

DEPARTMENT OF ECOLOGY  
NWRO Water Quality Program  
Technical Memorandum

May 8, 2006

TO: Files

FROM: Dave Garland, NWRO Watershed Unit Supervisor

SUBJECT: Sample results and findings of Ecology 'Freeland Creek' bacteria Water quality survey 4-11-06

Ecology's Northwest Regional Office conducted a reconnaissance bacteria water quality survey in the Freeland area on April 11, 2006. Fifteen surface water samples were collected between the Shell service station at SR 525 and Fish Road and Freeland County Park on Holmes Harbor. The samples were collected in sterilized 250 mL Nalgene jars, placed on ice, and transported to Ecology's Manchester Environmental Lab on April 12, 2006.



Figure 1. Myrtle Avenue and dock at Freeland County Park.

## Background

Bacteria water quality problems have been noted in the Freeland area since several studies were done in 2003-2004 by Herrera Environmental Consultants for the Island County Public Works Department in relation to a stormwater diversion and outfall structure installed there. Ecology funded the Freeland Water Quality Improvement Project between July 2002 and December 2005 to assess environmental conditions in Freeland basin and to provide water quality improvement recommendations and strategies for the main surface and stormwater drainage and outfall in Freeland (Island County Public Works, 2006).

Levels of fecal coliform bacteria were measured to indicate the potential risk to public health associated with the recreational and shellfish harvesting activities in Holmes Harbor. Elevated levels of fecal coliform bacteria were found by Herrera in the majority of the stormwater runoff samples and in many non-stormwater samples collected from the Freeland basin (Herrera, 2004a). The final project report for the Freeland Water Quality Improvement Project recommended that bacteria source control efforts focus on pet wastes and/or septic systems (Island County Public Works, 2006).

Ecology and state Department of Health cooperatively conduct the BEACH Program, standing for Beach Environmental Assessment, Communication and Health Program, which samples bacteria at 75 marine swimming beaches in Puget Sound. Beach Program sampling verified high concentrations of bacteria in Holmes Harbor in 2004, and again in August 2005. The highest BEACH bacteria concentrations found in Holmes Harbor were at Freeland Park in nearshore marine water proximate to the Freeland Creek outfall.

## Sampling Survey

Ecology collected surface water bacteria samples in the Freeland basin on April 11, 2006 between 2:55 pm and 7:45 pm. The first two samples were collected near the beach at the new Freeland Park stormwater outfall vault and appeared to be relatively clean: 3 to 11 fecal colony forming units per 100 milliliters of water (cfu/100 mL). Six other samples were collected near Freeland Park in the vicinity of North Stewart Road and lower Myrtle Road and ranged from 3 to 180 cfu/100 mL. The 180 cfu/100 mL sample (sample #4) was collected at the downstream end of the driveway culvert at 1593 North Stewart Road and may indicate unknown contamination sources in the vicinity of East Harbor Road.

The highest sample result collected by Ecology on April 11, 2006 was 5,000 cfu/100 mL at the downstream edge of the Freeland Plaza on-site system drainfield. The ground around the downstream edge of the Freeland Plaza drainfield was saturated and had a sewage odor. The wet area at the drainfield was connected to standing water in the alder woodland immediately north of the shopping center, joined several small tributaries in the woodland, and ultimately flowed into Freeland Creek above sample site #9. The resultant diluted flow was sampled at Bill Green's property (1572 E. Beauregard) and yielded a fecal coliform count of 920 cfu/100 mL (Table 1- sample #9). Complete Ecology sample results for April 11, 2006 are shown in Table 1. Sample locations for #1, #2, and #7 are shown in Figure 1; all other sample locations are shown in Figure 2.

**Table 1. Ecology sample results in Freeland Basin 4-11-06**

Field ID	Site	Sampling Time	GPS coordinates	Fecal Coliform #/100 mL
1	Freeland Park storm vault outfall above rock filter	1455	W122 31 49.5 N48 00 56.3	3
2	Freeland Park storm vault outfall <u>below</u> rock filter	1505	W122 31 49.5 N48 00 56.3	11
3	salt marsh outflow midway betw. Beach berm & Stewart Road	1515		29
4	N. Stewart Rd ditch @ ds end of driveway culvert @ 1593 Stewart Rd.	1520		180
5	N. side of Stewart Rd culvert - unnamed stream #06-0100 (Freeland Creek)	1530	W122 31 49.5 N48 00 56.3	9
6	S. side of Stewart Rd culvert - eastward flow into Freeland Creek	1535	W122 31 47.8 N48 00 53.1	9
7	western Myrtle Rd ditch flow @ downstream end of driveway @ 5418 Myrtle Rd., Freeland	1630		5
"	lab duplicate of #7	"		8
8	Freeland Creek ~100 feet abv Stewart Rd (Herrera station #3)	1645	W122 31 47.8 N48 00 52.3	3
9	Freeland Cr. @ lite blue house – 1572 E. Beauregard, Freeland	1700	W122 31 48.3 N48 00 47.5	920
10	sewage leachate below Freeland Plaza drainfield area	1730		5,000
11	suspect sewage-influenced water in ditch near suspected holding tank behind Shell Car Wash	1900	W122 31 58.1 N48 00 27.3	2,500
12	upstream end of Shell station entrance driveway culvert by fire hydrant	1915	W122 31 53.5 N48 00 27.5	34
"	lab duplicate of #12	"		26
13	flow on east side of Fish Rd across from speed limit sign	1920	W122 31 52.8 N48 00 26.6	17
14	NE corner of SR 525 & Main - standing tea-colored water near Herrera station #1	1930		3
15	upper Freeland Creek flow behind Ace Hardware - Herrera station #2 - (upstream of Freeland Plaza on-site influence)	1945	W122 31 46.6 N48 00 40.9	230

In addition to Freeland Plaza drainfield, another potential source of bacterial pollution to Holmes Harbor was found near the Shell station car wash on Fish Road. A 3-foot diameter concrete well was observed next to the Shell car wash driveway containing grayish-colored water with a septic odor. Similar water with a gray cast was observed in the roadside ditch next to the well. The well or cistern appeared to have overflowed from plumbed discharges to the well or from rainfall entering the unsecured well lid. The water in the ditch adjacent to the well was sampled and yielded a fecal count of 2,500 cfu/100 mL. The three other samples (#12, 13, & 14) collected near the intersection of Fish Road and SR 525 had low bacteria counts (34, 17, and 3 cfu/100 mL).

