21, 2001 Letter
- 2003. NPDES Permit Number 003706 Renewal Application LOTT Wastewater Alliance – Budd Inlet Plant Additional Information Regarding Basis for Model Runs

Environmental Protection Agency (EPA)

- 1992. National Toxics Rule. Federal Register, V. 57, No. 246, Tuesday, December 22, 1992.
- 1991. Technical Support Document for Water Quality-based Toxics Control. EPA/505/2-90-001.
- 1988. Technical Guidance on Supplementary Stream Design Conditions for Steady State Modeling. USEPA Office of Water, Washington, D.C.
- 1985. Water Quality Assessment: A Screening Procedure for Toxic and Conventional Pollutants in Surface and Ground Water. EPA/600/6-85/002a.
- 1983. Water Quality Standards Handbook. USEPA Office of Water, Washington, D.C.

LOTT Alliance

- 2001. Renewal Request National Pollutant Discharge Elimination System Permit No. WA-003706-1
- 2002. LOTT Budd Inlet Treatment Plant NPDES Permit WA003706-1
- 1998. Budd Inlet Scientific Study Final Report
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- 1991. Wastewater Engineering, Treatment, Disposal, and Reuse. Third Edition.

Tsivoglou, E.C., and J.R. Wallace.

- 1972. Characterization of Stream Reaeration Capacity. EPA-R3-72-012. (Cited in EPA 1985 op.cit.)

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- 1994. Permit Writer's Manual. Publication Number 92-109
- 1993. Guidelines for Preparation of Engineering Reports for Industrial Wastewater Land Application Systems, Ecology Publication # 93-36. 20 pp.
- 1997. Water Reclamation and Reuse Standards, Ecology Publication # 97-23. 73 pp.



*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

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1994. Design Criteria for Municipal Wastewater Land Treatment, 10 pp

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Wright, R.M., and A.J. McDonnell.

1979. In-stream Deoxygenation Rate Prediction. Journal Environmental Engineering Division, ASCE. 105(E2). (Cited in EPA 1985 op.cit.)

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**APPENDIX A--PUBLIC INVOLVEMENT INFORMATION**

The Department has tentatively determined to reissue a permit to the applicant listed on page 1 of this fact sheet. The permit contains conditions and effluent limitations which are described in the rest of this fact sheet.

Public notice of application was published on October 8, 2000, October 15, 2000, July 15, 2002, July 21, 2002, July 13, 2003, July 20, 2003, July 18, 2004, and July 25, 2004, in *The Olympian* to inform the public that an application had been submitted and to invite comment on the reissuance of this permit.

The Department will publish a Public Notice of Draft (PNOD) on July 15, 2005, in *The Olympian* to inform the public that a draft permit and fact sheet are available for review. Interested persons are invited to submit written comments regarding the draft permit. The draft permit, fact sheet, and related documents are available for inspection and copying between the hours of 8:00 a.m. and 5:00 p.m. weekdays, by appointment, at the regional office listed below. Written comments should be mailed to:

Water Quality Permit Administrator  
Department of Ecology  
Southwest Regional Office  
P.O. Box 47775  
Olympia, WA 98504-7775

Any interested party may comment on the draft permit or request a public hearing on this draft permit within the 30-day comment period to the address above. The request for a hearing shall indicate the interest of the party and the reasons why the hearing is warranted. The Department will hold a hearing if it determines there is a significant public interest in the draft permit (WAC 173-220-090). Public notice regarding any hearing will be circulated at least 30 days in advance of the hearing. People expressing an interest in this permit will be mailed an individual notice of hearing (WAC 173-220-100).

Comments should reference specific text followed by proposed modification or concern when possible. Comments may address technical issues, accuracy and completeness of information, the scope of the facility's proposed coverage, adequacy of environmental protection, permit conditions, or any other concern that would result from issuance of this permit.

The Department will consider all comments received within 30 days from the date of public notice of draft indicated above, in formulating a final determination to issue, revise, or deny the permit. The Department's response to all significant comments is available upon request and will be mailed directly to people expressing an interest in this permit.

