



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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January 29, 2021

Steven Souza, Superintendent
Buzzards Bay Water District
15 Wallace Avenue
Buzzards Bay, MA 02532

Town: Bourne
WMA Permit #: Permit 9P-4-24-036.01
Program: Water Management Act
PWS ID: 4036001
Action: Permit Application/Permit Renewal Order to Complete

Dear Mr. Souza:

The Massachusetts Department of Environmental Protection (MassDEP) has completed its review of the Buzzards Bay Water District's ("BBWD") Water Management Act (WMA) permit application of October 7, 2020, for increased water withdrawal from the Buzzards Bay Basin. MassDEP will now review the permit application and conduct a compliance review of BBWD current WMA Permit, as amended June 29, 2018. In addition, all WMA permits in the Buzzards Bay Basin are expected to begin permit renewal review by MassDEP in 2021, therefore MassDEP will now conduct its review of BBWD's 20-year permit renewal application submitted to MassDEP on May 29, 2015. All permits in the Buzzards Bay Basin, including the BBWD, will be renewed through May 31, 2031.

Initial review reveals that some required components of the new permit application are incomplete, require clarification, or are technically deficient. WMA permit applications are not complete until all relevant public comment and other required technical elements are addressed to the satisfaction of MassDEP. Without submission of the required information, the application is incomplete. MassDEP requires you to submit a response to these questions **within 90 days of the issuance of this Order**.

MassDEP may, at its option, allow more time to submit this information if a written request for additional time is submitted before the deadline. If you fail to submit the additional information within the timeframe above, your application may be deemed withdrawn. Nothing contained in this Order to Complete (OTC) should be interpreted to preclude MassDEP from requiring additional information that is determined necessary to evaluate the application.

Following the completion of the review of your response to this OTC, MassDEP will prepare a draft of the renewed permit to be issued to BBWD for review and comment.

MassDEP looks forward to working with you as we review your Water Management Act permit and permit renewal applications. Please submit the following requested information and documentation as depicted in bold text to MassDEP, Attn: Elizabeth McCann, One Winter Street, 5th floor, Boston, MA 02108 and to Elizabeth.mccann@mass.gov.

This information is available in alternate format. Contact Michelle Waters-Ekanem, Director of Diversity/Civil Rights at 617-292-5751.
TTY# MassRelay Service 1-800-439-2370
MassDEP Website: www.mass.gov/dep

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EXISTING PERMIT CONDITIONS:

Special Condition 1, Maximum Authorized Annual Average Withdrawal Volume

BBWD is authorized by WMA registration #424036.06 to withdraw 0.37 million gallons per day (mgd). BBWD’s existing WMA permit #9P424036.01 (as amended June 29, 2018) authorizes an average daily withdrawal of up to an additional 0.16 mgd. The total authorized average daily withdrawal volume is 0.53 mgd. BBWD’s recent reported water withdrawals have been:

Year	2015	2016	2017	2018	2019
Reported withdrawals (mgd)	0.51	0.50	0.46	0.50	0.51

MassDEP bases public water supply permits on Department of Conservation and Recreation (DCR) water needs forecasts. DCR has analyzed water use data from public water suppliers (PWSs) in order to develop water needs forecasts for the upcoming permit period. For suppliers in the Buzzards Bay Basin, two sets of projections have been calculated, the first assuming the system will meet the Massachusetts performance standards of 65 residential gallons per capita day (RGPCD) and 10% unaccounted-for water (UAW), and the second assuming the system will continue at the current trends (Current Trend) for RGPCD and UAW.

DCR’s May 22, 2015, letter outlines the water needs forecasts for BBWD. The RGPCD used for forecasting the Current Trend projection is 57.9 and the UAW is 5.3%. BBWD may choose either set of projections as the basis for permitting. Permit applicants should consider projected population increases and future water needs, as well as other permit requirements, such as mitigation requirement described below, in deciding which projections to request as the basis for the permit.

Buzzards Bay Water District Water Needs Forecasts (MGD)		
Permit Period	DCR Water Needs Forecast	
	Current Trend	65/10
2016-2021	0.50	0.58
2021-2026	0.53	0.60
2026-2031	0.55 + 0.03 (5% buffer) = 0.58	0.63 + 0.03 (5% buffer) = 0.66

A buffer volume of up to 5% will be available to permittees complying with permit conditions, and experiencing municipal growth that was not anticipated in the DCR forecasts, and to those unable to meet the unaccounted-for-water performance standard of 10%, but who are meeting the functional equivalence requirement (described below). MassDEP will also provide additional flexibility by allowing volumes in the later 5-year blocks to be rolled forward through specific advance written approval from MassDEP, provided BBWD is meeting the permit conditions associated with residential gallons per capita day, unaccounted-for or functional equivalence requirements, requirement associated with limits on Nonessential Outdoor Water Use, and other water conservation requirements.

