



**GROWING AREA WM - Kennebec River
Phippsburg, Arrowsic and Georgetown**

Annual Report for 2006

**Report Date: March 20, 2007
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Jan Barter

APPROVAL

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Figure 1. Growing Area WM

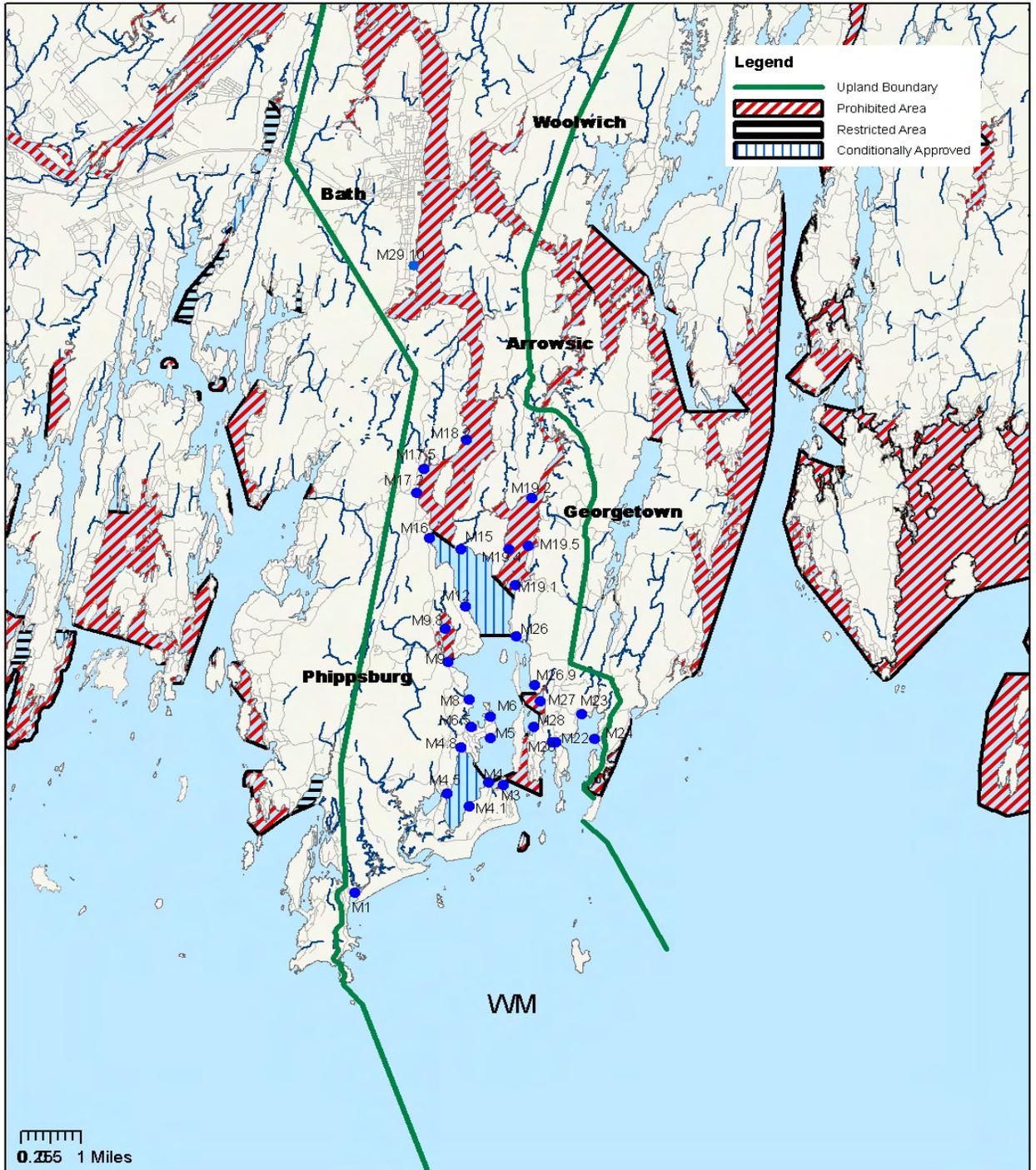


Maine Department of Marine Resources

Growing Area WM



1/25/07





Executive Summary

This is an annual review report for growing area WM written in compliance with the requirements of the 2005 model ordinance of National Shellfish Sanitation Program.

Shellfish Growing Area WM is the lower Kennebec River beginning at Small Point, Phippsburg and extends to the east side of Indian Point, Georgetown through Salter Island; and includes Atkins Bay, Wyman Bay, Parker Head flats, Drummore Bay, Squirrel Point flats, Back River - south of the Arrowsic-Georgetown Bridge, Todd Bay, Heal Eddy and Sagadahoc Bay. There are no areas available for any type of shellfish harvesting north of Squirrel Point, Arrowsic. The towns that fall into the boundary of growing area WM are Phippsburg, Arrowsic and Georgetown.

There are ten sewage treatment plants (STP) located in the Kennebec River watershed, with some located as far as Waterville on the Kennebec River, and Lewiston on the Androscoggin River. The Bath STP is the only facility located below the "Chops" – the mouth of Merry Meeting Bay which marks the confluence of the Kennebec and Androscoggin Rivers. This location is approximately seven miles north of the closest shellfish growing beds which are open for shellfish harvesting. The towns adjacent to approved shellfish growing beds in area WM are Phippsburg, Woolwich, Arrowsic, and Georgetown; these towns have no municipal sewage treatment facilities. All disposal systems located in those towns are private inground systems, licensed overboard discharges, outhouses or composting toilet systems. There are no marinas south of the Bath Bridge. There are only two working piers which provide support to local lobstering and fishing activities. These are located in at the mouth of Atkins Bay and at the mouth of Back River.

