Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
100 Cambridge Street Suite 900 Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

September 6, 2023
RE: Water Management Act
Permit No. 9P-4-21-231.01
Final BRP WM 02 Permit Amendment

Gene Fulmine
Pembroke Water Department
Town Hall, 100 Center Street
Pembroke, MA 02359

Dear Mr. Fulmine:

The Massachusetts Department of Environmental Protection (MassDEP) received a BRP WM 02 permit amendment application on March 25, 2022 from the Pembroke Water Department to add the new Swanberg Property Wellfield for public water supply. Please find the following attached documents:

- Findings of Fact in Support of the Final Permit Decision.
- Water Management Act Permit for withdrawals by the Pembroke Water Department in the South Coastal Basin.

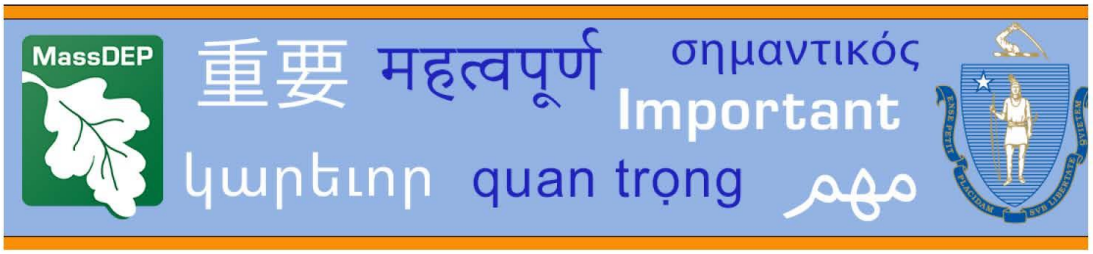
If you have any questions regarding the permit, please contact Shi Chen at shi.chen@mass.gov or 857-360-0042.

Sincerely,

Duane LeVangie
Water Management Program Chief
Bureau of Water Resources

ecc: Adam Kautza, FWE
Jill Getchell and Kevin MacKinnon, Weston & Sampson
Julia Blatt and Sarah Bower, Mass Rivers Alliance
Jennifer Pederson, Massachusetts Water Works Association

mass.gov.sharepoint.com/W:\DWPWMA\SERO\2023\Pembroke-4231000-Permit Amendment-9P42123101--2023-09-06



Communication for Non-English-Speaking Parties

This document is important and should be translated immediately.

If you need this document translated, please contact MassDEP's Director of Environmental Justice at the telephone number listed below.

Español Spanish

Este documento es importante y debe ser traducido inmediatamente. Si necesita traducir este documento, póngase en contacto con el Director de Justicia Ambiental de MassDEP (*MassDEP's Director of Environmental Justice*) en el número de teléfono que figura más abajo.

Português Portuguese

Este documento é importante e deve ser traduzido imediatamente. Se você precisar traduzir este documento, entre em contato com o Diretor de Justiça Ambiental do MassDEP no número de telefone listado abaixo.

繁體中文 Chinese Traditional

本文檔很重要，需要即刻進行翻譯。
如需對本文檔進行翻譯，請透過如下列示電話號碼與 MassDEP 的環境司法總監聯絡。

简体中文 Chinese Simplified

这份文件非常重要，需要立即翻译。
如果您需要翻译这份文件，请通过下方电话与 MassDEP 环境司法主任联系。

Ayisyen Kreyòl Haitian Creole

Dokiman sa a enpòtan epi yo ta dwe tradui l imedyatman. Si w bezwen tradui dokiman sa a, tanpri kontakte Direktè. Jistis Anviwònmantal MassDEP a nan nimewo telefòn ki endike anba a.

Việt Vietnamese

Tài liệu này và quan trọng và phải được dịch ngay. Nếu quý vị cần bản dịch của tài liệu này, vui lòng liên hệ với Giám Đốc Phòng Công Lý Môi Trường của MassDEP theo số điện thoại được liệt kê bên dưới.

ប្រទេសកម្ពុជា Khmer/Cambodian

ឯកសារនេះមានសារៈសំខាន់
ហើយគប្បីត្រូវត្រូវបានបកប្រែភ្លាមៗ។
ប្រសិនបើអ្នកត្រូវការអោយឯកសារនេះបកប្រែ
សូមទាក់ទងនាយកផ្នែកយុត្តិធម៌បរិស្ថានរបស់
MassDEPតាមរយៈលេខទូរស័ព្ទដែលបានរាយដូចខាងក្រោម។

Kriolu Kabuverdianu Cape Verdean

Es dokumentu sta important i tenki ser tradusidu immediatamenti. Se nho ta presisa ke es dokumentu sta tradisidu, por favor kontata O Diretor di Justisia di Environman di DEP ku es numero di telifoni menxionadu di baixo.

