Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Secretary

Martin Suuberg
Commissioner

October 24, 2019

Blythe C. Robinson, Town Administrator
Town of Norfolk
1 Liberty Lane, Room 205
Norfolk, MA 02056

Town: Norfolk
PWS Name: Norfolk Water Division
PWS ID #: 2208000
WMA Permit #: 9P-2-20-208.01
MassDEP Transmittal: X277105
Action: Final WMA Permit Amendment

Dear Ms. Robinson,

Please find the enclosed documents:

- Findings of Fact in Support of the Final WMA Permit Amendment Decision; and
- Final Water Management Act Permit Amendment 9P-2-20-208.01for the Town of Norfolk in the Charles River Basin.

If you have any questions regarding the permit, please contact Susan Connors at 508-767-2701 or me at 508-767-2827.

Sincerely,

Marielle Stone, Deputy Regional Director
Bureau of Water Resources

Cc: Robert McGhee, 33 Medway Branch, Norfolk, MA 02056
Ann Marie Petricca, Environmental Partners Group, Inc, 1900 Crown Colony Drive, Suite 402, Quincy, MA 02169 and Ryan Allgrove and Mark White (via email)
Town of Millis Board of Selectmen, 900 Main St, Millis, MA 02054
Emily Norton, Executive Director, Charles River Watershed Association
Jim McKay, Millis Public Works (via email)
Kathy Lannon and Barbara Thissell, Millis Health Department (via email)

continued on next page…

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Cc: Russ Tierney and Allen Phinney, Norfolk Water (via email)
Robert Cantoreggi, Deacon Perrotta, and Laurie Ruszala, Franklin DPW (via email)
Duane LeVangie, MassDEP-WMA (via email)
Jennifer A. Pederson, Mass Water Works Association (via email)
Julia Blatt, Mass Rivers Alliance (via email)

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Findings of Fact in Support of the Final Permit Amendment Decision
Town of Norfolk, Water Management Permit 9P-2-20-208.01

The Massachusetts Department of Environmental Protection ("MassDEP") has completed its review of the Water Management Act Permit Amendment application for the Town of Norfolk ("Norfolk") in the Charles River Basin pursuant to the Water Management Act, M.G.L. ch. 21G. As a result of the review and Norfolk's response to the Order to Complete that was received March 27, 2019, MassDEP hereby issues this Final Water Management Act Permit #9P-2-20-208.01 (the "Permit") in accordance with the Water Management Act ("WMA" or "the Act").

MassDEP makes the following Findings of Fact in support of the attached permit amendment, and includes herewith its reasons for approving the Permit and for the conditions of approval imposed, as required by MGL c 21G, §11 and the "Massachusetts Water Resources Management Program", 310 CMR 36.00 ("the Regulations").

The Town of Norfolk's Water Withdrawal and Permit History

The Town of Norfolk is authorized through its WMA Registration Statement and Permit to withdraw up to 229.95 MGY or 0.63 MGD from its sources in the Charles River Basin. On March 1, 2010 the Permit was renewed through February 28, 2029. The following Permit is an amendment to add a new withdrawal location, the Holbrook Wellfield. No additional withdrawal volume is authorized by this Permit. The new source will provide additional withdrawal capacity and flexibility within the current authorized withdrawal volume. Norfolk's reported withdrawal volumes for 2016, 2017, and 2018 were 0.42 MGD, 0.44 MGD, and 0.46 MGD respectively.

The Permit Extension Act and Permit Expiration Dates

The Permit Extension Act (PEA), Section 173 of Chapter 240 of the Acts of 2010, as amended by Sections 74 and 75 of Chapter 238 of the Acts of 2012, extended all existing permits by four years. Therefore the original expiration date of February 28, 2029 has been extended to February 28, 2033 for all permits in the Charles River Basin. Note that MassDEP revised the Water Management Act Regulations (310 CMR 36.00) in November 2014 to require permittees, where applicable, to address the impact of withdrawals on Cold Water Fishery Resources, and develop Minimization and Mitigation Plans. Changes were made to a few conditions as noted in

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the following descriptions but for the most part issues that are not directly related to the Permit Amendment will be addressed in the next permit review for Charles River Basin permits which is scheduled for 2020.

The Water Management Act

Permit Factors

Section 7 of the Act requires that MassDEP issue permits that balance a variety of factors including without limitation:

- Impact of withdrawal on other water sources;
- Water available within the safe yield of the water source;
- Reasonable protection of existing water uses, land values, investments and enterprises;
- Proposed use of the water and other existing or projected uses from the water source;
- Municipal and Massachusetts Water Resources Commission (WRC) water resources management plans;
- Reasonable conservation consistent with efficient water use;
- Reasonable protection of public drinking water supplies, water quality, wastewater treatment capacity, waste assimilation capacity, groundwater recharge areas, navigation, hydropower resources, water-based recreation, wetland habitat, fish and wildlife, agriculture, flood plains; and
- Reasonable economic development and job creation.

Safe Yield Permit Factor

Among the minimum permit factors Section 7 of the WMA requires is a determination by MassDEP that permitted water withdrawals are within the safe yield of the water source from which they are made. Section 2 of the Act defines "safe yield" as: "the maximum dependable withdrawal that can be made continuously from a water source including ground or surface water during a period of years in which the probable driest period or period of greatest water deficiency is likely to occur; provided however, that such dependability is relative and is a function of storage and drought probability".

For the purposes of the Water Management Program, MassDEP considers a water source to be the river basins delineated by the Water Resources Commission at 31 CMR 4.03. A map of the major river basins delineated by the Commission can be viewed in the Department of Conservation and Recreation guidance document "A Guide to the Interbasin Transfer Act and Regulations".

This permit is being issued in consideration of the safe yield methodology adopted by MassDEP on November 7, 2014, and described in the regulations at 310 CMR 36.13. MassDEP used the methodology described in the Regulations to calculate the safe yield for each river basin.

Under Section 11 of the Water Management Act, MassDEP cannot issue permits when the combined registered and permitted allocated withdrawal volumes exceed the safe yield of the water source. As of the issuance date of this Permit, the total allocated withdrawal volume does not exceed the safe yield for the Charles Basin. Under this Permit the Charles Basin safe yield will continue to be higher than the combined allocated withdrawal volume because the Permit

does not increase Norfolk's total allocated withdrawal but only authorizes a new source from which to withdraw those volumes.

