Black Lake Special District

Black Lake Special District Regular Meeting
Monday, February 25 • 6:15 pm • 2102 Carriage Drive Bldg E• Olympia

1. Call to Order

2. Roll Call

3. Approval of Agenda

4. Public Communication
   (Estimated Time: 0-30 Minutes, Sign-up Sheets are provided)
   During this portion of the meeting, citizens may address the Board for up to 3 minutes regarding items related to Special District business. In the event testimony exceeds 30 minutes, the Commission will allow for additional testimony to be taken at the end of the meeting for those who signed up at the beginning of the meeting and did not get an opportunity to speak during the allotted 30-minutes.

5. Approval of Consent Agenda

   Attachments: *January Regular Minutes*
   January Financials
   Contract for services based on the scope of work
   2019 Authorized Signature List for Districts
   OrgSupport Invoice #3127

6. Old Business
   a. March Alum Treatment
      i. Treatment and Loan Funding

7. New Business
   a. Creek and Rivulet Screening
   b. Lake Tapps Water Quality Monitoring Report
   c. Lake Whatcom Water Quality Monitoring Report

8. Items from the Floor

9. Continued Public Communication
   (If *needed* for those who signed up earlier and did not get an opportunity to speak during the allotted 30 minutes.)

10. Adjournment of Public Meeting

Next Meetings:
Work Session Meeting, March 4, 2019
Regular Meeting, March 18, 2019

120 State avenue ne, #303 • Olympia, WA 98501 • 360-867-8814 •
info@blacklakespecialdistrict.org

BLACK LAKE SPECIAL DISTRICT

Black Lake Special District Regular Meeting
Monday, January 28 • 6:15 pm • 2102 Carriage Drive Bldg E• Olympia

1. Call to Order – **Chair Stintzi called the meeting to order at 6:15 pm.**

2. Roll Call – **Chair Stintzi called roll and established a quorum.** Present:

    a. Lake Stintzi
    b. Brian Wilmovski

3. Approval of Agenda – **It was moved, second, passed unanimously to approve the agenda as Presented.**

4. Public Communication – None.

5. Approval of Consent Agenda – **It was moved, second, passed unanimously to approve the Consent Agenda as presented.**

    Attachments: *January Regular Minutes*

6. Old Business
    a. March Alum Treatment
        i. Treatment and Loan Funding – The next possible step is to conduct a bonding process with Thurston County. *Commissioner Wilmovski will discuss with bond council the best rate options for funding a bond under RCW 85.38.*

7. New Business
    a. Creek and Rivulet Screening Project – Commissioners reviewed the Herrera cost estimate for pollutant monitoring. Focus areas would include areas of higher septic density. *Consensus of commissioners is to request a formal agreement for services from Herrera based on the Black Lake Watershed Pollutant Monitoring – Phase 1 Scope of Work and place it on the next meeting agenda for consideration and possible action. Commissioner Stintzi will communicate with Thurston County to request testing of the lake water for blue green algae, particularly at the North end.*

8. Items from the Floor
    a. *Chair Stintzi will request an update on the ditch from the preservation supervisor.*

9. Continued Public Communication – None.
    (If *needed* for those who signed up earlier and did not get an opportunity to speak during the allotted 30 minutes.)

10. Adjournment of Public Meeting – *With no further business, Chair Stintzi adjourned the meeting at 6:50 pm.*

Next Meetings:
Regular Meeting, February 11, 2019

Black Lake Special District
Statement of Financial Position
As of January 31, 2019

	Jan 31, 19
ASSETS	
Current Assets	
Checking/Savings	
Thurston County Treasurer	246,197.38
Total Checking/Savings	246,197.38
Total Current Assets	246,197.38
TOTAL ASSETS	**246,197.38**
LIABILITIES & EQUITY	
Liabilities	
Current Liabilities	
Accounts Payable	
Accounts Payable	130,718.20
Total Accounts Payable	130,718.20
Total Current Liabilities	130,718.20
Total Liabilities	130,718.20
Equity	
Unrestricted Net Assets	118,052.79
Net Income	-2,573.61
Total Equity	115,479.18
TOTAL LIABILITIES & EQUITY	**246,197.38**

Black Lake Special District
Statement of Income and Expense
January 2019

		Jan 19
Ordinary Income/Expense		
Income		
Investments		
Interest-Savings, Short-term CD	389.75	
Total Investments		389.75
Rates & Charges		704.19
Total Income		1,093.94
Expense		
Contract Services		
Recurring Contract Services	2,500.00	
Total Contract Services		2,500.00
Governing Expenses		
Per Diem	1,140.00	
Total Governing Expenses		1,140.00
Operations		
Postage, Mailing Service	3.50	
Printing and Copying	23.60	
Supplies	0.45	
Total Operations		27.55
Total Expense		3,667.55
Net Ordinary Income		-2,573.61
Net Income		**-2,573.61**

