



WG Annual Review 2008
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GROWING AREA WG

Towns of Biddeford, Saco, Old Orchard Beach and Scarborough

ANNUAL REVIEW for 2008

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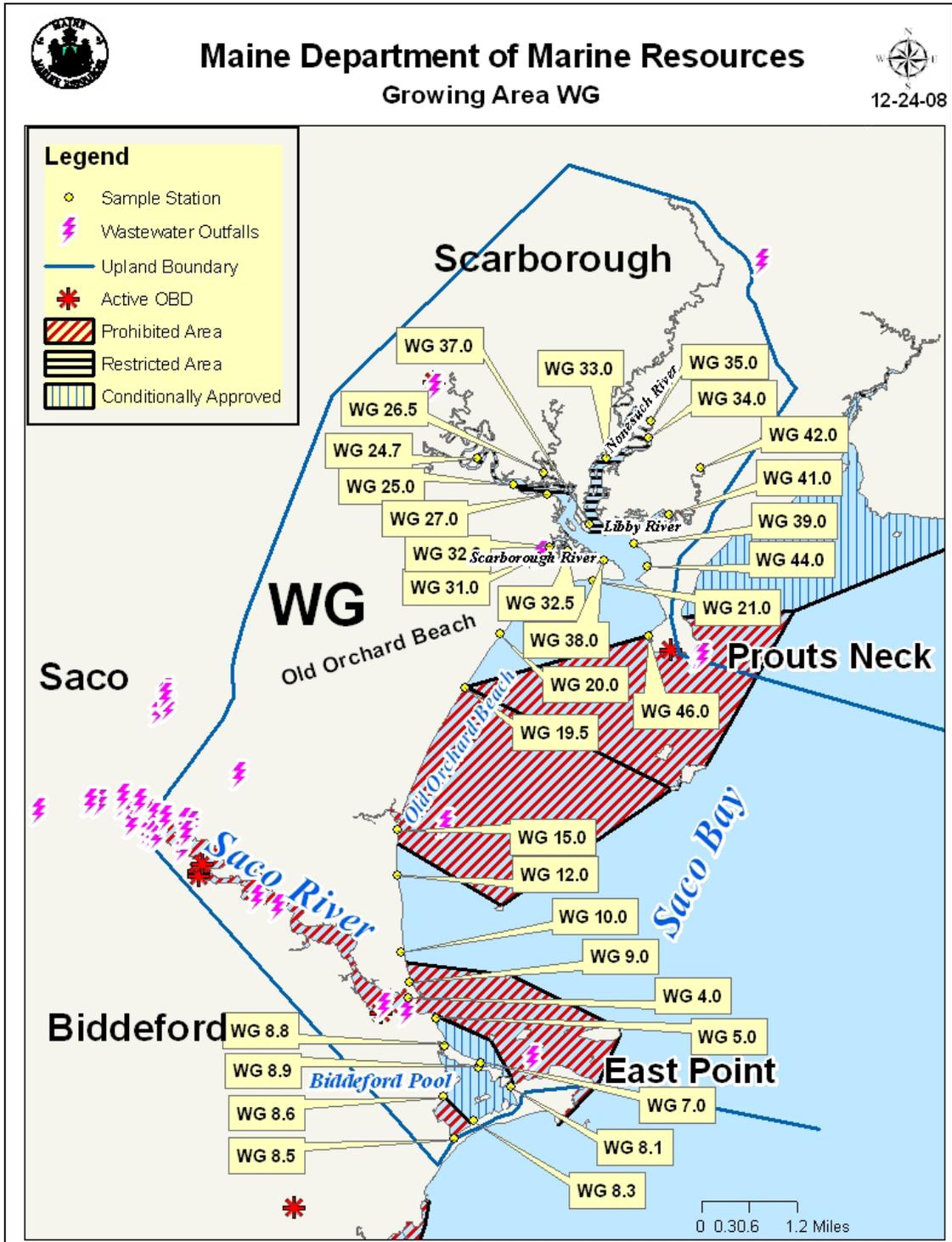


Figure 1. Growing Area WG, with Active Water Stations** (**Pink symbols indicate waste water and stormwater discharges)



Executive Summary

This is an annual report for growing area WG written in compliance with the requirements of the 2007 Model Ordinance and the National Shellfish Sanitation Program. Growing Area WG is the area between East Point, Biddeford and Prouts Neck, Scarborough.

There were no changes in classification in 2008. No stations were added, deactivated or created in 2008, however, the GPS coordinates for stations WG 32.5 and 41 were updated to reflect the accurate collection point in the database. One OBD was removed in 2008; OBD #1913 was removed on Prout's Neck, Scarborough.

The DMR entered into a Memorandum of Understanding (MOU) with the Town of Biddeford Shellfish Committee in 2008. The purpose of this MOU is for the City of Biddeford Shellfish Commission to supply volunteers for accelerated sampling of 3 water sample stations (WG 8.3, 8.5, and 8.6) towards possible reclassification of the southern area of Biddeford Pool. There is one recommendation for an upward classification change in Biddeford Pool as a result of this review.

The next sanitary survey report is due in 2013; the next triennial report is due in 2010.

Growing Area Description

Growing Area WG is the area between East Point, Biddeford and Prouts Neck, Scarborough (Figure 1); it includes the towns of Biddeford, Saco, Old Orchard Beach and Scarborough. A complete boundary description for this area can be found in the central files. The area includes Biddeford Pool, which is a circular embayment that drains out at low tide, and a number of expansive sandy beaches, including Hills Beach in Biddeford, Ferry Beach in Saco, Old Orchard Beach in the town of Old Orchard, Grand Beach and Western Beach in Scarborough. The area also includes the Scarborough River and its tributaries, Nonesuch River, Mill Brook, Cascade Brook and Libby River. The beaches are very popular with tourists and there is a significant increase in seasonal habitation and shore use during the summer months. The Scarborough River is a tidal marsh estuary with numerous grassy islands and spits, narrow and winding channels, attracting various waterfowl and deer. It is the largest salt marsh in the state, comprised of a tidal marsh, salt creeks, a freshwater marsh and uplands.

The major sources of pollution in area WG include the Biddeford Pool Waste Water Treatment Plant (WWTP), Biddeford Waste Water Treatment Plant, Saco Waste Water Treatment Plant, Old Orchard Beach Waste Water Treatment Plant, and the Old Orchard Beach storm water outfall. Other sources of pollution include boat moorings in Biddeford Pool (less than 10 with heads are moored at this area) and in the Scarborough River (monitored by station WG 38), non-point pollution in the tributaries of the Scarborough River, and a few remaining residential overboard discharges (OBDs). There are no aquaculture leases or licenses in growing area WG.



Current Classification(s)

Shellfish growing area WG currently has areas classified as:

Approved (10 stations)

- WG 10, 12, 20, 21, 25, 27, 32.5, 38, 39, 41, 44 and 46

Conditionally Approved

- Area No. 10, Saco River and Saco Bay (Biddeford, Saco, Old Orchard Beach), seasonal conditional areas; WG 5, 7, 8.1, 8.3, 8.6, 8.8 and 8.9

Restricted

- Area No. 11, Scarborough River, non-point pollution, WG 24.7, 26.5, 31, 32, 33, 34, 35 and 37

Prohibited

- Area No. 10, Saco River and Saco Bay (Biddeford, Saco, Old Orchard Beach), seasonal conditional areas; WG 4, 8.5, 9, 15, 19.5 and 42.

Please visit the DMR website to view legal notices for pollution areas 10, 11, and 12:

http://www.maine.gov/dmr/rm/public_health/closures/closedarea.htm#G

Activity during Review Period

On June 28, 2008, the DEP and the Biddeford Municipal Shellfish Warden dye tested two septic systems on Biddeford Pool. The property had two dwellings on the lot. The smaller of the dwellings (closer to the "Pool") was dye tested with red dye, in order to confirm that all pipes in the house drained domestic waste via one pipe to a septic system. The pipe in question drained to an apparent cesspool behind the house, several feet from the salt marsh. There was a hole in the ground through which the surveyors could look down into the system, and the red dye draining from the smaller house was observed through this hole. While water continued to run in the kitchen sink of this smaller dwelling, the surveyors observed the water level rise through the hole in the ground. The DEP suggested to the homeowner that they get something to cover the hole. No red dye was observed overflowing or discharging into the marsh behind the house. The surveyors observed no cattail plants in the marsh behind the house that would be indicative of a fairly constant source of fresh water and nutrients. The DEP then dye tested the larger house. The surveyors documented that all of the wastewater exits the basement through one pipe. The homeowner reported that there is a cesspool in the back yard between the larger house and the smaller house; but the homeowner was not certain as to its exact location. The homeowner did report that it had been pumped in the past. Yellow-green dye tablets were placed into the toilet, flushed several times and the surveyors also ran the bathroom sink. No green dye was observed in the tidal marsh behind the house. The shellfish warden agreed to check for the presence of dye periodically over the next couple of weeks. The DEP reported



that both homes receive very little use over the summer. On June 30, 2008, the Municipal Shellfish Warden reported that there was no presence of dye at the two tested properties.¹

While looking for dye in the marsh behind the tested dwellings a travel trailer was observed located very close to the marsh (within the vicinity of station WG 8.8), and the surveyors (DEP and the Municipal Shellfish Warden) conducted an inspection. This trailer was outfitted with both water and electric. The surveyors documented that the trailer had a direct discharge of gray water and sewage into the wetlands. The Municipal Shellfish Warden filed a complaint with the City of Biddeford Codes Enforcement that same day (June 28, 2008).² Prior to this inspection, the area was classified as conditionally approved based on season, and was in the closed status at the time the trailer was discovered. An update from the Biddeford Shellfish Warden, received on June 5, 2009, revealed that the codes enforcement officer followed up with the trailer's property owner and ordered them to remove the water and sewer hook-up; as long as the trailer remained in it's current location, the property owner would need to haul out all their sewage and grey water. The codes enforcement is not allowing any gray water discharge.³ In a personal conversation with the Shellfish Warden, he related that the trailer is only used for two weeks each summer and he monitors the trailer and the marsh around and behind the trailer during and after use to make sure that there is no illegal dumping of waste. The trailer is situated approximately 250 to 300 feet from the water, with a buffer of marsh grass between the trailer and the shore.⁴

The Biddeford Shellfish Warden has also reported the completion of two septic system replacements on Hills Beach Road in 2008. One replacement was at the corner of Pleasant Avenue and Hills Beach Rd, and another across from Buffleheads Restaurant.⁵

There were no classification changes in 2008.

Current Management Plan(s) for Conditional Area(s)

There is a management plan for the Biddeford Pool/Hills Beach Seasonal Area. Biddeford Pool/Hills Beach seasonal conditionally approved area is closed to harvesting June 1 through September 30, per the management plan. A copy of the management plan can be found in the central files. The management plan was reviewed on September 26, 2008 and the plan was updated on that date.

