



GROWING AREA EC – Deer Isle

Little Deer Isle, The Island of Deer Isle including Stonington, and various surrounding small uninhabited islands.

Annual Report for 2006

Final Report Date: December 31, 2006

John C. Fendl, Specialist I

APPROVAL

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Executive Summary

This report is an annual review of Growing Area EC, required under “Chapter IV, Section .01 Sanitary Survey, C(5) Annual Report” from the National Shellfish Sanitation Program’s *Guide for the Control of Molluscan Shellfish* (<http://www.cfsan.fda.gov/~ear/nss3-toc.html>) 2005 edition. The report may include, but is not limited to, observations made during sampling or surveying within the area, a review of the past year’s sampling results, inspection of any available reports, pollution source sampling results, a review of performance standards of discharges impacting the growing area and a brief documentation and summary of the findings of the annual reevaluation. Based on the information and data collected during this review period, any necessary changes will be discussed in the summary of this report.

Growing Area EC is primarily a rural area of Maine with low population density. It is an island community that is mostly residential with commercial fishing and tourism being the main industry. There are 23 overboard discharges with all but two encompassed by prohibited areas. The remaining two will be covered by closures as detailed in this report. One closure was repealed during the 2006 calendar year leaving nine current closures, all of which are classified as prohibited. There is only one municipal waste water treatment plant (WWTP) that remains unchanged from its original design and continues to operate within its license limits. Water quality in Growing Area EC continues to improve and acres of prohibited area are being repealed as a result. The Fifield Point part of closure 38C may be lifted as a result of the removal of OBD #2492. Water quality also improved in Inner Harbor, allowing the repeal of Closure 38A.

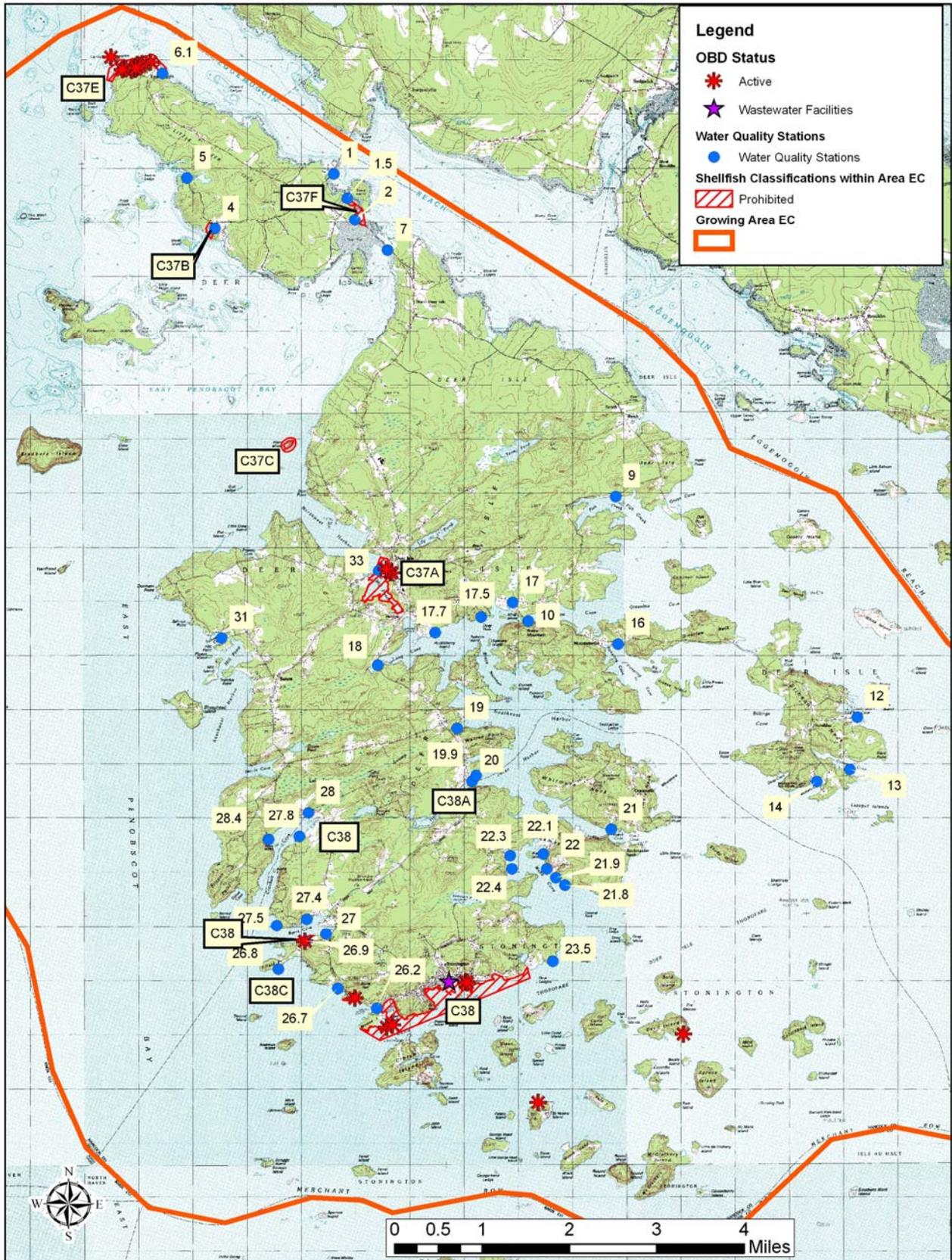


Figure 1: Overall Growing Area EC



Current Classifications

Approved- All shores and waters of the growing area not specifically described below.