No stations were added or reactivated in 2006. No licensed overboard discharges were removed that would allow more area to open. Based on this annual review, one change in classification is being proposed.

The next triennial review for area WM is due in 2007; the next sanitary survey is due 2013.

Growing Area M Boundary Description

Area M lies inside a line from the south tip of Small Point extending south offshore following the shellfish management zone line; AND extending north along Navy Rd, then north along Seal Cove Rd, then east along Small Point Rd to the intersection of Sumner Dr, then north to the intersection of Small Point Rd and Popham Rd, then north to the intersection of Main Rd and Clifford Rd, then northwest to the intersection of Route 1 and the Route 1 New Meadows on ramp, then north to the intersection of Ridge Rd and N. Bath Rd, then southwest to the intersection of Old Bath Rd and Peterson La, then southwest to the intersection of Thomas Point Rd and Bath Rd, then west to the intersection of Bath Rd and Maine St, then northwest to the intersection of Lewiston Rd and I 95, then northeast to the intersection of River Rd and White Rd, then north to the intersection of Old Belgrade Rd and I 95, then southeast to the intersection of S. Belfast Ave and Church Hill Rd, then south to the intersection of Bog Rd and Blinn Hill Rd, then south to the intersection of Old Stage Rd and Walker Rd, then southwest to



the intersection of Murphys Corner Rd and Hockomock Rd, then southwest to the intersection of Old Stage Rd and Crosby Rd, then south to the intersection of Old Stage Rd and Duck Camp Rd, then south along Old Stage Rd to Arrowsic Rd, then east and south along Arrowsic Rd, which becomes Five Island Rd to the intersection of Higgins Farm Rd, then south to the intersection of Bay Point Rd and the old woods road to Todd Bay (opposite the north end of Long Island), then east to the intersection of Indian Point Rd and Marsh Rd, then south along Indian Point Rd to Indian Pt, then south and offshore following the shellfish management zone line.

Current Classifications

Shellfish growing Area WM currently has shellfish areas classified as:

Approved (12 stations)

Prohibited (12 stations):

- 20A1. Kennebec River, Georgetown, Woolwich, Phippsburg, Arrowsic and West Georgetown
- 20A.2. Mill Pond, Phippsburg
- 20A.3. Todd Bay, Georgetown
- 20A.4. Lower Kennebec River, Georgetown and Phippsburg
- 20A.5. Phippsburg
- 20A.6. Wood Island

Conditionally approved (6 stations):

- 20B Lower Kennebec, Seasonal Conditional Area; Phippsburg, Arrowsic and West Georgetown
- 20C. Atkins Bay, Rainfall Conditional Area; Phippsburg

Visit the Maine DMR website to view DMR Regulation 95.07F, Closed Area No. 20, Kennebec River and Tributaries:

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

Current Management Plan(s)

There currently are two conditionally managed areas in Growing Area WM.:

Seasonal rainfall area in Atkins Bay, Phippsburg (closes on ≥ 1.5 "/24 hours from 10/1-5/14)
Seasonal area at Squirrel Point-Parker Head Flats (5/15 – 9/30)

Management plans for both conditional areas can be found in DMR's central files.

Annual Review of Management Plans for Conditional Areas

Both the Atkins Bay rainfall conditional area and lower Kennebec seasonal conditional area failed to meet conditions of the management plan, due to the lower than required sampling



frequency of the conditional stations. This issue has been noted by DMR, and has been resolved during the 2007 sampling season.

The complete reviews of the management plants for the two conditional areas in shellfish growing area WM are located in Appendices B and C.

Review of Water Quality

Transitioning to Membrane Filtration for Seawater and Pollution Source Samples

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 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 geometric approved standard of 14 fecal coliforms per 100 ml and geometric 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. It must be remembered that this weighted standard is only used for data sets encompassing data from the two different test methods, MF and MPN (3 tube/3 dilution). If decisions are to be made on a single test result analyzed by the MF method or a multiple number of test results all exclusively analyzed by the MF method, the 90th percentile standard is 31 fecal coliforms per 100 ml.

This was the first year the water quality program documented, in the database, the inability to collect a sample based on the following parameters: if the tide stage was too low to collect the sample, there was a safety issue with collecting the sample, the location was inaccessible or "other" which was accompanied by a comment on the data sheet. Stations that were unable to be sampled due to any of these parameters show 999 in the salinity column and have no data recorded in any of the columns except the time which is recorded so the actual tide stage can be computed. Stations that were missed due to the above parameters were required to be made up to assure that each station would receive the required six samples during the sampling season.

Water Quality Data Review

Geometric means and P90 scores for area WM are shown in Table 1. All active water sampling stations in growing area WM that were classified as approved, restricted and prohibited were sampled six times during the 2006 sampling season, using the systematic random sampling



technique (Appendix D). Geometric means and P90 scores were calculated using fecal coliform data from the most recent 30 data points; station WM 6.5 was established in late 2005 and currently has only 7 data points. Stations which are not meeting their current classification standards are highlighted in yellow. Please refer to appendix A for table header explanations.