Contact Deneen Simpson 857-406-0738
Massachusetts Department of Environmental Protection
100 Cambridge Street 9th Floor Boston, MA 02114
TTY# MassRelay Service 1-800-439-2370 • https://www.mass.gov/environmental-justice
(Version revised 8.2.2023) 310 CMR 1.03(5)(a)

Русский Russian

Это чрезвычайно важный документ, и он должен быть немедленно переведен. Если вам нужен перевод этого документа, обратитесь к директору Департамента экологического правосудия MassDEP (MassDEP's Director of Environmental Justice) по телефону, указанному ниже.

العربية Arabic

هذه الوثيقة مهمة وتجب ترجمتها على الفور.

إذا كنت بحاجة إلى ترجمة هذه الوثيقة، فيرجى الاتصال بمدير العدالة البيئية في MassDEP على رقم الهاتف المذكور أدناه.

한국어 Korean

이 문서는 중대하므로 즉시 번역되어야 합니다.
본 문서 번역이 필요하신 경우, 매사추세츠 환경보호부의 "환경정의" 담당자 분께 문의하십시오. 전화번호는 아래와 같습니다.

հայերեն Armenian

Այս փաստաթուղթը կարևոր է, և պետք է անհապաղ թարգմանել այն:
Եթե Ձեզ անհրաժեշտ է թարգմանել այս փաստաթուղթը, դիմեք Մասաչուսեթսի շրջակա միջավայրի պահպանության նախարարության (MassDEP) Բնապահպանական հարցերով արդարադատության ղեկավարին (Director of Environmental Justice)՝ ստորև նշված հեռախոսահամարով

فارسی Farsi Persian

این نوشتار بسیار مهمی است و باید فوراً ترجمه شود.
اگر نیاز به ترجمه این نوشتار دارید لطفاً با مدیر عدالت محیط زیستی MassDEP در شماره تلفن ذکر شده زیر تماس بگیرید.

Français French

Ce document est important et doit être traduit immédiatement. Si vous avez besoin d'une traduction de ce document, veuillez contacter le directeur de la justice environnementale du MassDEP au numéro de téléphone indiqué ci-dessous.

Deutsch German

Dieses Dokument ist wichtig und muss sofort übersetzt werden. Wenn Sie eine Übersetzung dieses Dokuments benötigen, wenden Sie sich bitte an MassDEP's Director of Environmental Justice *(Direktor für Umweltgerechtigkeit in Massachusetts)* unter der unten angegebenen Telefonnummer.

Ελληνική Greek

Το έγγραφο αυτό είναι πολύ σημαντικό και πρέπει να μεταφραστεί αμέσως. Αν χρειάζεστε μετάφραση του εγγράφου αυτού, παρακαλώ επικοινωνήστε με τον Διευθυντή του Τμήματος Περιβαλλοντικής Δικαιοσύνης της Μασαχουσέτης στον αριθμό τηλεφώνου που αναγράφεται παρακάτω

Italiano Italian

Questo documento è importante e deve essere tradotto immediatamente. Se hai bisogno di tradurre questo documento, contatta il Direttore della Giustizia Ambientale di MassDEP al numero di telefono sotto indicato.

Język Polski Polish

Ten dokument jest ważny i powinien zostać niezwłocznie przetłumaczony. Jeśli potrzebne jest tłumaczenie tego dokumentu, należy skontaktować się z dyrektorem ds. sprawiedliwości środowiskowej MassDEP pod numerem telefonu podanym poniżej.

हिन्दी Hindi

यह दस्तावेज महत्वपूर्ण है और इसका अनुवाद तुरंत किया जाना चाहिए। यदि आपको इस दस्तावेज का अनुवाद कराने की जरूरत है, तो कृपया नीचे दिए गए टेलीफोन नंबर पर MassDEP के पर्यावरणीय न्याय निदेशक से संपर्क करें।

Contact Deneen Simpson 857-406-0738
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Findings of Fact in Support of Final Permit Decision
Water Management Act Permit #9P-4-21-231.01
Pembroke Water Department

The Massachusetts Department of Environmental Protection (MassDEP) has completed its review of the Pembroke Water Department's ("Pembroke") Water Management Act (WMA) permit amendment application of March 25, 2022, for adding an additional withdrawal source, the Swanberg Property Wellfield for public water supply. The Department hereby proposes to issue Water Management Permit #9P-4-21-231.01 (the "Permit") in accordance with the Water Management Act (M.G.L. c. 21G) and the regulations promulgated thereunder at 310 CMR 36.00. The Department makes the following Findings of Fact in support of the attached Final Permit Amendment and includes herewith its reasons for issuing the Final Permit and for conditions of approval imposed, as required by M.G.L. c. 21G, § 11, and 310 CMR 36.00. The Permit is being issued since such action is necessary for the promotion of the purposes of M.G.L. c. 21G. The Department may amend, suspend or terminate the Permit, after notice and hearing, in accordance with the provisions of 310 CMR 36.29(1).