BBWD’s permit renewal application requests authorization for withdrawals higher than either of the DCR forecasts.

	DCR 65/10 Water Needs Forecast (MGD)	Current Trend Forecast (MGD)	BBWD Request (MGD)
2015-2020	0.50	0.58	0.76
2020-2025	0.53	0.60	0.77
2025-2030	0.55 + 0.03 (5% buffer) = 0.58	0.63 + 0.03 (5% buffer) = 0.66	0.78

On December 30, 2020, representatives of BBWD, DCR staff and MassDEP Water Management staff met to discuss the discrepancy in the BBWD and DCR forecasts and information that could be provided to DCR to update the 2015 water needs forecasts. BBWD should continue to work with DCR to develop mutually agreed upon water needs forecasts. MassDEP will base the permit renewal volumes on the May 22, 2015, DCR forecast or any updated DCR forecast that are developed as part of this permit application review.

Question 1: Please provide an update on work with DCR to develop mutually agreed upon water needs forecasts through 2031, and any updated forecasts.

Special Condition 2, Maximum Authorized Daily Withdrawals from each Withdrawal Point

The maximum daily pumping rates for all sources during 2015-2019 are shown below. Wells #1 and #2 are registered-only with the WMA and so maximum daily pumping is not a condition of BBWD’s permit. Pumping information on Wells #1 and #2 is provided here for informational purposes.

Source ID 4036001	Source Name	Maximum Daily Rate (mgd)	2015 Max day (mgd)	2016 Max day (mgd)	2017 Max day (mgd)	2018 Max day (mgd)	2019 Max day (mgd)
01G	Well #1	0.50	0.33	0.33	0.44	0.44	0.35
02G	Well #2	0.46	0.43	0.42	0.41	0.37	0.38
03G	Well #3	0.86	0.73	0.75	0.59	0.47	0.62
04G	Well #4	0.58	0.57	0.55	0.58	0.54	0.51
05G	Well #5	1.18	0	0	0	0	0.69

BBWD reported no maximum daily pumping exceedances. No further information in required.

Special Condition 3 and 4, Zone II Delineation and Wellhead Protection

MassDEP records show that BBWD has approved Zone II delineations for all permitted wells and is in compliance with the wellhead protection requirement in 310 CMR 22.21(2). No further information is required.

Special Conditions 5, Performance Standard for Residential Gallons Per Capita Day Water Use (RGPCD)

Year	2015	2016	2017	2018	2019
Reported RPGCD	52	52	45	47	43

BBWD is in compliance with its current WMA permit requirement of 80 RGPCD for residential water use. No further information is required.

As a condition of the renewed permit BBWD will be required to meet 65 RGPCD within 2 full calendar years or adopt a plan to bring the system into compliance by the 5th year of the permit. Provisions for functional equivalence will be included in the permits. If your system does not meet the RGPCD standard for year 2023, or any year thereafter, you will be required to develop and implement a compliance plan designed to bring the system into compliance with the standard by December 31, 2026, or you may be required to implement the MassDEP Functional Equivalence Plan at that time.

Special Condition 6, Performance Standard for Unaccounted for Water (UAW)

Year	2015	2016	2017	2018	2019
Reported UAW	9.8%	7.8%	8.7%	12.2%	16.6%

BBWD has been in compliance with its current WMA permit requirement of 15% UAW every year except 2019. MassDEP notes that UAW has shown a steady increase in recent years.

Question 2: Please provide an explanation or analysis of the reasons UAW has risen steadily in recent years, and BBWD’s plan to bring UAW back below 10%.

The UAW required for all PWS permittees is now 10% for 2 out of every 3 years. As a condition of the renewed permit, BBWD will be required to meet 10% UAW for 2 out of the 3 most recent years throughout the permit. If your system does not meet the standard, then you will be required to meet the functional equivalence requirements based on the *AWWA/IWA Water Audits and Loss Control Programs, Manual of Water Supply Practices, M36*. An outline of the functional equivalence requirements is attached to this letter.