Table 1. Geometric means and P90 scores for Area WM, 2001-2006

STATION	CLASS	CNT	MFCNT	GeoMean	SDV	MAX	P90	APPD_STD	RESTR_STD
WM001.00	A	30	3	6.4	0.48	240	26.5	47	282
WM003.00	A	30	3	4.9	0.44	240	18	47	282
WM005.00	A	30	4	5.8	0.48	93	24.1	46	277
WM006.00	A	30	3	9.7	0.6	93	56.3	47	282
WM006.50	New	7	5	7.8	0.58	43	44.2	35	194
WM008.00	A	30	3	8.6	0.48	93	35.7	47	282
WM009.00	P	30	3	10.8	0.56	240	57.2	47	282
WM009.80	P	30	3	11.9	0.5	93	51.1	47	282
WM017.20	P	30	3	12	0.54	240	58.7	47	282
WM017.50	P	30	3	14.3	0.68	240	106.3	47	282
WM018.20	P	30	3	14.3	0.6	240	83.4	47	282
WM019.10	P	30	3	7.7	0.49	240	32.5	47	282
WM019.20	P	30	3	10.5	0.54	93	51.3	47	282
WM019.40	P	30	3	9.4	0.57	240	51.3	47	282
WM019.50	P	30	3	9.8	0.58	240	54.2	47	282
WM020.00	A	30	4	6.9	0.47	160	27.8	46	277
WM022.00	A	30	5	6.5	0.42	43	22.5	45	271
WM023.00	A	30	4	7	0.49	93	29.4	46	277
WM024.00	A	30	4	6.1	0.55	460	30.9	46	277
WM026.00	A	30	4	6.5	0.48	93	26.4	46	277
WM026.90	A	30	3	7	0.62	460	43.5	47	282
WM027.00	P	30	4	9.5	0.58	460	53	46	277
WM028.00	A	30	3	6.5	0.53	240	30.4	47	282
WM029.10	P	30	2	18.8	0.66	460	131.8	48	288

Geomean and P90 scores for the two conditional areas located in growing area WM are shown in Tables 2 and 3. Only data points obtained in the area open status were used in calculating the means and P90 scores.

Table 2. Geometric means and P90 scores for Atrkins Bay Rainfall Conditional Area, 2001-2006.

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WM004.00	CA	30	2	5.2	0.45	93	19.6	48	288
WM004.10	CA	30	2	5.8	0.48	93	23.9	48	288
WM004.50	CA	30	2	4.8	0.42	240	16.8	48	288
WM004.80	CA	30	2	5.8	0.51	93	26.4	48	288



Table 3. Geometric means and P90 scores for Lower Kennebec Seasonal Conditional Area, 2001-2006.

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WM012.00	CA	30	2	7.4	0.54	93	36.5	48	288
WM015.00	CA	30	2	6.6	0.47	93	26.3	48	288
WM016.00	CA	30	2	6.5	0.43	93	23.4	48	288

All approved and restricted water monitoring stations met their current classification, with the exception of station WM 6.0; this station, along with the new station WM 6.5, should be reclassified from approved to conditionally approved based on season. Most of the high fecal coliform scores at station WM 6.0 occurred between October and December. Therefore, the proposed reclassification suggests that this area should remain closed between October 1st and December 31st. The P90 score for this station during the open status (January 1 – September 30) is currently 20.7, and it meets approved standards.

An additional recommendation based on the 2006 water quality review is to change the current Squirrel Point/Parker Head flats seasonal conditional area open status period from 5/15 - 9/30 to 10/1 - 12/31. Based on the analysis of water quality data, most of the high scores in this conditional area occurred in the months of October, November and December. Using the new open status of January 1 to September 30, the P90 scores for the three stations that currently fall into the boundaries of this conditional area are all below the approved standard (31.6, 33.1 and 19.9 for stations WM 12, 15 and 16, respectively). A further recommendation for this conditional area is to expand its boundaries to include the western shore of Back River, Arrowsic, the southern section of Drummore Bay, up to the next station meeting approved standards, WM17.2, as well as the southern portion of Wyman Bay.

Shoreline Survey Activity

Shoreline survey work was done in the Parker Head Pond watershed portion of the growing area by Maine DEP and DMR in the fall of 2006 (Figure 2). Information regarding all identified pollution sources was submitted to the town for remediation. Growing Area WM had no significant changes in pollution sources during the review period. Field observations were made during regularly scheduled random sampling runs, as well as during volunteer site certifications, new staff training runs, and flood sampling.



Figure 2. Parker Head Pond Survey Area, 2006



Maine Department of Marine Resources



Parker Head Pond Survey area

4-26-07





Shellfish aquaculture and/or wet storage activities

There are no aquaculture sites or wet storage permits in growing area WM.

Changes in classification required/requested at this time

As a result of this review, there are three proposed changes. The first proposed change is to lengthen the current Squirrel Point/Parker Head (Lower Kennebec River) flats seasonal conditional area open status period from 5/15-9/30 to 1/1-9/31. Additionally, the boundary for this conditional area should expand to include the western shore of Back River Arrowsic, the southern section of Drummore Bay, up to station WM17.2, and the southern portion of Wyman Bay. The second proposed change is to reclassify stations WM6.0 and WM6.5 from approved to conditionally approved based on season; the area should remain closed from 10/1 to 12/31. The final proposed change resulting from this review is to reopen Hunniwell Cove, in the town of Phippsburg. The area was closed in 2003/2004 due to two plumbing code violations: a failing septic, located on Map14/lot13, confirmed by a dye test, and an illegal gray water discharge, Map14/lot14, also confirmed by a dye test. Since the closure, the gray water has been connected to the properly functioning septic system and a "do not inhabit order" has been issued to the owner of property with the failing septic. This information has been confirmed by the Phippsburg Code Enforcement/ Plumbing Inspector. Water quality at station WM 3.0, which is located on the boundary of Hunniwell Cove prohibited area continues to meet approved standard, confirming that the area can be reopened.