Current Annual Review of Management Plan(s)

Per the management plan, a review of the Biddeford Pool/Hills Beach seasonal data was completed on September 23, 2008 to confirm that all conditional stations continued to meet the appropriate standard as defined in the DMR Shellfish Area Growing Area Classification SOP. All stations met the appropriate standard and the area reopened as defined. The complete annual review can be found in Appendix A.



Water Quality Review and Discussion

Table 1 lists all active approved, restricted and prohibited stations in Growing Area WG, with their respective Geomean and P90 calculations for 2008. Please refer to Appendix B for a key to interpreting the headers on the columns of Table 1. The approved and restricted standards for each station are also displayed in Table 1. These standards will fluctuate yearly as a result of the DMR transition from a most probable number (MPN) fecal coliform test method to a membrane filtration (MF) method and are dependent on the number of sample analyzed by MPN versus MF. The total number of data points used in the calculations is displayed in the Count column and includes both MPN and MF values. The number of data points analyzed by MF is displayed in the MFCNT column. This fluctuating standard will cease when all 30 data points have been analyzed by the MF method. A more detailed explanation of this transition can be found in central files.

All approved stations met their NSSP classification standard in 2008. All restricted stations met their NSSP classification standard in 2008.

Table 1. Geomean and P90 Scores Based on 30 Most Recent Data Points, Growing Area WG

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WG004.00	P	30	14	18.4	0.67	560	131.6	40	226
WG008.50	P	30	23	5.1	0.53	118	24.7	34	188
WG009.00	P	30	14	5.2	0.43	93	18.6	40	226
WG010.00	A	30	14	4.6	0.37	23	13.8	40	226
WG012.00	A	30	14	3.8	0.47	93	15.4	40	226
WG015.00	P	30	14	5.4	0.45	120	20.3	40	226
WG019.50	new	22	14	4.7	0.59	460	26.8	37	203
WG020.00	A	30	14	5.6	0.52	240	26.3	40	226
WG021.00	A	30	14	6.4	0.58	240	35.3	40	226
WG024.70	new	16	13	7.4	0.6	280	44.5	34	183
WG025.00	A	30	15	7.5	0.51	90	34.1	39	221
WG026.50	new	12	12	4.7	0.46	38	18.9		
WG027.00	A	30	15	5.2	0.48	56	21.5	39	221
WG031.00	R	30	15	17.6	0.6	240	103.7	39	221
WG032.00	R	30	18	8.3	0.54	150	40	37	208
WG032.50	new	20	18	2.8	0.27	24	6.3	32	173
WG033.00	R	30	16	9.4	0.67	460	67.5	38	217
WG034.00	R	30	15	11.5	0.69	460	88.8	39	221
WG035.00	new	26	16	16.5	0.56	142	88.4	37	206
WG037.00	new	12	12	2.4	0.26	14	5.2		
WG038.00	A	30	17	5.8	0.59	600	33	38	212
WG039.00	A	30	15	4.9	0.48	240	20.1	39	221
WG041.00	A	30	19	4.2	0.36	62	12.7	36	203



STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WG042.00	P	30	12	26.8	0.70	460	217.3	40	235
WG044.00	A	30	15	4	0.55	620	20.3	39	221
WG046.00	A	30	15	3.6	0.39	84	11.1	39	221

Table 2 lists all conditionally approved stations in Biddeford Pool/Hills Beach seasonal conditional area, with their respective Geomean and P90 calculations for 2008. Data for conditionally approved stations reflects only the open status. All stations met the approved standard during open status.

Table 2. Biddeford Pool/Hills Beach Seasonal Conditional Area, Open Status, Based on 30 Most Recent Data Points

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WG005.00	CA	30	14	5.5	0.42	43	18.9	40	226
WG007.00	CA	30	14	5.5	0.47	93	21.9	40	226
WG008.10	CA	30	14	4.5	0.37	43	13.4	40	226
WG008.30	new	15	15	3.2	0.42	36	11.1		
WG008.60	new	15	15	4.7	0.52	52	22.2		
WG008.80	CA	30	14	5.3	0.52	460	24.1	40	226
WG008.90	CA	30	14	5.6	0.56	240	29.4	40	226

All approved, restricted and prohibited stations that were active at the beginning of 2008 were sampled at least 6 times following the systematic random sampling (SRS) schedule (Table 3 and Appendix C). At some stations, additional samples were collected under adverse conditions. Biddeford Pool/Hills Beach conditionally approved stations were sampled 6 times in the open status. Conditionally approved stations WG 8.3, 8.5 and 8.6 are sampled on an accelerated (extra) sampling regime (2 times per month, starting in July 2008), and they were sampled an additional 3 times each in 2008.

Table 3. WG Samples Collected in 2008

Station	Class	Adverse		Extra		Random		Total	Comments
		Closed	Open	Closed	Open	Closed	Open		
WG004.00	P					6		6	
WG005.00	CA					2	6	8	Flood station
WG007.00	CA					2	6	8	
WG008.10	CA	5				2	6	13	
WG008.30	CA				3	2	6	11	MOU for accelerated sampling in 2008
WG008.50	P			3		8		11	MOU for accelerated sampling in 2008
WG008.60	CA				3	2	6	11	MOU for accelerated sampling in 2008
WG008.80	CA					2	6	8	Flood station



Station	Class	Adverse		Extra		Random		Total	Comments
		Closed	Open	Closed	Open	Clsed	Open		
WG008.90	CA					2	6	8	Flood station
WG009.00	P					6		6	
WG010.00	A	10	2				6	18	
WG012.00	A	12					6	18	
WG015.00	P					6		6	
WG019.50	A						6	6	
WG020.00	A	5					6	11	
WG021.00	A	5					6	11	
WG024.70	R						6	6	
WG025.00	A						6	6	
WG026.50	R						6	6	
WG027.00	A	17					6	23	Flood station
WG031.00	R						6	6	
WG032.00	R						6	6	
WG032.50	A						6	6	GPS coordinates updated in 2008 to reflect collection point
WG033.00	R						6	6	
WG034.00	R						6	6	
WG035.00	R						6	6	
WG037.00	R						6	6	
WG038.00	A	12					6	18	Flood station
WG039.00	A	12					6	18	Flood station
WG041.00	A						6	6	GPS coordinates updated in 2008 to reflect collection point
WG042.00	P					6		6	
WG044.00	A	5					6	11	
WG046.00	A	12					6	18	Flood station

Figures 2, 3 and 4 show the P90 trends over the past three years, for all approved, restricted and conditionally approved stations in growing area WG; Figure 4 shows data collected during the open status only. During the transition from MPN to MF analysis method, the approved standard will decrease every year, until all samples have been analyzed by the MF method. In order to show the trend of the P90 value over the years, the calculated P90 scores are expressed as a percentage of the approved standard (or restricted standard for restricted stations); any station showing the 2008 column on or above 100 percent does not meet the standard for its classification. Stations 10, 12, 20, 21, 25, 27, 38 and 39 have shown no notable trends over the past three years; stations 44 and 46 have shown an improvement in water quality (decreasing P90 scores), and only station WG 38 has shown an upward trend between 2006 and 2008. Two stations are currently at 50 percent of the approved standard.



All restricted stations are well under the limit of their classification standard. All stations show an increase in P90 scores between 2007 and 2008, and stations WG 33 and 34 have shown a steady decrease in water quality over the three year period (2006 to 2008).

All conditionally approved stations are well under the limit of their classification standard. Stations WG 8.3 and 8.6 are new stations and the P90 standards are not represented in figure 4. Water quality has shown an improvement over the three year period at stations WG 5, 8.5 and 8.8; stations WG 7 and 8.1 have shown a slight increase in scores between 2006 and 2007, and then a significant improvement in scores between 2007 and 2008. Water quality at station WG 8.9 has shown little change over the past 3 years.

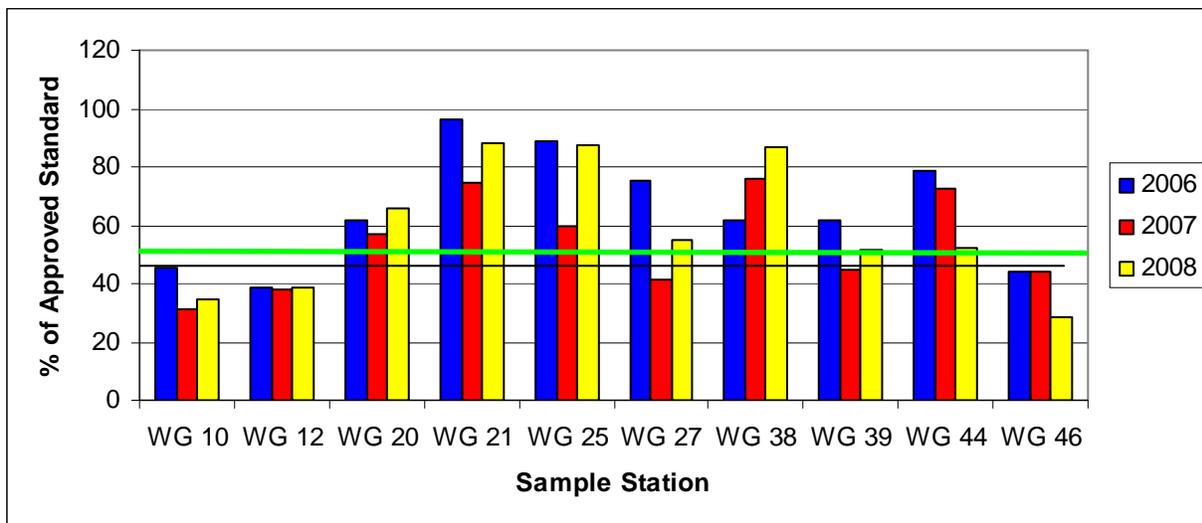


Figure 2. Area WG P90 Scores for Approved Stations (expressed as the percent of the approved standard), 2006-2008

