

Washington State Department of Health Office of Environmental Health and Safety

Annual Growing Area Review

PREPARED BY: Jean Snyder
AREA: Vaughn Bay
YEAR ENDING: December 31, 2015
CLASSIFICATION: Approved, Prohibited

Activities In The Growing Area in 2015

All stations in the growing area were sampled seven times using the Systematic Random Sampling method. Six sample events occurred in Open status. Approximately 55 acres were downgraded from Approved to Conditionally Approved in August due to two marine stations (608 and 745) failing the Approved water quality standard. This portion of the growing area is closed for five days after 1-inch or greater rainfall occurs in 24-hours. The Conditionally Approved area was closed five times for a total of 35 days. The entire growing area was closed for 7 days in December due to excessive rainfall conditions.

Tacoma-Pierce County Health Department received EPA, National Estuary Program, Pollution Identification and Control funds for sanitary surveys of several areas on the Key Peninsula including Vaughn Bay. In addition, Pierce County Surface Water Management received EPA, National Estuary Program funds to create a Shellfish Protection District (RCW 90.72) and draft a Closure Response Plan for the downgraded area in Vaughn Bay.

Analytical Results Of Water Samples

Table 1 summarizes the most recent unsorted 30 samples collected from each of the sampling stations. Most stations were heavily impacted by one storm event, or 'first flush event' (1.94 inches of rain in 24-hours) on September 23-24, 2014.

All stations within the Approved area meet the NSSP water quality standard with the exception of Station 650. Station 650 fails to meet the NSSP water quality standard with estimated 90th percentile of 44.3 FC/100 mL. Table 2 is the most recent 30-sample summary when less than 1-inch had occurred within 5 days of the sampling event. Station 608 continues to fail water quality standards during Open status with an estimated 90th percentile of 59 FC/100 mL. However during 2015, the area around Station 608 was in Closed status. In addition to the two failing stations, stations 611 and 745 are listed as "Threatened" and station 607 and 613 are "Concerned". Table 3 includes individual sample results for the failing and Threatened stations.

Change In Actual Pollution Sources That Impact The Growing Area

The repair of a failing on-site sewage system near Station 608 was completed in January.

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Classification Status

- Well within the classification standards
- Meets standards, but some concerns
- Meets standards, but threatened with downgrade in classification
- Fails to meet current classification standards

Remarks and Recommendations

Station 608 and Station 650 do not meet the Approved water quality standard for their current classification. Station 650 appears to be impacted by rainfall events. The classification of both areas should be re-evaluated.

Management Plan Evaluation:

1. Have all parties involved complied with the conditions of the management plan..... Yes
2. Has reporting been adequate to manage the conditional area..... Yes
3. Does the area consistently meet approved area criteria when it is open for harvest..... Yes
4. Has a field inspection of critical pollution sources been conducted Yes

TABLE 1
Unsorted Data Summary of Marine Stations in Vaughn Bay

Sampling Event Type: Regulatory
 Maximum Number of Samples: 30

Tides Included: ALL

Station Number	Classification	Date Range	Range (FC/100 mL)	GeoMean (FC/100 mL)	E90th (FC/100 mL)	Meets Standard
35	Approved	5/5/2011 - 12/15/2015	1.7 - 240.0	2.5	8.9	Y
607	Approved	5/5/2011 - 12/15/2015	1.7 - 2400.0	3.4	20.1	Y
611	Approved	5/5/2011 - 12/15/2015	1.7 - 920.0	5.6	33.0	Y
612	Approved	5/5/2011 - 12/15/2015	1.7 - 2400.0	2.7	15.1	Y
613	Approved	5/5/2011 - 12/15/2015	1.7 - 2400.0	3.3	22.0	Y
650	Approved	5/5/2011 - 12/15/2015	1.7 - 1600.0	4.8	44.3	N
608	Conditionally Approved	5/5/2011 - 12/15/2015	1.7 - 1600.0	7.9	91.9	N
633	Conditionally Approved	5/5/2011 - 12/15/2015	1.7 - 2400.0	5.9	45.0	N
745	Conditionally Approved	5/5/2011 - 12/15/2015	1.7 - 2400.0	7.4	61.5	N
609	Prohibited	5/5/2011 - 12/15/2015	1.7 - 2400.0	20.2	182.8	N
610	Prohibited	5/5/2011 - 12/15/2015	1.7 - 1600.0	7.4	68.6	N

TABLE 2
Data Summary of the Conditionally Approved Marine Stations with a 1-inch Rainfall Sort

Sampling Event Type: Regulatory
 Maximum Number of Samples: 30

Tides Included: ALL

Includes data for rainfall amounts: 0.00 - 0.99" on days 0 – 4 previous to the sampling event.