Prohibited – C37A, Deer Isle; (12/01/1999)

Prohibited – C37B, Blastow Cove, Deer Isle; (08/17/1988)

Prohibited – C37C, Heart Island, Deer Isle; (04/13/2001)

Prohibited – C37E, Eggmoggin, Little Deer Isle; (05/22/1989)

Prohibited – C37F, Little Deer Isle to Stave Island, Deer Isle; (10/06/2006)

Prohibited – C38, Stonington Harbor and the Northwest Branch of Crockett Cove, Deer Isle and Stonington; (09/28/2001)

Prohibited – C38A, Inner Harbor, Stonington-Deer Isle; (12/29/1999)

Prohibited – C38B, Burnt Cove, West Stonington; (12/07/2005)

Prohibited – C38C, Fifield Point to Moose Island, Stonington; (11/28/2001)

Closure 37F was repealed 02/28/2006 because water quality scores at station EC 17.7 dropped down into the approved range with a geomean of 5.6 and a P90 of 43.1. Details can be found in the addendum report titled “Addendum 2-17-06 Long Cove, Deer Isle C37D” which is kept on file at the Lamoine Facility and can be found at: <..\Surveys\Addendum 2-17-06 Long Cove, Deer Isle C37D.doc>



Current Management Plan

There are no Conditional Areas within Growing Area EC.

Current Annual Review of Management Plan

N/A

Review of Water Quality

The Maine Department of Marine Resources has chosen to switch to a fecal coliform method that was approved for use in the National Shellfish Sanitation Program (NSSP) at the Interstate Shellfish Sanitation Conference in 2003. This method is the Membrane Filtration (MF) for Fecal Coliforms using mTEC agar with a two hour resuscitation step.

The NSSP relies on two standards to determine classification of harvest areas; a geometric average (geomean) of the 30 sample data set and for systematic random sampling strategy a 90th percentile. The 90th percentile is basically a variability component and encompasses the variability of the test method plus an allowance for some variability due to changing conditions in the water. The variability or precision of the test method employed impacts the 90th percentile standard. The more precise the test method, the less variability one would expect when conducting repeated measurements. The less variability translates into a lower 90th percentile standard. The MF procedure is a more precise procedure than most of the MPN dilution series approved for the use in the NSSP program. The 90th percentile standard for MF is 31 compared to the less precise 3 dilution/ 3tubes per dilution MPN 90th percentile standard of 49.

The geometric mean and the 90th percentile are calculated on 30 data points extending over a five year period. During the transition from MPN to MF, we will be accumulating MF data points. The statistical calculations will be a combination of MPN and MF data points. The FDA has determined that the best way to handle the data is to perform the calculations as always for the data set, but to compare the data set to a hybrid weighted 90th percentile. This hybrid standard is calculated by weighting the relative contributions of each method to the database. This will mean that as the number of MPN data points reduce and the number of MF data points increase the 90th percentile standard that the sample site is compared to will change over time. Once all 30 data points are analyzed using MF, the 90th percentile for approved classification will be 31 and for restricted (for depuration) will be 163. The geomean approved standard of 14 fecal coliforms per 100 ml and geomean restricted standard of 88 fecal coliforms per 100 ml will remain the same for both methods.

Reports that display 90th percentiles will show the number of data points derived from MF analysis and will show the appropriate 90th percentile standard for that MPN/MF combination for approved and restricted classifications. These standards will be reported in columns marked "APPD_STD" and "RESTR_STD".

Samples in Area EC are collected by vehicle during Systematic Random Sampling. There were 40 active stations sampled during this review period. All active sample sites met the minimum six (6) sample criteria in 2006.



New station EC 19.9 was activated in 2006 and sampled for the first time on 04/18/06. It was added to the random sampling schedule and six samples were collected during the year. This station was activated as a boundary station for closure 38A. Station 20 is within closure 38A and had failing P90 scores of 68.4 in 2004 and 56.6 in 2005, but water quality improved significantly in 2006 when the P90 dropped to 36.1. Failing water quality scores was the only reason closure 38A remains in place, since OBD# 1656 was removed. The figure below shows the location of WQ station EC 19.9.