Summary and Future Work

Shellfish growing area WM is a complex area impacted by the flow of both the Androscoggin and Kennebec Rivers and all of their tributaries. A study was conducted in 2001 (available in the central files) in order to determine what the impact of these two rivers was on the lower section of the Kennebec river and its shellfish growing areas. The results of this study suggest that pollution coming from upstream of the city of Bath is diluted to approved classifications levels before reaching the shellfish harvesting beds. For the next triennial report, additional sample collection after significant rainfall is recommended, in order to better understand the impact of up-stream pollutants during adverse conditions. Additionally, non-point pollution sources downstream of the city of Bath should be evaluated in order to better understand the impact of more localized pollution sources, which originate in the southern-most portion of the Kennebec River watershed, on shellfish growing areas in WM.

In summary, most water quality monitoring stations in area WM continue to support their current classification status. This annual review recommended 1) a reclassification of two stations from approved to conditionally approved based on season; 2) a modification of the open status for the Lower Kennebec River seasonal conditional area; and 3) a reopening of a previously prohibited area, due to the completion of remediation effort in the area..



Appendix A. 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).

Count = 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)

Geo_Mean = 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 B. Current Annual Review of Management Plan for Atkins Bay

LOWER KENNEBEC RIVER CONDITIONAL AREA - C20G/C20

(Atkins Bay rainfall area is conditional on rainfall from 10/1 – 5/14 and closes when rainfall ≥ 1.5 " in any 24 hour period)

The management plan shall specify the frequency and thoroughness with which the conditionally approved area will be reevaluated.

- A. The conditionally approved area must be evaluated at least once a year.**
- B. The evaluation shall include:**

(1) Evaluation of compliance with the management plan

The Atkins Bay Rainfall Conditional area closed on 10/17/05 and due to additional rainfall events and failing reopening sample results the area did not reopen until 2/23/06. It closed twice more during 2006. The first was on 4/5/06 reopening 4/26/06, the second time it closed on 10/12/06 and reopened on 12/14/06. The year 2006 was the third wettest on record and there were multiple flood closures over the course of the year. An administrative change in the legal notices for the lower Kennebec River moved the Atkins Bay conditional portion into closure C- 20.

(2) Adequacy of reporting

Rainfall reporting was prompt in accordance with the management plan. The Phippsburg representative is required, by the management plan to notify: State Police (if the problem occurs during non business hours) who in turn notify Marine Patrol Division I at Boothbay Harbor, and during normal business hours the DMR in Boothbay Harbor (see management plan for details)

(3) Review of the cooperation of the persons involved

The cooperation between the Phippsburg representative and DMR has been excellent. Notification is always prompt and phone messages with any questions which may arise are always returned in a timely fashion.

(4) Determination of compliance with approved growing area criteria

Water quality scores in the conditionally approved portions (when in the open status) continue to meet classification criteria as outlined by the NSSP (Table 1). Following a rainfall necessitated closure, the area remains closed for a mandatory 14 day period; samples are collected at a set station array and the results of these samples must meet approved criteria.

(5) Field inspection of critical pollution sources

The pollution sources in C20G/C20 conditional area are of a non-point nature with pollution entering the estuary via numerous drainages gullies and intermittent streams, as well as from the Kennebec River itself.



(6) Collection of water quality samples

Water quality samples must be collected six times in the open status. In 2006, Atkins Bay conditional area was sampled five times, instead of six, while in the open status. This conditional area was closed multiple times throughout the year due to heavy rainfall, making sampling six times in the open status more difficult than in previous years. In the future, DMR will be more diligent about ensuring that the management plan is followed, and this area is sampled six times in the open status.

(7) Written analysis of the findings of the evaluation and recommendations based on the analysis

Based on analysis of water quality data, the conditions of and participation in an MOU with the Town of Phippsburg, and the presence of a well trained and reliable shellfish warden, the conditional area of the Atkins Bay in the Lower Kennebec River is currently properly classified according to NSSP criteria.

Table 1. Atkins Bay Conditional Area water quality scores, open status, 2001-2006

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WM004.00	CA	30	2	5.2	0.45	93	19.6	48	288
WM004.10	CA	30	2	5.8	0.48	93	23.9	48	288
WM004.50	CA	30	2	4.8	0.42	240	16.8	48	288
WM004.80	CA	30	2	5.8	0.51	93	26.4	48	288



Appendix C. Current Annual Review for Lower Kennebec River

SQUIRREL POINT FLATS SEASONAL CONDITIONAL AREA - C 20H/ C20

(Seasonal conditional area)

The management plan shall specify the frequency and thoroughness with which the conditionally approved area will be reevaluated.

A. The conditionally approved area must be evaluated at least once a year.

B. The evaluation shall include:

(1) Evaluation of compliance with the management plan

The Parker Head flats and Squirrel Pt flats conditional area is based on season. For several years the area has maintained approved water quality from 5/15 – 9/30. However, more recent data seems to indicate that the area may be able to be classified in the open status for a considerably longer but slightly different time frame, from 1/1 – 8/31 .