Station Number	Classification	Date Range	Range (FC/100 mL)	GeoMean (FC/100 mL)	E90th (FC/100 mL)	Meets Standard
608	Conditionally Approved	9/15/2010 - 12/15/2015	1.7 - 1600.0	7.4	59.0	N
633	Conditionally Approved	9/15/2010 - 12/15/2015	1.7 - 110.0	4.3	18.5	Y
745	Conditionally Approved	9/15/2010 - 12/15/2015	1.7 - 110.0	6.1	32.6	Y

The standard for approved shellfish growing waters is fecal coliform geometric mean not greater than 14 organisms / 100 mL with an estimated 90th percentile not greater than 43 organisms / 100 mL. The above table shows bacteriological results in relation to program standards.

TABLE 3
Data Summary of Failing and Threatened Marine Stations (SRS)

Station: 611 Classification: Approved Method: SRS
 Total Samples: 30 Date Range: 05/05/2011 - 12/15/2015
 Range (FC/100 mL): 1.7 - 920.0 E90th (FC/100 mL): 33
 GeoMean (FC/100 mL): 5.6 Meets Standard: Y

Sample Date	Event Type	Time	Tide	SWT	Salinity	Fecal Coliform
05/05/2011	Regulatory	11:19	Ebb	12	26	2.0
07/07/2011	Regulatory	12:52	Ebb	18	27	4.5
09/21/2011	Regulatory	11:41	Flood	16	28	1.7
12/01/2011	Regulatory	15:34	Ebb	9	28	1.7
02/28/2012	Regulatory	12:33	Ebb	8	28	1.7
05/15/2012	Regulatory	12:55	Flood	16	26	4.5
05/29/2012	Regulatory	11:26	Flood	15	26	4.5
06/26/2012	Regulatory	12:40	Flood	16	26	6.8
07/19/2012	Regulatory	09:30	Ebb	18	25	2.0
09/18/2012	Regulatory	10:30	Ebb	16	29	13.0
12/19/2012	Regulatory	11:52	Ebb	7	25	11.0
02/28/2013	Regulatory	10:12	Ebb	8	27	4.5
04/17/2013	Regulatory	11:28	Ebb	11	24	1.7
06/12/2013	Regulatory	10:00	Ebb	17	21	4.5
08/12/2013	Regulatory	11:43	Ebb	20	27	7.8
10/08/2013	Regulatory	11:36	Ebb	14	27	49.0
12/05/2013	Regulatory	10:46	Ebb	9	29	1.8
01/09/2014	Regulatory	11:54	Flood	7	28	17.0
03/18/2014	Regulatory	10:24	Ebb	9	20	1.7
05/01/2014	Regulatory	09:05	Ebb	12	27	6.8
07/15/2014	Regulatory	10:22	Ebb	21	27	11.0
09/24/2014	Regulatory	09:28	Ebb	17	15	920.0
11/24/2014	Regulatory	11:38	Ebb	10	28	49.0
02/17/2015	Regulatory	12:54	Flood	10	26	1.7
04/13/2015	Regulatory	09:57	Flood	12	25	2.0
06/18/2015	Regulatory	09:31	Ebb	19	21	4.5
08/17/2015	Regulatory	09:51	Ebb	18	28	23.0
10/27/2015	Regulatory	09:49	Ebb	14	28	4.5
11/16/2015	Regulatory	11:43	Ebb	11	24	1.7
12/15/2015	Regulatory	10:30	Ebb	9	26	2.0

Station: 650**Classification: Approved****Method: SRS****Total Samples: 30****Date Range: 05/05/2011 - 12/15/2015****Range (FC/100 mL): 1.7 - 1600.0****E90th (FC/100 mL): 44.3****GeoMean (FC/100 mL): 4.8****Meets Standard: N**