Further information may be obtained from the Department by telephone, (360) 407-6278, or by writing to the address listed above.

This permit and fact sheet were written by Dave Dougherty

## **APPENDIX B--GLOSSARY**

**Acute Toxicity**--The lethal effect of a pollutant on an organism that occurs within a short period of time, usually 48 to 96 hours.

**AKART**-- An acronym for "all known, available, and reasonable methods of prevention, control, and treatment".

**Ambient Water Quality**--The existing environmental condition of the water in a receiving water body.

**Ammonia**--Ammonia is produced by the breakdown of nitrogenous materials in wastewater. Ammonia is toxic to aquatic organisms, exerts an oxygen demand, and contributes to eutrophication. It also increases the amount of chlorine needed to disinfect wastewater.

**Average Monthly Discharge Limitation** --The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month (except in the case of fecal coliform). The daily discharge is calculated as the average measurement of the pollutant over the day.

**Average Weekly Discharge Limitation** -- The highest allowable average of daily discharges over a calendar week, calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Beneficial Use** – The use of reclaimed water, that has been transported from the point of production to the point of use without an intervening discharge to the waters of the state, for a beneficial purpose.

**Best Management Practices (BMPs)**--Schedules of activities, prohibitions of practices, maintenance procedures, and other physical, structural and/or managerial practices to prevent or reduce the pollution of waters of the State. BMPs include treatment systems, operating procedures, and practices to control: plant site runoff, spillage or leaks, sludge or waste disposal, or drainage from raw material storage. BMPs may be further categorized as operational, source control, erosion and sediment control, and treatment BMPs.

**BOD<sub>5</sub>**--Determining the Biochemical Oxygen Demand of an effluent is an indirect way of measuring the quantity of organic material present in an effluent that is utilized by bacteria. The BOD<sub>5</sub> is used in modeling to measure the reduction of dissolved oxygen in a receiving water after effluent is discharged. Stress caused by reduced dissolved oxygen levels makes organisms less competitive and less able to sustain their species in the aquatic environment. Although BOD is not a specific compound, it is defined as a conventional pollutant under the federal Clean Water Act.

**Bypass**--The intentional diversion of waste streams from any portion of a treatment facility.

**CBOD<sub>5</sub>** – The quantity of oxygen utilized by a mixed population of microorganisms acting on the nutrients in the sample in an aerobic oxidation for five days at a controlled temperature of 20 degrees Celsius, with an inhibitory agent added to prevent the oxidation of nitrogen compounds. The method for determining CBOD<sub>5</sub> is given in 40 CFR Part 136.

**Chlorine**--Chlorine is used to disinfect wastewaters of pathogens harmful to human health. It is also extremely toxic to aquatic life.

**Chronic Toxicity**--The effect of a pollutant on an organism over a relatively long time, often 1/10 of an organism's lifespan or more. Chronic toxicity can measure survival, reproduction or growth rates, or other parameters to measure the toxic effects of a compound or combination of compounds.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**Clean Water Act (CWA)**--The Federal Water Pollution Control Act enacted by Public Law 92-500, as amended by Public Laws 95-217, 95-576, 96-483, 97-117; USC 1251 et seq.

**Combined Sewer Overflow (CSO)**--The event during which excess combined sewage flow caused by inflow is discharged from a combined sewer, rather than conveyed to the sewage treatment plant because either the capacity of the treatment plant or the combined sewer is exceeded.

**Compliance Inspection - Without Sampling**--A site visit for the purpose of determining the compliance of a facility with the terms and conditions of its permit or with applicable statutes and regulations.

**Compliance Inspection - With Sampling**--A site visit to accomplish the purpose of a Compliance Inspection - Without Sampling and as a minimum, sampling and analysis for all parameters with limits in the permit to ascertain compliance with those limits; and, for municipal facilities, sampling of influent to ascertain compliance with the percent removal requirement. Additional sampling may be conducted.