Black Lake Special District
Profit & Loss Budget vs. Actual

Cash Basis — **January through December 2019**

	Jan - Dec 19	Budget	$ Over Budget	% of Budget
Ordinary Income/Expense				
Income				
Investments				
Interest-Savings, Short-term CD	389.75	1,925.00	-1,535.25	20.2%
Total Investments	389.75	1,925.00	-1,535.25	20.2%
Rates & Charges	704.19	163,520.00	-162,815.81	0.4%
Total Income	1,093.94	165,445.00	-164,351.06	0.7%
Expense				
Business Expenses				
Treasurer Fees	0.00	1,635.00	-1,635.00	0.0%
Total Business Expenses	0.00	1,635.00	-1,635.00	0.0%
Contract Services				
Attorney Fees & Charges	0.00	2,000.00	-2,000.00	0.0%
Non-recurring Contract Services	0.00	3,000.00	-3,000.00	0.0%
Recurring Contract Services	5,000.00	30,000.00	-25,000.00	16.7%
Total Contract Services	5,000.00	35,000.00	-30,000.00	14.3%
Governing Expenses				
Per Diem	1,710.00	7,000.00	-5,290.00	24.4%
Total Governing Expenses	1,710.00	7,000.00	-5,290.00	24.4%
Lake Management				
Control	0.00	45,000.00	-45,000.00	0.0%
Permitting Fees	0.00	500.00	-500.00	0.0%
Total Lake Management	0.00	45,500.00	-45,500.00	0.0%
Operations				
Postage, Mailing Service	4.50	550.00	-545.50	0.8%
Printing and Copying	32.20	2,090.00	-2,057.80	1.5%
Supplies	0.75	50.00	-49.25	1.5%
Technology & Online Services	0.00	400.00	-400.00	0.0%
Total Operations	37.45	3,090.00	-3,052.55	1.2%
Other Types of Expenses				
Insurance	0.00	2,809.00	-2,809.00	0.0%
Note Payments	0.00	64,640.00	-64,640.00	0.0%
Other Expenses	0.00	0.00	0.00	0.0%
Total Other Types of Expenses	0.00	67,449.00	-67,449.00	0.0%
Total Expense	6,747.45	159,674.00	-152,926.55	4.2%
Net Ordinary Income	-5,653.51	5,771.00	-11,424.51	-98.0%
Net Income	**-5,653.51**	**5,771.00**	**-11,424.51**	**-98.0%**

BLACK LAKE WATERSHED POLLUTANT MONITORING - PHASE 1

On January 8, 2019, the Black Lake Sewer District (District) requested that Herrera Environmental Consultants (Herrera) to prepare a scope of work and cost estimate to conduct sampling and analysis of major streams and storm drains flowing into Black Lake to identify locations that are important sources of phosphorus and fecal coliform bacteria indicative of contamination from on-site septic systems. For this initial pollutant monitoring project, Herrera will collect approximately four samples from each of approximately 16 locations for analysis of total phosphorus, fecal coliform bacteria, and optical brightener fluorescence, which is present in laundry detergent and will serve as a septic system tracer.

The sampling design will be to collect two storm event samples and two base flow event samples from each location to evaluate differences in pollutant concentrations under different hydrological conditions when either stormwater runoff (from impervious surfaces during storm events) or ground water seepage (including drainage from septic systems during base flow events) dominate the source of drainage to the lake. Herrera will evaluate the results and prepare a data report, identifying hot spots of contamination from stormwater runoff and ground water seepage, and recommending additional monitoring to verify septic system contamination of hot spots using microbial source tracking (fecal bacteria DNA by qPCR).

This proposed scope of work includes a discussion of the activities, assumptions, deliverables, and a schedule associated with this project. The proposed schedule assumes a project start date of February 22, 2019.

TASK 1.0 – SAMPLING AND ANALYSIS

Herrera will prepare a map of the Black Lake watershed showing locations of known streams, storm drains, and septic systems using GIS data obtained from Thurston County. Herrera will select up to 16 sampling locations representing major surface water sources draining to Black Lake and including subbasins containing a high density of septic systems. Preliminary sampling locations identified by the District and Herrera include the following 15 sites (Figure 1):

- Site 1 - Drainage to SW lake shore at Evergreen Shores Beach Club, 7540 Lakeside St. SW (46.977740, -122.987002)
- Site 2.- Drainage to Site 1 from an upstream location under Lakeside St at 7527 Lakeside St. SW (46.978454, -122.989719)

- Site 3 - Drainage under Lakeside St at 7415 Lakeside St. SW (46.980355, -122.988307)
- Site 4 - Creek entering W shore of lake at Columbus Park at 5700 Black Lake Blvd SW (46.994455, -122.980265)
- Site 5 - Creek entering NW shore of lake at 4409 Black Lake Blvd SW (47.007679, -122.975791) near Goldsby St NW, but creek is shown 1,000 ft NE of this location on google maps
- Sites 6A/6B - Two drainages to NE shore of lake at Timberlane Mobile Estates, 4707 Black Lake Belmore Rd. SW where there is a high concentration of septic systems along the lake shore for 1,700 ft (between 47.006507, -122.96792 and 47.002690, -122.972183)
- Site 7 - Drainage to E shore of lake from Black Lake Bible Camp, 6521 Fairview Rd. SW (46.989201, -122.976266)
- Sites 8A/8B/8C - Fish Pond Creek entering E shore of lake at Kenneydell Park at 6745 Fairview Rd. SW for Site 8A (46.986388, -122.974428), upstream at 66th Ave SW for Site 8B (46.989034, -122.964669) and further upstream at Belmore St SW for Site 8C (46.993139, -122.957062)
- Sites 9A/B/C - Unnamed creek entering SE shore of lake at Site 9A (46.979873, -122.977449) with two forks passing under Fairview Rd SW including the south fork for Site 9B (46.97900, -122971309) and the north fork for Site 9C (46.979501, -122.971277)
- Site 10 - Drainage entering E shore of lake near 60th Ave SW that is an area of high septic system density (46.994083, -122.975705).

