



STATE OF  
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DEPARTMENT OF ECOLOGY

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M E M O R A N D U M  
October 30, 1980

To: Dick Cunningham  
From: Dale Clark *DC*  
Subject: Summary of Burley Lagoon Survey Activities

State Water Quality Standard (DOE Jurisdiction)

Burley Lagoon is Class AA marine waters. The state standard for this classification is, "Fecal coliforms shall not exceed a median value of 14 organisms/100 ml, with not more than 10% of samples exceeding 43 organisms/100 ml."

State Market Standard for Oyster Flesh (DSHS Jurisdiction)

Fecal coliforms shall not exceed a value of 230 organisms/100 grams of oyster flesh.

Summary of Studies (see map for reference)

August 1978 - During late summer, DSHS conducted a survey of Burley Lagoon, Purdy Creek, and Burley Creek after oyster tissue samples displayed fecal counts exceeding the market standard. The water quality survey findings indicated that fecal counts were exceeding state AA water and oyster tissue standards in many parts of the bay. Final closure of the upper sections of Burley Lagoon to oyster production occurred in September 1978 after detection of fecal coliform levels 700 times the state market standard (see map).

In conjunction with the water quality survey, a door-to-door survey was conducted for the purpose of finding point sources of fecal contamination. A large number of failing septic systems were found along with other sources (livestock, waterfowl, domestic pets, etc.). However, DSHS did not feel that these sources were accountable for the high levels displayed by the oysters (this did not turn out to be the case).

DSHS wrote a letter to Pierce County Health Department requesting that pollution sources identified during the sanitary survey be corrected.

March 1979 - DOE conducted a water quality survey which showed fecal coliform levels exceeding the state's water quality standard at all ten

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stations sampled in the lagoon. However, oyster tissue samples were also analyzed and were found to be within the market standard.

November 20, 1979 - A letter from the Tacoma-Pierce County Health Department to DSHS informed them that enforcement action had taken place on identified sewage disposal failures as per the August 1978 survey.

March 1980 - DSHS conducted a second shellfish tissue analysis for fecal coliforms. The results indicated that fecal coliform counts still exceeded the state market standard.

March 1980 - DOE conducted a second water quality survey with results that demonstrated low fecal coliform levels at all sampling sites except station 1 (located below a pond where waterfowl are kept). The variability of the non-point sources was noted and a follow-up survey in the low-flow, warm-weather months was recommended.

The intent of the DSHS and DOE March 1980 surveys was to document changes in water quality in Burley Lagoon after Pierce County Health District completed the enforcement actions.

August 1980 - DOE conducted a summer low-flow survey of Burley Lagoon, Purdy Creek, and Burley Creek. Sampling indicated that fecal coliform counts were exceeding the state standards. Nonpoint sources in Purdy and Burley creeks appeared to be the main sources of bacterial contamination. Due to workload, DSHS was not able to analyze tissue samples at the time of the survey; therefore it was not known whether the oysters had bacterial levels exceeding market standards. The market levels probably were exceeded due to the increased filtering activity during summer months and the oysters' capability of accumulating fecal coliform counts many times that of background levels.

#### Overall Observations

1. Fecal coliform counts continue to exceed the state AA water quality standard for waters in which oysters are commercially grown even though some corrective actions have been taken.
2. The fecal coliform counts continue to exceed the state market value for oyster tissue.
3. Most of the point sources of contamination (failing septic systems, waterfowl ponds, bathing beaches, etc.) have been documented and enforcement action has taken place to correct such sources.

4. Highly variable non-point sources such as domestic animals and waterfowl (both wild and domestic) and possibly some undetected other sources, are the most probable remaining source of contamination.
5. The current levels of fecal coliforms may be considered background levels for areas of urban development. The lagoon may be as well off as it's going to get, considering the fact that the drainages which feed it are urbanized.
6. Due to the continual increase in the urban population, the background level of fecal contamination may continue to increase.
7. The uptake of nutrients by oysters varies seasonally due to temperature and metabolism, resulting in periods when fecal counts may be within market standards.

#### Response to Your Specific Questions

1. What is the real quality of the closed oyster beds?

Burley Lagoon is closed to oyster harvesting in the middle reach, encompassing 1/3 of the total surface area. The lagoon has been closed to oyster cultivation since September 1978 due to high fecal coliform levels which indicate sewage contamination. Since the closure, Pierce County has enforced (we understand this is the case) the upgrading of all documented sewage system failures. This enforcement has reduced the fecal coliform levels in the water to state water quality standards during some periods, possibly early spring (NOTE: not well documented at this time). Although water quality in the lagoon appears to be better now, it is still borderline in terms of our water quality standards. Studies indicate that the fecal coliform levels may now be attributed to non-point sources in the surrounding watershed and possibly resident waterfowl, unless something has been missed. These sources are variable in nature and therefore hard to predict, but may be considered as background levels. The fecal coliform levels from the oysters in the closed areas appear to pass state market values (230 organisms/100 ml) during certain times of the year. It is my feeling that any future oyster harvesting in the closed area must be closely monitored for contamination.

2. What is the cause of the problem?

Non-point sources of fecal contamination are the most probable source of the problem. Dairy waste, resident waterfowl, and domestic pets or livestock would contribute fecal coliform contamination to the surrounding watershed. All documented sewage

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system failures have apparently been taken care of due to enforcement action by Pierce County Health Department. A follow-up system survey may be in order at this time to certify the enforcement activity. There also is the possibility of "undiscovered" sources. Failing drainfields sometimes are extremely difficult to locate because the discharge may slowly leach into a water body in an inconspicuous spot.

3. Who could correct the problem?

A well-coordinated and publically supported educational program to inform the people of the area concerning the problem would be advised. The bay is their resource and they would benefit by keeping it non-polluted. The Department of Social and Health Services should have some type of public relations department capable of spreading such information. Grants to local farms to help pay for fencing of pasture that borders on the creeks would be appropriate.

I am not sure that the problem can ever be completely corrected. Urbanized areas like around Burley Lagoon typically experience problems of this nature as they grow. The problem is particularly frustrating when oyster production is considered because this resource requires perhaps the most pristine of waters to meet health standards because they can "concentrate" bacteria.

DC:cp

Attachment

BURLEY CREEK

BURLEY LAGOON



OYSTERS NOT GROWN UP HERE

CLOSED AREA

PURDEY CREEK

WESTERN OYSTER CO. OFFICE (YAMASHITA)

MOST OF BURLEY OYSTER PRODUCTION IS IN THIS AREA.