Findings of Fact for the Performance Standards

Specific performance standards are applied to new Water Management permits and to existing permits at the time they are amended, during permit reviews, or permit renewal. Consistent with Section 3 of the Act, the performance standards of 65 residential gallons per capita day or less and 10% or less of unaccounted for water, summer limits on withdrawals, and efforts to offset the impacts of increasing withdrawal volumes are based on the Massachusetts Water Conservation Standards approved by the Water Resources Commission in 2006 and revised in July 2018. The latest Standards can be found at:
https://www.mass.gov/files/documents/2018/09/11/ma-water-conservation-standards-2018.pdf

MassDEP believes these standards are reasonable based on studies and data developed throughout the country, the 1996 AWWA Leak Detection and Water Accountability Committee report on water accountability (AWWA Journal; July 1996; pp. 108-111), and the fact that the average values in 2017 for Massachusetts were 54 RGPCD, and 14% UAW. While these performance standards represent the minimum standards required for compliance with the Permit, MassDEP believes that through the implementation of all the terms and conditions of Water Management permits, municipalities can meet the performance standards for RGPCD and UAW.

Norfolk has been required to meet the 65 residential gallons per capita day (RGPCD) and 10% unaccounted-for-water (UAW) performance standards since calendar year 2011. MassDEP will consider any permittee that has been unable to meet the 65 RGPCD or 10% UAW performance standard within five years of receiving its permit to be achieving functionally equivalent compliance with the performance standards, if they:

- are complying with the Water Conservation requirements included in the permit,
- have implemented the required limits on nonessential outdoor water use, and
- are making demonstrable efforts to finance, implement and enforce a MassDEP-approved compliance plan.

Because circumstances vary, a permittee may present an analysis of the cost effectiveness of implementing certain conservation measures required by MassDEP and offer alternative measures. The analysis must explicitly consider environmental impacts and must produce environmental benefits. MassDEP will allow permittees to:

- 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 Functional Equivalence Plan(s) (See Appendix A & B).

Findings of Fact for Special Permit Conditions

The following Findings of Fact for the special condition included in the permit generally describe the rationale and background for each special condition in the permit. This summary of permit special conditions is not intended to, and should not be construed as, modifying any of the special conditions. In the event of any ambiguity between this summary and actual permit conditions, the permit language shall control.

MassDEP records indicate that all of Norfolk's sources have approved Zone II delineations. Public water suppliers are required to obtain MassDEP approval of Zone II delineations during the new source approval process and prior to activating any new sources; therefore this condition has been removed as a condition of this permit. The Zone II delineation for the proposed wellfield was approved with the WS19 pumping test approval on February 12, 2019.

Special Condition 1, Maximum Authorized Annual Average Withdrawal Volume, reflects the authorized withdrawal volumes based on water use projections prepared by the Department of Conservation and Recreation (DCR), Office of Water Resources for Norfolk dated November 18, 2008. The volume allocated for Period One of the permit used DCR's projection for Norfolk that assumed water use calculated with the RGPCD and UAW values calculated at that time. The allocation for the final three periods of the permit assumes future water use based on 65 RGPCD and 10% UAW. These water needs forecast were prepared based on the Water Resources Commission's policy for developing water needs forecasts, which is available at: https://www.mass.gov/files/documents/2016/08/ob/forecast.pdf.

Norfolk's total authorized withdrawal may be increased by an additional 5% (0.63 MGD registered and permitted for a total of up to 229.95 MGY) to accommodate uncertainty in the growth projections, and/or to accommodate the water demand of a community that has met the 65 RGPCD and 10% UAW performance standards or has not met the performance standards, but has met the functional equivalence requirements included in this permit. MassDEP will use its permitting discretion to apply the 5% buffer as warranted during a review of the permit or through the approval of a permit amendment application.

Special Condition 2, Maximum Authorized Daily Withdrawals from each Withdrawal Point, reflects the maximum daily withdrawal rates by source, according to MassDEP approved pumping test and/or Zone II rates. This amendment includes an assigned rate of 0.40 MGD for the Holbrook Wellfield based on the Zone II delineation.

Special Condition 3, Groundwater Supply Protection, reflects the requirements for Norfolk to meet compliance with the Massachusetts Drinking Water Regulations at 310 CMR 22.21(1)(e). Specifically the Zone II for the Holbrook Wellfield needs to be adopted into the "Aquifer and Water Supply and Interim Wellhead Protection District" in Norfolk's Zoning Bylaws prior to activation of the wellfield. The updated map is proposed to be adopted into the zoning bylaw at the Fall 2019 Town Meeting.

Special Condition 4, Performance Standard for Residential Gallons Per Capita Day Water Use, discussed previously. As accepted by MassDEP, Norfolk's RGPCD values for 2016, 2017, and 2018 were 50, 48, and 47, respectively.

Special Condition 5, Performance Standard for Unaccounted for Water (UAW), discussed previously. This permit condition has changed since the 2010 permit issued to Norfolk to reflect MassDEP's latest approach to controlling UAW. UAW is defined as the residual resulting from the total amount of water supplied to a distribution system as measured by master meters, minus the sum of all amounts of water measured by consumption meters in the distribution system, and minus confidently estimated and documented amounts used for certain necessary purposes.

UAW includes unavoidable leakage, recoverable leakage, meter inaccuracies (unless they fall under the category of source meter calibration which allows for adjustment per results of source meter calibration); errors in estimation of stopped meters, unauthorized hydrant openings, illegal connections, stand pipe overflows, data processing errors; and undocumented firefighting uses. The need for water main flushing and the use of water in construction or meter calibration should be metered or estimated as appropriate to assist in determining actual demand. Uses that can be confidently estimated and documented in writing include: storage tank overflow and drainage; water main flushing and flow testing; firefighting; bleeders or blow-offs; sewer and stormwater system flushing; and street cleaning. Any adjustments made as a result of properly documented source meter calibration should be provided as required by the Annual Statistical Report (ASR). Any adjustment in the calculation of UAW made as a result of confidently estimated uses should be fully documented in the ASR.

As accepted by MassDEP, Norfolk's UAW percentages for 2016, 2017, and 2018 were 9%, 11%, and 11%, respectively.

Special Condition 6, Requirement to Report Raw and Finished Water Volumes, ensures that the information necessary to evaluate compliance with the conditions included herein is accurately reported.

Special Condition 7, Water Withdrawals that Exceed Baseline Withdrawal Volumes. Baseline withdrawal is the volume withdrawn in compliance with the Act during the calendar year 2005, the average volume withdrawn in compliance with the Act from 2003 to 2005, or the registered volume, whichever is highest. Norfolk's Baseline withdrawal volume is 0.49 MGD, the average withdrawal from 2003-2005. Water use above the 0.49 MGD baseline for Norfolk will require offsets if feasible. As noted above Norfolk has not exceeded their baseline during the last three years. Note this condition will be revised as part of the next permit review.

Special Condition 8, Seasonal Limits on Nonessential Outdoor Water Use, is based upon Permittee's Residential Gallons per Capita Day (RGPCD) for the preceding year, and will be implemented according to either: 1) calendar triggered restrictions; or 2) streamflow triggered restrictions.