The Permit Extensions

The current permit issued to Pembroke on May 23, 2018 has an expiration date of August 31, 2030. Note that recent promulgation of revised regulations (310 CMR 36.00) has adjusted permit expiration dates in several basins, including the South Coastal Basin, so all permits moving forward in this basin will have a December 6, 2031 expiration date.

The Water Management Act (M.G.L.c. 21G)

The Water Management Act (Act) requires that MassDEP issue permits that balance a variety of factors including without limitation:

- Impact of the withdrawal on other sources of water;
- Time of year when the withdrawal will be made;
- Water available within the safe yield of the source;
- Reasonable protection of existing water uses, land values, investments and enterprises

- Proposed use of the water and other existing or projected uses of water from the water source;
- Municipal and Massachusetts Water Resources Commission (WRC) water resource 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, floodplains; and
- Reasonable economic development and job creation.

Water Management Regulation Revisions

In 2010 the Executive Office of Energy and Environmental Affairs (EEA) convened the Sustainable Water Management Initiative (SWMI) for the purpose of incorporating the best available science into the management of the Commonwealth's water resources. SWMI was a multi-year process that included a wide range of stakeholders and support from the Departments of Environmental Protection, Fish and Game, and Conservation and Recreation. In November 2012 the *Massachusetts Sustainable Water Management Initiative Framework Summary* (*https://www.mass.gov/files/documents/2016/08/wf/swmi-framework-nov-2012.pdf*) was released.

On November 7, 2014, the Department adopted revised Water Management Regulations at 310 CMR 36.00 that incorporate elements of the SWMI framework and the Water Conservation Standards adopted by the Massachusetts WRC. The regulations reflect a carefully developed balance to protect the health of Massachusetts' water bodies while meeting the needs of businesses and communities for water.

Without limitation, the Department has incorporated the following into Water Management permitting:

- Safe yield determinations for the major river basins based on a new methodology developed through SWMI (see the Safe Yield in the South Coastal Basin section of this document);
- Water conservation and performance standards reviewed and approved by the WRC in July 2018 (https://www.mass.gov/files/documents/2018/09/11/ma-water-conservation-standards-2018.pdf), including without limitation;
- Environmental protections developed through SWMI, including without limitation;
    - protection for coldwater fish resources;
    - minimization of withdrawal impacts in areas stressed by groundwater use;
    - mitigation of the impacts of increasing withdrawals.

Safe Yield in the South Coastal Basin

This permit is being issued under the Safe Yield methodology adopted by MassDEP on November 7, 2014, and described in the Regulations at 310 CMR 36.13. As of the date of issuance of this permit, the safe yield for the South Coastal Basin water source is 70.1 million gallons per day (MGD), and total allocated withdrawals are 45.48 MGD. The maximum withdrawals that will be authorized in this permit, and all other permits currently under review

by the Department within the South Coastal Basin, will be within the remaining safe yield and may be further conditioned as outlined in the regulations.

Findings of Fact for Permit Conditions in Pembroke's Water Management Act Permit

The Findings of Fact for the special conditions 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 permit special conditions. In the event of any ambiguity between this summary and the actual permit conditions, the permit language shall control. Note that Special Conditions 7 and 11 through 13 have not changed from the conditions included in the 2018 permit.

Special Condition 1, Maximum Authorized Annual Average Withdrawal, reflects the authorized annual average withdrawal volume for each period during the life of this permit. The existing system-wide withdrawal volumes for Pembroke is 1.84 million gallons per day (MGD) and this amended permit does not authorize an increase in the withdrawal volume. Pembroke may increase its annual average daily withdrawals to the maximum authorized volume (1.84 MGD) prior to December 6, 2026 if Pembroke is meeting the requirements of Special Conditions of 5, 6, 7 and 8 outlined in the permit. If not, Pembroke is constrained to the volumes identified for each period outlined in the permit.

Special Condition 2, Maximum Daily Withdrawals from Groundwater Withdrawal Points, reflects the MassDEP approved Zone II maximum daily pumping rate for each of Pembroke`s permitted wells based on prolonged pumping tests. The Swanberg Wellfield has been approved for a maximum daily withdrawal rate of 0.37 MGD. Pembroke exceeded the authorized maximum daily withdrawal volume for the Windswept Well #5 (4231000-05G) in 2021 due to water quality and quantity issues in the Hobomock Well #1 (4231000-01G) and the Bryantville Well #4 (4321000-04G). The Swanberg Wellfield is expected to supplement the lost capacity at those other permitted wells. Withdrawals in excess of these maximum daily rates require approval from the Department.