Sample Date	Event Type	Time	Tide	SWT	Salinity	Fecal Coliform
05/05/2011	Regulatory	11:25	Ebb	13	26	1.7
07/07/2011	Regulatory	12:54	Ebb	18	27	7.8
09/21/2011	Regulatory	11:44	Flood	16	28	2.0
12/01/2011	Regulatory	15:36	Ebb	9	27	1.7
02/28/2012	Regulatory	12:36	Ebb	7	21	2.0
05/15/2012	Regulatory	13:00	Flood	15	27	1.7
05/29/2012	Regulatory	11:29	Flood	15	27	1.7
06/26/2012	Regulatory	12:42	Flood	16	26	1.7
07/19/2012	Regulatory	09:31	Ebb	19	23	1.7
09/18/2012	Regulatory	10:31	Ebb	16	29	7.8
12/19/2012	Regulatory	11:53	Ebb	8	27	2.0
02/28/2013	Regulatory	10:14	Ebb	8	25	1.7
04/17/2013	Regulatory	11:30	Ebb	11	27	1.7
06/12/2013	Regulatory	10:02	Ebb	17	28	7.8
08/12/2013	Regulatory	11:45	Ebb	20	29	33.0
10/08/2013	Regulatory	11:38	Ebb	14	28	11.0
12/05/2013	Regulatory	10:49	Ebb	9	29	1.8
01/09/2014	Regulatory	11:56	Flood	7	25	33.0
03/18/2014	Regulatory	10:27	Ebb	9	12	1.8
05/01/2014	Regulatory	09:07	Ebb	12	24	4.5
07/15/2014	Regulatory	10:23	Ebb	21	27	2.0
09/24/2014	Regulatory	09:29	Ebb	17	5	1600.0
11/24/2014	Regulatory	11:40	Ebb	10	28	4.5
02/17/2015	Regulatory	12:51	Flood	10	28	1.7
04/13/2015	Regulatory	09:55	Flood	12	27	1.7
06/18/2015	Regulatory	09:33	Ebb	19	27	2.0
08/17/2015	Regulatory	09:52	Ebb	18	28	1.7
10/27/2015	Regulatory	09:51	Ebb	14	22	920.0
11/16/2015	Regulatory	11:45	Ebb	11	27	7.8
12/15/2015	Regulatory	10:33	Ebb	9	26	4.5

Station: 608

**Classification: Conditionally
Approved**

Method: SRS

Total Samples: 30

Range (FC/100 mL): 1.7 - 1600.0

GeoMean (FC/100 mL): 7.4

Date Range: 09/15/2010 - 12/15/2015

E90th (FC/100 mL): 59

Meets Standard: N

Includes data for rainfall amounts 0.00-0.99 on days 0-4 previous to the sampling event.

Sample Date	Event Type	Time	Tide	SWT	Salinity	Fecal Coliform
09/15/2010	Regulatory	15:16	Ebb	16	29	13.0
11/09/2010	Regulatory	12:12	Ebb	12	28	17.0
12/21/2010	Regulatory	13:07	Flood	8	26	9.3
01/06/2011	Regulatory	14:40	Ebb	8	28	4.0
05/05/2011	Regulatory	11:23	Ebb	12	20	13.0
07/07/2011	Regulatory	12:40	Ebb	17	27	31.0
09/21/2011	Regulatory	11:31	Flood	16	28	4.0
12/01/2011	Regulatory	15:25	Ebb	9	25	4.5
02/28/2012	Regulatory	12:20	Ebb	7	27	1.7
05/15/2012	Regulatory	12:46	Flood	16	26	4.5
05/29/2012	Regulatory	11:17	Flood	15	26	4.5
06/26/2012	Regulatory	12:30	Flood	15	25	1.7
07/19/2012	Regulatory	09:21	Ebb	18	24	11.0
09/18/2012	Regulatory	10:22	Ebb	16	29	4.5
02/28/2013	Regulatory	10:02	Ebb	8	28	1600.0
04/17/2013	Regulatory	11:21	Ebb	11	27	1.7
06/12/2013	Regulatory	09:51	Ebb	17	28	2.0
08/12/2013	Regulatory	11:33	Ebb	19	28	240.0
10/08/2013	Regulatory	11:27	Ebb	14	29	7.8
12/05/2013	Regulatory	10:36	Ebb	9	26	2.0
01/09/2014	Regulatory	11:42	Flood	7	24	49.0
03/18/2014	Regulatory	10:14	Ebb	9	15	4.5
05/01/2014	Regulatory	08:56	Ebb	12	27	1.7
07/15/2014	Regulatory	10:14	Ebb	20	28	79.0
02/17/2015	Regulatory	13:04	Flood	10	26	1.7
04/13/2015	Regulatory	10:08	Flood	11	27	1.7
06/18/2015	Regulatory	09:24	Ebb	19	29	2.0
08/17/2015	Regulatory	09:42	Ebb	19	27	2.0
10/27/2015	Regulatory	09:38	Ebb	14	25	7.8
12/15/2015	Regulatory	10:20	Ebb	9	27	14.0