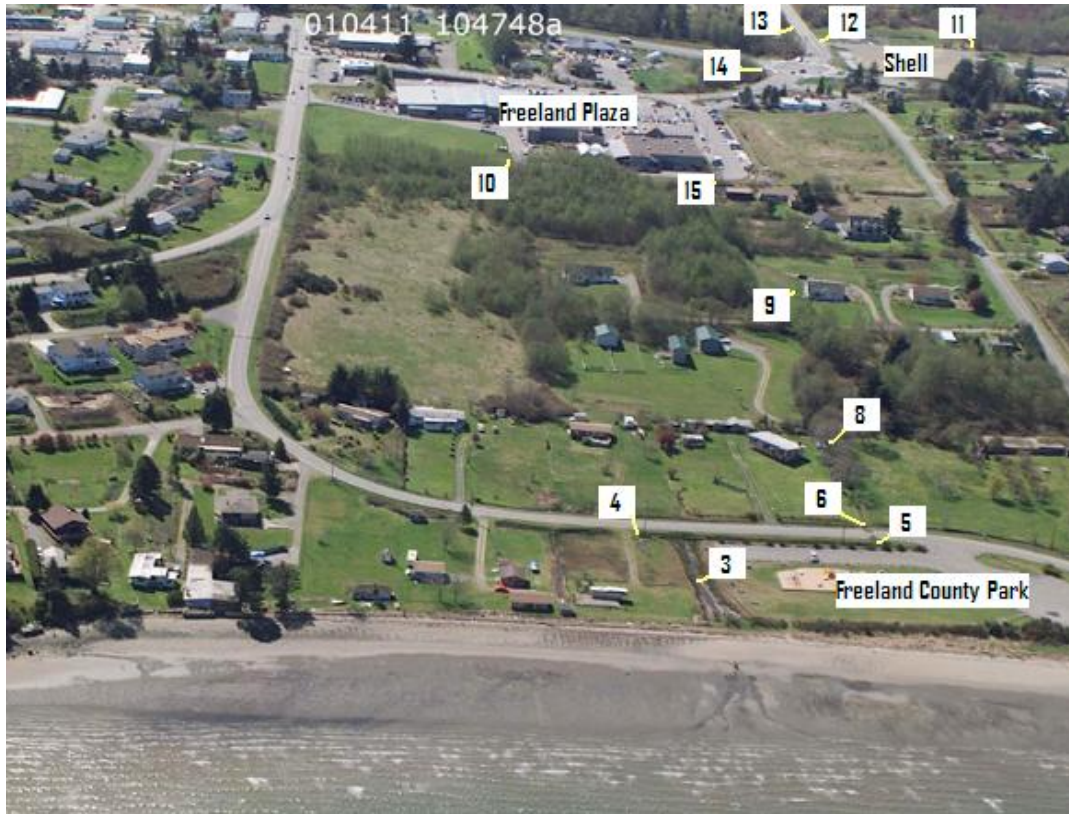


Figure 2. East Harbor Road and North Stewart Road curving down to Freeland County Park on Holmes Harbor. (Freeland Plaza shopping center is at top of picture)

Drainage from the area south of SR 525 that flows to Freeland Park coalesces into a pipe beneath the Ace Hardware parking lot and discharges at the north end of the parking area behind Ace. This discharge is unaffected by the Freeland Plaza drainfield and yielded a bacteria count of 230 cfu/100 mL (sample #15).

### Survey Findings

Sample results from the April 11 Freeland basin sampling survey indicate at least two sources of bacteria pollution draining into Holmes Harbor at Freeland County Park. Bacteria from the Freeland Plaza on-site system drainfield appears to be the most significant contamination problem for Freeland Creek and Holmes Harbor. The septic well near the Shell car wash is another potential source of bacterial contamination to Holmes Harbor. There could be other sources influencing drainage from the outfall pipe at the north edge of Ace Hardware parking lot (sample #15) based on the 230 cfu/100 mL fecal count collected there. Finally, there may be other contamination sources that were not evident at the time of the April 11 sampling survey.

### Recommendations

The Freeland Plaza on-site system and Shell septic well should be corrected as soon as possible to prevent further contamination of Freeland Creek and Holmes Harbor.

### References

- Herrera, 2003. Existing Habitat Conditions – Freeland Water Quality Improvement Project, for Island County Public Works, September 2, 2003, 20 pp. plus appendices.
- Herrera, 2004a. Freeland Water Quality Improvement Project – Water Quality Assessment Report, prepared by Herrera Environmental Consultants, Inc. for Island County Public Works Department, May 28, 2004, 66 pp. plus appendices.
- Herrera, 2004b. Stormwater Treatment Recommendations and Final Project Report – Freeland Water Quality Improvement Project, prepared by Herrera Environmental Consultants, Inc. for Island County Public Works, June 10, 2004 Draft, 32 pp.
- Island County, 2006. Final Project Report for Agreement G0200361: Freeland Water Quality Improvement, Island County Public Works Department, February 6, 2006, 13 pp.