Special Condition 3, Zone II Delineations, all of Pembroke`s permitted sources have approved Zone II`s delineated. No further Zone II work is required as a condition of this permit.

Special Condition 4, Wellhead Protection, requires Pembroke to amend the boundaries of the protection district to include the Zone II of the Swanberg Wellfield and demonstrate it has used their best efforts to obtain protection for the portion of the Swanberg Wellfield`s Zone II located in Marshfield. Pembroke submitted a copy of the letter issued on March 15, 2023 requesting the Town of Marshfield to include the Swanberg Wellfield Zone II in their protection district and to adopt a non-zoning floor drain prohibition. Prior to operating the Swanberg Wellfield, Pembroke must amend the boundaries of the protection district to include the Zone II of the Swanberg Wellfield. Documentation that it has amended the protection district shall be submitted to MassDEP Drinking Water Program for its review and approval.

Special Condition 5, Performance Standard for Residential Gallons Per Capita Day (RGPCD) Water Use, for all PWS is 65. If Pembroke fails to meet the RGPCD performance standard in its 2022 Annual Statistical Report (ASR) or in any ASR thereafter, Pembroke must

file with that ASR a RGPCD Plan that meet Functional Equivalence Requirements outlined in Appendix A. As accepted by the Department, Pembroke`s RGPCD for the most recent three years has been:

Pembroke RGPCD		
2021	2020	2019
49	49	47

Special Condition 6, Performance Standard for Unaccounted for Water (UAW), for all PWS is 10%. Pembroke is required to meet 10% or less UAW for 2 of the 3 most recent years throughout the permit period. Permittees that fails to document compliance with the UAW performance standard 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 accepted by the Department, Pembroke`s UAW for the most recent three years has been:

Pembroke UAW		
2021	2020	2019
11%	0%	0%

Special Condition 7, Seasonal Limits on Nonessential Outdoor Water Use, reflects the restrictions on nonessential outdoor water use from May through September. The options outlined in Special Condition 7 are based on whether reported RGPCD for the previous year was in compliance with the RGPCD Performance Standard (see Special Condition 5, Performance Standard for RGPCD).

In addition, outdoor water use by suppliers, like Pembroke, with wells in August net groundwater depleted subbasins[1] is limited to 1or 2 days per week to minimize withdrawals from depleted subbasins.

Each year Pembroke may choose one of two options for implementing nonessential outdoor watering restrictions.

- **Calendar triggered restrictions** are in place from May 1st through September 30th. Many public water suppliers find this option easier to implement and enforce than the streamflow triggered approach
- **Streamflow triggered restrictions** are 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 commence when streamflow falls below the trigger for three consecutive days. Once implemented, the restrictions remain in place until streamflow at

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

the assigned USGS local stream gage meets or exceeds the trigger streamflow for seven consecutive days.

If Pembroke selects the streamflow trigger approach, it has been assigned USGS stream gage 01105730 Indian Head River at Hanover, MA. The May-June streamflow trigger is 31 cubic feet per second (cfs), and the July-September streamflow trigger is 13 cfs. Should the reliability of flow measurement at the Indian Head River gage be so impaired as to question its accuracy, Pembroke may request the Department review and approval to transfer to another gage to trigger restrictions. The Department reserves the right to require use of a different gage.

- **The 7-Day Low Flow Trigger**, at which restrictions increase, is incorporated into both Calendar and Streamflow Triggered restrictions in order to provide additional protection to streamflows when flows are very low. The 7-day low flow trigger for Pembroke is 4.9 cfs.

Pembroke may choose to implement limits on nonessential outdoor water use that are stricter than those required by the permit. In addition, Pembroke should continue its efforts to inform their customers of the nonessential outdoor water use restrictions and implement enforcement efforts when necessary.

Special Condition 8, Water Conservation Requirements, incorporates the Water Conservation Standards for the Commonwealth of Massachusetts reviewed and approved by the Water Resources Commission in July 2018 (https://www.mass.gov/doc/massachusetts-water-conservation-standards-2). The System Water Audits and Leak Detection, and the Pricing Requirement have been updated based on the OTC responses submitted by Pembroke on March 14, 2023.

Special Condition 9, Coldwater Fish Resource (CFR) Protection, requires permittees with permitted withdrawals that impact streamflow at a CFR, identified at https://mass-eoeea.maps.arcgis.com/apps/webappviewer/index.html?id=c4fd3ee7ab5544bbaa9d81eb47ffbc7a to shift withdrawals to their other withdrawals points, as feasible, to minimize impact at the CFR.