Special Condition 7, Water Conservation Requirements

Based on the *Commonwealth of Massachusetts Water Resources Commission Water Conservation Questionnaire for Public Water Suppliers*, dated October 7, 2020, included as part of the permit application, BBWD is meeting most of the conservation requirements in the current permit. MassDEP is requesting additional information in two areas.

Please note that MassDEP recognizes that BBWD does not have direct control over the conservation efforts of the Town of Bourne, to the Massachusetts Maritime Academy. In order to meet the requirements of the permit, BBWD must show that “best efforts” have been made to make each aware of the requirements of the permit.

Question 3: The *Conservation Questionnaire* lists municipal buildings that have been retrofitted, and then states that all other buildings are cost prohibitive to retrofit. Please provide additional information on which buildings are not retrofitted, why they are considered cost-prohibitive, and whether the Town of Bourne has plans to upgrade or renovate the building in the next 5 years.

Question 4: The Massachusetts Maritime Academy appears to be BBWD’s largest water user. Please describe water conservation practices in place at the Academy, including any installation of low-flow water fixtures, recent or planned facility renovations that would include installation of low-flow water fixtures, any reductions or limits on outdoor water use for irrigation of landscaping or yards, etc.

NEW PERMIT CONDITIONS:

MassDEP expects to modify BBWD’s Water Management permit to include conditions consistent with WMA regulations that were promulgated in 2014. The renewed permit will include restrictions on nonessential outdoor water use and require mitigation of withdrawals over a baseline volume, if feasible, when future withdrawals exceed the baseline volume.

Nonessential Outdoor Water Use Restrictions

All renewed permits will require restrictions on nonessential outdoor water use from May 1st through September 30th. Restrictions for public water supply systems in the Buzzards Bay Basin will be triggered when:

- groundwater levels fall to the monthly 25th percentile in an assigned groundwater monitoring well; and
- Level 1- Mild Drought or greater is declared for the Southeast Drought Region by the Massachusetts Drought Management Task Force.

BBWD’s nonessential outdoor water use restrictions will be triggered by groundwater levels at USGS Monitoring Well 415453070434901 (MA-PWW 22) in Plymouth, MA. The restrictions are to be implemented when the water level (measured as depth to water) in the USGS well declines to or below the groundwater trigger for 60 consecutive days, and can be lifted when the water level recovers to less than the trigger for 30 consecutive days. BBWD will be required to restrict nonessential outdoor water use to no more than two (2) days per week before 9 am and after 5 pm when BBWD’s RGPCD for the preceding year was 65 or below, or to no more than one (1) day per week before 9 am and after 5 pm when BBWD’s RGPCD for the preceding year was above 65.

USGS Groundwater Monitoring Well 415453070434901 (MA-PWW 22) in Plymouth, MA							
Monthly 25 th Percentile Trigger Values*							
Month	March	April	May	June	July	August	Sept
Depth to water level, feet below land surface	24.5	24.1	24.1	24.0	24.5	25	25.3

*Revised USGS values based on updated records may be included in the WMA permit

Restricted Nonessential Outdoor Water Uses

Nonessential outdoor water uses that are subject to mandatory restrictions include:

- irrigation of lawns via automatic irrigation systems or sprinklers;
- filling swimming pools;
- washing vehicles, except in a commercial car wash or as necessary for operator safety; and
- washing exterior building surfaces, parking lots, driveways or sidewalks, except as necessary to apply surface treatments such as paint, preservatives, stucco, pavement or cement.

The following uses may be allowed when mandatory restrictions are in place:

- irrigation to establish a new lawn and new plantings during the months of May and September;
- irrigation of public parks and recreational fields before 9 a.m. and after 5 p.m.;
- irrigation of gardens, flowers and ornamental plants by means of a hand-held hose or drip irrigation system; and
- irrigation of lawns by means of a hand-held hose.

Water uses NOT subject to mandatory restrictions are those required:

- for health or safety reasons;
- by regulation;
- for the production of food and fiber;
- for the maintenance of livestock; or
- to meet the core functions of a business (for example, irrigation by golf courses as necessary to maintain tees, greens, and minimal fairway watering, or irrigation by plant nurseries as necessary to maintain stock).

Public Notice of Water Use Restrictions

The PWS shall notify its customers of the restrictions and the consequences of failing to adhere to the restrictions.