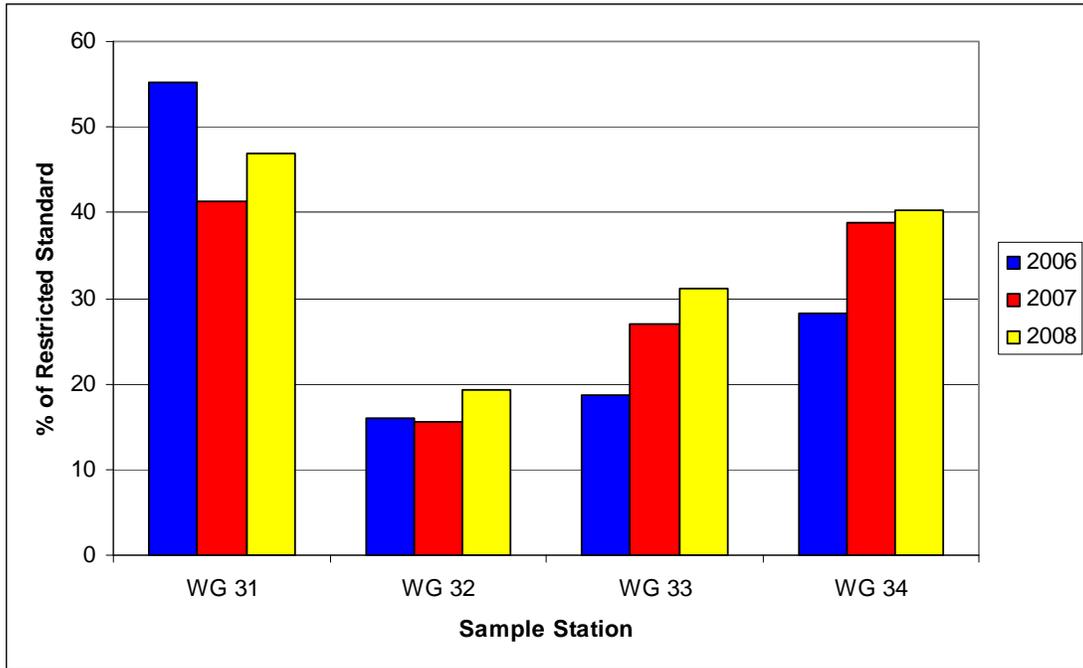


Figure 3. Area WG P90 Scores for Restricted Stations (expressed as the percent of the restricted standard), 2006-2008

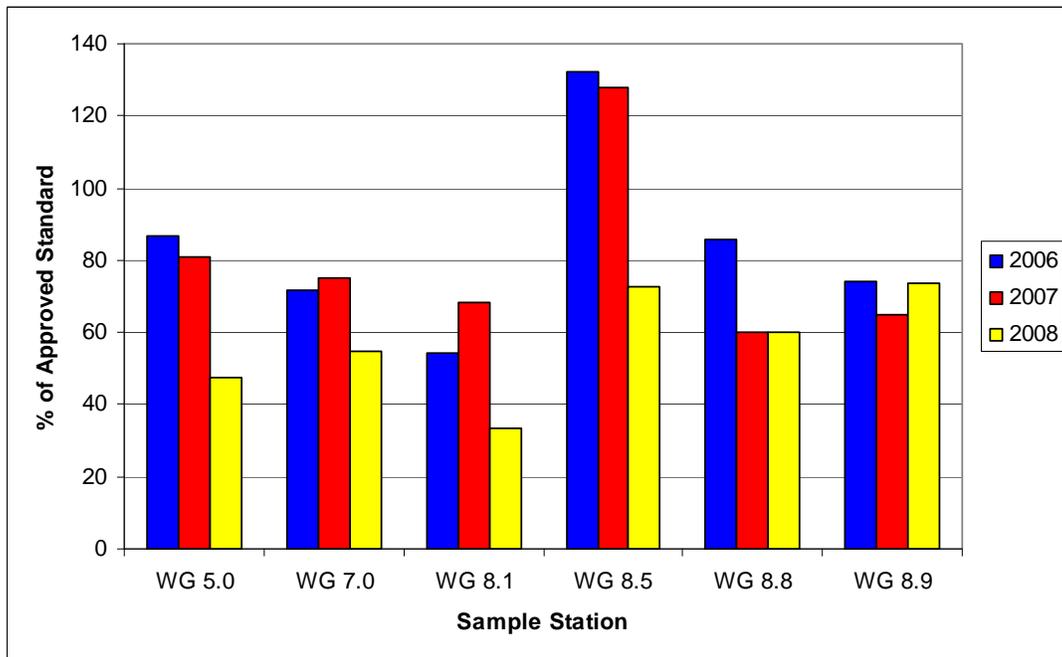


Figure 4. Area WG P90 Scores for Conditionally Approved Stations (expressed as the percent of the approved standard), Open Status 2006-2008



Shoreline Survey Activity

The DEP and the Biddeford Municipal Shellfish Warden conducted dye tests in suspect systems in Biddeford Pool in June 2008. Details on activities and findings can be found in the "Activity during Review Period" section. No drive through survey was conducted in 2008. A drive through survey will be scheduled for 2009 and future years.

Aquaculture/Wet Storage Activity

There is no aquaculture or wet storage activities in growing area WG.

Recommendations for Upward Classification

Biddeford Pool

Biddeford Pool is being proposed for an upward classification change based on identified pollution sources (malfunctioning septic systems and straight pipes) being remediated, a rainfall analysis and a recent shoreline survey. The area has been classified as conditionally approved based on season, since (at least) June 5, 2000, with an open status from October 1 to May 31. There have been several iterations and changes in the size of the conditionally approved area since 2000. On April 20, 2006, the open season was shortened to November 1 to April 30. The entire shoreline of Biddeford Pool was surveyed by DMR and DEP in 2005 (Hills Beach side) and 2006. Two malfunctioning systems and eleven questionable systems requiring additional investigation were identified during the 2006 survey. During the summer of 2006, two malfunctioning septic systems were identified in the Biddeford Pool area (near station WG 8.5), in an area which is currently classified as prohibited. These systems were replaced at the end of December 2006. On February 28, 2007, the north side of Biddeford Pool (stations WG 8.8 and 8.9) was reclassified as "Conditionally Approved", with the closed status from June 1 through September 30. This rule amendment also moved the prohibited boundary line at the mouth of Biddeford Pool so that the area from Fort Point to the west end of Lester B. Orcutt Boulevard was re-classified to "Conditionally Approved", with the same closed status dates; the justification for this legal amendment was the replacement of a malfunctioning septic system. The south side of the Pool remained prohibited, with upward classification for this area pending on improved water quality after the replacement of a malfunctioning septic systems west of station WG 8.5. Two new stations were established on the boundary line in the middle of the Pool, WG 8.3 and 8.6.

As a result of the replacement septic systems west of station 8.5, the DMR entered into a Memorandum of Understanding (MOU) with the Town of Biddeford Shellfish Committee in 2008. The purpose of this MOU is for the City of Biddeford Shellfish Commission was to supply volunteers for accelerated sampling of 3 water sample stations (WG 8.3, 8.5, and 8.6), towards a possible reclassification of the southern area of Biddeford Pool.

Biddeford Pool is monitored by stations WG 8.1, 8.3, 8.5, 8.6, 8.8 and 8.9; station 8.5 is located within a prohibited area at the mouth of the stream draining into the southeast 'corner' of the cove. Sample stations 8.3 and 8.6 (conditionally approved stations) were created to monitor the



boundary between the conditionally approved area and the prohibited area in February 2007; As of August 2009, these stations had over 30 data points in their dataset (random and extra strategy samples). At the end of 2008, all stations met the approved standards, using year round data. Trends over the past 5 review years are presented in Figure 5 for stations WG 8.1, 8.5, 8.8 and 8.9. Stations WG 8.1 and WG 8.9 have met the approved standard for the past 5 review years, and station WG 8.8 has met the approved standard for the past 2 review years. This station is located in the vicinity of the direct graywater and blackwater discharge from a trailer; both discharges were eliminated in 2008, and is likely that water quality at station WG 8.8 will improve in the future. Station WG 8.5 met the approved standard in 2008; this improvement in water quality is most likely attributed to the replacement of malfunctioning septic systems at three cottages west of stations WG 8.5, in December 2006.

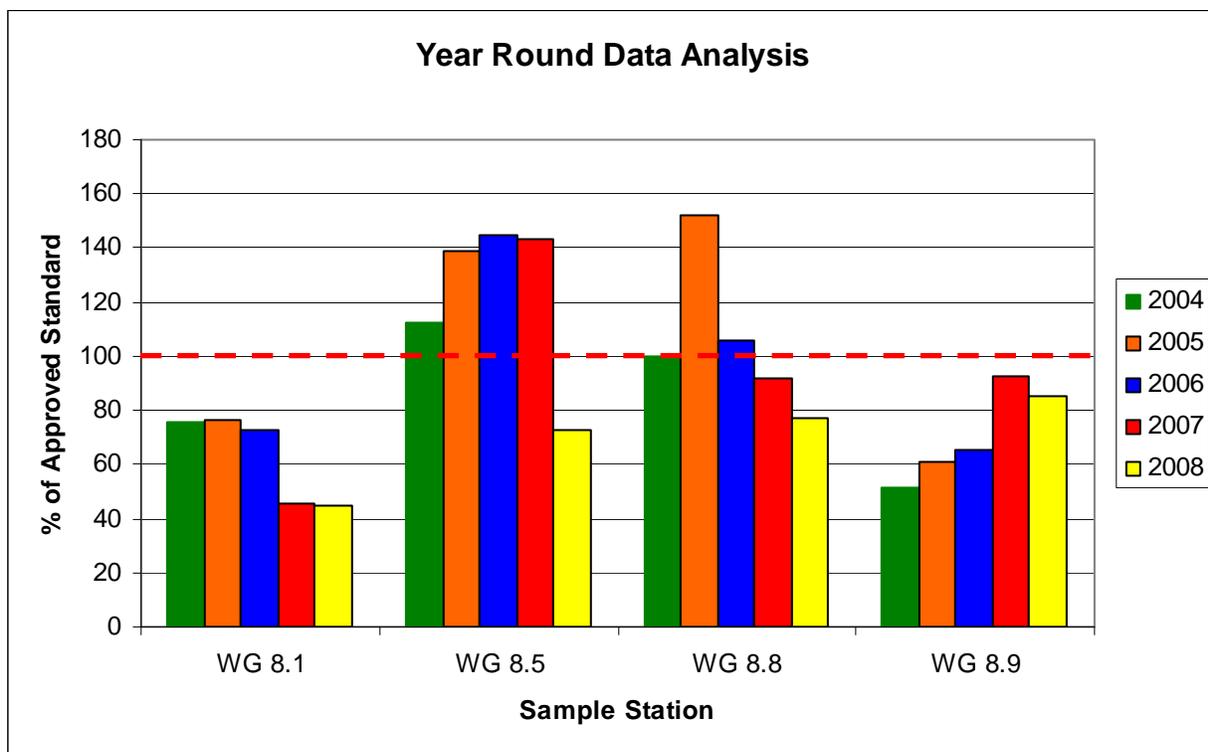


Figure 5. Biddeford Pool P90 Scores for Stations WG 8.1, 8.5, 8.8 and 8.9 (expressed as the percent of the approved standard), Year Round Data 2004-2008

A more comprehensive data assessment and analysis was completed to determine whether seasonality or adverse weather conditions have a significant impact on water quality in Biddeford Pool. This rainfall and seasonal assessment considered all individual scores collected between 2002 and August 2009, at the six stations proposed for upgrades (Tables 5-9); scores exceeding the variability standard (P90) are highlighted in yellow in each table. All data (random, extra, adverse, excluding data collected while area was under an emergency flood closure) collected from 2002 through August 2009 were considered. Cumulative rainfall recorded for the 72 hour period prior to the day of collection, as well as cumulative rainfall for 72



hour period prior to the day of collection plus the rainfall that occurred on the sample date are also noted on each table. For conditionally approved stations, data collected during the months in the closed status under the current management plan (June- September) are highlighted in gray in each table.