Pembroke`s sources 4231000-01G, 02G, 04G and 05G are located in Subbasin 22023, which supports a coldwater fishery in Herring Brook. Department of Fish and Game review of Pembroke`s sources in Subbasin 22023 shows that only Well 01G is close enough to Herring Brook to impact streamflow at the CFR. Well 01G has been off-line since 2009 due to water quality concerns and withdrawals have been shifted to other wells away from the CFR. Pembroke stated in the OTC responses that the Town has no plan to resume withdrawals at Well 01G.

The Swanberg Wellfield is located in Subbasin 22022, which has a coldwater fishery in Pudding Brook. MassDEP consulted with the Division of Fisheries and Wildlife about the potential impacts on the CFR from the withdrawals at the Swanberg Wellfield. The Swanberg Wellfield is located considerably downstream of where Brook Trout had previously been identified. The 15-day pumping test conducted for the Swanberg Wellfield did not show a significant impact on surface water levels in the wetlands associated with Stump Pond. In conclusion, there appears to

be minimal impact on the CFR from the withdrawals at the Swanberg Wellfield. No further optimization is required unless Pembroke anticipates using Well 01G again during the life of this permit.

Special Condition 10, Minimization of Groundwater Withdrawal impacts in Stressed Subbsins, requires permittees with permitted groundwater sources in subbasins with net groundwater depletion of 25% or more during August to minimize their withdrawal impacts on those subbasins to the greatest extent feasible, through optimization of groundwater sources, surface water releases to improve streamflows, outdoor water use restrictions and water conservation programs that go beyond standard Water Management permit requirements.

Pembroke`s groundwater sources 4231000-01G, 02G, 04G and 05G are located in Subbasin 22023, which is 59.4% August net groundwater depleted. Pembroke was required by the 2018 permit to minimize the impacts of its groundwater withdrawals from the 01G, 02G, 04G and 05G by implementing more stringent seasonal limits on nonessential outdoor water use. The Town is also required to continue the implementation of the by-law prohibiting automatic irrigation systems from connecting to the town`s water distribution system, the evaluation of the rate structure every two years, providing customers with water consumption information, and the continued implementation of their automatic drive-by meter reading system. Based on Department records and information submitted by Pembroke, the Department has updated the minimization requirements as follows:

- Well 01G has been off-line since 2009 and Pembroke has no plan to resume withdrawals from that well. 04G has deteriorated to the point that the well yields no more than 100 gallons per minute (GPM). The Swanberg Wellfield is located in Subbasin 22022 which is less than 25% August net groundwater depleted and is downstream of an identified cold-water fisheries. The Swanberg Wellfield is intended to serve as a replacement for 01G. Pembroke has one registered groundwater source, Well 03G, in an unassessed coastal area in which August net groundwater depletion cannot be readily determined. There are other resources including anadromous fisheries and a public water supply source near Well 03G. Department review of Pembroke`s pumping records show that Pembroke has consistently pumped Well 03G at between 60% and 65% of its Department-approved maximum daily capacity throughout the past 5 summers. This permit does not require that Pembroke shift additional pumping to Well 03G because increased pumping could have adverse effects on sensitive resources in the area.
- Pembroke has no surface water supplies and, therefore, cannot make releases to improve streamflow.
- The limits on nonessential outdoor water use set forth in Special Condition 7 are restrictions developed to minimize withdrawals in August net groundwater depleted subbasins. Pembroke shall continue the implementation and enforcement of the nonessential outdoor water use.
- Pembroke outlined its current conservation measures that go beyond standard Water Management permit requirements. The continued implementation of those measures is required in **Special Condition 10**.

Special Condition 11, Mitigation of Impacts for Withdrawals that Exceed Baseline, requires mitigation, where feasible, for withdrawals over a baseline volume. Baseline withdrawal means

the volume of water withdrawn during calendar year 2005 plus 5%, or the average annual volume withdrawn from 2003 through 2005 plus 5%, whichever is greater provided that:

(a) baseline cannot be less than a permittee's registered volume;
(b) baseline cannot be greater than the permittee's authorized volume for 2005; and
(c) if, during the period from 2003 to 2005, the permittee's withdrawals from the water source were interrupted due to contamination of the source or construction of a treatment plant, the Department will use best available data to establish a baseline volume from the water source.