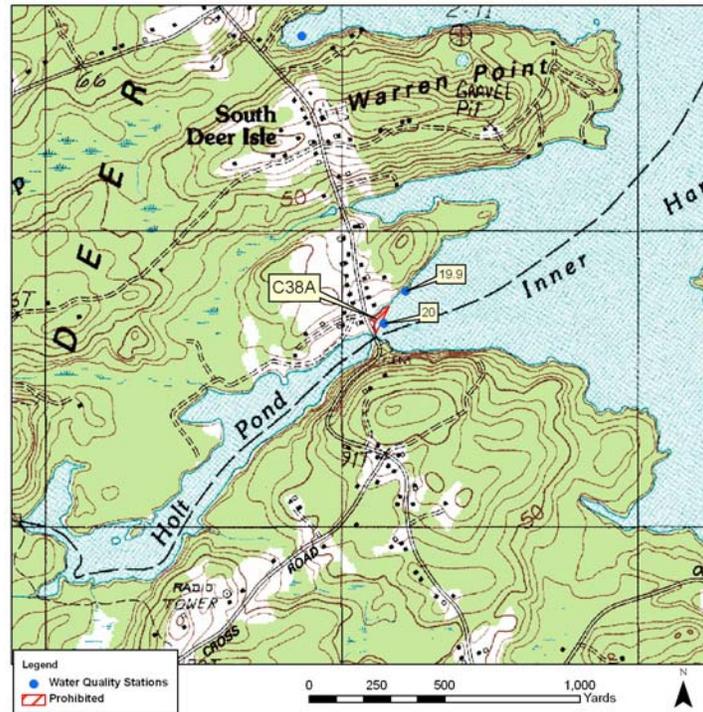


Figure 2: WQ Station EC 19.9

Table 1 below lists all active stations in Growing Area EC, with their respective Geomean and P90 calculations.

Table 1: Geomean and P90 Calculations

STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
EC001.00	A	30	2	4.2	0.31	43	10	48	288
EC001.50	A	30	2	4.4	0.47	460	17	48	288
EC002.00	P	30	2	7.4	0.71	460	59	48	288
EC004.00	P	30	2	4.1	0.33	43	11	48	288
EC005.00	A	30	2	3.6	0.22	15	6.7	48	288
EC006.10	P	12	2	3.3	0.22	9.1	6.3	45	271
EC007.00	A	30	2	3.7	0.39	240	12	48	288
EC009.00	A	30	2	3.6	0.34	93	10	48	288
EC010.00	A	30	2	4.9	0.56	460	25	48	288
EC012.00	A	30	2	3.8	0.35	75	11	48	288
EC013.00	A	30	2	3.1	0.17	23	5.2	48	288
EC014.00	A	30	2	4.4	0.37	43	13	48	288
EC016.00	A	30	2	4.2	0.38	93	13	48	288
EC017.00	A	30	2	4.5	0.4	180	15	48	288
EC017.50	A	30	2	3.3	0.19	20	5.8	48	288
EC017.70	A	30	2	4.3	0.53	1100	21	48	288



STATION	CLASS	COUNT	MFCNT	GEO_MEAN	SDV	MAX	P90	APPD_STD	RESTR_STD
EC018.00	A	30	2	3.4	0.25	43	7.2	48	288
EC019.00	A	30	2	4.6	0.53	460	22	48	288
EC019.90	A	6	2	5.6	0.62	93	36	42	245
EC020.00	P	30	2	6	0.61	1100	36	48	288
EC021.00	A	30	2	3.5	0.23	23	6.9	48	288
EC021.80	A	30	2	3	0.09	7.2	4	48	288
EC021.90	A	30	2	4.8	0.58	1100	27	48	288
EC022.00	A	30	2	4.8	0.48	240	20	48	288
EC022.10	A	30	2	3.9	0.51	1100	18	48	288
EC022.30	A	30	2	4	0.38	150	12	48	288
EC022.40	A	30	2	3.6	0.27	23	8	48	288
EC023.50	A	30	2	3.1	0.17	15	5.1	48	288
EC026.20	A	30	2	4.3	0.42	240	15	48	288
EC026.70	A	30	2	3.2	0.17	15	5.2	48	288
EC026.80	P	12	2	3.3	0.28	23	7.5	45	271
EC026.90	P	30	2	5.2	0.5	240	23	48	288
EC027.00	A	30	2	4.3	0.39	64	13	48	288
EC027.40	A	30	2	3.6	0.23	23	7.1	48	288
EC027.50	A	12	2	2.9	0.09	3.6	3.8	45	271
EC027.80	A	30	2	3.5	0.28	43	8	48	288
EC028.00	P	30	2	11.5	0.68	460	86	48	288
EC028.40	A	30	2	6.2	0.55	460	32	48	288
EC031.00	A	30	2	3.6	0.23	16	7.1	48	288
EC033.00	P	30	2	3.7	0.32	43	9.4	48	288

All stations meet approved criteria of Geomeans being no greater than 14 and P90s being no greater than the value in the APPD_STD column, with the exceptions of EC 2 and EC 28. Station 2 is within closed area C37F, and station 28 is within C45B.

Table 2 below shows P90 values for the past three consecutive years. Stations 2 and 28.4 show a steady increase, while stations 14, 17.7, 20, 21.9, 22.1, 22.3, & 26.2 show a steady decrease over the triennium. Now that station EC 20 has come down to a Geomean of 6 fc/100ml and a P90 of 36, closure 38A may be lifted.