(2) Determination as to adequacy of reporting

There is no need for reporting by the towns of Phippsburg and Arrowsic since the condition is not based on an occurrence such as a rainfall event or a bypass but rather upon a season.

(3) Review of the cooperation of the persons involved

The cooperation between the municipal warden for Phippsburg and Arrowsic, DMR – Marine Patrol and DMR is excellent.

(4) Determination of compliance with approved growing area criteria;

An evaluation of the data collected from stations in the seasonal conditional area shows that water quality scores in the conditionally approved portions (when in the open status) continue to meet criteria as outlined in the NSSP manual.

(5) Field inspection of critical pollution sources;

The pollution sources in C20H/C20 seasonal conditional area are of a non-point nature with pollution entering the estuary via numerous drainages gullies and intermittent streams, as well as from the Kennebec River itself.

(6) Collection of water quality samples

Water quality samples must be collected at least 6 times per year, while in the area is in the open status. However, due to the short open period – 4 months, the fact that these stations can only be collected by boat and the fact that the Arrowsic volunteers sampling the area failed to collect two scheduled runs, the count for the open period was only four. The possibility of having these samples collected by the Phippsburg volunteer as part of his run will be looked at for the 2007 season as a way to address this problem.

(7) Written analysis of the findings of the evaluation and recommendations

Based on analysis of the data, and the presence of a management plan, as well as, the presence of a well trained and reliable shellfish warden, the seasonal conditional area of Parker



Head and Squirrel Point flats in the Lower Kennebec River is currently properly classified based on the NSSP criteria.

Table 1. Water quality scores for Lower Kennebec seasonal conditional area, open status, 2001-2006

STATION	CLASS	CNT	MFCNT	GM	SDV	MAX	P90	APPD_STD	RESTR_STD
WM012.00	CA	30	2	7.4	0.54	93	36.5	48	288
WM015.00	CA	30	2	6.6	0.47	93	26.3	48	288
WM016.00	CA	30	2	6.5	0.43	93	23.4	48	288



Appendix D. Water Quality Data for Growing Area WM, 2006

Station	Date	Collect	Tide	Temp	Strat	ADV	Stat	CL	A1COL	MFCOL
WM1.00	03/20/06	RL	LE	-2	R	W	O	A	<3.0	-
WM1.00	06/26/06	PSC	F	14	R	P	O	A	240	-
WM1.00	07/17/06	PSC	H	10	R	N	O	A	<3.0	-
WM1.00	08/23/06	PSC	F	16	R	-	O	A	-	25.1
WM1.00	10/18/06	RL	HF	8	R	P	O	A	-	20
WM1.00	12/06/06	RL	F	5	R	-	O	A	-	4
WM3.00	03/20/06	RL	L	-1	R	W	O	A	3.6	-
WM3.00	06/26/06	PSC	F	14	R	P	O	A	3.6	-
WM3.00	07/17/06	PSC	H	10	R	NW	O	A	<3.0	-
WM3.00	08/23/06	PSC	F	17	R	-	O	A	-	<2.0
WM3.00	10/18/06	RL	H	8	R	P	O	A	-	10
WM3.00	12/06/06	RL	F	5	R	-	O	A	-	2
WM4.00	01/10/06	RL	H	0	A	-	C	CA	15	-
WM4.00	01/30/06	PSC	F	1	A	P	C	CA	9.1	-
WM4.00	02/05/06	RL	H	0	A	P	C	CA	7.3	-
WM4.00	02/08/06	RL	H	-3	A	P	C	CA	93	-
WM4.00	02/21/06	RL	HF	0	A	-	C	CA	<3.0	-
WM4.00	03/28/06	RL	F	1	R	N	O	CA	<3.0	-
WM4.00	04/23/06	PSC	HF	4	R	-	C	CA	<3.0	-
WM4.00	06/26/06	PSC	F	14.5	R	PW	O	CA	9.1	-
WM4.00	07/17/06	PSC	HE	13	R	N	O	CA	3	-
WM4.00	08/23/06	PSC	F	15	R	-	O	CA	-	<2.0
WM4.00	09/13/06	PSC	F	12	R	N	O	CA	-	<2.0
WM4.00	10/18/06	RL	H	10	R	PW	C	CA	-	25
WM4.00	12/06/06	RL	F	3	R	-	C	CA	-	22
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WM4.10	01/30/06	PSC	F	1	A	P	C	CA	9.1	-
WM4.10	02/05/06	RL	H	0	A	P	C	CA	9.1	-
WM4.10	02/08/06	RL	H	-3	A	P	C	CA	93	-
WM4.10	02/21/06	RL	HF	0	A	-	C	CA	<3.0	-
WM4.10	03/28/06	RL	F	1	R	N	O	CA	<3.0	-
WM4.10	04/23/06	PSC	HF	5	R	-	C	CA	3.6	-
WM4.10	06/26/06	PSC	F	14.5	R	P	O	CA	<3.0	-
WM4.10	07/17/06	PSC	HE	13.5	R	N	O	CA	3.6	-
WM4.10	08/23/06	PSC	F	16	R	-	O	CA	-	2
WM4.10	09/13/06	PSC	F	13	R	N	O	CA	-	2
WM4.10	10/18/06	RL	H	10	R	P	C	CA	-	25
WM4.10	12/06/06	RL	F	2	R	-	C	CA	-	36
WM4.10	12/12/06	RL	E	1	A	W	C	CA	-	3.6
WM4.50	01/10/06	RL	H	-1	A	-	C	CA	15	-
WM4.50	01/30/06	PSC	F	-1	A	P	C	CA	9.1	-
WM4.50	02/05/06	RL	H	0	A	P	C	CA	43	-
WM4.50	02/08/06	RL	H	-3	A	P	C	CA	43	-
WM4.50	02/21/06	RL	HF	-1	A	-	C	CA	<3.0	-
WM4.50	03/28/06	RL	F	1	R	N	O	CA	<3.0	-
WM4.50	04/23/06	PSC	HF	5	R	-	C	CA	3.6	-