- For groundwater level-triggered restrictions, when the daily depth to water level at the assigned USGS monitoring well declines to or below the trigger for 60 consecutive days, customers shall be notified as soon as possible, but within three days of implementing the restrictions.

Notice to customers shall include the following:

- A detailed description of the restrictions and penalties for violating the restrictions;
- The need to limit water use, especially nonessential outdoor water use, to ensure a sustainable drinking water supply and to protect natural resources; and
- Ways individual homeowners can limit water use, especially nonessential outdoor water use.

Notice that restrictions have been put in place shall be filed each year with MassDEP within 14 days of the restriction’s effective date.

If a PWS has developed nonessential water use restrictions that result in comparable or greater environmental protection, MassDEP will review and may approve the alternative restrictions for inclusion in the renewed permit.

Mitigation

Permittees requesting an increase above their baseline withdrawal must undertake mitigation commensurate with the impact of their increased withdrawals. BBWD’s baseline withdrawal volume is 0.51MGD, based on 2005 authorized withdrawal volume. BBWD’s average annual water use between 2015 and 2019 was 0.50 mgd. DCR water needs forecasts and BBWD’s permit application request indicate that BBWD’s water withdrawals are expected to exceed the 0.51 mgd baseline during the permit period as shown in the table below.

Permit Period	DCR Current Trend Forecast	DCR 65/10 Forecast	BBWD’s Forecast
	Forecast – 0.51 MGD Baseline = Mitigation Amount (MGD)		
2020-2025	0.53 – 0.51 = 0.02	0.60 – 0.51 = 0.09	0.77 – 0.51 = 0.26
2025-2030	0.58 – 0.51 = 0.07	0.66 – 0.51 = 0.15	0.78 – 0.51 = 0.27

The mitigation volume calculations in the table below are based on the DCR 65/10% forecast and the BBWD application forecast and show the volume to be mitigated after adjusting for wastewater returns via on-site septic systems for each forecast scenario. The summary assumes that BBWD’s future withdrawals will be discharged to on-site septic systems at the same rate (71%, with 29% sent to the Wareham WWTP which discharges to surface water) as current water withdrawals.

Question 5: MassDEP notes that the Massachusetts Maritime Academy holds an NPDES permit for discharge to surface water. Does this permit include discharge of the water provided by BBWD? If so, what percentage of the water distributed by the BBWD goes to Massachusetts Maritime Academy?

After calculating the adjustment for withdrawals over baseline that will be returned to groundwater through septic system discharge, BBWD’s mitigation requirement will be up to 59,000 gallons per day if the DCR 65/10 forecasts are used in permitting, and up to 107,000 gallons per day if the BBWD forecasts are used.

BBWD's Mitigation Volume Calculation	
DCR 65/10 Forecast	BBWD's Forecast
Permitted amount above Baseline = 0.15 MGD Permitted amount above Baseline: $0.66 - 0.51 = 0.15$ MGD	Permitted amount above Baseline = 0.27 MGD Permitted amount above Baseline: $0.78 - 0.51 = 0.27$ MGD
Adjustment for Wastewater Discharge to Local Groundwater = 0.091 MGD 71% of increased withdrawals are delivered to areas with on-site septic systems: $0.15 \text{ MGD} \times 0.71 (71\%) = 0.1065 \text{ MGD}$ 85% of water delivered to areas with on-site septic systems returns to groundwater: $0.1065 \text{ MGD} \times 0.85 (85\%) = 0.090525 \text{ MGD}$	Adjustment for Wastewater Discharge to Local Groundwater = 0.163 MGD 71% of increased withdrawals are delivered to areas with on-site septic systems: $0.27 \text{ MGD} \times 0.71 (71\%) = 0.1917 \text{ MGD}$ 85% of water delivered to areas with on-site septic systems returns to groundwater: $0.1917 \text{ MGD} \times 0.85 (85\%) = 0.162945 \text{ MGD}$
Mitigation Amount after Adjustment for Wastewater Discharge to Local Groundwater = 0.059 MGD Permitted amount above baseline (0.15 MGD) – adjustment for wastewater discharge to local groundwater (0.091 MGD) = 0.059 MGD or 59,000 gallons per day	Mitigation Amount after Adjustment for Wastewater Discharge to Local Groundwater = 0.099 MGD Permitted amount above baseline (0.27 MGD) – adjustment for wastewater discharge to local groundwater (0.163 MGD) = 0.107 MGD or 107,000 gallons per day

Question 7: BBWD is required to prepare a Mitigation Plan and implementation timetable for any volumes requested above its baseline of 0.51 MGD in consultation with MassDEP and EOWEA Agencies, as appropriate.