Table 2: P90 Three Year History

Area EC P90 History				Area EC P90 History			
Station#	2004	2005	2006	Station#	2004	2005	2006
EC001.00	11.8	14.7	10.3	EC021.00	6.7	6.7	6.9
EC001.50	8.6	16.5	17.2	EC021.80	4.3	4.4	4
EC002.00	27.9	46.9	58.8	EC021.90	43.9	42.5	26.9
EC004.00	9.7	8.2	10.8	EC022.00	23.8	35.8	19.8
EC005.00	4	6.2	6.7	EC022.10	34.8	29.1	17.8
EC006.10		6.5	6.3	EC022.30	21.3	13.9	12.4
EC007.00	11	10.6	11.7	EC022.40	12.7	7.9	8
EC009.00	5.7	10	10	EC023.50	5.2	5.2	5.1
EC010.00	22	27.6	25.4	EC026.20	18.2	16.5	14.8
EC012.00	8.7	11.8	10.6	EC026.70	5.6	5.6	5.2
EC013.00	4	5.2	5.2	EC026.80		2.9	7.5
EC014.00	24.2	18.5	13.3	EC026.90	15.3	29.2	22.5
EC016.00	16.6	19.1	12.7	EC027.00	16.6	7.5	13.4
EC017.00	11.4	7.2	14.8	EC027.40	7.7	5.3	7.1
EC017.50	5.6	4	5.8	EC027.50		3.4	3.8
EC017.70	44.5	43.1	20.5	EC027.80	36.3	5.6	8
EC018.00	6.6	8.9	7.2	EC028.00	169.2	85.1	86.1
EC019.00	9.2	25.9	21.6	EC028.40	16.5	23.8	31.6
EC019.90			35.8	EC031.00	11.3	5.6	7.1
EC020.00	68.4	56.6	36.1	EC033.00	11.9	13.3	9.4

Table 3 below shows the number of samples taken during the 2006 sampling year.

Table 3: 2006 Sample Count

Station	Class	Status	Sample Count	COMMENTS
EC001.00	A	O	6	
EC001.50	A	O	6	
EC002.00	P	C	6	
EC004.00	P	C	6	
EC005.00	A	O	6	
EC006.10	P	C	6	Reactivated 12-04
EC007.00	A	O	6	
EC009.00	A	O	6	
EC010.00	A	O	6	
EC012.00	A	O	6	
EC013.00	A	O	6	
EC014.00	A	O	6	Reclass-CP to OA OBD removed and improved water quality 1/13/04
EC016.00	A	O	6	
EC017.00	A	O	6	
EC017.50	A	O	6	Reclass-CA to OA, improved water quality.
EC017.70	A	O	5	Reclass CA to OA 2-06
EC017.70	CA	C	1	Reclass CA to OA 2-06
EC018.00	A	O	6	
EC019.00	A	O	6	
EC019.90	A	O	6	
EC020.00	P	C	7	Change class P to A on 3/27/07.



Station	Class	Status	Sample Count	COMMENTS
EC021.00	A	O	6	
EC021.80	A	O	6	
EC021.90	A	O	6	
EC022.00	A	O	6	
EC022.10	A	O	6	
EC022.30	A	O	6	
EC022.40	A	O	6	
EC023.50	A	O	6	
EC026.20	A	O	6	
EC026.70	A	O	6	
EC026.80	P	C	6	New Station 12-04. Changed class P to A on 3/27/07.
EC026.90	P	C	6	
EC027.00	A	O	6	Reclass-CP to OA 12/7/05
EC027.40	A	O	6	Reclass-CP to OA 12/7/05
EC027.50	A	O	6	New Station 12-04
EC027.80	A	O	6	
EC028.00	P	C	6	
EC028.40	A	O	6	
EC031.00	A	O	6	
EC033.00	P	C	6	

Shoreline Survey Activity

DMR shoreline survey activity was limited to drive through observations during random water sampling runs, with the exception of the unnamed cove south of Fifield Point, which was surveyed on Nov. 7, 2006. This cove was surveyed after receiving information from Pam Parker of DEP, that OBD #2492 had been converted to a sub surface system on 1/3/06. The OBD was found to have been removed and no other pollution problems were found within this part of closure 38C. Since the presence of this OBD was the only reason for this closure, this part of closure 38C may now be lifted.

