



Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Central Regional Office • 8 New Bond Street, Worcester MA 01606 • 508-792-7650

Charles D. Baker
Governor

Matthew A. Beaton
Secretary

Karyn E. Polito
Lieutenant Governor

Martin Suuberg
Commissioner

November 21, 2018

Town of Blackstone
Attn: Daniel M. Keyes, Town Administrator
53 Elm Street
Blackstone, MA 01504

Town: Blackstone
PWS Name: Blackstone Water Department
PWS ID #: 2032000
WMA Permit #: 9P-2-12-032.01
MassDEP Transmittal: WM02 X271131
Action: Final WMA Permit Amendment

Dear Mr. Keyes,

Please find the enclosed documents:

- Findings of Fact in Support of the Final Water Management Act Permit Amendment Decision; and
- Final Water Management Act Permit Amendment 9P-2-12-032.01 for the Town of Blackstone in the Blackstone River Basin.

The draft Permit was posted in the Public Notice section of the October 10, 2018 MEPA Monitor. Notice of the draft Permit issuance was also mailed to all WMA Registrants and Permittees in the Blackstone River Basin and to other interested parties offering a thirty (30) day comment period. No comments were submitted to MassDEP. 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: Charles Sawyer, Water Commissioner, Blackstone DPW – Water Division, 53 Elm St, Blackstone, MA 01504
Blackstone Headwaters Coalition, P.O. Box 70477, Worcester, MA 01607
Blackstone River Watershed Association, 271 Oak Street, Uxbridge, MA 01569
ecc: Mass Water Works Association (MWWA@verizon.net)
Mass Rivers Alliance (juliablatt@massriversalliance.org)
Duane LeVangie, MassDEP-WMA-Boston



Massachusetts Department of Environmental Protection
One Winter Street, Boston MA 02108 • Phone: 617-292-5751
Communication For Non-English Speaking Parties - 310 CMR 1.03(5)(a)



1 English:

This document is important and should be translated immediately. If you need this document translated, please contact MassDEP's Diversity Director at the telephone numbers listed below.



2 Español (Spanish):

Este documento es importante y debe ser traducido inmediatamente. Si necesita este documento traducido, por favor póngase en contacto con el Director de Diversidad MassDEP a los números de teléfono que aparecen más abajo.



3 Português (Portuguese):

Este documento é importante e deve ser traduzida imediatamente. Se você precisa deste documento traduzido, por favor, entre em contato com Diretor de Diversidade da MassDEP para os números de telefone listados abaixo.



4(a) 中國 (傳統) (Chinese (Traditional)):

本文件非常重要，應立即翻譯。如果您需要翻譯這份文件，請用下面列出的電話號碼與MassDEP的多樣性總監聯繫。



4(b) 中国 (简体中文) (Chinese (Simplified)):

本文件非常重要，應立即翻譯。如果您需要翻譯這份文件，請用下面列出的電話號碼與MassDEP的多樣性總監聯繫。



5 Ayisyen (franse kreyòl) (Haitian) (French Creole):

Dokiman sa-a se yon bagay enpòtan epi yo ta dwe tradui imedyatman. Si ou bezwen dokiman sa a tradui, tanpri kontakte Divèsite Direktè MassDEP a nan nimewo telefòn ki nan lis pi ba a.



6 Việt (Vietnamese):

Tài liệu này là rất quan trọng và cần được dịch ngay lập tức. Nếu bạn cần dịch tài liệu này, xin vui lòng liên hệ với Giám đốc MassDEP đa dạng tại các số điện thoại được liệt kê dưới đây.



7 ប្រទេសកម្ពុជា (Kmer (Cambodian)):

ឯកសារនេះគឺមានសារៈសំខាន់និងគួរត្រូវបានបកប្រែភ្លាមៗ ប្រសិនបើអ្នកត្រូវបានបកប្រែឯកសារនេះសូមទំនាក់ទំនងជាមួយក្រុមការងារ MassDEP នៅលេខទូរស័ព្ទដែលបានរាយនាងក្រោម។



8 Kriolu Kabuverdianu (Cape Verdean):

Es documento é importante e deve ser traduzido imidiatamente. Se bo precisa des documento traduzido, por favor contacta Director de Diversidade na MassDEP's pa es numero indicode li d'boche.