**Composite Sample**--A mixture of grab samples collected at the same sampling point at different times, formed either by continuous sampling or by mixing a minimum of four discrete samples. May be "time-composite"(collected at constant time intervals) or "flow-proportional" (collected either as a constant sample volume at time intervals proportional to stream flow, or collected by increasing the volume of each aliquot as the flow increased while maintaining a constant time interval between the aliquots.

**Construction Activity**--Clearing, grading, excavation and any other activity which disturbs the surface of the land. Such activities may include road building, construction of residential houses, office buildings, or industrial buildings, and demolition activity.

**Continuous Monitoring** --Uninterrupted, unless otherwise noted in the permit.

**Critical Condition**--The time during which the combination of receiving water and waste discharge conditions have the highest potential for causing toxicity in the receiving water environment. This situation usually occurs when the flow within a water body is low, thus, its ability to dilute effluent is reduced.

**Dilution Factor**--A measure of the amount of mixing of effluent and receiving water that occurs at the boundary of the mixing zone. Expressed as the inverse of the effluent fraction e.g., a dilution factor of 10 means the effluent comprises 10% by volume and the receiving water 90%.

**Engineering Report**--A document, signed by a professional licensed engineer, which thoroughly examines the engineering and administrative aspects of a particular domestic or industrial wastewater facility. The report shall contain the appropriate information required in the Water Reclamation and Reuse Standards, WAC 173-240-060 or 173-240-130.

**Fecal Coliform Bacteria**--Fecal coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. The presence of high numbers of fecal coliform bacteria in a water body can indicate the recent release of untreated wastewater and/or the presence of animal feces.

**Grab Sample**--A single sample or measurement taken at a specific time or over as short period of time as is feasible.

**Groundwater Recharge Criteria** -- The contaminant criteria found in the drinking water quality standards adopted by the state board of health pursuant to chapter 43.20 RCW and the department of health pursuant to chapter 70.119A RCW.

**Industrial User**-- A discharger of wastewater to the sanitary sewer which is not sanitary wastewater or is not equivalent to sanitary wastewater in character.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**Industrial Wastewater**--Water or liquid-carried waste from industrial or commercial processes, as distinct from domestic wastewater. These wastes may result from any process or activity of industry, manufacture, trade or business, from the development of any natural resource, or from animal operations such as feed lots, poultry houses, or dairies. The term includes contaminated storm water and, also, leachate from solid waste facilities.

**Infiltration and Inflow (I/I)**--"Infiltration" means the addition of ground water into a sewer through joints, the sewer pipe material, cracks, and other defects. "Inflow" means the addition of precipitation-caused drainage from roof drains, yard drains, basement drains, street catch basins, etc., into a sewer.

**Interference** -- A discharge which, alone or in conjunction with a discharge or discharges from other sources, both:

Inhibits or disrupts the POTW, its treatment processes or operations, or its sludge processes, use or disposal and;

Therefore is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation) or of the prevention of sewage sludge use or disposal in compliance with the following statutory provisions and regulations or permits issued thereunder (or more stringent State or local regulations): Section 405 of the Clean Water Act, the Solid Waste Disposal Act (SWDA) (including title II, more commonly referred to as the Resource Conservation and Recovery Act (RCRA), and including State regulations contained in any State sludge management plan prepared pursuant to subtitle D of the SWDA), sludge regulations appearing in 40 CFR Part 507, the Clean Air Act, the Toxic Substances Control Act, and the Marine Protection, Research and Sanctuaries Act.

**Major Facility**--A facility discharging to surface water with an EPA rating score of > 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Maximum Daily Discharge Limitation**--The highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

**Method Detection Level (MDL)**--The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is above zero and is determined from analysis of a sample in a given matrix containing the analyte.

**Minor Facility**--A facility discharging to surface water with an EPA rating score of < 80 points based on such factors as flow volume, toxic pollutant potential, and public health impact.

**Mixing Zone**--A volume that surrounds an effluent discharge within which water quality criteria may be exceeded. The area of the authorized mixing zone is specified in a facility's permit and follows procedures outlined in State regulations (Chapter 173-201A WAC).