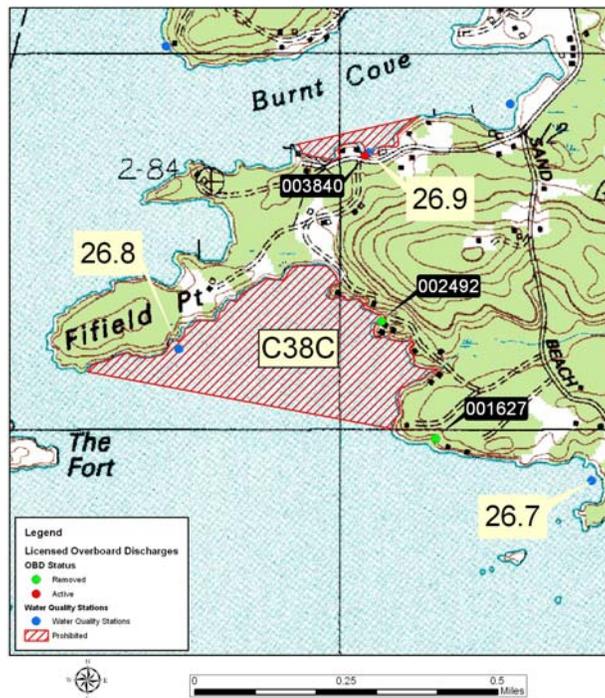


Figure 3: South of Fifield Point Survey Area

The Stonington wastewater treatment facility was reviewed for the Triennial Report in 2005 with no discrepancies found. No violations or bypass events were reported in 2006. There is a 12-year sanitary survey report due at the end of 2011. Shoreline survey field work and data collection necessary for the report will take place during the 2011 calendar year.

Shellfish aquaculture or wet storage activities in the area

Table 4: Aquaculture Leases in the Growing Area

Site ID	Name	Primary Species	Expiration Date
ING 04	Scott Ingraham	Oysters	12/31/2006
PEN LD2	Danny Weed	American Oysters	2/20/2013
PEN SN1	Jack Hamble Jr.	Blue Mussels	7/31/2015
PEN SN2	Jack Hamble Jr.	Blue Mussels	5/29/2015
PEN STH	Downeast Aquaculture	Blue Mussels	3/15/2016