1. **Calendar triggered restrictions:** Restrictions shall be implemented from May 1st through September 30th. Many public water suppliers will find this option easier to implement and enforce than the streamflow triggered approach.

2. **Streamflow triggered restrictions:** Restrictions shall be implemented at those times when streamflow falls below designated flow triggers measured at an assigned, web-based, real-time U.S. Geologic Survey (USGS) stream gage from May 1st through September 30th. At a minimum, restrictions shall commence when streamflow falls below the trigger for three consecutive days. Once implemented, the restrictions shall

remain in place until streamflow at the assigned USGS local stream gage meets or exceeds the trigger streamflow for seven consecutive days.

The basis for streamflow triggers is derived from Aquatic Base Flow (ABF) values calculated by the Sustainable Yield Estimator (SYE) for simulated natural flow applied to the assigned local USGS stream gage. The two-tiered trigger values are based on flow levels that are protective of aquatic habitat for fish spawning during the spring bioperiod, designated with the June ABF; and protective flows for fish rearing and growth during the summer bioperiod, designated with the August ABF trigger. Protective flow levels are derived from index gage flow data which represent the least altered stream flows in Massachusetts, and are further described in the Department of Conservation and Recreation (DCR) and USGS Index Reports.

If Norfolk selects the streamflow approach, it has been assigned the USGS local stream gage of #01103500 – Charles River at Dover, MA. The June ABF estimated using SYE is 0.93 cubic feet per second per square mile (cfsm) and the August ABF value is 0.34 cfsm. These cfsm units translate to your local gage streamflow triggers as 170 cubic feet per second (cfs) for May and June, and 62 cfs for July, August and September.

Should the reliability of flow measurement at the Charles River at Dover gage be so impaired as to question its accuracy, Permittee may request MassDEP's review and approval to transfer to another gage to trigger restrictions. MassDEP reserves the right to require use of a different gage.

Drought triggered restrictions are incorporated into the seasonal limits on outdoor water use as outlined in this Special Condition. Times of low streamflow and drought do not always coincide, but both low streamflow and drought conditions can have adverse effects on water supplies, natural resources and aquatic life. Please note that many communities impose drought-based outdoor water use restrictions before the Massachusetts Drought Management Task Force declares a Drought Advisory because drought conditions can begin to impact local water supplies before a regional advisory is declared.

This permit condition will be updated at the next basin wide permit renewal to replace the drought triggered restrictions with a 7 day low flow that will limit non-essential outdoor water use to one day per week regardless of the RGPCD value.

Special Condition 9, Water Conservation Requirements, incorporates the Water Conservation Standards for the Commonwealth of Massachusetts reviewed and approved by the Water Resources Commission in July 2006 and revised in July 2018.

Response to Comments from the Town of Norfolk

Comment 1

The Town of Norfolk submitted a comment via email on May 16, 2019 noting that the Spruce Road Well 2A (2208000-04G) was missing from the Permit.

Response 1

Spruce Road Well 2A is a replacement well that was activated after the 2010 Permit was issued. Replacement wells are added to Permits and Registrations at the next issuance. This Final Permit adds Spruce Road Well 2A as a withdrawal point.

Comment 2
Through their consultant, Norfolk questioned the language in Special Condition 1 regarding access to water volumes in later permit periods and questioned why the third Permit Period contained nine years.

Response 2
MassDEP recognizes that future growth in water demand may not occur precisely as forecast. Therefore, the Final Permit will authorize withdrawals of up to the maximum of 0.63 MGD at any time during the life of the Permit provided that Norfolk is meeting the following Special Permit Conditions and receives MassDEP's approval:

- Residential Gallons Per Capita Day,
- Unaccounted for Water or all UAW functional equivalence requirements,
- Seasonal Limits on Nonessential Outdoor Water Use, and
- Water Conservation Requirements

Additionally, the years of the Permit Periods have been changed to correspond with DCR's water needs forecast.

Response to Comments from Charles River Watershed Association
Charles River Watershed Association (CRWA) submitted comments on June 21, 2019. A meeting was held in Norfolk with representatives from Norfolk, CRWA, and MassDEP to discuss the comments.

Comment 1
"The amended Water Withdrawal Permit (Amended Permit) should require the Town to perform an optimization study incorporating operation of the Wellfield to determine how the system can be operated to meet the community's needs with the minimum possible environmental footprint, especially as related to summertime flow in the Charles River and Mill River."

Response 1
MassDEP reviewed the Sustainable Water Management Initiative (SWMI) subbasins (ID 21133 and ID 21166) that contain Norfolk's existing sources and the proposed wellfield. Both subbasins are classified as Groundwater Category 5 and Biologic Category 5. Subbasin 21133 with the Holbrook Wellfield and Norfolk's Gold Street Wells includes 89 square miles of upstream watershed area and has an August net groundwater depletion (NGD) of 46.1% while the subbasin for Norfolk's Spruce Road Wells represents only 4 square miles of watershed and has an August NGD of 112.3%. Based on this information and reduced pumping capacity at the Gold Street Wells, MassDEP believes that supplementing or shifting withdrawals from subbasin 21166 to 21133 would be an environmental benefit. Any further evaluation of source optimization is not required.

Comment 2
"MassDEP should incorporate the following conditions into the Amended Permit now instead of waiting until either the five-year review scheduled for 2020 (as noted on page 2 of the Findings of Fact) or the permit renewal process scheduled for 2022 (noted on page 3 of Findings of Fact):

- *Use of the most up to date version of the Massachusetts Water Conservation Standards, revised July 2018, as opposed to the version of the standards approved in 2012, and*
- *Offset requirements for water use about the 0.49 MGD baseline"*

Response 2
The final permit has been updated to include the reference to the July 2018 revision of the Massachusetts Water Conservation Standards in the Findings of Fact. Special Condition 7 of the draft and final permits requires that an offset feasibility study be performed if Norfolk's annual average withdrawal volume exceeds the baseline volume of 0.49 MGD. Norfolk has not withdrawn more than the baseline volume of 0.49 MGD. This condition remains unchanged at this time but the baseline volume for Norfolk will be revised in the Permit renewal to 0.52 MGD based on the definition of baseline in the Water Management Act Regulations.

Comment 3
"The Amended Permit should expressly require the development and implementation of a groundwater monitoring plan, and the Town's continued commitment to conservation and demand reduction measures."

Response 3
The statement in the MEPA certificate referenced in CRWA's comment letter is an excerpt from the Environmental Notification Form submitted by Norfolk. Norfolk clarified the intent of its proposal was to monitor ground water levels in the six wellpoints in order to optimize performance. After issuance of the MEPA certificate, MassDEP reviewed the pumping test and determined that there were no areas of concern in the surface water monitoring points during the pumping test that warranted long term monitoring of the ground or surface waters surrounding the wellfield. MassDEP consulted with MEPA staff to confirm they understood that the permit would not be including long term ground monitoring.