The calculated baseline volume for the Pembroke is 459.9 MGY or 1.26 MGD, which is the 2005 authorized volume. This permit authorizes Pembroke to withdraw up to 1.84 MGD, and therefore Pembroke needs to mitigate the difference between the authorized volume and the baseline volume (i.e., 0.58 MGD). A wastewater adjustment can be applied against the volume required to be mitigated for systems where the water withdrawn is returned to the ground as wastewater within the same major basin as the withdrawal. Pembroke reported on its new permit application that about 5% of its wastewater is discharged to the Taunton Basin through private septic systems and the remaining 95% of the wastewater is disposed of through on-site sewage disposal systems to the South Coastal Basin. MassDEP is going to assume that the wastewater generated by the additional withdrawal over baseline of 0.58 MGD will be returned to groundwater via septic systems in the Taunton and South Coastal Basin in the same percentages as is returned now. Water that is returned to groundwater in the South Coastal Basin will receive 85% wastewater return adjustment and water that is returned to groundwater in the Taunton Basin will receive 43% wastewater return adjustment. This adjustment results in a volume of 0.099 MGD to be mitigated by Pembroke.

Because Pembroke's authorized volume exceeds its baseline volume, a mitigation plan is required. Pembroke identified the acquisition of several cranberry bogs that ceased production permanently since 2005 for inclusion in a mitigation plan. Cranberry bogs that have ceased operation after January 1, 2005 may qualify for the direct mitigation credits. Only the portion of water consumptively lost to the basin during the baseline period is eligible for direct credits. Based on industry-wide standards, cranberry bogs are estimated to consume 22.5% of their allocated water via irrigation and evapotranspiration losses, with the remaining 77.5% returned to the basin. Permittees who acquire or own cranberry bogs that cease operation may receive a direct mitigation credit based on the cultivated acreage reported in compliance with their WMA registration or permit between the periods of 2003-2005.

According to MassDEP`s records and the information submitted by Pembroke, the cranberry bogs eligible for direct mitigation credits in this permit include properties formally known as the Edgewood Bogs, the Andruk Bogs, and the Oldham Bog. The total irrigated acreage during the baseline period for these three bogs was 84.5 acres for the part of the Edgewood Bogs located in the Taunton portion of Pembroke, 25.53 acres at the Andruk Bogs, and 6 acres at the Oldham Bog. Because the eligible Edgewood Bogs are located in the Taunton Basin, Pembroke will receive 50% of the calculated credits for this property. Pembroke will receive 100% of the calculated credits for the other two bogs. The total direct mitigation credits achieved through the decommissioning of these cranberry bogs is 0.148 MGD. Details are presented in Appendix C.

According to MassDEP`s review, Pembroke has identified a total direct mitigation credit through its decommissioning of cranberry bogs (0.148 MGD), sufficient to address their mitigation volume of 0.099 MGD. Should there be any changes to the status of those three cranberry bogs during the life of this permit, Pembroke should contact MassDEP about the changes and the mitigation requirements will need to be reassessed.

Special Condition 12, Water Conservation Levels requires that withdrawals from Well #5 cease if the water level in Great Sandy Bottom Pond falls below 52.1 feet above MSL as measured by the Abington-Rockland Joint Water Works. Pembroke stated in the OTC responses that on August 19th to August 20th, 2022 and on September 17th to October 4th, 2022, the Town did not cease the pumping of Well #5 when the water levels at the Great Sandy Bottom Pond fell below the base level of 52.1 feet above mean sea level (MSL) due to the decreased capacity of Well #4. The Swanberg Wellfield is intended to serve as a replacement for the lost capacity at other permitted wells. The groundwater withdrawals from the Windswept Well #05G shall be constrained by water levels in Great Sandy Bottom Pond and the Town shall consult with MassDEP if it needs to operate the Well #5 when water level in Great Sandy Bottom Pond falls below 52.1 feet above MSL.

Special Condition 13, Reporting Requirements, ensures that the information necessary to evaluate compliance with the conditions included herein is accurately reported.

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection
100 Cambridge Street Suite 900 Boston, MA 02114 • 617-292-5500

Maura T. Healey
Governor

Kimberley Driscoll
Lieutenant Governor

Rebecca L. Tepper
Secretary

Bonnie Heiple
Commissioner

WATER WITHDRAWAL PERMIT
Pembroke Water Department

This permit is issued pursuant to the Massachusetts Water Management Act (WMA) for the sole purpose of authorizing the withdrawal of a volume of water as stated below and subject to the following special and general conditions. This permit 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-4-21-231.01 **RIVER BASIN:** South Coastal

PERMITTEE: Pembroke Water Department

EFFECTIVE DATE: September 6, 2023
EXPIRATION DATE: December 6, 2031*
* The original expiration date for this permit was August 31, 2030. The expiration date was extended by 462 days due to COVID-19 Order No. 42, "Order Resuming State Permitting Deadlines and Continuing to Extend the Validity of Certain State Permits," issued on July 2, 2020.