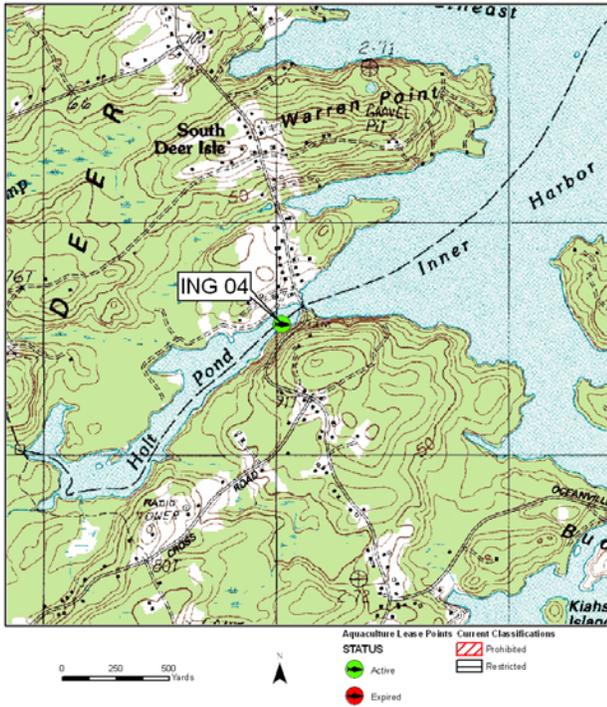


Figure 4: Lease Site ING 04 Map



Figure 6: Lease Sites PEN SN1 & PEN SN2 Map

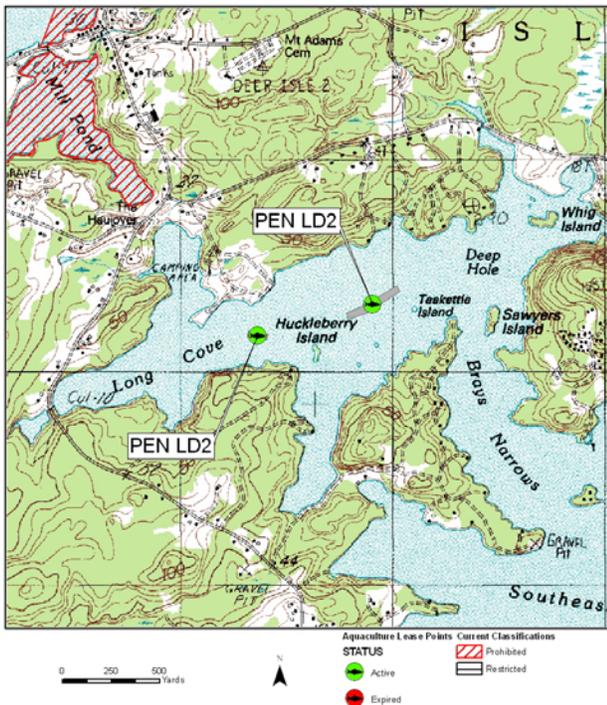


Figure 5: Lease Site PEN LD 2 Map

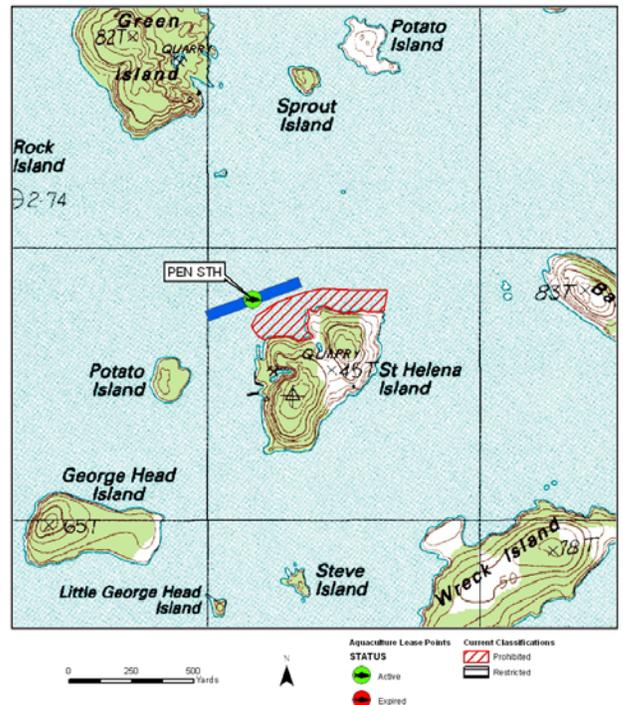


Figure 7: Lease Site PEN STH Map



Changes in classification required/requested at this time

There are currently no closures around OBD #2298 and #2333. These unclassified OBDs were discovered in the new DMR connection to DEP's RESCOM database. Figures 8, 9, 10, and 11 below illustrate both the dilution zone calculations based on flow rates, and maps showing the required dilution zones and proposed prohibited zones for these two OBDs.

WWTP CALCULATION SPREADSHEET

This spreadsheet can be used to calculate a dilution zone for any pipe with a flow and an FC load.

This color cell requires an input

This color cell is calculated automatically

	Flow rate=	2,400	Gallons/day(GPD)
	There are 7.481 gallons in one cu.ft., so GPD divided by 7.481=	321	Cu.Ft./day
	There are 283 100ml units in one cu.ft., so 283 times Cu. Ft./day=	90,790	100ml. Units/day
	Bacteria load=	100,000	FC colonies/100ml
	Bacteria load times the number of 100ml. Units/day=	9,079,000,134	Total FC/day
	or	9.08E+09	Total FC/day
	Fecal coliform bacteria must be diluted down to <14 FC/100ml of water.		
	FC colonies/day divided by 14=	648,500,010	100ml units of receiving waters for dilution.
	There are 283 100ml units per cu.ft., so 100ml. Units divided by 283=	2,291,519	cu.ft. of receiving waters for dilution.
	Average depth of receiving waters =	30	Ft.
	Cu.ft. of receiving waters / by average depth=	76,384	Square ft. of surface water, or closure size.
	Square ft. times 0.092903 =	7,096	Square meters
	Square meters times 0.0002471=	1.8	acres

VIRAL DILUTION

	Cu.ft./day times 1000=	320,813	cu.ft. of receiving waters required for 1000:1 dilution
	Cu.ft./depth of receiving waters=	10,694	square ft. of surface water
	Square ft. times 0.092903 =	993	square meters of surface
	Square meters times 0.0002471=	0.2	acres
	Bacterial dilution zone required is	7,096	square meters
	Viral dilution zone required is	993	square meters

Figure 8: OBD# 2298 Dilution Calculation

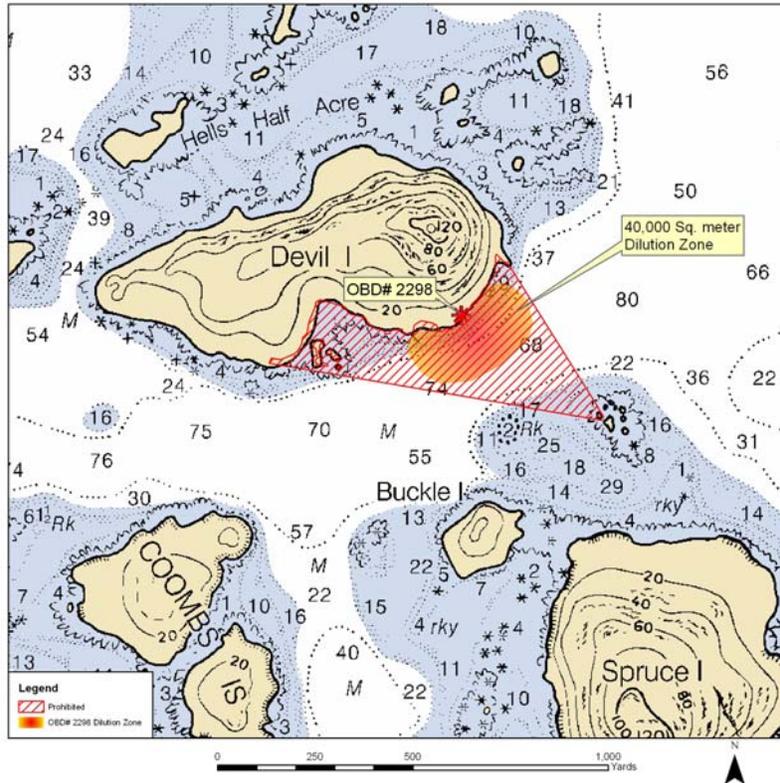


Figure 9: Map of OBD# 2298

The calculated dilution zone for OBD# 2298 is 7,096 square meters of surface area based on an average depth of 30 feet in the vicinity of the discharge point. For illustration purposes, the dilution zone shown on the map in figure 9 is 40,000 square meters, this allows for additional buffer in the unlikely event of an error in calculation. The proposed prohibited zone is 121,000 square meters, which encompasses the discharge point and calculated dilution zone.