9 Русский язык (Russian):

Этот документ должен быть немедленно. Если вам нужна помощь при переводе, свяжитесь пожалуйста с директором по этике и разнообразие в MassDEP по телефону указанному ниже.

**10 العربية (Arabic):**

هذه الوثيقة الهامة وينبغي أن تترجم على الفور. اذا كنت بحاجة الى هذه الوثيقة المترجمة، يرجى الاتصال مدير التنوع في MassDEP على أرقام الهواتف المدرجة أدناه.

**11 한국어 (Korean):**

이 문서는 중요하고 즉시 번역해야 합니다. 당신이 번역이 문서가 필요하다면 아래의 전화 번호로 MassDEP의 다양성 감독에 문의하시기 바랍니다.

**12 հայերեն (Armenian):**

Այս փաստաթուղթը շատ կարևոր է եւ պէտք է թարգմանել անմիջապէս. Եթէ Ձեզ անհրաժեշտ է այս փաստաթուղթը թարգմանվել դիմել MassDEP բարձագանությունը տնօրէն է հեռախոսահամարների թվարկված են ստորեւ.

**13 فارسی (Farsi [Persian]):**

این سند مهم است و باید فوراً ترجمه شده است. اگر شما نیاز به این سند ترجمه شده، لطفاً با ما تماس بگیرید. MassDEP در شماره تلفن های ذکر شده در زیر.

**14 Français (French):**

Ce document est important et devrait être traduit immédiatement. Si vous avez besoin de ce document traduit, s'il vous plaît communiquer avec le directeur de la diversité MassDEP aux numéros de téléphone indiqués ci-dessous.

**15 Deutsch (German):**

Dieses Dokument ist wichtig und sollte sofort übersetzt werden. Wenn Sie die Übersetzung von diesem Dokument benötigen, wenden Sie sich bitte bei der/dem Diversity Director MassDEP an die unten aufgeführte Telefonnummer.

**16 Ελληνική (Greek):**

Το έγγραφο αυτό είναι σημαντικό και θα πρέπει να μεταφραστούν αμέσως. Αν χρειάζεστε αυτό το έγγραφο μεταφράζεται, παρακαλούμε επικοινωνήστε Diversity Director MassDEP κατά τους αριθμούς τηλεφώνου που αναγράφεται πιο κάτω.

**17 Italiano (Italian):**

Questo documento è importante e dovrebbe essere tradotto immediatamente. Se avete bisogno di questo documento tradotto, si prega di contattare la diversità Direttore di MassDEP ai numeri di telefono elencati di seguito.

**18 Język Polski (Polish):**

Dokument ten jest ważny i powinien być natychmiast przetłumaczony. Jeśli potrzebujesz tego dokumentu tłumaczone, prosimy o kontakt z Dyrektorem MassDEP w różnorodności na numery telefonów wymienionych poniżej.

**19 हिन्दी (Hindi):**

यह दस्तावेज़ महत्वपूर्ण है और तुरंत अनुवाद किया जाना चाहिए. आप अनुवाद इस दस्तावेज़ की जरूरत है, नीचे सूचीबद्ध फोन नंबरों पर MassDEP की विविधता निदेशक से संपर्क करें.