None of the stations reviewed showed a consistent seasonal effect, based on the current closed status of June through September. All stations, with the exception of WG 8.3, showed multiple elevated scores outside of the seasonal closed status; this suggests that Biddeford Pool is affected by pollution that is not limited by seasonality. Generally, all reviewed stations showed some rainfall effect, with the majority of elevated scores in each station's dataset (2002 through August 2009) occurring after cumulative rainfall within three days of collection. However, the effect of rainfall on higher fecal scores was not consistent by station. Specifically, station WG 8.1 had three elevated scores in its dataset, two occurring after a 0.50 inches of cumulative rainfall (May 2006 and July 2008), and one occurring after 0.28 inches (November 2003) (Table 4). Overall, 23 samples have been collected following cumulative rainfall of 0.5 inches or greater, with only two scores exceeding the variability standard, suggesting that the rainfall effect at this station is not consistent or predictable. Station WG 8.3, which serves as a boundary station for the prohibited area, received only one score which was slightly over the variability standard (36 CFU/100ml), which occurred after 0.94 inches of cumulative rainfall in 72 hours prior to collection, suggesting that this station is not impacted by rainfall (Table 5). Station WG 8.6, which also serves as a boundary station for the prohibited area in Biddeford Pool, has three slightly elevated scores in its dataset (33CFU/100 ml, 49CFU/100 ml and 52CFU/100 ml), with two scores occurring during dry weather, and one occurring after 0.94 inches of rain had occurred within 4 days prior to collection (Table 7). Similar to station WG 8.3, this station is not impacted by rainfall.

Station WG 8.8 had seven scores which exceed the variability standard since 2002 (Table 8). These high scores occurred across all precipitation amounts (from 0.01 inches to 1.79 inches within 3 days prior to sample date). All high scores occurred between the months of May and November. Since 2006, only one slightly elevated score (56 cfu/100 ml) has been observed at this station. It is possible that these high scores can be attributed to an illegal graywater and blackwater discharge from a trailer (see Activity during Review Year section for details). This pollution source has been reported to the town codes enforcement officer, and has been remediated in 2008. Station WG 8.9 showed six elevated scores from 2002 -2007, with no clear seasonal or precipitation trends (Table 9).

Prohibited station WG 8.5, which was located near the identified septic malfunctions which were remediated in December 2006, has shown multiple elevated scores throughout its dataset, with all of its elevated scores occurring after cumulative rainfall of 0.5 inches or greater, within three days of sample collection. Since the malfunctioning septic system was replaced, only one elevated score has been observed at this station (46 fc/100 ml on 12/1/2008). One tidal stream drains into the prohibited area at station WG 8.5; this stream has been sampled six times since 2008 (Table 10). No scores have exceeded the approved standard, indicating that this stream is not a source of fecal pollution to Biddeford Pool.



Table 4. Seasonal and Rainfall Assessment, Station WG 8.1, 2002-August 2009

Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3/19/2003	R	-	30			<3									
0	0	4/16/2003	R	-	30				<3								
0	0	3/7/2006	R	-	28			<3									
0	0	9/24/2007	R	-	30									<2			
0	0	4/22/2009	R		28				<2								
0	0	6/16/2009	R		20						11						
0	0.001	2/8/2005	R	-	30		9.1										
0	0.001	10/5/2005	R	-	30										<3		
0	0.01	2/10/2009	R		30		<2										
0	0.4	11/15/2005	R	-	26											23	
0.001	0.002	12/13/2005	R	-	25												3.6
0.01	0.01	11/16/2004	R	-	28											9.1	
0.01	0.01	1/4/2006	R	-	18	3.6											
0.01	0.01	6/19/2007	R	-	27						<2						
0.01	0.01	11/12/2008	R	-	22											10	
0.01	0.04	8/13/2007	R	-	30								<2				
0.02	0.02	3/6/2007	R	-	30			<2									
0.02	0.12	8/1/2006	R	P	28								23				
0.02	0.19	8/11/2009	R	-	25								2				
0.021	0.051	4/10/2002	R	-	30				<3								
0.03	0.03	12/4/2002	R	-	30												<3
0.03	0.03	10/15/2008	R	-	26										8		
0.04	0.05	12/9/2007	R	-	30												<2
0.04	1.39	11/6/2002	R	P	30											3.6	
0.062	0.062	4/18/2006	R	-	22				3.6								
0.062	0.063	1/7/2004	R	-	30	23											
0.08	0.08	5/23/2007	R	-	17					20							
0.11	0.12	10/23/2007	R	-	31										<2		
0.18	0.2	1/12/2009	R		25	2											
0.2	0.2	2/25/2004	R	-	31		<3										



Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.202	0.222	1/9/2002	R	-	32	23											
0.28	0.281	11/24/2003	R	-	22											460	
0.301	0.302	3/24/2004	R	-	30			<3									
0.33	0.33	2/14/2006	R	-	28		<3										
0.331	0.331	4/7/2004	R	-	30				<3								
0.38	0.38	6/2/2008	R	-	30						4						
0.43	0.51	3/2/2005	R	-	28			<3									
0.46	0.46	4/2/2008	R	-	32				<2								
0.471	2.471	10/16/2002	R	P	32										<3		
0.472	0.482	3/13/2002	R	-	29			<3									
0.49	1.15	3/11/2009	R		31			<2									
0.53	0.53	9/26/2006	R	-	30									2			
0.58	0.58	7/10/2002	R	-	26							43					
0.59	0.6	3/3/2008	R	-	30			<2									
0.65	0.65	7/22/2008	R	-	27							110					
0.66	0.66	11/19/2007	R	-	22											14	
0.67	0.67	5/5/2008	R	-	18					5.5							
0.69	0.69	1/3/2007	R	P	30	<2											
0.71	0.79	12/4/2006	R	-	26												4
0.73	0.75	5/14/2003	R	-	26					9.1							
0.75	0.99	4/30/2007	R	P	23				6								
0.781	0.782	1/25/2005	R	-	21	<3											
0.8	0.8	2/13/2002	R	-	25		43										
0.801	1.051	5/21/2006	A	P	28					93							
0.981	2.411	10/29/2003	R	P	20										31		
0.99	0.99	12/8/2003	R	-	21												3.6
1.02	1.02	5/5/2004	R	-	31					<3							
1.07	1.07	6/16/2009	R	-	20						11						
1.17	1.17	2/5/2003	R	-	32		3.6										
1.212	1.242	12/8/2004	R	P	18												43
1.54	1.54	10/18/2004	R	-	8.1										9.1		
1.55	1.55	2/4/2008	R	-	30		<2										



Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1.7	1.83	4/22/2009	R	P	28				1.9								
2.27	2.27	5/15/2002	R	-	22					9.1							

Table 5. Seasonal and Rainfall Assessment, Station WG 8.3, 2002- August 2009

Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	9/24/2007	R	-	30									2			
0	0	3/25/2009	E		24			<2									
0	0	4/8/2009	E		28				<2								
0	0	4/22/2009	R	P	28				<2								
0	0	5/5/2009	E		25					2							
0	0	5/19/2009	E		28					<2							
0	0	6/2/2009	E		30						<2						
0	0	6/16/2009	R		24						10						
0	0.01	1/27/2009	E		30	<2											
0	0.01	2/10/2009	R	O	30		<2										
0.01	0.01	6/19/2007	R	-	27						2						
0.01	0.01	11/12/2008	R	-	28											<2	
0.01	0.04	8/13/2007	R	-	30								<2				
0.02	0.02	3/6/2007	R	-	30			<2									
0.02	0.19	8/11/2009	R		26								12				
0.03	0.03	10/15/2008	R	-	26										<2		
0.04	0.05	12/9/2007	R	-	30												2
0.08	0.08	5/23/2007	R	-	20					2							
0.11	0.12	10/23/2007	R	-	32										<2		
0.18	0.2	1/12/2009	R		24	4											
0.38	0.38	6/2/2008	R	-	30						<2						
0.45	0.51	12/15/2008	E	T	30												<2
0.46	0.46	4/2/2008	R	-	29				<2								
0.49	1.15	3/11/2009	R	P	29			<2									



Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.59	0.6	3/3/2008	R	-	30			<2									
0.65	0.65	7/22/2008	R	-	29							20					
0.66	0.66	11/19/2007	R	-	21											18	
0.67	0.67	5/5/2008	R	-	16					2							
0.68	0.94	12/1/2008	E	P	15												36
0.75	0.99	4/30/2007	R	P	22				6								
0.84	0.85	2/25/2009	E		30		<2										
1.55	1.55	2/4/2008	R	-	28		<2										
1.88	1.88	10/29/2008	E	P	29										7.3		

Table 6. Seasonal and Rainfall Assessment, Station WG 8.5, 2002- August 2009

Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3/19/2003	R	-	30			<3									
0	0	4/16/2003	R	-	30				3.6								
0	0	3/7/2006	R	N	22			<3									
0	0	9/24/2007	R	-	30									2			
0	0	3/25/2009	E		23			<2									
0	0	4/8/2009	E		26				<2								
0	0	4/22/2009	R	P	24				2								
0	0	5/5/2009	E		25					4							
0	0	5/19/2009	E		25					2							
0	0	6/2/2009	E		28						2						
0	0	6/16/2009	R		18						2						
0	0.001	2/8/2005	R	-	28		3.6										
0	0.001	10/5/2005	R	-	30										3.6		
0	0.01	1/27/2009	E		30	4											
0	0.01	2/10/2009	R		28		<2										
0	0.4	11/15/2005	R	-	30											93	
0.001	0.002	12/13/2005	R	-	22												<3



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Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.01	0.01	11/16/2004	R	-	28											<3	
0.01	0.01	1/4/2006	R	-	13	9.1											
0.01	0.01	6/19/2007	R	W	26						<2						
0.01	0.01	11/12/2008	R	-	28											4	
0.01	0.04	8/13/2007	R	-	28								27				
0.02	0.02	3/6/2007	R	-	30			<2									
0.02	0.12	8/1/2006	R	P	30								<3				
0.02	0.19	8/11/2009	R		26								40				
0.021	0.051	4/10/2002	R	-	28				<3								
0.03	0.03	12/4/2002	R	-	30												<3
0.03	0.03	10/15/2008	R	-	27										20		
0.04	0.05	12/9/2007	R	-	30												4
0.04	1.39	11/6/2002	R	P	30											9.1	
0.062	0.062	4/18/2006	R	N	20				3.6								
0.062	0.063	1/7/2004	R	-	30	<3											
0.11	0.12	10/23/2007	R	-	32										4		
0.18	0.2	1/12/2009	R		25	<2											
0.2	0.2	2/25/2004	R	W	30		<3										
0.202	0.222	1/9/2002	R	-	32	3.6											
0.28	0.281	11/24/2003	R	-	26											9.1	
0.29	0.3	5/30/2007	R	-	26					2							
0.301	0.302	3/24/2004	R	-	30			<3									
0.33	0.33	2/14/2006	R	-	28		<3										
0.331	0.331	4/7/2004	R	-	30				<3								
0.38	0.38	6/2/2008	R	-	30						<2						
0.43	0.51	3/2/2005	R	-	22			<3									
0.45	0.51	12/15/2008	E	T	30												2
0.46	0.46	4/2/2008	R	-	20				3.6								
0.471	2.471	10/16/2002	R	P	31										15		
0.472	0.482	3/13/2002	R	-	27			<3									
0.49	1.15	3/11/2009	R	P	31			5									
0.53	0.53	9/26/2006	R	-	30									6			