WWTP CALCULATION SPREADSHEET

This spreadsheet can be used to calculate a dilution zone for any pipe with a flow and an FC load.

	Flow rate=	300 Gallons/day(GPD)
		40 Cu.Ft./day
	There are 7.481 gallons in one cu.ft., so GPD divided by 7.481=	11,349 100ml. Units/day
	There are 283 100ml units in one cu.ft., so 283 times Cu. Ft./day=	
	Bacteria load=	100,000 FC colonies/100ml
		1,134,875,017 Total FC/day
	Bacteria load times the number of 100ml. Units/day=	or 1.13E+09 Total FC/day
	Fecal coliform bacteria must be diluted down to <14 FC/100ml of water.	
	FC colonies/day divided by 14=	81,062,501 100ml units of receiving waters for dilution.
	There are 283 100ml units per cu.ft., so 100ml. Units divided by 283=	286,440 cu.ft. of receiving waters for dilution.
	Average depth of receiving waters =	6 Ft.
	Cu.ft. of receiving waters / by average depth=	47,740 Square ft. of surface water, or closure size.
	Square ft. times 0.092903 =	4,435 Square meters
	Square meters times 0.0002471=	1.1 acres

VIRAL DILUTION

	Cu.ft./day times 1000=	40,102 cu.ft. of receiving waters required for 1000:1 dilution
	Cu.ft./depth of receiving waters=	6,684 square ft. of surface water
	Square ft. times 0.092903 =	621 square meters of surface
	Square meters times 0.0002471=	0.2 acres
	Bacterial dilution zone required is	4,435 square meters
	Viral dilution zone required is	621 square meters

Figure 10: OBD# 2333 Dilution Calculation

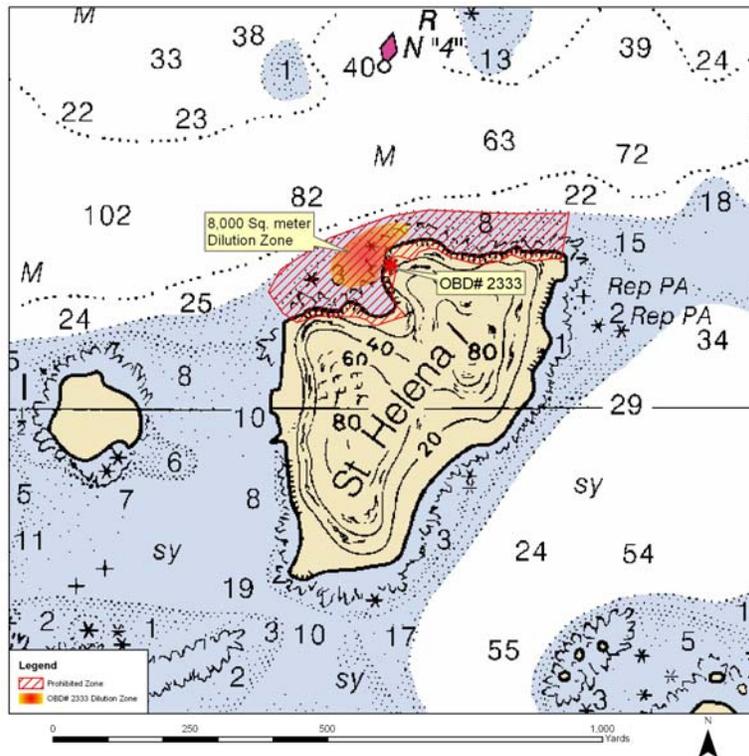


Figure 11: Map of OBD# 2333

The calculated dilution zone for OBD# 2333 is 4,435 square meters of surface area based on an average depth of 6 feet in the vicinity of the discharge point. For illustration purposes, the dilution zone shown



on the map in figure 11 is 8,000 square meters, this allows for additional buffer in the unlikely event of an error in calculation. The proposed prohibited zone is 48,000 square meters, which encompasses the discharge point and calculated dilution zone.

Current map in file/online/in map book?

Yes

Legal notices updated in file/closure binder/online?

Yes, confirmed 12-01-2006

Discussion and Summary

All active stations have met the minimum number of samples required by the random sampling criteria. The water sampling protocol will remain the same in the 2007 sampling year. Samples from 2006 were processed with two different methods as a result of switching laboratory testing methods mid year. From 2007 and forward, Maine DMR will use the Membrane Filtration (MF) method exclusively for seawater samples.

Water quality in Growing Area EC continues to improve and acres of prohibited area are being repealed as a result. The Fifield Point part of closure 38C may be lifted as a result of the removal of OBD #2492. Water quality also improved in Inner Harbor, allowing the repeal of Closure 38A.