The District will assist Herrera with access to proposed locations on private property. Herrera will conduct reconnaissance of the proposed locations in one day to confirm access and the presence of base flow drainage during dry weather at all locations. Herrera will provide the District with a final list of sampling locations prior to sample collection.

Herrera will collect four water samples from each location for a total of 64 water samples. Each location will be sampled once on each of four separate occasions to include two storm events and two non-storm (base flow) events. Storm events predicted to produce at least 0.25 inches of rain in 24 hours will be targeted during daylight hours. Base flow events will be targeted on a day when the predicted rainfall amount is less than 0.10 inches. Sample collection and handling methods will be according to methods approved by the EPA and Washington Department of Ecology.

The 48 water samples will be analyzed for total phosphorus and fecal coliform bacteria by a local laboratory using methods approved by the EPA and Washington Department of Ecology.

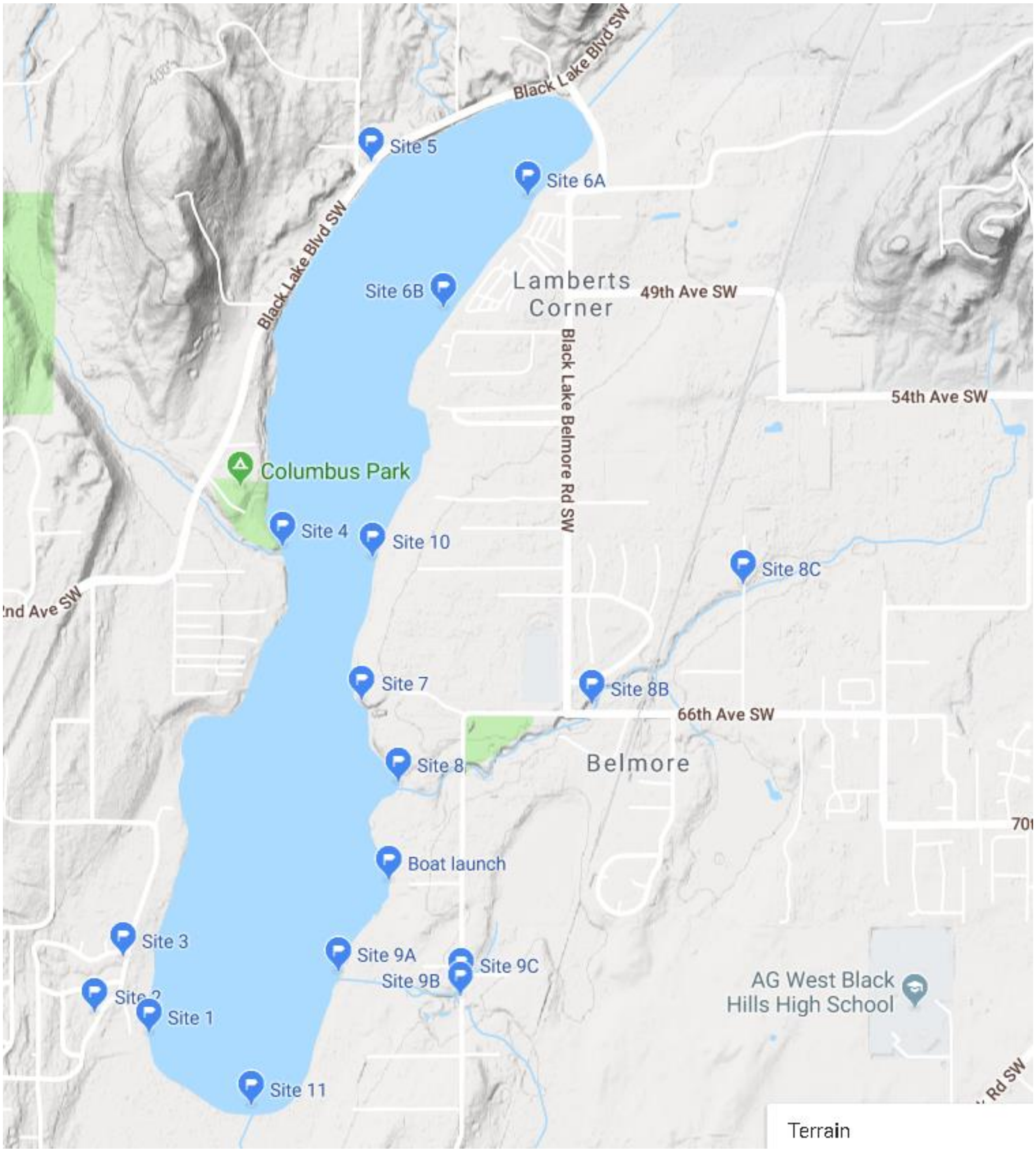

Figure 1. Preliminary Black Lake Pollutant Source Sampling Sites.

Assumptions

- The District will obtain any needed permissions for accessing private property to collect the samples.

- Each sampling location will be easily and safely accessible.
- Each sampling event will be conducted by one scientist from Herrera's Olympia office and all samples will be collected on weekdays in one day for each event.