NUMBER OF WITHDRAWAL POINTS: 5
Groundwater: 5
Surface Water: 0

USE: Public Water Supply
DAYS OF OPERATION: 365
LOCATION:

Source Name	PWS Source ID Code
Hobomock Well #1	4231000-01G
Center Street Well #2	4231000-02G
Bryantville Well #4	4231000-04G
Windswept Well #5	4231000-05G
Swanberg Wellfield	TBD

SPECIAL CONDITIONS

1. Maximum Authorized Annual Average Withdrawal Volume

This permit authorizes Pembroke Water Department to withdraw water from the South Coastal Basin at the rate described below (Table 1). The volume reflected by this rate is in addition to the 0.99 million gallons per day previously authorized to Pembroke under Water Management Act (WMA) Registration #4-21-231.01 for withdrawal from the South Coastal 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 permit period over the term of this permit.

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 1: Maximum Authorized Withdrawal Volumes

Permit Periods	Total Raw Water Withdrawal Volumes			
	Permit		Registration + Permit	
	Daily Average (MGD)	Total Annual (MGY)	Daily Average (MGD)	Total Annual (MGY)
9/6/2023 to 12/6/2026	0.71*	259.15*	0.99+0.71=1.70*	620.5*
12/7/2026 to 12/6/2031	0.85	310.25	0.99+0.85=1.84	671.6

* With advance written approval from the Department, Pembroke is authorized to increase annual average daily withdrawals to the maximum authorized (1.84 MGD) prior to 2026 if Pembroke is meeting the following Permit Special Conditions:

- Residential gallons per capita day water (RGPCD) of 65 or less or all RGPCD functional equivalence requirements in Special Condition 5;
- Unaccounted for Water use (UAW) of 10% or less or all UAW functional equivalence requirements in Special Condition 6;
- Seasonal Limits on Nonessential Outdoor Water Use in Special Condition 7; and
- Water Conservation requirements in Special Condition 8.

2. Maximum Authorized Daily Withdrawals from Groundwater Withdrawal Points

Withdrawals from permitted withdrawal points are not to exceed the approved maximum daily volumes listed below without specific advance written approval from MassDEP (Table 2). 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 2: Maximum Daily Withdrawal Volumes

Source Name	PWS Source Code ID	Maximum Daily Rate (MGD)
Hobomock Well #1	4231000-01G	0.53
Center Street Well #2	4231000-02G	1.00
Bryantville Well #4	4231000-04G	1.00
Windswept Well #5	4231000-05G	Approved for 0.50 MGD annual average daily rate per MassDEP letter of 7/26/2000. In addition, pumping shall cease when the water level of Great Sandy Bottom Pond falls below 52.1'above MSL. See Special Condition 11.
Swanberg Wellfield	4231000-XXG	0.37

3. **Zone II Delineation**
   MassDEP records show that all Pembroke`s sources have approved Zone II delineations. Therefore, no further Zone II delineation work is required.

4. **Wellhead Protection**
   Pembroke shall amend the boundaries of its protection district to include the Zone II of the Swanberg Wellfield and submit documentation that their protection district has been amended prior to the operation of the Swanberg Wellfield. Contact MassDEP Drinking Water Program/Boston Catherine Sarafinas-Hamilton at Catherine.sarafinas-hamilton@mass.gov for further information on the requirements.

5. **Performance Standard for Residential Gallons Per Capita Day Water Use**
   The Town of Pembroke`s performance standard for residential gallons per capita day (RGPCD) is 65 gallons or less. Pembroke shall document its compliance with this performance standard in the Annual Statistical Report (ASR). If Pembroke does not meet the standard, it shall be in compliance with the functional equivalence requirements outlined in Appendix A.

6. **Performance Standard for Unaccounted for Water**
   The Town of Pembroke`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 Pembroke 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.

7. **Seasonal Limits on Nonessential Outdoor Water Use**
   Pembroke shall limit nonessential outdoor water use through mandatory restrictions from May 1st through September 30th as outlined in below (Table 3). To the extent feasible, all

summer outdoor water use should take place before 9 am and after 5 pm when evaporation and evapotranspiration rates are lower.