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Findings of Fact in Support of the Final Permit Amendment Decision Town of Blackstone, Water Management Permit 9P-2-12-032.01

The Massachusetts Department of Environmental Protection ("MassDEP") has completed its review of the Water Management Act (WMA) Permit Amendment application for the Town of Blackstone ("Blackstone") in the Blackstone River Basin pursuant to the Water Management Act, M.G.L. ch. 21G. As a result of the review and Blackstone's response to the Order to Complete that was received November 20, 2017, MassDEP hereby issues this Final Water Management Act Permit #9P-2-12-032.01 (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 Blackstone's Water Withdrawal and Permit History

Blackstone holds a registration statement (2-12-032.01) for an average annual daily withdrawal volume of 0.44 million gallons per day (MGD). Blackstone was issued a Water Management Act permit in November 1990 in order to increase the total authorized withdrawal volume. In June 2000, Blackstone's Permit was amended to include Wells 5A, 6, and 6A as approved sources. The original permit expired on February 28, 2009 and a one-year interim permit was issued authorizing the continued withdrawal of the previously permitted volume. Blackstone's permit was renewed March 1, 2010 with an interim authorization of 0.25 MGD in addition to the registered volume of 0.44 MGD. The WMA Permit was amended on February 14, 2012 to add Well 8 as a withdrawal point. A Water Needs Forecast was prepared in 2018 by the Department of Conservation and Recreation which is reflected in this Permit Amendment. An additional allocation of 0.10 MGD from March 15 through November 15 annually and 0.25 MGD from November 16 through March 15 is authorized solely for sale to American National Power. Blackstone has a contractual agreement to provide this additional water to American National Power if needed by the power company.

The following Permit is an amendment to add a new withdrawal location, Well 9, located on the west side of Harris Pond. No additional withdrawal volume is authorized by this Permit. Well 9 will provide additional withdrawal capacity and flexibility within the current authorized

withdrawal volume. Blackstone's reported withdrawal volumes for 2015, 2016, and 2017 were 0.58 MGD, 0.54 MGD, and 0.56 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 Blackstone River Basin. Note that MassDEP revised the Water Management Act Regulations (310 CMR 36.00) in November 2014 to require permittee's, where applicable, to address the impact of withdrawals on Cold Water Fishery Resources, and develop Minimization and Mitigation Plans. Those issues that are not directly related to the Permit Amendment will be addressed in the next permit review for Blackstone 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

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 Blackstone's sources have approved Zone II delineations. Public Water Systems are required to obtain MassDEP approval of Zone II delineations during the new source approval process and prior to activating any new sources.

Special Condition 1, Maximum Authorized Annual Average Withdrawal Volume, reflects the Water Needs Forecast prepared for Blackstone in 2018 by the Department of Conservation and Recreation. MassDEP also authorized an additional allocation of 0.1 MGD from March 15 through November 15 and 0.25 MGD from November 16 through March 14 solely for sale to American National Power (ANP). ANP's recent average use has been 16,500 gpd in the summer and 30,300 gpd in the winter.

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 0.612 MGD (425 gpm) for Well 9 based on the pumping test performance.

Special Condition 3, Performance Standard for Residential Gallons Per Capita Day Water Use, discussed previously. As accepted by MassDEP, Blackstone's RGPCD for 2015, 2016, and 2017 was 56, 51, and 43, respectively

Special Condition 4, Performance Standard for Unaccounted for Water (UAW), discussed previously. Blackstone is required to meet 10% or less UAW for 2 of the 3 most recent years throughout the Permit period. Permittees that cannot comply within the timeframe in the Permit must meet 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. As

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 Blackstone Basin. Under this Permit the Blackstone Basin safe yield will continue to be higher than the combined allocated withdrawal volume because the Permit does not increase Blackstone’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 2012. These standards can be found at:

<http://www.mass.gov/eea/docs/dcr/watersupply/intbasin/waterconservationstandards.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 2015 for Massachusetts were 58 RGPCD, and 15% 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.

Blackstone 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.

accepted by MassDEP, Blackstone's UAW for the 2015, 2016, and 2017 was 14%, 1%, and 11%, respectively.

Special Condition 5, 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 Blackstone selects the streamflow approach, it has been assigned the USGS local stream gage of #01112500 – Blackstone River at Woonsocket, RI. The June ABF estimated using SYE is 0.96 cfs and the August ABF value is 0.38 cfs. These cfs units translate to your local gage streamflow triggers as 398 cubic feet per second (cfs) for May and June, and 157 cfs for July, August and September.