Deliverables and Schedule

- Watershed map of sampling locations on March 1, 2019.
- Site reconnaissance by March 8, 2019
- Sample collection from March 11 through April 30, 2019.
- Laboratory reports by May 21, 2019.

TASK 2.0 – DATA ANALYSIS AND REPORTING

Herrera will analyze the laboratory data upon receipt of all laboratory reports. Herrera will review the quality of data provided by the laboratory and take appropriate corrective actions if necessary. Subbasin drainage areas and will be delineated and septic system density will be calculated for each sampling location. `The relative amount of phosphorus loading and potential for stormwater and septic system contamination will be identified for each sampling location by comparing the results to water quality standards, historical data collected within and outside the watershed by others, and the subbasin drainage area and septic system density.

If significant sources (hot spots) of septic system pollution are identified, Herrera will recommend methods for a subsequent (Phase 2) investigation at locations upstream of the hot spots. The second phase of monitoring would employ microbial source tracking methods that Herrera has used in other lake watersheds to successfully identify locations of human fecal sources originating from septic systems using fecal DNA analysis by quantitative polymerase chain reaction (qPCR). This two-phased monitoring approach is recommended by EPA to first identify hot spot locations using inexpensive traditional analytical methods and watershed analyses, followed by using expensive microbial source tracking methods at a limited number of locations where potential contamination from septic systems has been identified in the first phase.

Herrera will prepare a data report presenting the monitoring methods, results, conclusions, and recommendations. Results will be presented on the watershed map to facilitate interpretation. Laboratory reports and representative photographs will be presented in appendices. Herrera will submit a draft report to the District for review and will prepare a final report responding to comments on the draft report.

Assumptions

- The draft and final reports will be submitted as PDF files by e-mail.
- The District will provide one set of review comments on the draft report within 2 weeks of receiving the report.

Deliverables

- Draft data report by June 28, 2019.
- Final data report by July 26, 2019.

Task 3.0 – Project Management

Herrera's project manager (Rob Zisette) will be responsible for ongoing administration of the project, including preparing invoices and progress reports, as well as coordination of work efforts with the designated client point of contact (Lake Stintzi). Herrera's project manager will have phone and e-mail contact with the District on an as-needed basis.

Herrera's project manager (Rob Zisette) will prepare and present a brief PowerPoint presentation of the study results and recommendations at a District meeting upon completion of the draft report.

Deliverables

- Monthly progress reports and invoices from February 22 through August 15, 2019.
- Powerpoint presentation of the study results and attendance to a meeting by August 15, 2019.

HERRERA ENVIRONMENTAL CONSULTANTS

Cost Estimate for Black Lake Watershed Pollutant Monitoring - Phase 1

Herrera Proposal No. 15-06161-001

Black Lake Watershed Pollutant Monitoring - Phase 1			Task 1.0		Task 2.0		Task 3.0		TOTAL	
Number of Tasks : 3			*Sampling and Analysis*		*Data Analysis and Reporting*		*Project Management*			
		Schedule (start and end dates)	***2/22/19 - 5/21/19***		***5/21/19 - 7/26/19***		***2/22/19 - 8/15/19***			
COST SUMMARY										
Labor				$10,830		$13,381		$2,710		$26,920
Travel and per diem				$58		$0		$0		$58
Other direct costs (ODCs)				$160		$0		$0		$160
Analytical laboratory				$4,800		$0		$0		$4,800
GRAND TOTAL				**$15,848**		**$13,381**		**$2,710**		**$31,938**
COST ITEMIZATION										
Labor		(2019 rates)								
Personnel		Rate/Hour	Hours	Cost	Hours	Cost	Hours	Cost	Hours	Cost
Lenth, John	Vice President	$256.69	0	$0	2	$513	0	$0	2	$513
Zisette, Rob	Scientist VI	$247.87	8	$1,983	24	$5,949	10	$2,479	42	$10,411
Catarra, Gina	Scientist III	$148.48	0	$0	10	$1,485	0	$0	10	$1,485
Blaud, Brianna	Scientist III	$131.59	64	$8,422	32	$4,211	0	$0	96	$12,633
Geigel, Joseph	GIS Analyst II	$106.26	4	$425	6	$638	0	$0	10	$1,063
Saavedra, Robin	Accounting Admin. III	$115.58	0	$0	0	$0	2	$231	2	$231
Jackowich, Pam	Admin. Coord. IV	$117.03	0	$0	5	$585	0	$0	5	$585
SUBTOTAL LABOR (Burdened Labor)			**76**	**$10,830**	**79**	**$13,381**	**12**	**$2,710**	**167**	**$26,920**
TRAVEL AND PER DIEM	Unit	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Auto Use	Mile	$0.58	100	$58.00	0	$0.00	0	$0.00	100	$58
SUBTOTAL TRAVEL AND PER DIEM				**$58**		**$0**		**$0**		**$58**
OTHER DIRECT COSTS	Unit	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Decontamination supplies	Day	$15	4	$60.00	0	$0.00	0	$0.00	4	$60
Cyclops OB Meter (Turner)	Day	$25	4	$100.00	0	$0.00	0	$0.00	4	$100
SUBTOTAL ODCs				**$160**		**$0**		**$0**		**$160**
ANALYTICAL LABORATORY	Unit	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
Spectra (TP, FC)	Sample	$75	64	$4,800.00	0	$0.00	0	$0.00	64	$4,800
SUBTOTAL LABORATORY				**$4,800**		**$0**		**$0**		**$4,800**

WATER QUALITY MONITORING REPORT

LAKE TAPPS SEPTIC SYSTEM LEACHATE DETECTION SURVEY

Prepared for
Cascade Water Alliance

Prepared by
Herrera Environmental Consultants, Inc.