- Please note that the mitigation volume is adjusted by subtracting 85% of the withdrawal volume above baseline that will be returned to groundwater through septic systems. Up to 85% of BBWD's water use that is disposed through septic systems is returned to the ground water and will not require mitigation.

The enclosed *Mitigation Planning for WMA Permitting for Public Water Systems* provides information on mitigation planning.

- Qualifying mitigation measures that have been put into place since 2005, and that are still operable or effective, are eligible components of a Mitigation Plan and should be included in the written plan with the date of implementation.

Additional mitigation activities may be phased in over the life of this permit provided that any volumes withdrawn over the 0.51 MGD baseline are mitigated prior to when those volumes are withdrawn.

- The Mitigation Plan will need to include a plan and anticipated implementation schedule for all mitigation required during the life of the permit. However, should water use increase by less than forecast, mitigation implementation will be required only for actual water withdrawals.

MassDEP staff will be available for consultation on potential mitigation projects at BBWD's request. Contact Beth McCann (Elizabeth.mccann@mass.gov or 617 292-5901) to arrange a mitigation planning consultation meeting.

Minimization of Groundwater Withdrawal Impacts in subbasins¹ having August net groundwater depletion of 25% or greater was incorporated into the Water Management Regulations in November 2014. Minimization is not required because there are no delineated subbasins in coastal areas, including the portion of the Buzzards Bay Basin where BBWD is located, and therefore no delineation of net groundwater depletion.

Coldwater Fish Resource Protection was incorporated into the Water Management Regulations in November 2014. BBWD's withdrawals do not impact any waters that the MA Division of Fisheries and Wildlife has identified as supporting coldwater fish at this time, and therefore Coldwater Fish Resource Protection will not be incorporated into BBWD's renewed permit.

If you have any questions concerning this letter, please contact Beth McCann at Elizabeth.mccann@mass.gov.

Sincerely,



Duane LeVangie, Chief
Water Management Program

Enc: *Functional Equivalence: 10% Unaccounted for Water Performance Standard
Mitigation Planning for WMA Permitting for Public Water Systems*

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Cc: E Graham, DCR OWR
P Kellogg, MassDEP SERO
K Bentsen, MassDFW
J Pederson, MWWA
J Blatt, Mass Rivers Alliance
S. Bower, Mass Rivers Alliance

¹ Subbasins used for WMA permitting are the 1,395 subbasins delineated by the U.S. Geological Survey in *Indicators of Streamflow Alteration, Habitat Fragmentation, Impervious Cover, and Water Quality for Massachusetts Stream Basins* (Weiskel et al., 2010, USGS SIR 2009-5272).

Functional Equivalence with the 10% Unaccounted for Water (UAW) Performance Standard

Water Loss Control Program: MassDEP will consider PWS permittees who cannot meet the 10% UAW performance standard to be functionally equivalent, and in compliance with their permit, if they have an on-going Water Loss Control Program in place that ensures best practices for controlling water loss.

Developing a Municipal Water Loss Control Program: A permittee who fails to document compliance with the 10% UAW performance standard for 2 out of the 3 years during the permit period, shall develop a Municipal Water Loss Control Program in accordance with the *AWWA M36 Water Audits and Loss Control Program*. Within 5 full calendar years of failing to meet the standard, the permittee shall:

1. Conduct an annual “top down” water audit, calculate the data validity level/score using AWWA Water Loss Control Committee’s Free Water Audit Software, and submit the AWWA WLCC Free Water Audit Software Reporting Worksheet and data validity score annually as an attachment to the Annual Statistical Report (ASR).
 - If a PWS’s data validity level/score is less than Level III (51-70), steps recommended through the audit(s) shall be taken to improve the reliability of the data prior to developing a component analysis and long-term program to reduce real and apparent water losses.
 - i. Data with a validity score of 50 or less are considered too weak to be used to develop a component analysis or for infrastructure planning and maintenance.
 - ii. Developing data with an acceptably strong validity score can be a multi-year process.
2. When the data validity score meets the Level III (51-70) requirement, conduct a component analysis to identify causes of real and apparent water loss and develop a program to control losses based on the results of the component analysis.
3. Submit the Municipal Water Loss Control Program that includes an M36 component analysis and implementation schedule, and identifies implementation funding to the Department.
4. Upon request of the Department, the permittee shall report on its implementation of the water loss control program.
5. Continued implementation of the Program will be required in order for the permittee to be considered functionally equivalent with the 10% UAW performance standard and in compliance with their permit.