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Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.58	0.58	7/10/2002	R	-	28						150						
0.59	0.6	3/3/2008	R	-	28			<2									
0.64	0.64	12/10/2003	R	-	30												<3
0.65	0.65	7/22/2008	R	-	28							<2					
0.66	0.66	11/19/2007	R	-	20											26	
0.67	0.67	5/5/2008	R	-	13					2							
0.68	0.94	12/1/2008	E	P	16												46
0.69	0.69	1/3/2007	R	P	28	4											
0.71	0.79	12/4/2006	R	-	28												118
0.73	0.75	5/14/2003	R	-	18					9							
0.75	0.99	4/30/2007	R	P	22				<2								
0.781	0.782	1/25/2005	R	N	30	<3											
0.8	0.8	2/13/2002	R	-	30		<3										
0.801	1.051	5/21/2006	A	P	14					39							
0.84	0.85	2/25/2009	E		29		<2										
0.981	2.411	10/29/2003	R	P	18										240		
1.02	1.02	5/5/2004	R	-	31					<3							
1.021	1.111	5/27/2004	R	P	20					3.6							
1.17	1.17	2/5/2003	R	-	9		9.1										
1.212	1.242	12/8/2004	R	WP	12												93
1.54	1.54	10/18/2004	R	-	28										93		
1.55	1.55	2/4/2008	R	W	26		2										
1.55	1.81	4/25/2005	R	P	27				93								
1.79	2.88	5/25/2005	R	P	10					240							
1.88	1.88	10/29/2008	E	PW	29										14		
2.27	2.27	5/15/2002	R	-	22					3.6							



Table 7. Seasonal and Rainfall Assessment, Station WG 8.6, 2002- August 2009

Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	9/24/2007	R	W	31									16			
0	0	3/25/2009	E	N	25			<2									
0	0	4/8/2009	E	N	26				<2								
0	0	4/22/2009	R	P	27				<2								
0	0	5/5/2009	E	N	25					<2							
0	0	5/19/2009	E	N	28					<2							
0	0	6/2/2009	E	N	30						<2						
0	0	6/16/2009	R		18						2						
0	0.01	1/27/2009	E	WN	30	2											
0	0.01	2/10/2009	R	W	30		<2										
0.01	0.01	6/19/2007	R	-	26						7.3						
0.01	0.01	11/12/2008	R	-	29											<2	
0.01	0.04	8/13/2007	R	-	29								49				
0.02	0.02	3/6/2007	R	W	30			<2									
0.02	0.19	8/11/2009	R		26								13				
0.03	0.03	10/15/2008	R	-	27										52		
0.04	0.05	12/9/2007	R	W	30												<2
0.08	0.08	5/23/2007	R	-	24					2							
0.11	0.12	10/23/2007	R	-	32										18		
0.18	0.2	1/12/2009	R		26	2											
0.38	0.38	6/2/2008	R	-	29						14						
0.45	0.51	12/15/2008	E	TN	30												4
0.46	0.46	4/2/2008	R	-	30				<2								
0.49	1.15	3/11/2009	R	P	30			<2									
0.59	0.6	3/3/2008	R	-	32			2									
0.65	0.65	7/22/2008	R	-	28							24					
0.66	0.66	11/19/2007	R	-	22											8	
0.67	0.67	5/5/2008	R	-	14					<2							
0.68	0.94	12/1/2008	E	NP	18												33
0.75	0.99	4/30/2007	R	P	20				3.6								



Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.84	0.85	2/25/2009	E	N	29		<2										
1.55	1.55	2/4/2008	R	-	30		2										
1.88	1.88	10/29/2008	E	PN	28										18		

Table 8. Seasonal and Rainfall Assessment, Station WG 8.8, 2002- August 2009

Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3/19/2003	R	-	30			<3									
0	0	4/16/2003	R	-	30				<3								
0	0	3/7/2006	R	-	30			<3									
0	0	9/24/2007	R	-	31									10			
0	0	4/22/2009	R	p	20				2								
0	0	6/16/2009	R		19						5.5						
0	0.001	2/8/2005	R	-	28		9.1										
0	0.001	10/5/2005	R	-	30										<3		
0	0.01	2/10/2009	R		28		2										
0	0.4	11/15/2005	R	-	24											3.6	
0.001	0.002	12/13/2005	R	-	27												9.1
0.01	0.01	11/16/2004	R	-	30											3.6	
0.01	0.01	1/4/2006	R	-	18	3.6											
0.01	0.01	6/19/2007	R	-	26						<2						
0.01	0.01	11/12/2008	R	-	29											4	
0.01	0.04	8/13/2007	R	-	28								56				
0.02	0.02	7/10/2003	R	-	30							93					
0.02	0.02	3/6/2007	R	-	30			<2									
0.02	0.12	8/1/2006	R	P	28								15				
0.02	0.19	8/11/2009	R		26								12				
0.021	0.051	4/10/2002	R	-	30				<3								
0.03	0.03	12/4/2002	R	-	30												<3
0.03	0.03	10/15/2008	R	-	28										9.1		



Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.04	0.05	12/9/2007	R	-	30												4
0.04	1.39	11/6/2002	R	P	28											93	
0.062	0.062	4/18/2006	R	-	24				3.6								
0.062	0.063	1/7/2004	R	-	30	<3											
0.08	0.08	5/23/2007	R	-	12					8							
0.11	0.12	10/23/2007	R	-	31										4		
0.18	0.2	1/12/2009	R	-	26	2											
0.2	0.2	2/25/2004	R	-	30		<3										
0.202	0.222	1/9/2002	R	-	32	3.6											
0.28	0.281	11/24/2003	R	-	18											7.3	
0.301	0.302	3/24/2004	R	-	30			<3									
0.33	0.33	2/14/2006	R	-	28		3.6										
0.331	0.331	4/7/2004	R	-	30				<3								
0.38	0.38	6/2/2008	R	-	29						6						
0.43	0.51	3/2/2005	R	-	21			3.6									
0.46	0.46	4/2/2008	R	-	27				<2								
0.471	2.471	10/16/2002	R	P	31										<3		
0.472	0.482	3/13/2002	R	-	29			<3									
0.49	1.15	3/11/2009	R	p	28			18									
0.53	0.53	9/26/2006	R	-	22									18			
0.58	0.58	7/10/2002	R	-	30							150					
0.59	0.6	3/3/2008	R	-	28			2									
0.65	0.65	7/22/2008	R	-	29							11					
0.66	0.66	11/19/2007	R	-	24											2	
0.67	0.67	5/5/2008	R	-	13					2							
0.69	0.69	1/3/2007	R	P	30	2											
0.71	0.79	12/4/2006	R	-	28												6
0.73	0.75	5/14/2003	R	-	15					93							
0.75	0.99	4/30/2007	R	P	16				6								
0.781	0.782	1/25/2005	R	-	25	<3											
0.8	0.8	2/13/2002	R	-	20		3.6										



Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.801	1.051	5/21/2006	A	P	16					23							
0.92	1.67	11/14/2006	A	P	2											8.8	
0.981	2.411	10/29/2003	R	P	14										120		
0.99	0.99	12/8/2003	R	-	26												23
1.02	1.02	5/5/2004	R	-	30					3.6							
1.021	1.111	5/27/2004	R	P	20					<3							
1.17	1.17	2/5/2003	R	-	5		3.6										
1.212	1.242	12/8/2004	R	WP	2												39
1.54	1.54	10/18/2004	R	-	23										23		
1.55	1.55	2/4/2008	R	-	30		2										
1.55	1.81	4/25/2005	R	P	20				43								
1.79	2.88	5/25/2005	R	P	10					460							
2.27	2.27	5/15/2002	R	-	25					3							

Table 9. Seasonal and Rainfall Assessment, Station WG 8.9, 2002- August 2009

Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0	0	3/19/2003	R	-	30			<3									
0	0	4/16/2003	R	-	30				3.6								
0	0	3/7/2006	R	-	30			<3									
0	0	9/24/2007	R	-	30								4				
0	0	4/22/2009	R	P	23				2								
0	0	6/16/2009	R		23						6						
0	0.001	2/8/2005	R	-	29		<3										
0	0.001	10/5/2005	R	-	30										9.1		
0	0.01	2/10/2009	R		28		<2										
0	0.4	11/15/2005	R	-	30											<3	
0.001	0.002	12/13/2005	R	-	24												<3
0.01	0.01	11/16/2004	R	-	28											<3	



Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.01	0.01	1/4/2006	R	-	20	7.3											
0.01	0.01	6/19/2007	R	-	26						42						
0.01	0.01	11/12/2008	R	-	28											<2	
0.01	0.04	8/13/2007	R	-	30								<2				
0.02	0.02	3/6/2007	R	-	32			2									
0.02	0.12	8/1/2006	R	P	20								<3				
0.02	0.19	8/11/2009	R		16								6				
0.021	0.051	4/10/2002	R	-	19				<3								
0.03	0.03	12/4/2002	R	-	30												9.1
0.03	0.03	10/15/2008	R	-	28										14		
0.04	0.05	12/9/2007	R	-	30												8
0.04	1.39	11/6/2002	R	P	30											93	
0.062	0.062	4/18/2006	R	W	25				<3								
0.062	0.063	1/7/2004	R	-	31	3.6											
0.08	0.08	5/23/2007	R	-	25					4							
0.11	0.12	10/23/2007	R	-	31										6		
0.18	0.2	1/12/2009	R	W	26	<2											
0.2	0.2	2/25/2004	R	-	30		<3										
0.202	0.222	1/9/2002	R	-	30	93											
0.28	0.281	11/24/2003	R	-	19											3.6	
0.301	0.302	3/24/2004	R	-	30			<3									
0.33	0.33	2/14/2006	R	-	26		<3										
0.331	0.331	4/7/2004	R	-	30				<3								
0.38	0.38	6/2/2008	R	-	29						2						
0.43	0.51	3/2/2005	R	-	28			<3									
0.46	0.46	4/2/2008	R	-	30				<2								
0.471	2.471	10/16/2002	R	P	32										<3		
0.472	0.482	3/13/2002	R	-	28			<3									
0.49	1.15	3/11/2009	R	P	18			2									
0.53	0.53	9/26/2006	R	-	28									7.3			
0.58	0.58	7/10/2002	R	-	30							23					