MassDEP agrees with the comment regarding continued water conservation and demand reduction measures and includes Special Conditions 4, 5, 7, 8 and 9 in the Permit to address.

Comment 4
"The Town is currently not meeting the UAW standard and must comply with the functional equivalence requirements outlined in Appendix B of the Amended Permit."

Response 4
MassDEP agrees with this comment. Special Condition 5 and Appendix B of the Permit require that Norfolk complies with the functional equivalence requirements of the Permit within 5 full calendar years of Norfolk's failure to document compliance with the UAW performance standard for 2 of the 3 most recent years throughout the permit period.

Comment 5
If at any time in the future MassDEP or the Town seek to accelerate the schedule of permitted Maximum Authorized Annual Withdrawal Volumes mandated by Table 2: Maximum Authorized Annual Withdrawal Volumes, such a proposed acceleration should be subject to public notice and comment in accordance with 310 CMR 36.23.

Response 5
The volumes authorized in Table 2 of Special Condition 1 of the Permit were part of the WMA Permit renewal public notice process. MassDEP recognizes that growth may occur sooner than anticipated in the 20 year water needs forecast. Later volumes in the Permit cannot be withdrawn without MassDEP written approval and are subject to Norfolk's compliance with multiple conditions related to water conservation and offsets.

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WATER WITHDRAWAL PERMIT
MGL C 21G

This Permit Amendment is issued pursuant to the Massachusetts Water Management Act for the sole purpose of authorizing the withdrawal of a volume of water as stated herein and subject to the following special and general conditions. This Permit Amendment conveys no right in or to any property beyond the right to withdraw the volume of water for which it is issued.

PERMIT NUMBER: 9P-2-20-208.01 **RIVER BASIN:** Charles

PERMITTEE: Town of Norfolk

ISSUANCE DATE: October 24, 2019

EXPIRATION DATE: February 28, 2033

NUMBER OF WITHDRAWAL POINTS: 4 Groundwater

USE: Public Water Supply

DAYS OF OPERATION: 365

LOCATION(S):

Table 1: Withdrawal Point Identification

Source Name	PWS Source ID Code
Gold Street Well 1	2208000-01G
Spruce Street Well 2	2208000-02G
Gold Street Well 1A	2208000-03G
Spruce Street Well 2A	2208000-04G
Holbrook Wellfield	To Be Assigned

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SPECIAL PERMIT CONDITIONS

1. Maximum Authorized Annual Average Withdrawal Volume

This permit authorizes the Town of Norfolk (Norfolk) to withdraw water from the Charles River Basin at the rate described below in Table 2. Table 2 specifies the permitted volumes and permitted plus registered volumes for each permit period. The registered volume of 0.17 MGD was previously authorized to Norfolk under Water Management Act Registration #2-20-208.02 for withdrawal from the Charles River Basin. The permitted volume reflected by this rate is in addition to the volume registered to Norfolk. The authorized volumes are expressed both as an annual average daily withdrawal rate (million gallons per day or MGD), and as a total annual withdrawal volume (million gallons per year or MGY) for each permit period of the permit term.

MassDEP bases these withdrawal volumes on the raw water volume from the authorized withdrawal points, and will use the raw water amount to assess compliance with the registered and permitted withdrawal volumes. Norfolk's baseline withdrawal for the purpose of triggering the Special Condition "Water Withdrawals that Exceed Baseline Withdrawal Volumes" is 0.49 MGD.

Table 2: Maximum Authorized Annual Withdrawal Volumes

Permit Periods	Total Raw Water Withdrawal Volumes			
	Permit		Permit + Registration	
	Daily Average (MGD)	Total Annual (MGY)	Daily Average (MGD)	Total Annual (MGY)
3/1/2010 to 2/28/2014	0.36	131.40	0.53	193.45
3/1/2014 to 2/29/2019	0.36	131.40	0.53	193.45
3/1/2019 to 2/28/2024	0.40	146.00	0.57	208.05
3/1/2024 to 2/28/2033	0.43 (0.46*)	156.95 (167.90*)	0.60 (0.63*)	219.00 (229.95*)

*With specific advance written approval from MassDEP, Norfolk is authorized to increase the maximum authorized annual withdrawal volume to 0.63 MGD prior to March 1, 2028 provided that Norfolk is meeting the following Special Permit Conditions:

- Residential Gallons Per Capita Day,
- Unaccounted for Water or all UAW functional equivalence requirements,
- Seasonal Limits on Nonessential Outdoor Water Use, and
- Water Conservation Requirements

2. Maximum Authorized Daily Withdrawal from Each Withdrawal Point

Withdrawals from individual withdrawal points are not to exceed the approved maximum daily volumes listed below in Table 3 without specific advance written approval from MassDEP. The authorized maximum daily volume is the approved rate of each source. In no event shall the combined withdrawals from the individual withdrawal points exceed the withdrawal volumes authorized above in Special Condition 1.

Table 3: Maximum Authorized Daily Withdrawal Volumes

Source Name	PWS Source ID Code	Rate
Gold Street Well 1	2208000-01G	0.432 MGD (300 gpm) combined rate
Gold Street Well 1A	2208000-03G	
Spruce Street Well 2	2208000-02G	0.72 MGD (500 gpm)*
Spruce Street Well 2A	2208000-04G	0.327 MGD (227 gpm)*
Holbrook Wellfield	To Be Assigned	0.40 MGD

*The Spruce Street Wells have a combined approved rate of 500 gpm. Spruce Street Well #1A is further limited to a maximum daily rate of 227 gpm based on the pumping test performance.

3. Groundwater Supply Protection

Permittee shall demonstrate compliance with the Massachusetts Drinking Water Regulations at 310 CMR 22.21(1)(e). The Zone II for the Holbrook Wellfield is required to be adopted into the "Aquifer and Water Supply and Interim Wellhead Protection District" in Norfolk's Zoning Bylaws prior to activation of the wellfield.

4. Performance Standard for Residential Gallons Per Capita Day Water Use

Permittee's performance standard for residential gallons per capita day (RGPCD) is 65 gallons. Permittee is required to report its RGPCD water use annually in its Annual Statistical Report (ASR) and document compliance with this Performance Standard in its ASR. Permittee shall report its RGPCD and the calculation used to derive that figure as part of its ASR including, without limitation, the source of the data used to establish the service population and the year in which this data was developed. See Appendix A for additional information on the requirements if the performance standard for RGPCD is not met.