A PWS permittee may choose to discontinue the Municipal Water Loss Control Program implementation if UAW, as reported on the ASR and approved by the Department, is below 10% for four consecutive years, and the water audit data validity scores are at least Level III (51-70) for the same four years.

NOTE FOR SMALL SYSTEMS: For small systems with less than 3,000 service connections or a service connection density of less than 16 connections per mile of pipeline, the Unavoidable Annual Real Loss (UARL) calculation and the Infrastructure Leak Index (ILI) developed as the final steps of the top down water audit may not result in valid performance indicators, and may not be comparable to the UARL and ILI calculations for larger systems.

However, these small systems can benefit from developing reliable data and conducting an annual top down water audit. Small systems can rely on the real losses (gallons per mile of main per day) performance indicator developed in the water audit as a measure of real water loss when developing a water loss control program. The M36 Manual discusses the audit process for small systems, and includes a chapter to guide small systems in understanding the results of their audits and in developing a water

loss control program (*Manual of Water Supply Practices – M36, Fourth Edition, Chapter 9: Considerations for Small Systems*, pp. 293-305).

MassDEP Water Loss Control Program: If the permittee is required to develop a Water Loss Control Program in order to be functionally equivalent with the 10% Unaccounted for Water Performance Standard, and the permittee has not developed a Municipal Water Loss Control Program that includes a component analysis and identifies implementation funding after 5 full calendar years of failing to meet the standard, the permittee will be required to implement the MassDEP UAW Water Loss Control Program measures outlined below:

- Complete an annual water audit and leak detection survey, as described in the AWWA M36 Manual, for the entire system.
 - Within one year, repair 75% (by water volume) of all leaks detected in the survey that are under the control of the public water system;
 - Thereafter, repair leaks as necessary to reduce permittee's UAW to 10% or the minimum level possible.
- Meter inspection and, as appropriate, repair, replace and calibrate water meters:
 - Large Meters (2" or greater) – within one year
 - Medium Meters (1" or greater and less than 2") – within 2 years
 - Small Meters (less than 1") - within three years
 - Thereafter, calibrate and or replace all meters according to type and specification.
- Bill at least quarterly within three years.
- Review the permittee's water pricing structure and ensure revenues are sufficient to pay the full cost of operating the system.

Hardship: A permittee may present an analysis of the cost-effectiveness of implementing certain conservation measures included in the MassDEP Water Loss Control Program and offer alternative measures. Any analysis must explicitly consider environmental impacts and must produce equal or greater environmental benefits.

A permittee's hardship analysis shall:

- Document economic hardship and present an analysis demonstrating that implementation of specific measures will cause or exacerbate significant economic hardship;
- Present reasons why specific measures are not cost-effective because the cost would exceed the costs of alternative methods of achieving the appropriate standard; and
- Propose specific conservation measures that would result in equal or greater system-wide water savings or equal or greater environmental benefits than the conservation measures included in the MassDEP UAW Water Loss Control Program.

MassDEP will review a permittee's detailed, written analysis to determine whether unique circumstances make specific water loss control measures less cost-effective than alternatives, or infeasible for the permittee.

Mitigation Planning for WMA Permitting for Public Water Systems

The Order to Complete/Request for Additional Information that MassDEP prepares after review of each permit application may include additional instructions or information, specific to the applicant, to be used in developing the mitigation plan and implementation timetable.

MassDEP staff will be available for consultation on potential mitigation projects. Contact Beth McCann (Elizabeth.mccann@mass.gov or (617)292-5901) to arrange a mitigation planning consultation meeting.

Direct Mitigation Activities will improve streamflow as a result of increased groundwater recharge, decreased stormwater runoff to streams, or surface water releases. The credit is based on a volumetrically calculated rate of water returned within the basin. The following actions can be considered for direct mitigation credit. MassDEP has developed detailed guidance and certification procedure for each of these direct mitigation activities.

1) **Surface Water Release**

A permittee may have control over an impoundment that could be used to supplement downstream flow through controlled releases. Such opportunities will be informed by factors such as a reservoir's firm yield; ecological, infrastructure, and recreation considerations for the impoundment; structural limitations of the dam; and potential to improve the timing, magnitude, and duration of downstream flows to more closely mimic natural flow conditions and improve habitat or fish passage, without compromising other in-lake uses.