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Rain 72 hour	Rain 72 hour +day of sample	Date	STRAT	ADV	SAL%	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
0.59	0.6	3/3/2008	R	-	30			<2									
0.65	0.65	7/22/2008	R	-	29							10					
0.66	0.66	11/19/2007	R	-	26											2	
0.67	0.67	5/5/2008	R	-	17					<2							
0.69	0.69	1/3/2007	R	P	30	2											
0.71	0.79	12/4/2006	R	-	28												106
0.73	0.75	5/14/2003	R	-	16					<3							
0.75	0.99	4/30/2007	R	P	18				12								
0.781	0.782	1/25/2005	R	-	30	<3											
0.8	0.8	2/13/2002	R	-	25		3.6										
0.801	1.051	5/21/2006	A	P	26					43							
0.981	2.411	10/29/2003	R	P	22										9.1		
0.99	0.99	12/8/2003	R	-	30												<3
1.021	1.111	5/27/2004	R	P	25					30							
1.17	1.17	2/5/2003	R	-	27		9.1										
1.212	1.242	12/8/2004	R	P	16												9.1
1.54	1.54	10/18/2004	R	-	27										7.3		
1.55	1.55	2/4/2008	R	-	30		2										
1.55	1.81	4/25/2005	R	P	25				240								
1.79	2.88	5/25/2005	R	P	12					93							
2.27	2.27	5/15/2002	R	-	26					3.6							



Table 10. Fecal Coliform Scores from Stream Samples, Station WG 8.5, 2009

Sample Date	CFU/100ml	Salinity ppt	Rain on Sample Day	Rain 24 hrs	Rain 48 hrs	Rain 72 hrs
03/11/09	<2.0	30	0.25"	0	0.03"	0.20"
03/25/09	<2.0	16	0	0	0	0
04/08/09	14	4	0	0.03"	0.95"	0
05/05/09	18	16	0.22"	0	0	0
05/19/09	2	22	0	0	0.18"	0
06/02/09	2	20	0	0	0.15"	0.01"

In order to further assess the impact of intermittent elevated fecal scores associated with rainfall, the P90 scores were re-calculated using only those data points obtained after precipitation events. Station WG 8.5 was not included in this analysis, as high scores at this station were most likely associated with a known pollution source, which has been remediated. In Table 11, the P90 calculations were completed using data collected between 2002 and August 2009, when at least 0.25 inches of cumulative rainfall had occurred within three day of sample collection. Using this dataset, all stations met the approved standard. In Table 12, the P90 calculations were re-calculated using data collected between 2002 and August 2009, when at least 0.50 inches of cumulative rainfall had occurred within three day of sample collection. Using this data set, all stations met the geometric mean standard for an approved classification, while stations WG 8.8 and 8.9 exceeded the P90 standard. Finally, in Table 13, the P90 calculations were re-calculated using data collected between 2002 and August 2009, when at least 1.0 inches of cumulative rainfall had occurred within three day of sample collection. Using this dataset, all stations met the geometric mean standard for an approved classification, while stations WH 8.8 and 8.9 exceeded the standard. These results suggest that stations WG 8.1, 8.3 and 8.6 are not significantly impacted by rainfall, while stations WG 8.8 and 8.9 have an intermittent rainfall effect, and that occasional high scores associated with heavier rainfall events (>0.5 inches or greater) can cause these stations to exceed the approved criteria for the variability standard (P90), while meeting the geometric mean standard. Thus, the Biddeford Pool data set has more variability when considering only the data collected after heavier rainfall events. However, when considering all data collected from 2002 through August 2009, at all rainfall amounts, the P90 scores for all stations meet the approved standard (Table 14).

Table 11. P90 Sores using Fecal Scores Occurring after Cumulative Rainfall >0.25 inches

Station	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WG008.10	62	26	5.5	0.52	460	26.4	40	232
WG008.30	34	34	2.9	0.36	36	8.4	31	163
WG008.60	34	34	4.3	0.48	52	18.2	31	163
WG008.80	67	27	6.6	0.55	460	33.8	40	234
WG008.90	64	26	5.4	0.51	240	24.6	40	234

Table 12. P90 Sores using Fecal Scores Occurring after Cumulative Rainfall >0.50 inches

Station	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WG008.10	27	12	6.9	0.55	110	35.6	39	228



Station	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WG008.30	14	14	4.3	0.47	36	18	31	163
WG008.60	14	14	4	0.46	33	16.1	31	163
WG008.80	31	13	9.8	0.67	460	71.3	40	232
WG008.90	29	12	7.7	0.61	240	47.6	40	233

Table 13. P90 Sores using Fecal Scores Occurring after Cumulative Rainfall >1.00 inches

Station	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WG008.10	13	4	6.9	0.56	93	37.2	42	248
WG008.30	6	6	3.1	0.33	10	8.7	31	163
WG008.60	6	6	2.8	0.39	18	9.2	31	163
WG008.80	17	5	12.6	0.7	460	103.9	42	250
WG008.90	15	4	11.4	0.67	240	86.2	43	254

Table 14. P90 Sores using Fecal Scores collected from 2002 through August 2009

Station	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WG008.10	62	26	5.5	0.52	460	26.4	40	232
WG008.30	34	34	2.9	0.36	36	8.4	31	163
WG008.60	34	34	4.3	0.48	52	18.2	31	163
WG008.80	67	27	6.6	0.55	460	33.8	40	234
WG008.90	64	26	5.4	0.51	240	24.6	40	234

Fecal coliform scores from stations WG 8.1, 8.3, 8.6, 8.8, and 8.9, were analyzed in the context of tidal stage in order to determine if tidal stage has an impact on elevated fecal coliform levels (Table 15). Station WG 8.5 was not analyzed since all but one of the station's high score occurred before a known pollution source was remediated. Overall, between 2002 and 2008, a total of 211 samples were collected from the 5 stations; 60 percent of samples were collected on a flooding tide and 40 percent were collected on an ebbing tide. Among the stations examined, 16 samples collected on an ebbing tide exceeded the approved standard (19 percent of total samples collected on an ebb tide), in comparison to 27 samples collected on a flood tide (21 percent of total samples collected on a flood tide). The similarity in the frequency of elevated scores between the two tidal stages suggests that neither tidal stage has a stronger adverse impact on fecal scores in Biddeford Pool

Table 15. Tide Stage Assessment, Stations WG 8.1-8.9, 2002-2008

Tide	Tide Stage	WG 8.1		WG 8.3		WG 8.6		WG 8.8		WG 8.9	
		N	# samples exceeding approved standard								
Ebb	L	0	0	0	0	0	0	1	0	1	0
	LE	1	1	0	0	0	0	0	0	0	0
	E	13	2	3	1	3	1	13	4	11	0
	HE	11	2	7	0	7	2	7	1	7	2
Flood	F	9	4	2	0	2	1	14	8	13	4



Tide	Tide Stage	WG 8.1		WG 8.3		WG 8.6		WG 8.8		WG 8.9	
		N	# samples exceeding approved standard								
	H	12	2	4	0	3	1	14	0	16	0
	HF	8	0	4	2	5	3	10	0	9	2
	LF	1	0	0	0	0	0	0	0	0	0

The shoreline survey for the area proposed for upward classification has been completed in the last five years. DEP and DMR surveyed Biddeford Pool in July, August, September and October 2006. Malfunctioning septic systems and a straight pipe were identified and corrected as illustrated in Table 16 and Figure 6.

Table 16. Biddeford Pool Pollution Source Remediation, 2007-2008

Town/Area	Pollution ID	Actual / Potential	Direct / Indirect	Pollution Description and Action Taken	Survey Date
Biddeford Pool	BIDD PS1	P	I	Cesspool; DEP dye test showed no impact to shore	30-Jun-08
	BIDD PS2	A	D	Graywater discharge; straight pipe; no IGS system; LPI confirmed system location; no problems noted during follow up visits; monitored every year by Municipal Shellfish Warden	10-Jun-09
	BIDD PS3	A	D	Septic system malfunction replaced	10-Jun-09
	BIDD PS4	A	D	Septic system malfunction replaced	10-Jun-09
	BIDD PS5	A	D	Two malfunctioning septic systems; new system installed Dec 2006	01-Jan-07



Figure 6. Remediation Efforts in Biddeford Pool

Based on this review, Biddeford Pool (WG 8.1, 8.3, 8.5, 8.6, 8.8 and 8.9) is recommended for an upgrade in classification, from conditionally approved and prohibited to approved.



Summary

Overall, water quality in growing area WG supports its current classifications under the NSSP. One classification upgrade is proposed in this report. A year round data analysis of Biddeford Pool shows that the area now meets the approved standard and is recommended for reclassification from “prohibited” and “conditionally approved” to approved classification.

The following work is recommended for the 2009 review year and for the next sanitary survey report (2013): 1) updating the sanitary survey on the remaining shoreline in Scarborough by the end of 2009; 2) continue monitoring streams throughout growing area WG, and record flow rates under a variety of environmental conditions; and 3) schedule drive through surveys in WG annually to maintain compliance with the NSSP.

References

¹Glowa, John. 24 June 2008. Biddeford Pool Septic System. [Livingston email]. Accessed 3 June 2009.

²Morrisette, David. 26 June 2008. Fw. Letter to Codes June 26th 2008. [Livingston email]. Accessed 3 June 2009.

³Morrisette, David. 5 June 2009. Re: request for current status of complaint of 06.26.08. [personal email]. Accessed 5 June 2009.

⁴Morrisette, David. (2009) [personal interview] cited 10 June 2009.

⁵Morrisette, David. 3 October 2008. Biddeford Pool. [Livingston email]. Accessed 10 June 2009.