Station	Date	Collect	Tide	Temp	Strat	ADV	Stat	CL	A1COL	MFCOL
WM4.50	06/26/06	PSC	F	14	R	P	O	CA	3.6	-
WM4.50	07/17/06	PSC	HE	14	R	N	O	CA	<3.0	-
WM4.50	08/23/06	PSC	F	15	R	-	O	CA	-	<2.0
WM4.50	09/13/06	PSC	F	13	R	N	O	CA	-	<2.0
WM4.50	10/18/06	RL	H	9	R	P	C	CA	-	800
WM4.50	12/06/06	RL	F	2	R	-	C	CA	-	50
WM4.50	12/12/06	RL	E	1	A	W	C	CA	-	18
WM4.80	01/10/06	RL	H	-2	A	-	C	CA	9.1	-
WM4.80	01/30/06	PSC	F	-1	A	P	C	CA	21	-
WM4.80	02/05/06	RL	H	0	A	P	C	CA	13	-
WM4.80	02/08/06	RL	H	-3	A	P	C	CA	93	-
WM4.80	02/21/06	RL	HF	0	A	W	C	CA	<3.0	-
WM4.80	03/28/06	RL	F	1	R	N	O	CA	<3.0	-
WM4.80	04/23/06	PSC	HF	6	R	-	C	CA	<3.0	-
WM4.80	06/26/06	PSC	F	14.5	R	P	O	CA	3.6	-
WM4.80	07/17/06	PSC	HE	13	R	N	O	CA	3.6	-
WM4.80	08/23/06	PSC	F	14	R	-	O	CA	-	2
WM4.80	09/13/06	PSC	F	17	R	N	O	CA	-	<2.0
WM4.80	10/18/06	RL	H	9	R	P	C	CA	-	24
WM4.80	12/06/06	RL	F	2	R	-	C	CA	-	38
WM4.80	12/12/06	RL	E	.5	A	W	C	CA	-	8
WM5.00	03/20/06	RL	LF	0	R	N	O	A	<3.0	-
WM5.00	06/26/06	PSC	F	14.5	R	P	O	A	3.6	-
WM5.00	07/17/06	PSC	HE	10	R	N	O	A	3.6	-
WM5.00	08/23/06	PSC	F	13	R	-	O	A	-	<2.0
WM5.00	09/13/06	PSC	F	13	R	N	O	A	-	2
WM5.00	10/18/06	RL	H	9	R	P	O	A	-	<2.0
WM5.00	12/06/06	RL	HF	2	R	-	O	A	-	24
WM5.00	12/12/06	RL	E	3	A	W	O	A	-	6
WM6.00	03/20/06	RL	LF	-1	R	N	O	A	9.1	-
WM6.00	06/26/06	PSC	F	15	R	P	O	A	7.3	-
WM6.00	07/17/06	PSC	HE	14	R	N	O	A	3.6	-
WM6.00	08/23/06	PSC	F	15	R	-	O	A	-	2
WM6.00	10/18/06	RL	H	9	R	P	O	A	-	22
WM6.00	12/06/06	RL	HF	2	R	-	O	A	-	56
WM6.50	03/28/06	RL	F	1	R	W	O	A	<3.0	-
WM6.50	08/23/06	PSC	F	17	R	-	O	A	-	<2.0
WM6.50	09/26/06	JB	F	16	R	-	O	A	-	2
WM6.50	10/18/06	RL	H	9.5	R	P	O	A	-	33
WM6.50	12/06/06	RL	HF	2	R	-	O	A	-	18
WM6.50	12/18/06	JB	E	4	R	-	O	A	-	6
WM8.00	03/28/06	RL	F	1	R	N	O	A	<3.0	-
WM8.00	06/26/06	PSC	F	16	R	P	O	A	3.6	-
WM8.00	07/17/06	PSC	HE	14	R	N	O	A	15	-
WM8.00	08/23/06	PSC	F	16	R	-	O	A	-	4
WM8.00	10/18/06	RL	H	10	R	P	O	A	-	20
WM8.00	12/06/06	RL	HF	3	R	-	O	A	-	29
WM9.00	03/20/06	RL	LF	-3	R	N	C	P	3.6	-
WM9.00	06/26/06	PSC	F	16	R	P	C	P	3.6	-
WM9.00	07/17/06	PSC	HE	15	R	N	C	P	9.1	-
WM9.00	08/23/06	PSC	F	17	R	-	C	P	-	<2.0