1. INTRODUCTION

Cascade Water Alliance (Cascade) owns the Lake Tapps Reservoir and plans to eventually use the reservoir as a municipal water supply source. Cascade also has agreements with homeowners regarding lake levels in Lake Tapps reservoir, and with Tribal interests for in-stream flows, habitat, and restoration.

Cascade has concerns that onsite sewage systems (OSS or septic systems) are a source of fecal coliform bacteria and phosphorus pollution of Lake Tapps. Leachate from OSS drain fields may contain high levels of phosphorus and fecal bacteria if drain field soils are not adequately filtering these pollutants from OSS effluent. Leachate also contains man-made compounds found in most detergents called optical brighteners. These compounds may be detectible at low levels using a field meter and useful as an indicator of leachate entering the lake.

A water quality monitoring survey was completed to determine if septic systems located near the shore are contaminating Lake Tapps, either by shallow groundwater seepage or surfacing failure. Various microbiological, chemical, biochemical, and molecular techniques for detecting septic system effluent in drainage from the survey area and in the lake have been used elsewhere were considered for this survey.

The survey design included monitoring of select field and laboratory parameters on 1 day in January 2018 during a scheduled drawdown of Lake Tapps. This type of hydrologic event is considered ideal for OSS effluent detection because shallow ground water drainage to the lake would be most likely observed during a lowered lake level. Water quality monitoring was conducted in the lake near the shoreline and in surface water discharges to the lake during wet weather. Wet weather surveys are ideal for detecting OSS effluent because rainfall saturates soils, and increases the shallow groundwater table and potential transport of leachate beyond OSS drain fields. All discharges in the survey area drained only properties served by septic systems.

This report is organized into the following sections:

- Background
- Methods
- Results and Discussion
- Conclusions and Recommendations
- Next Steps
- References

5. CONCLUSIONS AND RECOMMENDATIONS

The Lake Tapps septic survey was successfully conducted along 7.9 miles of shoreline on January 18, 2018. Survey findings and recommended actions are summarized in Table 4. Based on the parameter concentrations observed at each sample station, levels of concern are presented for contamination of the lake from human sources (OSS), fecal bacteria, and phosphorus. Recommended actions include conducting additional sampling to confirm levels of concern at nine stations, and investigation of OSS operations and maintenance at three stations.

Table 4. Summary of Concerns and Recommended Actions for Lake Tapps.

Sample Station	Level of Contamination Concern			Recommended Action	
	Human	Fecal	Phosphorus	Re-Sample	Investigate OSS
1	Low	Low	Moderate	✓	
2	None	Low	Moderate		
3	Moderate	Low	Moderate	✓	✓
4	Moderate	Low	High	✓	✓
5	None	High	Low	✓	
6	Low	Moderate	Moderate	✓	
7	High	Moderate	Moderate	✓	✓
8	None	Low	Moderate		
9	Low	Low	Moderate	✓	
10	Low	Moderate	Low	✓	
11	None	Moderate	High	✓	

The Lake Tapps septic survey results clearly show that septic systems are contaminating Lake Tapps. OSS contamination was determined using DNA analysis of two human biomarkers. Human biomarkers were detected at 6 of the 10 sampled discharge stations and at the 1 sampled lake shore station. Moderate levels of human biomarkers were observed at one discharge (station 3) and the nearby lake shore station (station 4) located on the southwest shore of Driftwood Point. High levels of human markers were observed at one discharge (station 7) located on the northwest shore of Driftwood Point. The TPCHD should be contacted to investigate OSS operations and maintenance practices in these areas of Driftwood Point. OSS contamination concerns were low or not observed along the shores of Tacoma Point, Evergreen Point, Island 21, and two discharges (stations 1 and 2) located on Island A. Areas of low OSS contamination concern should be re-sampled to confirm the presence of human biomarkers before proceeding with additional OSS investigation.

Fecal coliform bacteria concentrations exceeded the Washington State surface water quality criterion (100 CFU/100 mL) at 5 of the 10 sampled discharge stations. A high fecal coliform bacteria concentration (2,040 CFU/100 mL) was observed at one discharge (station 5) where human biomarkers were not detected, indicating that animal sources were the likely cause for the high fecal coliform bacteria concentration. The fecal coliform bacteria criterion was exceeded at the one discharge (station 7) rated high for human biomarkers, but not at the two stations (stations 3 and 4) rated moderate for human biomarkers. These findings and the lack of correlation between fecal coliform bacteria and human biomarkers suggest that fecal coliform bacteria are not a good predictor of OSS contamination and that most of the fecal coliform bacteria originated from animal sources.