⁶Weather Underground, ©2009. [cited 10 August 2009]. Available from:
<http://www.wunderground.com/cgi-bin/findweather/getForecast?query=04005>



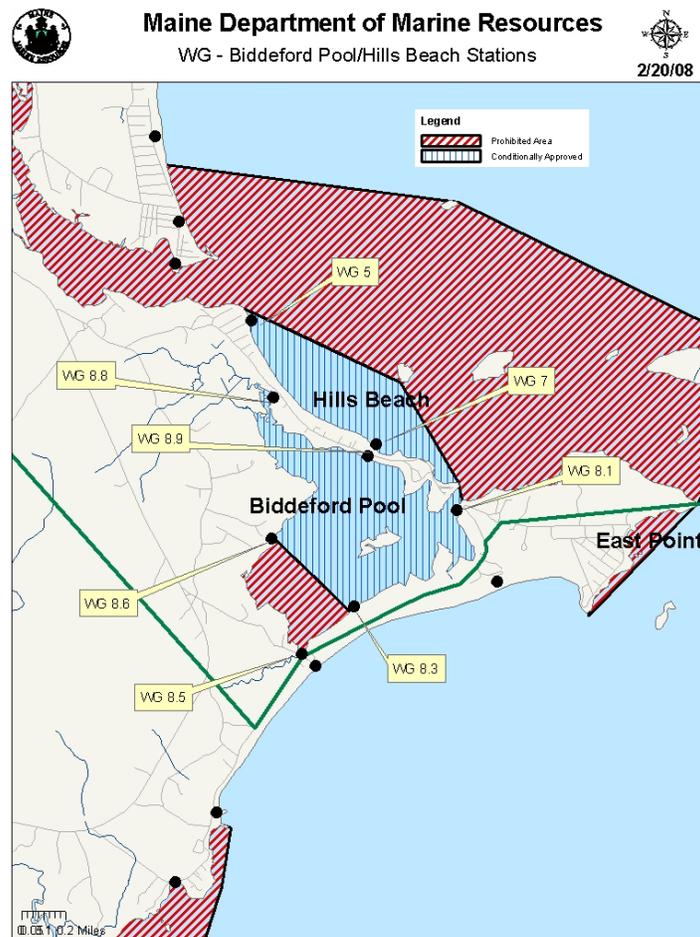
Appendix A. Annual Review of Management Plan-Biddeford Pool/Hills Beach

2008 Annual Review Biddeford Pool/Hills Beach Conditional Area Growing Area WG

Scope

Biddeford Pool/Hills Beach is a conditionally approved area due to seasonal variation in water quality, due to non-point source pollution. This area, monitored by stations WG 5, 7, 8.1, 8.3, 8.6, 8.8 and 8.9, was classified conditionally approved based on seasonal variation in water quality in 2000. DMR evaluated the Biddeford Pool data in December 1999, and made the assessment that there is greater variation in water quality during the summer months, due to an increase in seasonal population and an increase in shore usage during the summer months. The area met approved standards from October through May.

Figure 7. Growing Area WG Conditional Area Overview





Compliance with management plan

In 2008, the conditional area closed on June 1 and reopened on October 1. A review of the water quality was completed on September 23, 2008, to assure that water quality continued to meet approved standards during the area’s open season.

Adequacy of reporting and cooperation of involved persons

This management plan does not require reporting. A water quality data review is required prior to the area’s reopening, to verify that the approved standard is being met.

Compliance with approved growing area criteria

The annual review of seasonal data shows that the conditionally approved stations in Biddeford Pool met approved standards during the open season (Table 1).

Table 1. Conditional Area Geomean and P90 Scores, Open Status

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WG005.00	CA	30	14	5.5	0.42	43	18.9	40	226
WG007.00	CA	30	14	5.5	0.47	93	21.9	40	226
WG008.10	CA	30	14	4.5	0.37	43	13.4	40	226
WG008.30	new	15	15	3.2	0.42	36	11.1		
WG008.60	new	15	15	4.7	0.52	52	22.2		
WG008.80	CA	30	14	5.3	0.52	460	24.1	40	226
WG008.90	CA	30	14	5.6	0.56	240	29.4	40	226

Field inspection of critical pollution sources

The potential for seasonal pollution in Biddeford Pool/Hills Beach comes from increased shore usage (swimming, walking pets, etc.) and the influx of summer residents to their seasonal homes. Visual observations are made throughout the year during the course of random sampling and shoreline surveying.

Water sampling compliance history

In 2008, all stations were collected at least six times in the open status.

Analysis-Recommendations

It is DMR policy to evaluate the seasonal data each year, prior to the reopening, to ensure that the conditionally approved classification continues to be appropriate. The Biddeford Pool/Hills Beach data will be reviewed in September 2009, prior to the area’s reopening date. This area is being proposed for an upward re-classification, from conditionally approved based on season, to approved and open year round. Please refer to the Recommendation for Upward Classification section for more details.



Appendix B. Key to water quality table headers.

Station = water quality monitoring station

Class = classification assigned to the station; prohibited (P), restricted (R), conditionally restricted (CR), conditionally approved (CA) and approved (A).

CNT = the number of samples evaluated for classification, must be a minimum of 30.

MFCNT = the number of samples evaluated with the MTec method (included in the total Count column)

GM = means the antilog (base 10) of the arithmetic mean of the sample result logarithm (base 10).

SDV = standard deviation

Max = maximum score of the 30 data points in the count column

P90 = 90th percentile

APPD_STD = the 90th percentile, at or below which the station would meet approved criteria in the absence of pollution sources or poisonous and deleterious substances.

RESTR_STD = the 90th percentile, at or below which the station would meet restricted criteria.



Appendix C. Growing Area WG 2008 Data

Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WG004.00	02/06/08	EXT	HF	-2	15	R	P	C	P	6	E
	04/08/08	EXT	F	2	0	R	-	C	P	2	E
	06/04/08	LL	H	10	29	R	P	C	P	2	E
	07/28/08	MLP	LE	22	3	R	-	C	P	560	SW
	09/16/08	FP	HF	15	10	R	P	C	P	27	S
	11/17/08	MLP	F	5	0	R	W	C	P	78	W
WG005.00	02/04/08	EXT	H	-1	22	R	-	O	CA	4	CL
	03/03/08	FP	E	-3	28	R	-	O	CA	<2.0	SW
	04/02/08	LL	H	2	29	R	-	O	CA	<2.0	NW
	05/05/08	FP	E		1	R	-	O	CA	2	-
	06/02/08	LL	H	10	30	R	-	C	CA	22	SE
	07/22/08	EXT	H	20	26	R	-	C	CA	50	SW
	10/15/08	CLV	F	10	16	R	-	O	CA	6.3	CL
	11/12/08	AB	HF	6	28	R	-	O	CA	<2.0	CL
WG007.00	02/04/08	EXT	HE	-2	8	R	-	O	CA	10	CL
	03/03/08	FP	E	-3	18	R	-	O	CA	2	SW
	04/02/08	LL	H	2	25	R	-	O	CA	<2.0	NW
	05/05/08	FP	E	8	4	R	-	O	CA	4	S
	06/02/08	LL	H	13	26	R	-	C	CA	10	SE
	07/22/08	EXT	H	21	26	R	-	C	CA	48	CL
	10/15/08	CLV	F	10	21	R	-	O	CA	2	NE
	11/12/08	AB	H	5	18	R	-	O	CA	<2.0	N
WG008.10	02/04/08	EXT	E	0	30	R	-	O	CA	<2.0	CL
	03/03/08	FP	HE	-1	30	R	-	O	CA	<2.0	CL
	04/02/08	LL	E	3	32	R	-	O	CA	<2.0	NW
	05/05/08	FP	HE	7	18	R	-	O	CA	5.5	S
	06/02/08	LL	HE	9	30	R	-	C	CA	4	SW
	07/22/08	EXT	F	18	27	R	-	C	CA	110	CL
	10/15/08	CLV	HF	10	26	R	-	O	CA	8	CL
	11/12/08	AB	H	6.5	22	R	-	O	CA	10	CL
WG008.30	02/04/08	EXT	HE	0	28	R	-	O	CA	<2.0	CL
	03/03/08	FP	E	-1	30	R	-	O	CA	<2.0	SW
	04/02/08	LL	HE	2	29	R	-	O	CA	<2.0	NW
	05/05/08	FP	HE	7	16	R	-	O	CA	2	S
	06/02/08	LL	HE	12	30	R	-	C	CA	<2.0	S
	07/22/08	EXT	HF	17	29	R	-	C	CA	20	SW
	10/15/08	CLV	H	11	26	R	-	O	CA	<2.0	CL



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
	10/29/08	RSH	F	7	29	E	P	O	CA	7.3	SW
	11/12/08	AB	H	6	28	R	-	O	CA	<2.0	NE
	12/01/08	DMT	HF	4	15	E	P	O	CA	36	CL
	12/15/08	DMT	HF	7	30	E	T	O	CA	<2.0	SW
WG008.50	02/04/08	EXT	HE	-2	26	R	W	C	P	2	CL
	03/03/08	FP	HE	-4	28	R	-	C	P	<2.0	CL
	04/02/08	LL	HE	2	20	R	-	C	P	3.6	NW
	05/05/08	FP	HE	10	13	R	-	C	P	2	S
	06/02/08	LL	HE	12	30	R	-	C	P	<2.0	CL
	07/22/08	EXT	HF	22	28	R	-	C	P	<2.0	CL
	10/15/08	CLV	H	10	27	R	-	C	P	20	NE
	10/29/08	RSH	F	6	29	E	PW	C	P	14	SW
	11/12/08	AB	H	6	28	R	-	C	P	4	N
	12/01/08	DMT	HF	4	16	E	P	C	P	46	CL
	12/15/08	DMT	HF	6	30	E	T	C	P	2	SW
WG008.60	02/04/08	EXT	HE	0	30	R	-	O	CA	2	CL
	03/03/08	FP	E	-1	32	R	-	O	CA	2	SW
	04/02/08	LL	HE	2	30	R	-	O	CA	<2.0	NW
	05/05/08	FP	HE	10	14	R	-	O	CA	<2.0	S
	06/02/08	LL	HE	10	29	R	-	C	CA	14	SW
	07/22/08	EXT	HF	18	28	R	-	C	CA	24	SW
	10/15/08	CLV	H	11	27	R	-	O	CA	52	CL
	10/29/08	RSH	F	7	28	E	PN	O	CA	18	SW
	11/12/08	AB	H	6.5	29	R	-	O	CA	<2.0	NW
	12/01/08	DMT	HF	4	18	E	NP	O	CA	33	CL
	12/15/08	DMT	HF	7	30	E	TN	O	CA	4	SW
WG008.80	02/04/08	EXT	HE	-2	30	R	-	O	CA	2	CL
	03/03/08	FP	E	-4	28	R	-	O	CA	2	SW
	04/02/08	LL	H	2	27	R	-	O	CA	<2.0	NW
	05/05/08	FP	E	11	13	R	-	O	CA	2	S
	06/02/08	LL	H	11	29	R	-	C	CA	6	SE
	07/22/08	EXT	H	20	29	R	-	C	CA	11	CL
	10/15/08	CLV	F	10	28	R	-	O	CA	9.1	CL
	11/12/08	AB	H	5	29	R	-	O	CA	4	CL
WG008.90	02/04/08	EXT	HE	-1	30	R	-	O	CA	2	CL
	03/03/08	FP	E	-4	30	R	-	O	CA	<2.0	SW
	04/02/08	LL	H	2	30	R	-	O	CA	<2.0	NW
	05/05/08	FP	E	11	17	R	-	O	CA	<2.0	S
	06/02/08	LL	H	12	29	R	-	C	CA	2	SE