**National Pollutant Discharge Elimination System (NPDES)**--The NPDES (Section 402 of the Clean Water Act) is the Federal wastewater permitting system for discharges to navigable waters of the United States. Many states, including the State of Washington, have been delegated the authority to issue these permits. NPDES permits issued by Washington State permit writers are joint NPDES/State permits issued under both State and Federal laws.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**Pass through** -- A discharge which exits the POTW into waters of the—State in quantities or concentrations which, alone or in conjunction with a discharge or discharges from other sources, is a cause of a violation of any requirement of the POTW's NPDES permit (including an increase in the magnitude or duration of a violation), or which is a cause of a violation of State water quality standards.

**pH**--The pH of a liquid measures its acidity or alkalinity. A pH of 7 is defined as neutral, and large variations above or below this value are considered harmful to most aquatic life.

**Potential Significant Industrial User**--A potential significant industrial user is defined as an Industrial User which does not meet the criteria for a Significant Industrial User, but which discharges wastewater meeting one or more of the following criteria:

- a. Exceeds 0.5 % of treatment plant design capacity criteria and discharges <25,000 gallons per day or;
- b. Is a member of a group of similar industrial users which, taken together, have the potential to cause pass through or interference at the POTW (e.g. facilities which develop photographic film or paper, and car washes).

The Department may determine that a discharger initially classified as a potential significant industrial user should be managed as a significant industrial user.

**Quantitation Level (QL)**-- A calculated value five times the MDL (method detection level).

**Reclaimed Water** – Effluent derived in any part from sewage from a wastewater treatment system that has been adequately and reliably treated, so that as a result of that treatment, it is suitable for a beneficial use or a controlled use that would not otherwise occur and is no longer considered wastewater.

**Reclamation Facility** – means an arrangement of devices, structures, equipment, processes, and controls which produce reclaimed water suitable for the intended reuse.

**Sample Maximum** -- No sample shall exceed this value.

**Significant Industrial User (SIU)**--

- 1) All industrial users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR Chapter I, Subchapter N and;
- 2) Any other industrial user that: discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling, and boiler blow-down wastewater); contributes a process wastestream that makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority\* on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement (in accordance with 40 CFR 403.8(f)(6)).

Upon finding that the industrial user meeting the criteria in paragraph 2, above, has no reasonable potential for adversely affecting the POTW's operation or for violating any pretreatment standard or requirement, the Control Authority\* may at any time, on its own initiative or in response to a petition received from an industrial user or POTW, and in accordance with 40 CFR 403.8(f)(6), determine that such industrial user is not a significant industrial user.

\*The term "Control Authority" refers to the Washington State Department of Ecology in the case of non-delegated POTWs or to the POTW in the case of delegated POTWs.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**State Waters**--Lakes, rivers, ponds, streams, inland waters, underground waters, salt waters, wetlands, and all other surface waters and watercourses within the jurisdiction of the state of Washington.

**Stormwater**--That portion of precipitation that does not naturally percolate into the ground or evaporate, but flows via overland flow, interflow, pipes, and other features of a storm water drainage system into a defined surface water body, or a constructed infiltration facility.

**Surface Percolation** – The controlled application of water to the ground surface for the purpose of replenishing ground water.

**Technology-based Effluent Limit**--A permit limit that is based on the ability of a treatment method to reduce the pollutant.

**Total Coliform Bacteria**—Coliform bacteria are used as indicators of pathogenic bacteria in the effluent that are harmful to humans. Pathogenic bacteria in wastewater discharges are controlled by disinfecting the wastewater. A microbiological test is used to detect and enumerate the total coliform group of bacteria in water samples.

**Total Suspended Solids (TSS)**--Total suspended solids are the particulate materials in an effluent. Large quantities of TSS discharged to a receiving water may result in solids accumulation. Apart from any toxic effects attributable to substances leached out by water, suspended solids may kill fish, shellfish, and other aquatic organisms by causing abrasive injuries and by clogging the gills and respiratory passages of various aquatic fauna. Indirectly, suspended solids can screen out light and can promote and maintain the development of noxious conditions through oxygen depletion.