Station: 745

Classification: Conditionally
Approved

Method: SRS

Total Samples: 30

Range (FC/100 mL): 1.7 - 110.0

GeoMean (FC/100 mL): 6.1

Date Range: 09/15/2010 - 12/15/2015

E90th (FC/100 mL): 32.6

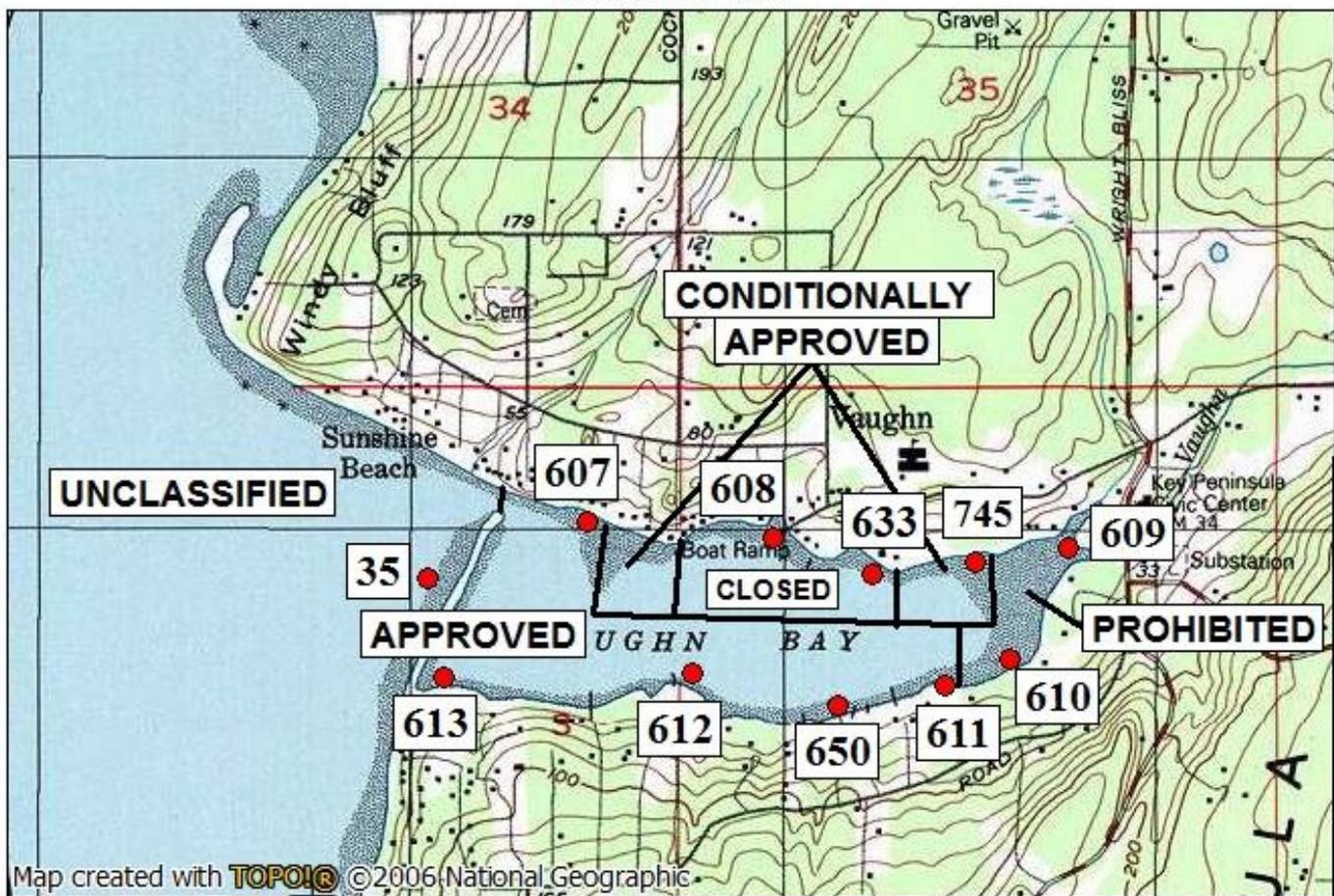
Meets Standard: Y

Includes data for rainfall amounts 0.00-0.99 on days 0-4 previous to the sampling event.

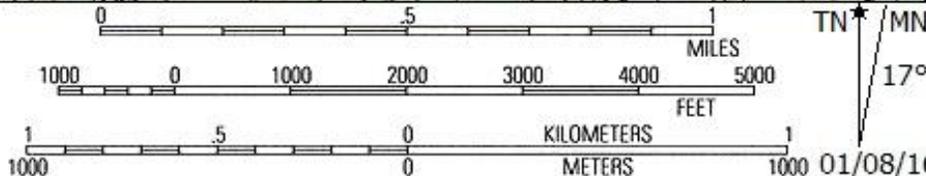
Sample Date	Event Type	Time	Tide	SWT	Salinity	Fecal Coliform
09/15/2010	Regulatory	15:21	Ebb	16	29	1.7
11/09/2010	Regulatory	12:16	Ebb	12	28	11.0
12/21/2010	Regulatory	13:02	Flood	8	26	49.0
01/06/2011	Regulatory	14:45	Ebb	8	28	2.0
05/05/2011	Regulatory	11:15	Ebb	12	25	4.5
07/07/2011	Regulatory	12:44	Ebb	18	27	7.8
09/21/2011	Regulatory	11:35	Flood	16	28	7.8
12/01/2011	Regulatory	15:28	Ebb	9	27	2.0
02/28/2012	Regulatory	12:26	Ebb	7	27	1.7
05/15/2012	Regulatory	12:49	Flood	16	26	4.5
05/29/2012	Regulatory	11:21	Flood	15	26	1.7