- MassDEP review shows that BBWD has no surface water impoundments from which water could be released to mitigate streamflow impacts. **Further discussion IS NOT required in the Mitigation Plan.**

2) **Stormwater Recharge**

Direct mitigation credit can be awarded where areas of directly connected impervious surfaces are disconnected, so that stormwater has an opportunity to infiltrate into the soil and recharge the underlying aquifer. Directly connected impervious surfaces are those that drain to a stormwater collection system and discharge directly to a waterway. Direct stormwater recharge requires the use of stormwater BMPs to infiltrate stormwater runoff to the subsurface.

- **Contact your Water Management Act permit application reviewer if you have stormwater recharge projects.**

3) **Infiltration and Inflow (I/I) Removal**

Infiltration, in the context of wastewater collection system maintenance, is groundwater that enters collection systems through sources such as defective pipes, pipe joints, and manhole walls.

Inflow, in the context of wastewater collection system maintenance, is water that enters the collection system through direct sources such as: catch basins, manhole covers, cross connections with storm drains, sump pumps, foundation drains, and downspouts.

- **Contact your Water Management Act permit application reviewer if you have an I/I system maintenance program for wastewater discharged to the Wareham Wastewater Treatment Facility.**

4) Decommissioning Cranberry Water Withdrawals

Direct mitigation credit can be awarded for acquiring bogs that were in operation between 2003-2005 and terminating the registration or permit for the bogs. Credit will be based on the consumptive water loss from the bogs in operation. **Indirect credit** can also be awarded for the land associated with the bog, but outside the bog footprint, if the land meets the criteria for Land Protection credit.

- **Contact your Water Management Act permit application reviewer if you have acquired decommissioned bog acreage.**

Indirect Mitigation activities are environmental improvements that will help to compensate for streamflow impacts resulting from withdrawals, such as habitat and water quality improvements, and water supply protection. Indirect mitigation activities are undertaken to offset the impacts of a withdrawal but are generally not amenable to volumetric calculation. Indirect mitigation requirements will be developed on a case-by-case basis in consultation with permittees. The table below outlines types of indirect mitigation that permittees may consider in their mitigation plan.

MassDEP has developed detailed guidance and certification procedure for each of these indirect mitigation activities. **Please contact your permit application reviewer for information on relevant projects.**

Indirect Mitigation Project Types	
Category	Indirect Mitigation Activity
Habitat Improvement*	Remove a dam or other flow barrier*
	Culvert replacement to meet stream crossing standards*
	Stream restoration (riparian planting and daylighting)*
	Install and maintain fish passage*
	Establish or contribute to an aquatic habitat restoration fund
Land Acquisition	Acquire property in for source water protection*
	Acquire property for other natural resource protection*
Wastewater	I/I removal program
Stormwater	Stormwater Bylaw
	Stormwater Utility
	MS4 Implementation
Bylaws (non-stormwater)	Private Well Bylaw
	Wetlands Bylaw
Water Quality Improvements	Septic System Maintenance Program
	Fertilizer By-Law
	Other Water Quality Improvements on a case by case basis in consultation with MassDEP
<p>*Note: Certain federal environmental improvement grants, and the projects funded in whole or in part by those grants, cannot be used to fulfill mitigation requirements. Accruing mitigation credit for projects funded with such restricted funds could result in the permittee being required to return federal grant funds. Permit applicants should be sure to check for restrictions on projects funded using federal environmental improvement grants, particularly dam removal, culvert replacement, fish passage and stream restoration projects, before including the project in a Mitigation Plan.</p>	

Mitigation Plan Implementation Timeline

The implementation timeline for a Mitigation Plan may be phased over the life of the permit provided that any water withdrawn over baseline is mitigated before those volumes are withdrawn. The permittee may delay implementation of the mitigation plan if withdrawals remain below baseline. All WMA permits undergo periodic review, with the permits typically reviewed at Years 5, 10, and 15 based on the permit expiration date for that basin. At the beginning of each 5-year period in which withdrawals are expected to exceed baseline, the permittee must implement mitigation activities to offset the anticipated withdrawal volume over baseline for that upcoming 5-year period.

MassDEP will make reasonable allowances, as necessary, for the first few years of the permit for suppliers whose withdrawals are above baseline at the time a permit is issued or renewed.