Should the reliability of flow measurement at the Blackstone River 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.

Please note that this Permit condition will be updated at the time of the Permit renewal in 2020 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 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 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 2012. Blackstone last conducted a leak detection survey in 2015. Leak detection surveys are required at least every three years; therefore one must be completed in 2018.



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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-2-12-032.01

RIVER BASIN: Blackstone

PERMITTEE: Town of Blackstone

ISSUANCE DATE: March 1, 2010

AMENDMENT DATE: November 21, 2018

EXPIRATION DATE: February 28, 2029

NUMBER OF WITHDRAWAL POINTS: 7 Groundwater

USE: Public Water Supply

DAYS OF OPERATION: 365

LOCATION(S):

Table 1: Withdrawal Point Identification

Source Name	PWS Source ID Code
Well 2	2032000-02G
Well 4	2032000-04G
Well 5 and 5A	2032000-05G
Well 6 and 6A	2032000-06G
Well 7	2032000-07G
Well 8	2032000-08G
Well 9	To Be Assigned

SPECIAL PERMIT CONDITIONS

1. Maximum Authorized Annual Average Withdrawal Volume

This Permit authorizes the Town of Blackstone to withdraw water from the Blackstone River Basin at the rate described below in Table 2. The volume reflected by this rate is in addition to the 0.44 million gallons per day previously authorized to Blackstone under Water Management Act Registration 212032.01 for withdrawal from the Blackstone River Basin. The permitted volume is 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 five-year period of the permit term.

An additional allocation of 0.10 MGD from March 15 through November 15 annually and 0.25 MGD from November 16 through March 15 annually is authorized solely for sale to American National Power. These volumes are in addition to the volumes listed in Table 2. The volumes, if accessed, shall be reported as monthly withdrawal volumes in an attachment to each Annual Statistical Report.

The Department of Environmental Protection (MassDEP) bases these withdrawal volumes on the raw water withdrawn from the authorized withdrawal points, and will use the raw water amount to assess compliance with the registered and permitted withdrawal volumes.

Table 2: Maximum Authorized Annual Withdrawal Volumes

5-Year Periods		Total Raw Water Withdrawal Volumes			
		Permit		Permit + Registration	
		Daily Average (MGD)	Total Annual (MGY)	Daily Average (MGD)	Total Annual (MGY)
Period One Years 2-5	3/1/2010 to 2/28/2017	0.25	91.25	0.69	251.85
Period Two Years 6-7	3/1/2017 to 2/28/2019	0.25	91.25	0.69	251.85
Period Two Years 8-10	3/1/2019 to 2/28/2023	0.21	76.65	0.65	237.25
Period Three Years 11-15	3/1/2023 to 2/28/2028	0.22	80.30	0.66	240.90
Period Four Years 16-20	3/1/2028 to 2/28/2033	0.23 (0.26*)	83.95 (94.90*)	0.67 (0.70*)	244.55 (255.50*)

* Period Four volumes may be increased by an additional 5% buffer to accommodate uncertainty in the growth projections used by the Department of Conservation and Recreation in the 20-year water needs forecasts, and/or to accommodate the water demand of a community that has not met the 65 RGPCD and 10% UAW performance standards, but has met the functional equivalence requirements included in this permit.

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	MGD
Well 2	2032000-02G	0.229
Well 7	2032000-07G	
Well 4	2032000-04G	0.287
Well 5 and 5A	2032000-05G	0.423
Well 6 and 6A	2032000-06G	0.403
Well 8	2032000-08G	0.72
Well 9	To Be Assigned	0.612

3. 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.

4. Performance Standard for Unaccounted for Water

Permittee's Performance Standard for Unaccounted for Water (UAW) is 10% or less of overall water withdrawal for 2 of the most recent 3 years throughout the permit period. If Permittee does not meet the standard, it shall be in compliance with the functional equivalence requirements outlined in Appendix B.