Station	Date	Collect	Tide	Temp	Strat	ADV	Stat	CL	A1COL	MFCOL
WM9.00	10/18/06	RL	H	9.5	R	P	C	P	-	11
WM9.00	12/06/06	RL	HF	2	R	-	C	P	-	31
WM9.80	03/28/06	RL	F	1	R	W	C	P	3.6	-
WM9.80	06/26/06	PSC	F	16	R	P	C	P	43	-
WM9.80	07/17/06	PSC	HE	17	R	N	C	P	23	-
WM9.80	08/23/06	PSC	F	16	R	-	C	P	-	4
WM9.80	10/18/06	RL	H	9	R	P	C	P	-	28
WM9.80	12/06/06	RL	HF	2	R	-	C	P	-	38
WM12.00	03/28/06	RL	F	1	R	N	C	CA	<3.0	-
WM12.00	06/26/06	PSC	HF	15	R	P	O	CA	<3.0	-
WM12.00	07/17/06	PSC	HE	15	R	N	O	CA	23	-
WM12.00	08/23/06	PSC	F	16	R	-	O	CA	-	4
WM12.00	09/26/06	JB	F	15	R	-	O	CA	-	2
WM12.00	10/18/06	RL	H	9.5	R	P	C	CA	-	20
WM12.00	12/06/06	RL	HF	1.5	R	-	C	CA	-	64
WM15.00	03/20/06	ASC	HF	3	R	-	C	CA	3.6	-
WM15.00	06/26/06	ASC	H	19	R	P	O	CA	3	-
WM15.00	07/17/06	ASC	F	21	R	-	O	CA	3.6	-
WM15.00	08/23/06	ASC	HE	17	R	-	O	CA	-	<2.0
WM15.00	09/27/06	ASC	HF	15	R	-	O	CA	-	2
WM15.00	10/18/06	ASC	HE	12	R	P	C	CA	-	16
WM16.00	03/20/06	RL	LF	0	R	N	C	CA	3.6	-
WM16.00	06/26/06	PSC	HF	16	R	P	O	CA	9.1	-
WM16.00	07/17/06	PSC	HE	13	R	N	O	CA	3.6	-
WM16.00	08/23/06	PSC	F	17	R	-	O	CA	-	20
WM16.00	09/26/06	JB	F	15	R	-	O	CA	-	2
WM16.00	10/18/06	RL	HE	9.5	R	P	C	CA	-	7.3
WM16.00	12/06/06	RL	HF	3	R	-	C	CA	-	48
WM17.20	03/28/06	RL	F	1	R	N	C	P	<3.0	-
WM17.20	06/26/06	PSC	HF	17	R	P	C	P	6.2	-
WM17.20	07/17/06	PSC	HE	15	R	N	C	P	<3.0	-
WM17.20	08/23/06	PSC	F	18	R	-	C	P	-	4
WM17.20	10/18/06	RL	HE	10	R	P	C	P	-	31
WM17.20	12/06/06	RL	HF	2	R	-	C	P	-	54
WM17.50	03/28/06	RL	F	1	R	W	C	P	<3.0	-
WM17.50	06/26/06	PSC	HF	16	R	P	C	P	9.1	-
WM17.50	07/17/06	PSC	HE	17	R	N	C	P	3.6	-
WM17.50	08/23/06	PSC	F	17	R	-	C	P	-	2
WM17.50	10/18/06	RL	HE	10	R	P	C	P	-	42
WM17.50	12/06/06	RL	HF	1.5	R	-	C	P	-	68
WM18.20	03/20/06	RL	LF	-2	R	W	C	P	3.6	-
WM18.20	06/26/06	PSC	HF	17	R	P	C	P	7.3	-
WM18.20	07/17/06	PSC	HE	17	R	N	C	P	5.7	-
WM18.20	08/23/06	PSC	HF	19	R	-	C	P	-	20
WM18.20	10/18/06	RL	HE	10	R	P	C	P	-	22
WM18.20	12/06/06	RL	H	1.5	R	-	C	P	-	74
WM19.10	03/22/06	GSC	E	3	R	-	C	P	<3.0	-
WM19.10	05/21/06	GSC	E	7	R	-	C	P	15	-
WM19.10	06/25/06	GSC	F	15	R	-	C	P	15	-
WM19.10	06/27/06	GSC	F	14	R	-	C	P	-	2
WM19.10	10/15/06	GSC	HE	10	R	-	C	P	-	12