5. Performance Standard for Unaccounted for Water (UAW)

Permittee's Performance Standard for Water (UAW) is 10% or less of overall water withdrawal for 2 of the most recent 3 years throughout the permit period beginning with calendar year 2018. If Permittee does not meet the standard, it shall be in compliance with the Functional Equivalence Requirements based on the AWWA/IWA Water Audits and Loss Control Programs, Manual of Water Supply Practices M36, as outlined in Appendix B. Permittee is required to report its UAW annually in its Annual Statistical Report (ASR) so as to document compliance with this performance standard. Permittee's ASR shall include the calculation used to derive that figure including, without limitation, the source of data used, the methodology for calculating UAW and any assumptions used in making the calculation.

Nothing in the Permit shall prevent a Permittee who meets the 10% performance standard from developing and implementing a water loss control program following the AWWA M36 Water Audits and Loss Control Programs. Permittees implementing a water loss control program based on AWWA M36 annual water audits and guidance shall continue to report UAW annually as required in the Annual Statistical Report for public water suppliers.

6. Requirement to Report Raw and Finished Water Volumes

Norfolk shall report annually on its ASR the raw water volumes and finished water volumes for the entire water system and the raw water volumes for individual water withdrawal points.

7. Water Withdrawals that Exceed Baseline Withdrawal Volumes

Norfolk's baseline withdrawal volume (Baseline) is 0.49 MGD or 178.85 MGY. Norfolk is required to perform an Offset Feasibility Study when water withdrawals for a calendar year exceed its Baseline. Norfolk shall make a written analysis of the cost effectiveness of each of the following Best Management Practices (BMP's) and any other BMP's selected by Norfolk to offset withdrawal increases.

BMP's to be evaluated shall include, but are not limited to:

Development Guidelines

- Low Impact Development, Conservation Development and Smart Growth bylaws or regulations in addition to those implemented through the November 2001 Best Development Practices Guidebook
- Land clearing/development bylaws (loam, native vegetation site clearing limitation, lawn size limitations) in addition to those implemented through the November 2001 Best Development Practices Guidebook

Water Bank

- Traditional water and/or sewer bank
- Institute "hook-up" fee for all new development with revenues to be dedicated to water conservation programs such as rebate programs for homeowners (efficient appliances)

Stormwater Management and Recharge

- Stormwater Utility or dedicated stormwater fees used to build and maintain stormwater infiltration facilities
- By-law implementing MA stormwater recharge standards townwide beyond the wetland areas required in the MA Stormwater Policy
- By-law requiring stormwater recharge above the rates required in the MA Stormwater Policy

Infiltration and Inflow

- Enhanced I/I program going forward for the next 5 years

Local Infiltration of Waste Water

If Norfolk is required to perform a Study, Norfolk shall:

- Within 60 days of the filing of an ASR indicating that a Study is required, submit a Study Scope of Work to MassDEP for approval;
- Within 6 months of MassDEP's approval of the Study Scope of Work, submit the completed Study to MassDEP for approval;
- MassDEP's approval of the Study Scope of Work and the completed Study will be presumed if MassDEP does not issue a written approval or denial of such submission within 60 days of the date submitted to MassDEP for approval.

If Norfolk files a subsequent ASR indicating that withdrawals for a calendar year again have exceeded its Baseline, then Norfolk shall:

- Implement the results of the Study;
- Document such implementation annually at the time it files its ASR; and
- Continue to implement the results of the Study as long as withdrawals exceed Baseline.

8. Seasonal Limits on Nonessential Outdoor Water Use

Permittee shall limit nonessential outdoor water use through mandatory restrictions from May 1st through September 30th as outlined in Table 4 below.

Permittee shall be responsible for tracking streamflows and drought advisories and recording when restrictions are implemented if streamflow triggered restrictions are implemented. See *Accessing Streamflow and Drought Advisory Website Information* in Table 4 for instructions.

Permittee shall document compliance with the summer limits on nonessential outdoor water use annually in its Annual Statistical Report (ASR), and indicate whether it anticipates implementing calendar triggered restrictions or streamflow triggered restrictions during the next year.

Nothing in this permit shall prevent Permittee from implementing water use restrictions that are more restrictive than those set forth in this permit.

Water Uses Restrictions

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

- irrigation of lawns via sprinklers or automatic irrigation systems;
- washing of vehicles, except in a commercial car wash or as necessary for operator safety; and
- washing of 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 by means of automatic sprinklers outside the hours of 9 am to 5 pm; and
- watering lawns, gardens, flowers and ornamental plants 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 limited fairway watering, or irrigation by plant nurseries as necessary to maintain stock).

Table 4 Seasonal Limits on Nonessential Outdoor Water Use

Permittees meeting the 65 RGPCD standard for the preceding year (as reported in the ASR and accepted by MassDEP) must implement either:

1. **Calendar Triggered Restrictions from May 1st through September 30th**
   No nonessential outdoor water use from 9 am - 5 pm

2. **Streamflow Triggered Restrictions from May 1st through September 30th**
   No nonessential outdoor water use from 9 am - 5 pm whenever:
   a) Streamflow at the assigned USGS local stream gage 01103500 Charles River at Dover falls below the following designated flow triggers for **three (3)** consecutive days:
      - May 1st through June 30th: **170 cfs** (based on minimum flows that are protective of habitat for fish spawning during the spring bioperiod), and
      - July 1st through September 30th: **62 cfs** (based on minimum flows that are protective of habitat for fish rearing and growth during the summer bioperiod).

      Once implemented, the restrictions shall remain in place until streamflow at the assigned USGS local stream gage meets or exceeds the trigger streamflow for **seven (7)** consecutive days; or

   b) A Drought Advisory or higher is declared by the Massachusetts Drought Management Task Force.

Permittees NOT meeting the 65 RGPCD standard for the preceding year (as reported in the ASR and accepted by MassDEP) must implement either:

1. **Calendar Triggered Restrictions from May 1st through September 30th**
   a) **Nonessential outdoor water use is allowed TWO DAYS per week** before 9 am and after 5 pm; and

   b) **Nonessential outdoor water use is allowed ONE DAY per week** before 9 am and after 5 pm; whenever a Drought Advisory or higher is declared by the Massachusetts Drought Management Task Force.

2. **Streamflow Triggered Restrictions from May 1st through September 30th**
   Nonessential outdoor water use is allowed ONE DAY per week before 9 a.m. and after 5 p.m. whenever:
   a) Streamflow at the assigned USGS local stream 01103500 Charles River at Dover falls below the following designated flow triggers for **three (3)** consecutive days:
      - May 1st through June 30th: **170 cfs** (based on minimum flows that are protective of habitat for fish spawning during the spring bioperiod), and
      - July 1st through September 30th: **62 cfs** (based on minimum flows that are protective of habitat for fish rearing and growth during the summer bioperiod).