06/26/2012	Regulatory	12:35	Flood	16	27	1.7
07/19/2012	Regulatory	09:24	Ebb	19	22	46.0
09/18/2012	Regulatory	10:26	Ebb	16	29	33.0
02/28/2013	Regulatory	10:06	Ebb	8	27	11.0
04/17/2013	Regulatory	11:24	Ebb	11	27	1.7
06/12/2013	Regulatory	09:55	Ebb	17	27	2.0
08/12/2013	Regulatory	11:37	Ebb	20	27	23.0
10/08/2013	Regulatory	11:31	Ebb	14	29	110.0
12/05/2013	Regulatory	10:40	Ebb	9	29	1.7
01/09/2014	Regulatory	11:47	Flood	7	12	79.0
03/18/2014	Regulatory	10:19	Ebb	10	12	7.8
05/01/2014	Regulatory	08:59	Ebb	12	20	1.8
07/15/2014	Regulatory	10:18	Ebb	20	27	13.0
02/17/2015	Regulatory	13:00	Flood	10	26	1.7
04/13/2015	Regulatory	10:04	Flood	12	27	1.7
06/18/2015	Regulatory	09:27	Ebb	19	29	2.0
08/17/2015	Regulatory	09:46	Ebb	19	28	11.0
10/27/2015	Regulatory	09:43	Ebb	14	25	13.0
12/15/2015	Regulatory	10:24	Ebb	9	9	4.5

MAP 1

VAUGHN BAY



Map created with **TOPOIC** ©2006 National Geographic



TN MN
17°
01/08/16