Station	Date	Collect	Tide	Temp	Strat	ADV	Stat	CL	A1COL	MFCOL
WM19.10	12/10/06	CCA	F	6	R	-	C	P	-	2
WM19.20	03/20/06	ASC	HF	3	R	-	C	P	3.6	-
WM19.20	06/26/06	ASC	HF	19	R	P	C	P	23	-
WM19.20	07/17/06	ASC	F	20	R	-	C	P	23	-
WM19.20	08/23/06	ASC	H	19	R	-	C	P	-	<2.0
WM19.20	09/27/06	ASC	HF	15	R	-	C	P	-	2
WM19.20	10/18/06	ASC	H	12	R	P	C	P	-	16
WM19.40	03/20/06	ASC	HF	2	R	-	C	P	3.6	-
WM19.40	06/26/06	ASC	H	19	R	P	C	P	3.6	-
WM19.40	07/17/06	ASC	F	20	R	-	C	P	3.6	-
WM19.40	08/23/06	ASC	H	19	R	-	C	P	-	<2.0
WM19.40	09/27/06	ASC	HF	15	R	-	C	P	-	<2.0
WM19.40	10/18/06	ASC	H	12	R	P	C	P	-	22
WM19.50	03/20/06	ASC	F	2	R	-	C	P	<3.0	-
WM19.50	06/26/06	ASC	H	18	R	P	C	P	3.6	-
WM19.50	07/17/06	ASC	F	20	R	-	C	P	3.6	-
WM19.50	08/23/06	ASC	HE	19	R	-	C	P	-	2
WM19.50	09/27/06	ASC	F	15	R	-	C	P	-	2
WM19.50	10/18/06	ASC	HE	12	R	P	C	P	-	8
WM20.00	03/22/06	GSC	LE	3	R	-	O	A	<3.0	-
WM20.00	05/21/06	GSC	E	11	R	-	O	A	14	-
WM20.00	06/25/06	GSC	F	14	R	-	O	A	3.6	-
WM20.00	09/06/06	GSC	F	15	R	-	O	A	-	2
WM20.00	10/15/06	GSC	HE	9	R	-	O	A	-	12
WM20.00	11/19/06	CWA	F	8	R	-	O	A	-	160
WM20.00	12/18/06	JB	HE	4	R	N	O	A	-	2
WM22.00	05/21/06	GSC	E	12	R	-	O	A	9.1	-
WM22.00	06/25/06	GSC	F	15	R	-	O	A	<3.0	-
WM22.00	09/06/06	GSC	F	15	R	-	O	A	-	<2.0
WM22.00	09/11/06	AJS	F	18	R	-	O	A	-	16
WM22.00	10/15/06	GSC	HE	9	R	-	O	A	-	<2.0
WM22.00	11/19/06	CWA	HF	7	R	-	O	A	-	8
WM22.00	12/18/06	JB	HE	4	R	-	O	A	-	<2.0
WM23.00	03/22/06	GSC	LE	6	R	-	O	A	<3.0	-
WM23.00	05/21/06	GSC	E	14	R	-	O	A	43	-
WM23.00	06/25/06	GSC	F	16	R	-	O	A	<3.0	-
WM23.00	09/06/06	GSC	HF	16	R	-	O	A	-	2
WM23.00	10/15/06	GSC	E	10	R	-	O	A	-	2
WM23.00	11/19/06	CWA	HF	7	R	-	O	A	-	4
WM23.00	12/18/06	JB	HE	3	R	N	O	A	-	7.3
WM24.00	03/22/06	GSC	LE	4	R	-	O	A	<3.0	-
WM24.00	05/21/06	GSC	E	10	R	-	O	A	<3.0	-
WM24.00	06/25/06	GSC	F	15	R	-	O	A	23	-
WM24.00	09/06/06	GSC	HF	15	R	-	O	A	-	6
WM24.00	10/15/06	GSC	E	9	R	-	O	A	-	7.3
WM24.00	11/19/06	CWA	HF	7	R	-	O	A	-	4
WM24.00	12/18/06	JB	H	5	R	-	O	A	-	<2.0
WM26.00	05/21/06	GSC	E	13	R	-	O	A	3.6	-
WM26.00	06/25/06	GSC	F	15	R	-	O	A	<3.0	-
WM26.00	09/06/06	GSC	HF	15	R	-	O	A	-	<2.0
WM26.00	09/11/06	AJS	F	15	R	-	O	A	-	4



Station	Date	Collect	Tide	Temp	Strat	ADV	Stat	CL	A1COL	MFCOL
WM26.00	10/15/06	GSC	HE	9	R	-	O	A	-	10
WM26.00	12/10/06	CCA	F	6	R	-	O	A	-	2
WM26.90	03/22/06	GSC	LE	4	R	-	O	A	<3.0	-
WM26.90	05/21/06	GSC	E	12	R	-	O	A	9.1	-
WM26.90	06/25/06	GSC	F	14	R	-	O	A	3.6	-
WM26.90	09/06/06	GSC	HF	16	R	-	O	A	-	<2.0
WM26.90	10/15/06	GSC	E	10	R	-	O	A	-	<2.0
WM26.90	12/10/06	CCA	F	6	R	-	O	A	-	2
WM27.00	05/21/06	GSC	E	12	R	-	C	P	11	-
WM27.00	06/25/06	GSC	F	14	R	-	C	P	9.1	-
WM27.00	09/06/06	GSC	HF	16	R	-	C	P	-	2
WM27.00	09/11/06	AJS	F	15	R	-	C	P	-	10
WM27.00	10/15/06	GSC	E	9	R	-	C	P	-	6
WM27.00	12/10/06	CCA	F	5	R	-	C	P	-	4
WM28.00	03/22/06	GSC	LE	3	R	-	O	A	<3.0	-
WM28.00	05/21/06	GSC	E	12	R	-	O	A	9.1	-
WM28.00	06/25/06	GSC	F	15	R	-	O	A	3	-
WM28.00	09/06/06	GSC	HF	15	R	-	O	A	-	2
WM28.00	10/15/06	GSC	HE	10	R	-	O	A	-	4
WM28.00	12/10/06	CCA	F	5	R	-	O	A	-	2
WM29.10	03/27/06	FP	E	8	R	-	C	P	<3.0	-
WM29.10	05/08/06	JB	E		R	-	C	P	3.6	-
WM29.10	06/19/06	LL	E	20	R	-	C	P	240	-
WM29.10	08/14/06	SXR	E	20	R	-	C	P	23	-
WM29.10	09/25/06	JXK	LF	14	R	-	C	P	-	6
WM29.10	11/07/06	FP	LF	4	R	-	C	P	-	106