**Upset**--An exceptional incident in which there is unintentional and temporary noncompliance with technology-based permit effluent limitations because of factors beyond the reasonable control of the Permittee. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, lack of preventative maintenance, or careless or improper operation.

**Water Quality-based Effluent Limit**--A limit on the concentration or mass of an effluent parameter that is intended to prevent the concentration of that parameter from exceeding its water quality criterion after it is discharged into a receiving water.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**APPENDIX C--TECHNICAL CALCULATIONS**

Several of the Excel® spreadsheet tools used to evaluate a discharger's ability to meet Washington State water quality standards can be found on the Department's homepage at <http://www.ecy.wa.gov>.

Performance limits were calculated with the PERFORMLIM spreadsheet using the below data:

**Data Summary - Critical Season Months**

S/S/F=Spring/Summer/Fall (April – October)

S/F=Spring/Fall (April, May, & October)

S=Summer (June-September)

Date of Data	Flow (MGD)	BOD (mg/l)	BOD (lbs/day)	TIN (mg/l)
2004 S/S/F	9.7	3.9	323	2.5
2004 S/F	9.8	4.7	383	2.6
2004 S	9.6	3.4	278	2.4
2003 S/S/F	9.7	4.9	418	2.2
2003 S/F	11.1	5.7	545	2.0
2003 S	8.7	4.4	323	2.3
2002 S/S/F	9.5	4.2	344	1.4
2002 S/F	10.2	4.0	351	1.6
2002 S	9.1	4.4	339	1.2
2001 S/S/F	9.3	3.8	297	2.2
2001 S/F	9.6	4.1	329	2.3
2001 S	9.0	3.6	273	2.2
2000 S/S/F	10	3.4	284	1.5
2000 S/F	10.4	3.7	320	1.5
2000 S	9.7	3.1	257	1.5
1999 S/S/F	10.4	5.9	511	1.6
1999 S/F	11.3	6.1	567	1.8
1999 S	9.7	5.7	469	1.5
1998 S/S/F	9.7	4.7	395	1.9
1998 S/F	10.3	4.8	427	2.0
1998 S	9.3	4.7	371	1.8
1997 S/S/F	11.7	3.9	379	2.2
1997 S/F	12.5	4.5	468	2.5
1997 S	11.1	3.4	311	2.0
1996 S/S/F	11	4.6	564	2.2
1996 S/F	12.3	5.5	867	1.7
1996 S	10.0	4.0	337	2.5
1995 S/S/F	9.7	2.9	244	2.1
1995 S/F	10.2	3.0	257	1.9
1995 S	9.4	2.7	235	2.3



**APPENDIX D--RESPONSE TO COMMENTS**

The following comments were received during the Public Notice of Draft Permit held for NPDES permit WA0037061. The public notice lasted from July 15, 2005, through August 14, 2005. A Public Hearing was not held.

Below is a listing of the comments received during the comment period. Two entities submitted comments, LOTT Alliance (the Permittee) and People for Puget Sound. The comments by People for Puget Sound were submitted a day after the comment period closed. Each comment is followed by the corresponding response, permit change (or lack of change), and the Department's justification of the change (or lack of change).

**Comments by LOTT Alliance**

**Permit Comment #1:**

Page 7, Section S1.A., second paragraph – The draft Permit defines discharge limitations in two stages:

- Interim Effluent Limitations, effective immediately upon issuance of the Permit through October 31, 2006; and
- Final Effluent Limitations, effective November 1, 2006.

We request the effective date for the Final Effluent Limitations be extended one year, to October 31, 2007, to allow us sufficient experience adjusting to two significant changes to our operating conditions – the new Interim Effluent Limitations, which are based on loadings rather than flows; and the planned start-up of the Hawks Prairie Reclaimed Water Satellite early in 2006.

The new discharge limitations will be very different for us operationally. Getting used to this new structure, and the operational and process control adjustments that will be required to implement it, will take a full year. Our Operations and Process Control staff need to gain experience meeting the new limits, and the seasonal transitions, across all four seasons of the year.