Total phosphorus concentrations exceeded the Washington State lake action level (20 μg/L) at 8 of the 10 sampled discharge stations and at the 1 sampled lake shore station. A high total phosphorus concentration (176 μg/L) was observed at one discharge (station 11), but OSS contamination was not the source of phosphorus because human biomarkers were not detected at this discharge. A high total phosphorus concentration (98 μg/L) was also observed at the one sampled lake shore station (station 4) that did exhibit a moderate level of human biomarkers. These findings and the lack of correlation between total phosphorus and human biomarkers suggest that OSS contamination was not a substantial source of phosphorus in the sampled discharges.

Optical brighteners and pH correlated with one human biomarker (*B. dorei*). Optical brightener fluorescence was more useful for detecting OSS contamination in the lake than discharges due to fluorescence of interfering organic compounds in the discharges. Optical brighteners may be useful for tracking OSS contamination upstream of individual discharges with consistent background fluorescence.

A second septic survey is recommended to confirm findings from this first survey. The second survey should be conducted by sampling nine of the priority discharges during wet weather when shallow groundwater flow is expected to occur at the discharges after the discharge of stormwater runoff (i.e., near the end of the storm hydrograph). If property access permissions can be obtained, discharges should be accessed from land and sampled at the outfall and upstream location(s). Optical brightener fluorescence and pH should be measured; and samples should be collected for analysis of human biomarkers, fecal coliform bacteria, and total phosphorus. Results of the two surveys should be evaluated to determine the appropriate actions.

The TPCHD should be requested to review this report and meet to discuss the study findings, confirmation monitoring recommendations, and a strategy for assessing OSS operations and maintenance needs at high priority areas in Driftwood Point.

6. NEXT STEPS

As recommended, TPCHD reviewed a draft of this report and met with Cascade on August 15, 2018, to discuss the next steps. Meeting notes are presented in Appendix C.

TPCHD agreed to perform the following next steps for investigating OSS contamination concerns identified by this study:

- Identify which properties drain to sample stations 3, 4, and 7, in cooperation with Pierce County Surface Water Management.
- Research records for OSS located on those properties to determine the OSS type and age, dates, and findings of known inspections, and previous OSS complaints, investigations, or actions taken.
- Inspect drainages from those properties during the winter of 2018–2019, collect fecal bacteria samples where potential contamination is indicated, and identify pollution sources if possible from the inspection findings and fecal test results.

TPCHD also clarified that investigations into possibly failing OSS are initiated by complaints, which cannot be anonymous. TPCHD will facilitate repairs of failing systems if surfacing sewage is observed or positive dye test results are obtained with high bacteria counts. TPCHD also notifies owners to perform operation and maintenance inspections as required by OSS code. All systems must be inspected and pumped for property sales. The frequency of operation and maintenance inspections varies for the following three risk categories:

- Low risk OSS include all gravity systems where inspection is only required for property sales.
- Moderate risk OSS include pressure systems, and offsite and shared drain fields where inspections are required every 3 years. TPCHD does not notify owners or enforce inspections of regular pressure systems but does enforce inspections of offsite and shared drain fields.
- High risk OSS include proprietary systems such as aerobic treatment units, Glendons, and subsurface drip systems where annual inspections are required. TPCHD notifies owners of the required inspections.

Low-risk gravity systems become moderate risk in designated areas of special concern which currently includes only the shellfish growing areas on the Key Peninsula. Approval from the Tacoma-Pierce County Board of Health would be needed to designate Lake Tapps as an area of special concern, which would elevate the risk of gravity systems from low to moderate, and would require inspections at least once every 3 years.

Cascade agreed to have Herrera re-sample the nine stations identified in Table 4 where human markers were observed or moderate to high levels of fecal bacteria were observed. This second set of samples will be collected during wet weather and analyzed according to the recommendations noted above. Herrera will coordinate with Cascade to obtain permission for land access to the sample stations.

THURSTON COUNTY
WASHINGTON
SINCE 1852

Note: ▪Keep a copy of the completed list. ▪Submit completed legible color copy image or paper original to **Auditor's Office Financial Services Division**. ▪An Interm Change is made by resubmitting an updated color copy image or piick-up the paper original. ▪A new form is required at year-end to start the new year.

2019 AUTHORIZED SIGNATURE LIST for DISTRICTS

See definitions for numbers next tab

Changes Only

Name (Type or Print)	Signature	Title	Number(s)	Date/Auth. Signature
Vernon Bonfield		Member	1,2	
Lake Stintzi		Member	1,2	
Brian Wilmovsky		Member	1,2	
Craig Ottavelli		Admin	4	
Nick Mattox		Admin	4	

Signed By:______________________________ **Date:** __________

Chairman of the Board

Department Name

Department Number

Fund Numbers

Revised 12/2017

OrgSupport
120 State Avenue NE, #303
Olympia, WA 98501

Invoice

Date	Invoice #
3/1/2019	3127

Bill To
Black Lake Special District 120 State Avenue NE, #303 Olympia, WA 98501

Description	Qty	Rate	Amount
Contract Services - February	1	2,500.00	2,500.00
Printing B&W	51	0.10	5.10

Total	$2,505.10

WATER QUALITY MONITORING REPORT

LAKE WHATCOM NORTH SHORE ON-SITE SEWAGE SYSTEM LEACHATE DETECTION PROJECT

Prepared for
Lake Whatcom Water & Sewer District

Prepared by
Herrera Environmental Consultants, Inc.