      Once implemented, the restrictions shall remain in place until streamflow at the assigned USGS local stream gage meets or exceeds the trigger streamflow for **seven (7)** consecutive days; or

   b) A Drought Advisory or higher is declared by the Massachusetts Drought Management Task Force.

Instructions for Accessing Streamflow and Drought Advisory Website Information
Streamflow information is available at the USGS National Water Information System (NWIS): Web Interface. The USGS NWIS default shows Massachusetts streamflows in real time, i.e., the most recent, usually quarterly hourly, reading made at each USGS stream gage. Seasonal Limits on Nonessential Outdoor Water Use are implemented when the mean daily streamflow falls below the designated trigger. The mean daily flow is not calculated until after midnight each day when the USGS computes the hourly data into a mean daily streamflow. As a result, permittees must use the mean daily streamflow from the preceding day when tracking streamflows. **Mean daily streamflow gage** readings are available at the USGS NWIS Web Interface at http://waterdata.usgs.gov/ma/nwis/current/?type=flow. • Scroll down to 01103500 Charles River at Dover. • Click on the gage number. • Scroll down to "Provisional Date Subject to Revision – Available data for this site" and click on the drop down menu. • Click on "Time-series: Daily data" and hit GO. • Scroll down to the "Available Parameters" box. Within the box, be sure "Discharge (mean)" is checked, then, under "Output Format" click "Table" and hit GO. • Scroll down to "Daily Mean Discharge, cubic feet per second" table and find the current date on the table. • Compare the cubic feet per second (cfs) measurement shown on the table to the cfs shown under Streamflow Triggered Restrictions above.
Drought Advisory information is available at the Massachusetts Department of Conservation and Recreation (DCR) Drought Status Website at https://www.mass.gov/service-details/current-drought-status. • The color coded map displays the six drought regions in Massachusetts. Restrictions are implemented when a Drought Advisory, Watch, Warning or Emergency is announced through the DCR website.

Public Notice of Water Use Restrictions

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

- For calendar-triggered restrictions, customers shall be notified by April 15th each year.
- For streamflow-triggered restrictions, when streamflow at the assigned USGS local stream gage falls below a streamflow trigger for three 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 streamflow for aquatic life; 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. Filing shall be in writing on the Water Use Restrictions Form on the MassDEP website. Notice to MassDEP need not be provided if Permittee has already implemented water use restrictions that conform to the applicable restrictions and those restrictions are still in force.

9. Water Conservation Requirements

Compliance with the following conservation measures was required in the Permit with an issuance date of March 1, 2010. Continuing compliance is required.

Table 5: Minimum Water Conservation Requirements

System Water Audits and Leak Detection
1. At a minimum, conduct a full leak detection survey every three years. Norfolk reported to MassDEP that leak detection surveys are completed annually on the entire distribution system.
2. Perform a leak detection survey of those sections of the distribution system that have not been surveyed within the last year whenever the percentage of unaccounted for water increases by 5% or more (for example an increase from 3% to 8%) over the percentage reported on the ASR for the prior calendar year. Within 60 days of completing the leak detection survey, Permittee shall submit to MassDEP a report detailing the leak detection survey, any leaks uncovered as a result of the survey or otherwise, dates of repair and the estimated water savings as a result of the repairs.
3. Conduct field surveys for leaks and repair programs in accordance with the *AWWA Manual 36*.
4. Permittee shall have repair reports available for inspection by MassDEP. Permittee shall establish a schedule for repairing leaks that is at least as stringent as the following: • Leaks of 15 gallons per minute or more shall be repaired as soon as possible but not later than one month after leak detection.* • Leaks of less than 15 gallons per minute, but greater than 5 gallons per minute, shall be repaired as soon as possible but not later than two months after leak detection.* • Leaks of 5 gallons per minute or less shall be repaired as soon as possible but not later than six months after leak detection, except that hydrant leaks of one gallon or less per minute shall be repaired as soon as possible.* • Leaks shall be repaired in accordance with the priority schedule including leaks up to the property line, curb stop or service meter, as applicable. Have water use regulations in place that require property owners to expeditiously repair leaks on their property. The following exceptions can be considered: • Repair of leakage detected during winter months can be delayed until weather conditions become favorable for conducting repairs;* and • Leaks in freeway, arterial or collector roadways may be coordinated with other scheduled projects being performed on the roadway.** *Reference: MWRA regulations 360 CMR 12.09 **Mass Highway or local regulations may regulate the timing of tearing up pavement on roads to repair leaks.
5. Ensure placement of sufficient funds in the annual water budget to conduct water audits and leak detection and repair leaks as necessary.

Table 5 (Continued): Minimum Water Conservation Requirements
Metering
1. Calibrate all source and finished water meters at least annually and report date of calibration on the ASR.
2. Ensure that the system is 100% metered, including all water use at municipal facilities (schools, school athletic fields, etc.). Permittee reports its system is 100% metered.
3. All water distribution system users shall have properly sized service lines and meters that meet AWWA calibration and accuracy performance standards. AWWA References: AWWA Manual M22 – Sizing Water Service Lines and Meters AWWA Manual M6 – Water Meters, or as amended
4. Permittee shall have an ongoing program to inspect individual service meters to ensure that all service meters accurately measure the volume of water used by your customers. The metering program shall include regular meter maintenance, including testing, calibration, repair, replacement and checks for tampering to identify and correct illegal connections.
5. Ensure placement of sufficient funds in the annual water budget to calibrate, repair, or replace meters as necessary.
Pricing
1. Implement a water revenue structure that includes the full cost of operating the water supply system in compliance with state and federal requirements by the next 5-year review (February 2014). Evaluate revenues every three to five years and adjust rates as needed. Full cost pricing factors all costs - operations, maintenance, capital, and indirect costs (environmental impacts, watershed protection) - into the revenue structure. AWWA References for Additional Information on Pricing: AWWA Manual 1 – Principals of Water Rates, Fees and Charges AWWA Manual 29 – Fundamentals of Water Utility Financing
2. Permittee shall not use decreasing block rates. Decreasing block rates which charge lower prices as water use increases during the billing period, are not allowed by M.G.L. Chapter 40 Section 39L.
Residential and Public Sector Conservation
1. Permittee shall meet the standards set forth in the Federal Energy Policy Act, 1992 and the Massachusetts Plumbing Code.
2. Meter or estimate water used by contractors using fire hydrants for pipe flushing and construction.
3. Municipal buildings • Norfolk reported in the Water Conservation Questionnaire submitted as part of the WMA Permit Amendment application that water saving devices have been installed in all public buildings. Norfolk shall continue to ensure that the plumbing codes are strictly applied in new and renovated buildings.
Industrial and Commercial Water Conservation
1. Permittee shall review the use records for its industrial, commercial and institutional water users and develop an inventory of the largest water users. Permittee shall develop and implement an outreach program designed to inform and (where appropriate) work with its largest industrial, commercial and institutional water users on ways to reduce their water use. Such outreach plans can include, but are not limited to: information on water audits, meter sizing, water reuse, low-flow plumbing fixtures, mandatory outdoor water use restrictions, suggestions for contacting