Simultaneous with this new mode of operation will be initial start-up of our very first Reclaimed Water Satellite, scheduled to take place early in 2006. We expect it will be necessary to have several months of testing and fine-tuning before we'll be fully operational and ready to distribute and use Class A Reclaimed Water from that satellite plant. Because the solids from the new Martin Way Reclaimed Water Plant will be sent to the Budd Inlet Treatment Plant, our Operations and Process Control staff will be facing another significant operational adjustment with which we'll need to gain experience across the seasons while we're still getting used to the new discharge limitations. It would be ideal to have at least one year of operation with this new facility, after an initial start-up period, prior to imposing the more restrictive Final Effluent Limitations.

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

**Permit Response #1:**

The permit as written allows the interim limits for the 2006 critical season (April-October) and then the final limits become effective for the 2007 critical season. This time schedule should give the Permittee the full year they desire to get used to the new limits and to bring the new satellite plant fully on-line. While the Department realizes that this schedule may be challenging to the Permittee, given the water quality concerns in the 303(d) listed Budd Inlet we expect the Permittee to maintain a high level of performance and adjust to the new limits in a timely manner. With the TMDL for Budd Inlet nearing completion, the Permittee may have even more challenging limits and waste load restrictions in the permit in the next couple of years. No change was made to the permit based on this comment.

**Permit Comment #2:**

Page 18, Section S4.F. – The May 15<sup>th</sup> annual due date for LOTT's flow and loading assessment is consistent with planning dates outlined in LOTT's Wastewater Resource Management Plan. In actual practice, since the Plan was published, we've found it difficult to actually achieve that schedule. We would appreciate having that annual due date changed to August 31.

**Permit Response #2:**

Moving the due date for the annual flow and loading assessment to August 31<sup>st</sup> is reasonable. The permit was changed as requested.

**Permit Comment #3:**

Page 38, Section R1. – The Total Nitrogen limit of 10 mg/L for reclaimed water produced at the Budd Inlet Treatment Plant poses some significant operational challenges during the cold and wet weather months. For the reasons discussed below, we propose changing that limit to a seasonal approach, consistent with other NPDES Permit limitations, with a 10 mg/L Total Inorganic Nitrogen (TIN) limit imposed only from April through October when the reclaimed water is most likely to be used for irrigation.

To attain a Total Nitrogen limit of 10 mg/L for the reclaimed water, the entire Budd Inlet Treatment Plant must remain in Biological Nutrient Removal (BNR) mode all year long, although the nutrient removal process is only required from April through October and only a small percentage of our effluent is being treated to Class A Reclaimed Water standards. Keeping the BNR system operational in the winter is problematic for three reasons – filament growth that affects sludge settleability, flow restriction, and increased energy consumption and chemical use.

- Sludge Settleability – The Budd Inlet Treatment Plant will need to operate at a much longer solids retention time in the winter season to achieve this level of nutrient removal because of the colder temperatures. This will encourage propagation of filamentous bacteria (Microthrix), which has a growth advantage in these environmental conditions. Those bacteria compromise our sludge settleability and increase the risk of suspended solids loss over the effluent weirs of the secondary clarifiers. This then restricts the amount of flow that the Treatment Plant can pump to the secondary clarifiers, particularly during peak flow events. The one useable method in place at this time for control of Microthrix has been a reduction of the mixed liquor suspended solids, which in turn lowers the aeration basin sludge age and allows the system to limit the population of the

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

relatively slow-growing *Microthrix*. This control becomes unattainable when complete nitrification/de-nitrification must be maintained.