HERRERA

LAKE WHATCOM WATER & SEWER DISTRICT

1220 Lakeway Drive
Bellingham, WA, 98229

(360) 734-9224
Fax 738-8250

PREFACE

Lake Whatcom Water and Sewer District (District) was formed in the 1960's for the primary purpose of reducing pollution entering Lake Whatcom from individual onsite sewage septic systems in the urbanized and growing Sudden Valley and Geneva communities. The District's public sewer system now serves the equivalent of 4,308 single family residences located in the Lake Whatcom watershed. By means of a network of sewer mains and pump stations an average of 0.78 million gallons of wastewater is collected and sent to the City of Bellingham's wastewater treatment plant every day. For nearly 50-years the District has worked with the State of Washington and other local governments to protect and improve Lake Whatcom water quality, which is the drinking water source for a population of nearly 100,000 people. The District's mission statement has long included the protection of Lake Whatcom water quality.

In furtherance of the District's mission to protect lake water quality, the District commissioned this study to investigate potential impacts from onsite septic systems at the end of Northshore Road where there is currently no public sewer system. The District contracted with Herrera Environmental Consultants to test lake water quality over a period of time using various state of the art scientific methods along 2.5 miles of shoreline starting at Agate Bay and ending at Whatcom County's Lake Whatcom Park. On this stretch there are 97 existing homes with the potential for development of around 30 more. Wastewater from these lots could result in as much as 22,000 gallons per day (8 million gallons annually) that is treated and dispersed by individual onsite sewage septic system drain fields located close to the lakeshore.

The District was concerned that wastewater percolating through soils from individual drain fields near the lakeshore may be carrying fecal coliform, phosphorus, and other chemicals to ground water that flows into the lake. The results of this study give credence to these concerns. DNA testing of the water samples positively identified fecal coliform entering the lake came from not just animals but also humans. The study made no attempt to quantify or perform a loading analysis, but proves that human feces are entering Lake Whatcom from several sources along Northshore Road.

The results of this study may support extending public sewer and eliminating septic systems near the lake. The District plans to coordinate with various Whatcom County departments and Washington State Department of Ecology to review all potential solutions to this problem, including the potential for extending public sewer to the end of Northshore Road.

Lake Whatcom Water and Sewer District
Board of Commissioners

EXECUTIVE SUMMARY

To protect the high quality water supply from Lake Whatcom, the Lake Whatcom Water and Sewer District investigated the area along approximately 2.3 miles of North Shore Road that includes approximately 97 homes currently served by on-site septic systems . A water quality monitoring study was developed to determine if septic systems along North Shore Road are contaminating Lake Whatcom, either by soil seepage or surfacing failure.

Herrera Environmental Consultants prepared a plan that considered various microbiological, chemical, biochemical, and molecular techniques for detecting septic system effluent in drainage from the study area and in the lake. The study design included monitoring of select field and laboratory parameters during three wet weather events in the winter of 2017, when septic system contamination would most likely be observed due to saturated soils and a high water table. Water quality monitoring was conducted in the lake near the shoreline and in discharges to the lake that drain only properties in the study area. Therefore, any discharge shown to be contaminated by septic system effluent is contaminating the lake from septic systems located within the study area.

The study was conducted, as planned, by boat during a large rain event on January 19 (2.20 inches in 48 hours), a moderate rain event on March 15 (0.87 inch in 48 hours), and a large rain event on March 29 (1.86 inches in 48 hours), 2017. The lake level rose 1.9 feet between January 19 and March 15, and another 0.7 foot by March 29, 2017.

For each rain event, field measurements were taken continuously in the lake and in all the observed surface water discharges to the lake, proceeding in a northwest direction along the shoreline from the control site (undeveloped forest) and then through the study area. Water samples were collected from select lake and surface water discharge locations where optical brighteners from laundry detergent were detected at greater than approximately 50 percent above the background measured at the lake control stations. During each event, a total of up to 18 samples were collected at lake control stations (undeveloped shoreline to southeast for background), lake impact stations (distant from drainage discharges in study area), discharge stations (draining only the study area), and one on-site sewage station (source confirmation). The samples were analyzed for microbiological parameters (fecal coliform bacteria and E. coli) for all three events, and for two different DNA biomarkers of human-specific fecal bacteria and chemistry parameters (total phosphorus, chloride, and bromide) for the second and third events only.

Study results showed that many septic systems in the study area are a likely source of contamination to Lake Whatcom. The DNA biomarkers of human-specific bacteria were found at moderate to high concentrations at 6 of the 13 sampled discharge stations and at 1 of the 4 sampled lake stations located along the 2.3-mile-long shoreline. At one discharge station, human biomarker concentrations were high for both wet weather sampling events and were present at levels similar to those measured in septic tank samples.

Discharge and lake samples contaminated by human biomarkers from septic system effluent also contained elevated levels of optical brighteners, fecal coliform bacteria, and total phosphorus. The elevated concentrations of optical brighteners indicate the presence of laundry detergents from septic system effluent. Fecal coliform bacteria and total phosphorus concentrations in the contaminated samples exceeded Washington State surface water quality standards, indicating impacts on public health and the lake environment, respectively. Both fecal coliform bacteria and total phosphorus positively correlated with optical brighteners, providing additional evidence that septic systems are a significant source of the observed contamination.