Table 5 (Continued): Minimum Water Conservation Requirements
Industrial and Commercial Water Conservation continued
trade associations for process specific information on water use reductions, and information on contacting the Executive Office of Environmental Affairs Office of Technical Assistance for Toxics Use Reduction (OTA) which offers a range of assistance and information to help facilities improve water use efficiency and reduce wastewater discharge. OTA can be contacted at (617) 626-1060 or at www.mass.gov/envir/ota.
2. Upon request by MassDEP, Permittee shall report on industrial, commercial and institutional water conservation including the results of its review of water use records for industrial, commercial and institutional water users, the inventory of the largest water users, copies of any outreach materials distributed to industrial, commercial and institutional water users, and to the extent practical, a summary of water use reductions or savings that have resulted. Upon receipt of this report, MassDEP will take whatever action it deems appropriate to promote the interests of the WMA, including without limitation requiring Permittee to take additional actions to reduce industrial, commercial and institutional water use.
Lawn and Landscape
1. Continue to implement Permittee's water use restriction bylaw.
Public Education and Outreach
1. Develop and implement a Water Conservation Education Plan. Permittee's Water Conservation Education Plan shall be designed to educate Permittee's water customers of ways to conserve water. Without limitation, Permittee's plan may include the following actions: • Annual work sheets, included in water bills or under separate cover, to enable customers to track water use and conservation efforts and estimate the dollar savings; • Public space advertising/media stories on successes (and failures); • Conservation information centers perhaps run jointly with electric or gas company; • Speakers for community organizations; • Partner with garden clubs and/or other organizations, to promote efficient water use; • Provide information on water-wise landscaping, gardening, efficient irrigation and lawn care practice; • Public service announcements; radio/T.V./audio-visual presentations; • Joint advertising with hardware stores to promote conservation devices; • Water conservation workshops for the general public • Use of civic and professional organization resources; • Special events such as Conservation Fairs; • Develop materials that are targeted to schools with media that appeals to children, including materials on water resource projects and field trips; and • Make multilingual materials available as needed. References and additional information available through the USEPA Water Sense Program at http://www.epa.gov/watersense.
2. Upon request of MassDEP, Permittee shall report on its public education and outreach effort, including a summary of activities developed for specific target audiences, any events or activities sponsored to promote water conservation and copies of written materials.

GENERAL PERMIT CONDITIONS (applicable to all permittees)

No withdrawal in excess of 100,000 gallons per day over the registered volume (if any) shall be made following the expiration of this permit, unless before that date MassDEP has received a renewal permit application pursuant to 310 CMR 36.00.

1. **Duty to Comply:** The Permittee shall comply at all times with the terms and conditions of this permit, the Act and all applicable State and Federal statutes and regulations.

2. **Operation and Maintenance:** The Permittee shall at all times properly operate and maintain all facilities and equipment installed or used to withdraw water so as not to impair the purposes and interests of the Act.

3. **Entry and Inspections:** The Permittee or the Permittee's agent shall allow personnel or authorized agents or employees of MassDEP to enter and examine any property over which Permittee has authority, title or control, for the purpose of determining compliance with this permit, the Act or the regulations published pursuant thereto, upon presentation of proper identification and an oral statement of purpose.

4. **Water Emergency:** Withdrawal volumes authorized by this permit are subject to restriction in any water emergency declared by MassDEP pursuant to M.G.L. c. 21G, §§ 15-17, M.G.L. c. 150, § 111, or any other enabling authority.

5. **Transfer of Permits:** This permit shall not be transferred in whole or in part unless and until MassDEP approves such transfer in writing, pursuant to a transfer application on forms provided by MassDEP requesting such approval and received by MassDEP at least thirty (30) days before the effective date of the proposed transfer. No transfer application shall be deemed filed unless it is accompanied by the applicable transfer fee established by 310 CMR 36.33.

6. **Duty to Report:** The Permittee shall submit annually, on a form provided by MassDEP, a certified statement of the withdrawal. Such report is to be received by MassDEP by the date specified by MassDEP. Such report must be submitted as specified on the report form.

7. **Duty to Maintain Records:** The Permittee shall be responsible for maintaining withdrawal and all other records as specified by this permit.

8. **Metering**: Withdrawal points shall be metered. Meters shall be calibrated annually. Meters shall be maintained and replaced as necessary to ensure the accuracy of the withdrawal records.

9. **Right to Amend, Suspend or Terminate:** MassDEP may amend, suspend or terminate the permit in accordance with M.G.L. c. 21G and 310 CMR 36.29.

APPEAL RIGHTS AND TIME LIMITS

This permit is a decision of MassDEP. Any person aggrieved by this decision may request an adjudicatory hearing as described herein and in accordance with the procedures described at 310 CMR 36.37. Any such request must be made in writing, by certified mail or hand delivered and received by MassDEP within twenty-one (21) days of the date of receipt of this permit. The hearing request, including proof of payment of the filing fee, must be mailed to:

Case Administrator
MassDEP Office of Appeals and Dispute Resolution
One Winter Street
Boston, MA 02108

No request for an appeal of this permit shall be validly filed unless a copy of the request is sent by certified mail, or delivered by hand to the local water resources management official in the community in which the withdrawal point is located; and for any person appealing this decision, who is not the applicant, unless such person notifies the permit applicant of the appeal in writing by certified mail or by hand within five (5) days of mailing the appeal to MassDEP.

CONTENTS OF HEARING REQUEST
310 CMR 1.01(6)(b) requires the request to include a clear and concise statement of the facts which are the grounds for the request and the relief sought. In addition, the request must include a statement of the reasons why the decision of MassDEP is not consistent with applicable rules and regulations, and for any person appealing this decision who is not the applicant, a clear and concise statement of how that person is aggrieved by the issuance of his permit.

FILING FEE AND ADDRESS
MassDEP's fee transmittal form, together with a valid check, payable to the Commonwealth of Massachusetts in the amount of $100 must be mailed to:

Commonwealth of Massachusetts
Department of Environmental Protection
P.O. Box 4062
Boston, MA 02211

The request shall be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver as described below.

EXEMPTIONS
The filing fee is not required if the appellant is a municipality (or municipal agency), county, district of the Commonwealth of Massachusetts, or a municipal housing authority.