- The Budd Inlet Treatment Plant is subject to flow spikes during high rainfall periods due to the combined sewer system in Downtown Olympia. With the sludge settleability issue described above, the Total Nitrogen limit of 10 mg/L for reclaimed water during winter months also potentially reduces the amount of influent flow that the Treatment Plant can effectively handle during these times when we need to manage and treat the greatest volumes.
- Continued BNR operation during the wettest months of the year causes a flow bottleneck at the head of the First Anoxic Basins due to the need for maintaining recycle flow rate of four times the influent flow rate to achieve de-nitrification during the winter months. To maintain this recycle rate, and thus the de-nitrification process, the Treatment Plant must run four 200-horsepower pumps at 75-90 percent speed. In addition, it substantially increases the aeration demand. This results in significant increased energy consumption, and associated costs, during some of the peak energy demand periods.

We recognize and appreciate that the Total Nitrogen limit in the Reclaimed Water Permit is intended for protection of groundwater, and that an appropriate limit is needed to avoid potential degradation of groundwater from groundwater recharge or irrigation. Since none of the reclaimed water currently produced at the Budd Inlet Treatment Plant is being used for groundwater recharge, and since irrigation during the winter months is unnecessary, we propose that Ecology consider applying the same kind of seasonal basis to this limit that it applies to our BNR operation. Specifically, we propose a TIN limit of 10 mg/L imposed on LOTT's Class A Reclaimed Water from April through October, and no specified limits during the November through March period. We recognize this would need to be accompanied by appropriate no-irrigation/no-infiltration restrictions on reclaimed water usage from November through March.

If the nitrogen limit for LOTT's reclaimed water could be based on TIN or Nitrate, rather than Total Nitrogen, the water quality criteria for groundwater/drinking water -- which is 10 mg/L Nitrate (NO<sub>3</sub>) as identified in WAC 173-200 Table 1) -- could easily be met during the April through October season.

**Permit Response #3:**

The Total Nitrogen limit was placed in the reclaimed water section of the permit for the protection of groundwater when the reclaimed water is used for a beneficial use that ends up going to ground. The beneficial uses of concern would be infiltration and irrigation. Since none of the reclaimed water is used for infiltration and since irrigation is not needed in the winter, the Nitrogen limit is not needed during the winter months. The permit was changed to a Total Nitrate limit of 10 mg/L and the limit was footnoted as only applying from April through October and any other time when the reclaimed water is used for irrigation or infiltration. With this change, the limit is only effective during the irrigation season. It also gives the Permittee the flexibility to use the water for irrigation in the winter season, if they can still meet the Nitrate limit.

**Permit Comment #4:**

Page 42, Section R4.B., second paragraph, last sentence -- We propose deleting the phrase "or adjacent basin" from that sentence. This places an undue burden on LOTT to define

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

characteristics and impacts far from an application site depending upon definition of “drainage basin.”

The term “significantly contribute” in the same sentence is subject to interpretation. Is there a basis for determining what that might mean?

**Permit Response #4:**

The phrase “or adjacent basin” was deleted as requested. It would not only be a burden to the Permittee to define characteristics and impacts far from an application site, it would be next to impossible for the Department to define a distant impact and enforce this requirement. The Department expects the Permittee to use their reclaimed water in a beneficial manner that will not cause groundwater flooding issues. The Department also removed the word “significantly”, so the requirement is more straightforward. Beneficial use of reclaimed water should not cause or contribute to a problem.

**Permit Comment #5:**

Page 46, Section R4.K., first paragraph – This provision should not apply for constructed wetlands and should apply only to natural wetlands. We suggest the following rewording “...purveyor may use reclaimed water for *natural* wetland enhancement, as long as...”

**Permit Response #5:**

The permit was changed as requested, since the requirement is meant for natural wetlands.

**Fact Sheet Comments:**

Although we realize it is not your intent to make revisions to the Fact Sheet at this stage, there are two items we wish to mention – one of which would be affected by the Total Nitrogen limit modification and the other which we inadvertently left out when providing previous factual comments.

**Fact Sheet Comment #1:**

Page 19 table – If the Total Nitrogen limit is revised, in accordance with above permit discussion, it will need to be changed in this table as well.

**Fact Sheet Response #1:**

The limit was revised in the permit, so the fact sheet was changed too.