Fecal coliform bacteria and total phosphorus concentrations were several orders of magnitude higher in septic tank samples than in lake samples, indicating that the lake was contaminated by diffuse seepage from septic system drain fields rather than overland flow from failed systems. The numerous and diffuse septic system sources present in the study area would be difficult to locate and control for protection of public health and the environment. Connecting homes in the study area to a sanitary sewer would prevent the ongoing contamination of Lake Whatcom from septic systems in the area.

1. INTRODUCTION

Lake Whatcom is the surface water supply for the Lake Whatcom Water and Sewer District (LWWSD) that currently serves a population of nearly 10,000 people from a water treatment plant located in Sudden Valley. Lake Whatcom is also the drinking water source for a number of residences that draw directly from the lake as well as the City of Bellingham, which serves a population of nearly 100,000.

The US Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology) determined that the water quality of Lake Whatcom has become polluted to the point where action must be taken. The Lake Whatcom Watershed Total Phosphorus and Bacteria TMDL (total maximum daily load) Water Quality Improvement Plan (Ecology 2016) addresses elevated amounts of fecal coliform bacteria and phosphorus, which causes excessive growth of algae and low dissolved oxygen levels. Sources contributing to the high phosphorus and bacteria levels may include failed on-site septic systems (OSS). The TMDL Water Quality Improvement Plan primarily relies on stormwater treatment to reduce phosphorus loadings to the lake, and only addresses OSS inputs through existing OSS regulations and permitting.

The City of Bellingham and Whatcom County each have a program to sample and analyze water quality of certain areas of Lake Whatcom and incoming streams. The LWWSD is a partner with the City of Bellingham and Whatcom County through inter-local agreements. However, there currently are no known efforts to sample and analyze the North Shore area of Lake Whatcom to investigate possible impacts from OSS leaching into the lake.

The LWWSD has concerns that OSS along the North Shore of Lake Whatcom may be contributing to phosphorus and fecal coliform bacteria pollution problems, as well as adding pharmaceutical and other manmade compounds to the lake. The leachate of OSS drain fields contain high levels of phosphorus and fecal bacteria. Leachate also contains man-made compounds found in most detergents called optical brighteners. These compounds may be detectible and useful as an indicator of leachate entering the lake.

The LWWSD evaluated OSS maintenance records showing recent OSS problems and a lack of regulatory compliance, and recommended conducting a water quality study to document impacts to Lake Whatcom by OSS in the North Shore Road area (Wilson 2015). Subsequent to a concentrated effort by the Whatcom County Health Department; 90 properties became current on their OSS inspections as of August 2016.

A water quality monitoring study was developed to determine if septic systems along North Shore are contaminating Lake Whatcom, either by soil seepage or surfacing failure. A quality assurance project plan (QAPP) was prepared that considered various microbiological, chemical, biochemical, and molecular techniques for detecting septic system effluent in drainage from the study area and in the lake (Herrera 2016). The study design included monitoring of select field and laboratory parameters during three wet weather events in the winter of 2017, when septic system contamination would be most likely observed due to saturated soils and a high water table. Water quality monitoring was conducted in the lake near the shoreline and in discharges to the lake. All 20 discharges in the study area drained only properties in the study area. Thus, any discharge shown to be contaminated by septic system effluent is contaminating the lake from a septic system located within the study area.

This report is organized into the following sections:

- Methods
- Results and Discussion
- Conclusions

Payment Voucher Transmittal
Drainage Dist #12 Black Lake

1. OrgSupport 120 State Ave NE#303 Olympia, WA 98501	3127	Contract Services - February	$2,505.10
Total for document:			$2,505.10

I, the undersigned do hereby certify under penalty of perjury, that the materials have been furnished, the services rendered or the labor performed as described herein and that the claim is a just, due and unpaid obligation against Drainage Dist #12 Black Lake ,
and that I am authorized to authenticate and certify to said claim.

Examined and Allowed

Secretary

Date

Commissioner

Commissioner

Commissioner

Date

THURSTON COUNTY
WASHINGTON
SINCE 1852

Thurston County Treasurer
January 2019 Statement
Black Lake DD #12
Fund 6354 - DD #12 BLACK LAKE

Cash Activity

Date	Description	Amount	Notes
01/01/2019	**Beginning Cash Balance**	**$246,243.44**	
	Receipts/Deposits/Refunds:		
01/31/2019	Tax & Assessment Receipts	704.19	
01/31/2019	Interest Paid	389.75	
	Total Deposits	**$1,093.94**	
	Warrant Issues & Voids/Fees/ACH/Wires:		
01/15/2019	Issued Warrants	(4,219.90)	
	Total Warrants and Electronic Disbursements	**($4,219.90)**	
01/31/2019	**Ending Cash Balance**	**$243,117.48**	

Warrant Activity

01/01/2019	**Beginning Warrants Outstanding**	**$2,869.55**
	Total Warrants Issued	4,219.90
	Total Warrants Redeemed	(3,439.55)
	Total Warrants Voided	-
01/31/2019	**Ending Warrants Outstanding**	**$3,649.90**

Investment Activity

01/01/2019	**Beginning Interest Receivable**	**$890.33**
	Interest Earned	396.06
	Cash Paid	(389.75)
01/31/2019	**Ending Interest Receivable**	**$896.64**

TCIP Yield (used to calculate interest earnings)	1.91%
LGIP Yield (budget benchmark)	2.37%