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
	07/22/08	EXT	H	20	29	R	-	C	CA	10	SW
	10/15/08	CLV	F	10	28	R	-	O	CA	14	CL
	11/12/08	AB	H	6	28	R	-	O	CA	<2.0	CL
WG009.00	02/06/08	EXT	HF	-1	26	R	P	C	P	18	E
	04/08/08	EXT	F	3	17	R	-	C	P	2	E
	06/04/08	LL	H	12	24	R	P	C	P	9.1	E
	07/28/08	MLP	L	17	30	R	-	C	P	<2.0	S
	09/16/08	FP	HF	13	16	R	P	C	P	9.1	CL
	11/17/08	MLP	F	6	31	R	-	C	P	7.3	W
WG010.00	02/06/08	EXT	HF	-1	30	R	P	O	A	4	E
	04/08/08	EXT	F	3	19	R	-	O	A	2	E
	06/04/08	LL	H	12	22	R	P	O	A	11	E
	07/28/08	MLP	L	18	30	R	-	O	A	2	S
	09/16/08	FP	HF	13	18	R	P	O	A	6	CL
	11/17/08	MLP	F	6	32	R	-	O	A	2	W
WG012.00	02/06/08	EXT	HF	-1	30	R	P	O	A	2	E
	04/08/08	EXT	F	3	25	R	-	O	A	2	E
	06/04/08	LL	H	12	24	R	P	O	A	5.5	E
	07/28/08	MLP	L	18	30	R	-	O	A	<2.0	S
	09/16/08	FP	HF	13	21	R	P	O	A	<2.0	CL
	11/17/08	MLP	F	6	32	R	-	O	A	<2.0	NW
WG015.00	02/06/08	EXT	HF	-1	30	R	P	C	P	18	E
	04/08/08	EXT	F	3	27	R	-	C	P	<2.0	E
	06/04/08	LL	HF	12	27	R	P	C	P	16	E
	07/28/08	MLP	L	18	24	R	-	C	P	120	S
	09/16/08	FP	H	12	26	R	P	C	P	2	S
	11/17/08	MLP	F	7	34	R	-	C	P	<2.0	NW
WG019.50	02/06/08	EXT	HF	-1	30	R	P	O	A	4	E
	04/08/08	EXT	F	3	30	R	-	O	A	<2.0	E
	06/04/08	LL	HF	12	30	R	P	O	A	31	E
	07/28/08	MLP	L	18	30	R	-	O	A	2	S
	09/16/08	FP	H	11	30	R	P	O	A	2	S
	11/17/08	MLP	F	7	32	R	W	O	A	2	W
WG020.00	02/06/08	EXT	HF	-1	30	R	P	O	A	<2.0	E
	04/08/08	EXT	F	3	30	R	-	O	A	2	E
	06/04/08	LL	HF	12	30	R	P	O	A	4	E
	07/28/08	MLP	L	19	30	R	-	O	A	<2.0	S
	09/16/08	FP	H	12	30	R	P	O	A	15	S
	11/17/08	MLP	F	7	32	R	-	O	A	<2.0	NW



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
WG021.00	02/05/08	DAH	LE	0	30	R	-	O	A	<2.0	E
	04/07/08	MDC	F	3	30	R	-	O	A	2	NE
	06/03/08	MYC	HF	15	31	R	-	O	A	2	SE
	07/28/08	DAH	L	24	29	R	-	O	A	6	-
	09/16/08	DAH	F	17	31	R	-	O	A	31	N
	11/12/08	DAH	HE	13	31	R	-	O	A	<2.0	-
WG024.70	02/05/08	DAH	E	0	6	R	-	O	R	36	CL
	04/07/08	MDC	F	6	8	R	-	O	R	6	NE
	06/03/08	DAH	H	15	30	R	-	O	R	<2.0	W
	08/04/08	MLP	F	20	10	R	P	O	R	280	CL
	09/16/08	DAH	HF	17	30	R	-	O	R	8	N
	11/12/08	DAH	E	13	30	R	-	O	R	<2.0	-
WG025.00	02/05/08	DAH	E	0	12	R	-	O	A	27	CL
	04/07/08	MDC	F	6	24	R	-	O	A	<2.0	NE
	06/03/08	DAH	H	15	30	R	-	O	A	<2.0	W
	08/04/08	MLP	F	19	24	R	P	O	A	90	E
	09/16/08	DAH	H	17	31	R	-	O	A	10	N
	11/12/08	DAH	E	12	31	R	-	O	A	8	-
WG026.50	05/05/08	DAH	HE	15	18	R	P	O	R	2	E
	06/03/08	DAH	H	15	30	R	-	O	R	6	CL
	09/16/08	DAH	HF	18	31	R	-	O	R	10	N
	10/14/08	AB	HF		999	R	-	O	R	-	-
	10/28/08	DAH	HF	9	29	R	P	O	R	16	E
	11/12/08	DAH	E	12	30	R	-	O	R	<2.0	-
	12/02/08	DAH	F	10	27	R	-	O	R	15	E
WG027.00	02/05/08	DAH	LE		12	R	-	O	A	26	-
	04/07/08	MDC	F	6	28	R	-	O	A	2	NE
	06/03/08	DAH	H	14	31	R	-	O	A	4	W
	08/04/08	MLP	HF	18	27	R	P	O	A	29	E
	09/16/08	DAH	H	16	32	R	-	O	A	2	N
	11/12/08	DAH	E	12	30	R	-	O	A	<2.0	-
WG031.00	04/07/08	MDC	F	7	0	R	-	O	R	5.5	NE
	05/05/08	LL	H	10	20	R	P	O	R	2	CL
	06/03/08	MYC	HF	14	28	R	-	O	R	34	SE
	07/28/08	MDC	E	20	2	R	N	O	R	94	SW
	09/16/08	DAH	H	18	28	R	-	O	R	16	N
	11/12/08	DAH	HE	12	29	R	-	O	R	2	-
WG032.00	05/05/08	DAH	HE	15	18	R	P	O	R	8	E
	06/03/08	DAH	H	17	28	R	-	O	R	8	SE



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
	09/16/08	DAH	HF	16	32	R	-	O	R	10	N
	10/14/08	AB	H	11	30	R	-	O	R	<2.0	S
	10/28/08	DAH	HF	9	28	R	P	O	R	20	E
	11/12/08	DAH	E	12	24	R	-	O	R	12	-
WG032.50	05/05/08	DAH	HE	13	26	R	P	O	A	<2.0	E
	06/03/08	DAH	H	14	30	R	-	O	A	<2.0	SE
	09/16/08	DAH	HF	16	31	R	-	O	A	4	N
	10/14/08	AB	H	11	30	R	-	O	A	<2.0	S
	10/28/08	DAH	HF	9	30	R	P	O	A	6	E
	11/12/08	DAH	E	12	32	R	-	O	A	2	-
WG033.00	02/05/08	DAH	E	0	10	R	-	O	R	13	CL
	04/07/08	MDC	HF	7	26	R	-	O	R	<2.0	NE
	06/03/08	DAH	H	15	31	R	-	O	R	<2.0	E
	07/28/08	DAH	E	25	15	R	-	O	R	80	CL
	09/16/08	DAH	HF	16	30	R	-	O	R	<2.0	N
	11/12/08	DAH	F	12	28	R	-	O	R	7.3	-
WG034.00	04/07/08	MDC	HF	7	24	R	-	O	R	<2.0	NE
	05/05/08	DAH	H	13	21	R	P	O	R	2	-
	06/03/08	DAH	HF	15	31	R	-	O	R	2	E
	07/28/08	DAH	E	25	8	R	-	O	R	124	CL
	09/16/08	DAH	HF	16	29	R	-	O	R	10	N
	11/12/08	DAH	F	11	26	R	-	O	R	6	-
WG035.00	02/05/08	DAH	E	0	0	R	W	O	R	35	CL
	04/07/08	MDC	HF	6	8	R	-	O	R	4	NE
	06/03/08	DAH	HF	16	30	R	-	O	R	13	E
	07/28/08	DAH	E	25	2	R	-	O	R	140	CL
	09/16/08	DAH	HF	19	26	R	-	O	R	30	N
	11/12/08	DAH	F	10	19	R	-	O	R	18	-
WG037.00	05/05/08	DAH	HE	15	25	R	P	O	R	<2.0	E
	06/03/08	DAH	H	15	31	R	-	O	R	<2.0	E
	07/28/08	DAH	E	24	24	R	-	O	R	14	CL
	09/16/08	DAH	HF	16	32	R	-	O	R	<2.0	N
	10/14/08	AB	HF	10	30	R	-	O	R	<2.0	S
	11/12/08	DAH	E	13	31	R	-	O	R	<2.0	-
WG038.00	02/05/08	DAH	LE	3	15	R	-	O	A	6	CL
	04/07/08	MDC	F	3	30	R	-	O	A	<2.0	E
	06/03/08	DAH	H	14	31	R	-	O	A	<2.0	W
	07/28/08	DAH	E	24	25	R	-	O	A	20	CL
	09/16/08	DAH	H	16	32	R	-	O	A	2	N



Station	Date	Collect	Tide	Temp	Sal	Strat	ADV	Stat	CL	MFCOL	WIND
	11/12/08	DAH	E	12	32	R	-	O	A	2	-
WG039.00	02/05/08	DAH	H	3	30	R	-	O	A	2	CL
	04/07/08	MDC	HF	8	30	R	-	O	A	<2.0	NE
	06/03/08	DAH	HF	14	31	R	-	O	A	<2.0	E
	07/28/08	DAH	E	22	26	R	-	O	A	18	CL
	09/16/08	DAH	F	16	32	R	-	O	A	4	N
	11/12/08	DAH	F	12	32	R	-	O	A	<2.0	-
WG041.00	05/05/08	DAH	HE	14	24	R	P	O	A	<2.0	E
	06/03/08	DAH	HF	15	30	R	-	O	A	4	E
	07/28/08	DAH	E	22	28	R	-	O	A	62	CL
	09/16/08	DAH	F	16	31	R	-	O	A	4	N
	10/14/08	AB	HF	11	30	R	-	O	A	<2.0	S
	11/12/08	DAH	E	12	30	R	-	O	A	12	-
WG042.00	02/05/08	DAH	E	3	12	R	-	C	P	12	W
	04/07/08	MDC	HF	7	2	R	-	C	P	16	NE
	06/03/08	MYC	H	15	26	R	-	C	P	108	SE
	07/28/08	MDC	E	21	9	R	N	C	P	154	SW
	09/16/08	DAH	HE	19	25	R	-	C	P	42	N
	11/12/08	DAH	F	9	4	R	-	C	P	104	-
WG044.00	02/05/08	DAH	HE	3	30	R	-	O	A	2	W
	04/07/08	MDC	H	8	30	R	-	O	A	<2.0	NE
	06/03/08	DAH	HF	15	32	R	-	O	A	<2.0	E
	07/28/08	DAH	E	22	29	R	-	O	A	2	CL
	09/16/08	DAH	H	16	32	R	-	O	A	3.6	N
	11/12/08	DAH	F	12	32	R	-	O	A	<2.0	-
WG046.00	02/05/08	DAH	HE	3	30	R	-	O	A	<2.0	W
	04/07/08	MDC	H	8	30	R	-	O	A	<2.0	NE
	06/03/08	DAH	HF	14	31	R	-	O	A	<2.0	CL
	07/28/08	DAH	E	22	29	R	-	O	A	<2.0	CL
	09/16/08	DAH	F	16	32	R	-	O	A	3.6	N
	11/12/08	DAH	HF	13	32	R	-	O	A	<2.0	-