**Fact Sheet Comment #2:**

Pages 20-23 tables, Lab Accreditation – LOTT has reorganized some of its Laboratory functions, and we discontinued some services. Accordingly, the accreditation for those functions is no longer being maintained. The items that should be deleted from the tables include:

- BIOASSAY (Toxicity) section – entire section
- CHEM I (General Chemistry) section – delete the following items:

*FACT SHEET FOR NPDES PERMIT WA0037061  
LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

- Alkalinity, Total (both listings)
  - Chloride
  - Hardness, Total (both listings)
  - Solids, Total Dissolved
  - Total Organic Carbon
- CHEM II (TRACE METALS) – Delete entire metals section

**Fact Sheet Response #2:**

The list in the fact sheet is a couple years old and was updated as requested.

**Comments by People for Puget Sound**

**Permit Comment #1:**

Mixing Zones. People For Puget Sound opposes mixing zones for toxic chemicals, especially persistent bioaccumulative toxic (PBT) chemicals, at all LOTT outfalls. The effluent from LOTT outfalls (as well as from the associated CSO facilities) includes loads of these chemicals. Recent studies by Sandra O’Neal, Peter Ross, and others have proven the adverse effects of PBTs in fish and marine mammals in Puget Sound. The toxic effect of bioaccumulative chemical does not “diminish” within the ecosystem as it might for conventional pollutants such as pH and BOD. It is not protective of the environment for these pollutants to be discharged at elevated concentrations due to the bioaccumulative nature of these chemicals in the sound’s wildlife.

**Permit Response #1:**

The Department shares your concern with persistent bioaccumulative toxic chemicals and efforts are underway to limit their use. For now, both the Clean Water Act and state regulation allows for mixing zones. No changes were made to the permit based on this comment.

**Permit Comment #2:**

Sediment Sampling/Receiving Water and Effluent Study. The sediment sampling should include more specific toxic contaminant analysis, including phthalates. The receiving waterbody is listed for a large number of toxic contaminants and some of the toxic load may be from the LOTT discharge.

**Permit Response #2:**

The permit requires significant receiving water and sediment sampling based on typical contaminants from sewage treatment plants and indicators of problems. Using the Department’s standard screening method from Chapter IX of the *Water Quality Program Permit Writer’s Manual* to determine if sediment sampling is needed, it was determined that no further sampling was required. As you are most likely aware, much of Budd Inlet’s toxic contaminants are due to past practices at the Cascade Pole site. Having the Permittee do additional sampling based on their proximity to a clean-up site is not warranted. No changes were made to the permit based on this comment.

**Permit Comment #3:**

*FACT SHEET FOR NPDES PERMIT WA0037061*  
*LOTT ALLIANCE BUDD INLET WASTEWATER TREATMENT PLANT*

Endangered Species. This permit and fact sheets do not address the threatened Chinook salmon and other species that may be adversely impacted by the discharges. What are the results of Section 7 consultations for this permit?

**Permit Response #3:**

Section 7 consultations are required when a Federal Agency takes an action that may impact endangered species. Since the renewal of this permit is not an action of a Federal Agency, Section 7 consultations are not required. Since this permit renewal imposes more restrictive limits on an existing discharge, there should be no adverse impacts to any species. Compliance with Water Quality standards provides appropriate protection for the water body. No changes were made to the permit based on this comment.

**Fact Sheet Comment #1:**

Fact Sheet omissions. It is unclear in the Fact Sheet (on page 7) if the wastewater characterization is from effluent at the end of the pipe or from water quality at the edge of the mixing zone. In addition, the pretreatment program should be better described in the Fact Sheet (when the permit is renewed) including a table showing the number and nature of industrial users and volume of pollutants of their effluents.

**Fact Sheet Response #1:**

The wastewater characterization in the fact sheet is described as data from the application and discharge monitoring reports. Since data from these sources is from the end of the pipe, it should be clear that the data in the table is end of pipe data. The pretreatment program is described in sufficient detail. If additional information is required on the industrial users, the best place for up-to-date information is the annual pretreatment report. Repeating that information in the fact sheet would likely give outdated information by the time the permit is issued. No changes were made to the permit based on this comment.