WAIVER
MassDEP may waive the adjudicatory hearing filing fee for any person who demonstrates to the satisfaction of MassDEP that the fee will create an undue financial hardship. A person seeking a waiver must file, together with the hearing request, an affidavit setting forth the facts which support the claim of undue hardship.

Marielle Stone, Deputy Regional Director
Bureau of Water Resources
Central Regional Office

10/24/19
Date

Appendix A – Residential Gallons Per Capita Day (RGPCD)

I. Compliance Plan Requirement

If the Permittee fails to achieve and document compliance with the RGPCD performance standard in its Annual Statistical Report (ASR), then the Permittee must file with that ASR a Residential Gallons Per Capita Day Compliance Plan (RGPCD Plan) which shall:

a. meet the requirement set forth below in Section II;
b. include measures to be implemented to meet the performance standard); and
c. include the schedule for implementing such measures.

The filing of an RGPCD Plan shall not constitute a return to compliance, nor shall it affect MassDEP's authority to take action in response to the Permittee's failure to meet the performance standard.

If an RGPCD Plan is required, the Permittee must:

a. submit information and supporting documentation sufficient to demonstrate compliance with its RGPCD Plan annually at the time it files its ASR; and
b. continue to implement the RGPCD Plan until it complies with the performance standard and such compliance is documented in the Permittee's ASR for the calendar year in which the standard is met.

II. Contents of an RGPCD Plan

A Permittee that does not meet the 65 RGPCD performance standard within 2 years, has the choice to file an RGPCD Plan containing measures that the Permittee believes will be sufficient to bring the system into compliance with the performance standard (Individual RGPCD Plan) or may adopt the MassDEP RGPCD Functional Equivalence Plan that includes mandated Best Management Practices (BMPs).

A Permittee that has been unable to meet the 65 RGPCD performance standard within 5 years must implement the MassDEP RGPCD Functional Equivalence Plan to be considered functionally equivalent with the performance standard.

At a minimum, all RGPCD Compliance Plans must include a detailed:

a. description of the actions taken during the prior calendar year to meet the performance standard;
b. analysis of the cause of the failure to meet the performance standard;
c. description and schedule of the actions that will be taken to meet the performance standard; and
d. analysis of how the actions described in c. will address the specific circumstances that resulted in the failure to meet the performance standard.

RGPCD Plans may be amended to revise the actions that will be taken to meet the performance standard.

<u>Individual RGPCD Plan</u>

Individual RGPCD Plan will document a plan to adopt and implement measures tailored to the specific needs of the water supply system that the Permittee believes will be sufficient to bring the system into compliance with the performance standard within three years.

At a minimum, all Individual RGPCD Plans for failure to meet the RGPCD performance standard must include implementation of at least one of the following residential conservation programs:

a. a program that provides water saving devices such as faucet aerators and low flow shower heads at cost;
b. a program that provides rebates or other incentives for the purchase of low water use appliances (washing machines, dishwashers, and toilets); or
c. the adoption and enforcement of an ordinance, bylaw or regulation to require the installation of moisture sensors or similar climate related control technology on all automatic irrigation systems.

If the Permittee is already implementing one or more of these programs, it must include in its Individual RGPCD Plan the continued implementation of such program(s), as well as implementation of at least one additional program. All programs must include a public information component designed to inform customers of the program and to encourage participation in the program.

Without limitation, the Individual RGPCD Plan for failure to meet the RGPCD performance standard may include any of the actions set forth in the MassDEP RGPCD Functional Equivalence Plan below.

MassDEP RGPCD Functional Equivalence Plan

In order to be considered functionally equivalent with the RGPCD performance standard, the Permittee must adopt and implement the MassDEP RGPCD Functional Equivalence Plan that requires all the following residential conservation programs:

a. a program that provides water saving devices such as faucet aerators and low flow shower heads at cost;
b. a program that provides rebates or other incentives for the purchase of low water use appliances (washing machines, dishwashers, and toilets);
c. the adoption and enforcement of an ordinance, bylaw or regulation to require the installation of soil moisture sensors or similar climate related control technology on all automatic irrigation systems;
d. the use of an increasing block water rate or a seasonal water rate structure as a tool to encourage water conservation;
e. the adoption and enforcement of an ordinance, bylaw or regulation to require that all new construction include water saving devices and low water use appliances; and
f. the implementation of monthly or quarterly billing.

Hardship

A Permittee may present an analysis of the cost effectiveness of implementing certain conservation measures included in the MassDEP RGPCD Functional Equivalence Plan and offer alternative measures. Any analysis must explicitly consider environmental impacts and must produce equal or greater environmental benefits. Suppliers will be able to present:

a. Reasons why specific measures are not cost effective because the cost would exceed the costs of alternative methods of achieving the appropriate standard;
b. Alternative 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 RGPCD Functional Equivalence Plan; and
c. When applicable, an analysis demonstrating that implementation of specific measures will cause or exacerbate significant economic hardship.

Appendix B – Functional Equivalence with the 10% Unaccounted for Water Performance Standard

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 program in place that ensures "best practices" for controlling water loss. The water loss control program will be based on annual water audits and guidance as described in the AWWA/IWA *Manual of Water Supply Practices – M36, Water Audits and Loss Control Programs* (AWWA M36).

If the Permittee fails to document compliance with the Unaccounted for Water performance standard (UAW of 10% or less for 2 of the 3 most recent years throughout the permit period), then the Permittee shall develop and implement a water loss control program following the *AWWA M36 Water Audits and Loss Control Programs* within 5 full calendar years.

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 with its 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 long-term program to reduce real and apparent water losses.
    - 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.
    - 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, the Permittee shall 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. The Permittee shall submit the component analysis and water loss control program with a proposed implementation schedule to MassDEP.

3. Continued implementation will be a condition of the Permit in place of meeting the 10% UAW performance standard.

4. Upon request of MassDEP, the Permittee shall report on its implementation of the water loss control program.

A PWS Permittee may choose to discontinue the water loss program implementation if UAW, as reported on the ASR and approved by DEP, 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 UAW Water Loss Control Measures: Permittees who do not have MassDEP approved Water Loss Control Programs in place by 6th calendar year after 2019 will be required to implement the MassDEP UAW Water Loss Control Measures outlined below:

- An annual water audit and leak detection survey, as described in the AWWA M36 Manual, of 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.
- Water pricing structure 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 UAW Water Loss Control Measures and offer alternative measures. Any analysis must explicitly consider environmental impacts and must produce equal or greater environmental benefits. Suppliers will be able to present:

- Reasons why specific measures are not cost effective because the cost would exceed the costs of alternative methods of achieving the appropriate standard;
- Alternative 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 Functional Equivalence Plan; and
- When applicable, an analysis demonstrating that implementation of specific measures will cause or exacerbate significant economic hardship.