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 of 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.

5. 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 01112500 - Blackstone River, Woonsocket, RI falls below the following designated flow triggers for **three (3)** consecutive days:

- May 1st through June 30th: **398 cfs** (based on minimum flows that are protective of habitat for fish spawning during the spring bioperiod), and
- July 1st through September 30th: **157 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 gage 01112500 - Blackstone River, Woonsocket, RI falls below the following designated flow triggers for **three (3)** consecutive days:

- May 1st through June 30th: **398 cfs** (based on minimum flows that are protective of habitat for fish spawning during the spring bioperiod), and
- July 1st through September 30th: **157 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 01112500 - Blackstone River, Woonsocket, RI.
- 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 <http://www.mass.gov/dcr/waterSupply/rainfall/drought.htm>.

- Under “Drought Status Reports”, click on “drought map” on the right-hand side of the page. 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.

6. Requirement to Report Raw and Finished Water Volumes

Blackstone 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. Blackstone shall report volumes recorded from the master meter leaving the treatment plant as finished water in Section D of the Annual Statistical Reports and shall report the sum of the individual source meters in Section D as raw water volumes.

7. Water Conservation Requirements

At a minimum, Permittee shall implement the following conservation measures forthwith and shall be in compliance with these measures on or before February 28, 2019. Compliance with the water conservation requirements shall be reported to MassDEP upon request or by February 28, 2019, unless otherwise noted below.

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. The first full leak detection survey shall be completed no later than 3 years from the date of last documented leak detection survey. Blackstone last conducted a leak detection survey in March 2015; therefore a survey must be completed in 2018.
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 <i>AWWA Manual 36</i> .
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: <ul style="list-style-type: none">• 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.

Table 5 Continued: Minimum Water Conservation Requirements

System Water Audits and Leak Detection Continued
<p>The following exceptions can be considered:</p> <ul style="list-style-type: none"> • 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.** <p>*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.</p>
<p>5. Ensure placement of sufficient funds in the annual water budget to conduct water audits and leak detection and repair leaks as necessary.</p>
Metering
<p>1. Calibrate all source and finished water meters at least annually and report date of calibration on the ASR.</p>
<p>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.</p>
<p>3. All water distribution system users shall have properly sized service lines and meters that meet AWWA calibration and accuracy performance standards.</p> <p>AWWA References: AWWA Manual M22 – Sizing Water Service Lines and Meters AWWA Manual M6 – Water Meters, or as amended</p>
<p>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.</p>
<p>5. Ensure placement of sufficient funds in the annual water budget to calibrate, repair, or replace meters as necessary.</p>
Pricing
<p>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.</p> <p>AWWA References for Additional Information on Pricing: AWWA Manual 1 – Principles of Water Rates, Fees and Charges AWWA Manual 29 – Fundamentals of Water Utility Financing</p>
<p>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.</p>

Table 5 (Continued): Minimum Water Conservation Requirements

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
 - On November 16, 2017 Permittee submitted a list of municipally owned buildings that are not completely retrofitted with water saving devices. The list includes Kennedy Elementary School, Elm Street Fire Station, Rathbun Street Fire Station, Roosevelt Park, and Goulet Park.
 - On or before January 1, 2021, Permittee shall ensure that all municipally owned public buildings in the service area are retrofitted.
 - Note municipally owned public buildings that may be scheduled for rehab or demolition after the January 1, 2021 deadline for completing the retrofits, may with MassDEP's approval, be exempted from this condition based on the schedule of work.

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 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. By May 1, 2019 Permittee's water use restriction bylaw shall be updated to provide authority to implement and enforce water use restrictions required by the Special Condition, "Seasonal Limits on Nonessential Outdoor Water Use".

Table 5 (Continued): Minimum Water Conservation Requirements

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, or other private and non-profit 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

11/21/18
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.

Individual RGPCD Plan

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, as of December 31, 2019, 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.