Many smaller closures within a geographic region are being rolled into one closure with many small parts. The intent of this change is to assign closure numbers to a region instead of to the closed area itself. For example, Southern Deer Isle, Stonington, and Merchants Row will become Closure 38 and any old closures within this region will become part of Closure 38. As some of these repeals and promulgations take place, any closure previously classified as prohibited will be reevaluated to see if it meets restricted standards. This is the case with the northwest branch of Crockett Cove, originally classified as prohibited when promulgated on November 28, 2001. This cove meets restricted standards with a geomean of less than 88 fc/100ml and a P90 of less than 288, and no known pollution sources in the area. Crockett Cove will be reclassified as restricted when C38 gets promulgated.

The Maine DEP and local town governments continue to work on OBD removal and abatement of failing septic systems at a pace that finances will allow. As government aid money becomes available, more known problem systems will be removed.

There are only approved and prohibited classifications within this growing area. Prohibited areas have sample sites on margins or have dilution calculations to support the size of the regulation closure. This growing area is due for a complete twelve year Sanitary Survey in 2011.



Maine Department of Marine Resources

Pollution Closed Area No. 38

Southern Deer Isle, Stonington, and Merchants Row
(Deer Isle and Stonington) 3/23/07

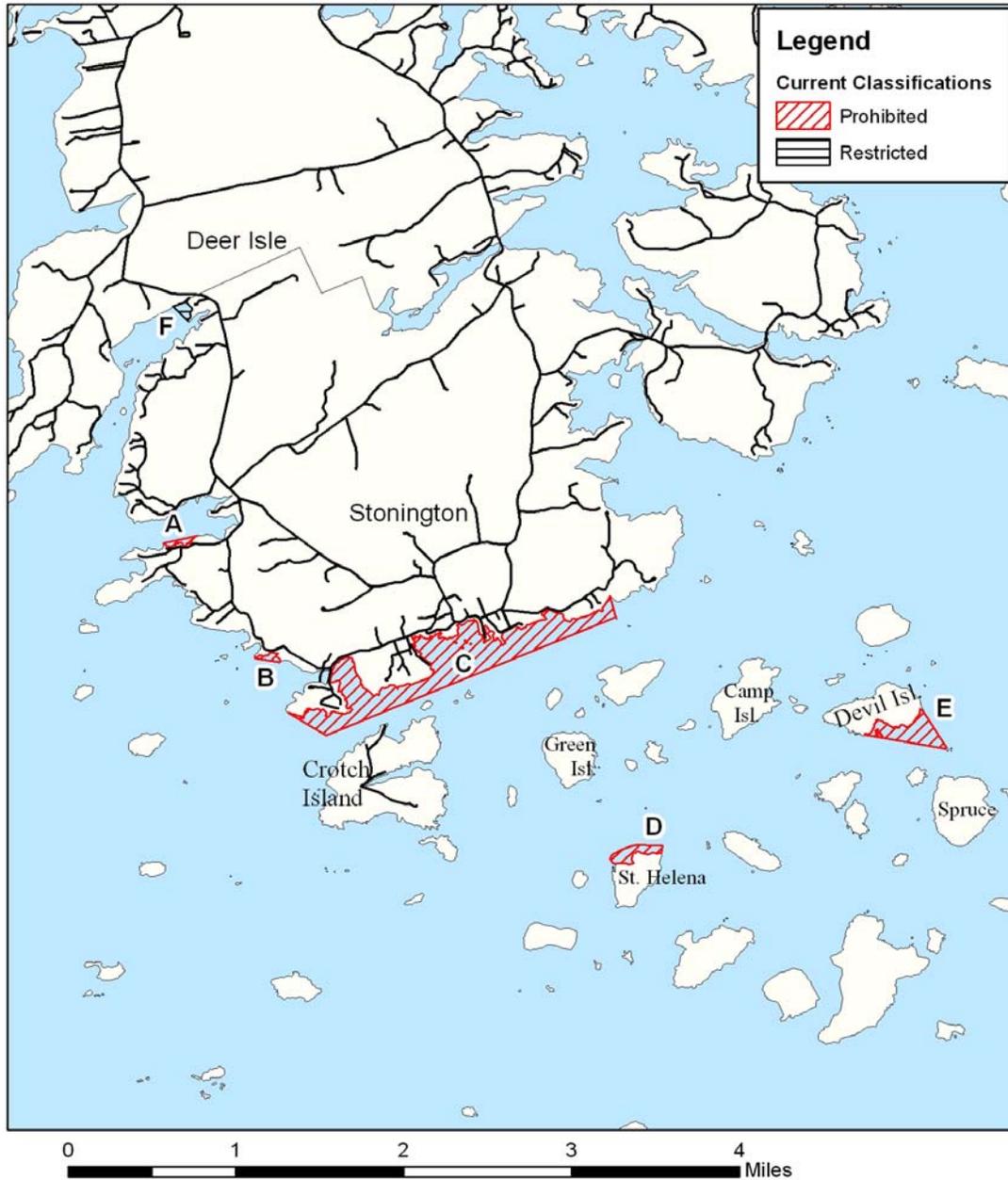


Figure 12: Proposed Reclassifications



Bibliography

None