Table 3: Seasonal Limits on Nonessential Outdoor Water Use

Restrictions if Pembroke has met the 65 RGPCD Standard for the preceding year RGPCD ≤ 65 as reported in the ASR and accepted by MassDEP	
Calendar Triggered Restrictions	Nonessential outdoor water use is restricted to: a) **two (2) days per week** before 9 am and after 5 pm; and b) **one (1) day per week** before 9 am and after 5 pm when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below 7-day the low-flow statistic **4.9 cfs** for three (3) consecutive days. Once streamflow triggered restrictions are implemented, they shall remain in place until streamflow at the gage meets or exceeds **4.9** cfs for seven (7) consecutive days.
Streamflow Triggered Restrictions	Nonessential outdoor water use is restricted to: a) **two (2) days per week** before 9 am and after 5 pm when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below: • May 1 – June 30: **31 cfs** for three (3) consecutive days • July 1 – September 30: **13 cfs** for three (3) consecutive day**s** b) **one (1) day per week** before 9 am and after 5 pm when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below the 7-day low-flow statistic **4.9 cfs** for three (3) consecutive days. Once implemented, the restrictions shall remain in place until streamflow at the gage meets or exceeds the trigger streamflow for seven (7) consecutive days.
Restrictions if Pembroke has not met the 65 RGPCD standard for the preceding year RGPCD > 65 as reported in the ASR and accepted by MassDEP	
Calendar Triggered Restrictions	Nonessential outdoor water use is restricted to **one (1) day per week** before 9 am and 5 pm.
Streamflow Triggered Restrictions	Nonessential outdoor water use is restricted to **one (1) day per week** before 9 am and after 5 pm when USGS stream gage 01105730 – Indian Head River at Hanover, MA falls below: • May 1 – June 30: **31 cfs** for three (3) consecutive days • July 1 – September 30: **13 cfs** for three (3) consecutive day**s** Once implemented, the restrictions shall remain in place until streamflow at the gage meets or exceeds the trigger streamflow for seven (7) consecutive days.

Instructions for Accessing Streamflow Website Information
If Pembroke chooses Streamflow Triggered Restrictions, Pembroke shall be responsible for tracking streamflows and drought advisories and recording and reporting to MassDEP when restrictions are implemented.
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 01105730 – Indian Head River at Hanover, MA.
- Click on the gage number.
- Click "Legacy real-time page."
- 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 "00060 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.

Pembroke shall document compliance with the Seasonal Nonessential Outdoor Water Use Restrictions annually in its Annual Statistical Report (ASR), and indicate whether it anticipates implementing calendar triggered restrictions or streamflow triggered restrictions during the next year.

Restricted Nonessential Outdoor Water Uses

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

- irrigation of lawns via sprinklers or automatic irrigation systems;
- filling swimming pools;
- 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, pavement or cement.

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

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

Water uses NOT subject to mandatory restrictions are those required:

- for health or safety reasons;
- by regulation;
- for the production of food and fiber;
- for the maintenance of livestock; or

- to meet the core functions of a business (for example, irrigation by golf courses as necessary to maintain tees, greens, and minimal fairway watering, or irrigation by plant nurseries as necessary to maintain stock).

Public Notice of Seasonal Nonessential Outdoor Water Use Restrictions

Pembroke 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 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 form "Notification of Water Use Restrictions" available on MassDEP's website.

Nothing in the permit shall prevent Pembroke from implementing water use restrictions that are more stringent than those set forth in this permit.

8. Water Conservation Requirements

At a minimum, Pembroke shall implement the following updated conservation measures forthwith. Compliance with the water conservation requirements shall be reported to MassDEP upon request, during all interim permit reviews, and at the time of permit renewal, unless otherwise noted below.

Table 4: Minimum Water Conservation Requirements
System Water Audits and Leak Detection
1. A full leak detection survey shall be completed by May 1, 2023. Then, at a minimum, conduct a full leak detection survey every three years.
2. Conduct leak detection of the entire distribution system within one year whenever the percentage of UAW 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, submit to the Department a report detailing the 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. Pembroke shall have repair reports available for inspection by MassDEP. Pembroke shall establish a schedule for repairing leaks that is at least as stringent as the following: • Leaks of 3 gallons per minute or more shall be repaired within 3 months of detection. • Leaks of less than 3 gallons per minute at hydrants and appurtenances shall be repaired as soon as possible.

• Leaks of less than 3 gallons per minute shall be repaired in a timely manner, but in no event more than 6 months from detection, except that leaks in freeway, arterial or collector roadways shall be repaired when other roadwork is being performed on the roadway. Leaks shall be repaired in accordance with Pembroke's priority schedule including leaks up to the property line, curb stop or service meter, as applicable. Pembroke shall have water use regulations in place that require property owners to expeditiously repair leaks on their property.
Metering
1. Calibrate all source and finished water meters at least annually and report date of calibration on the ASR.
2. Pembroke reports its system is 100% metered. All water distribution system users shall have properly sized service lines and meters that meet AWWA calibration and accuracy performance standards as set forth in AWWA Manual M6 – Water Meters.
3. Pembroke shall have an ongoing program to inspect individual service meters to ensure that all service meters accurately measure the volume of water used by its customers. The metering program shall include regular meter maintenance, including testing, calibration, repair, replacement and checks for tampering to identify and correct illegal connections. The plan shall include placement of sufficient funds in Pembroke's annual water budget to calibrate, repair, or replace meters as necessary.
Pricing
1. Pembroke shall maintain a water pricing structure that includes the full cost of operating the water supply system. Pembroke shall evaluate rates at a minimum every two years and adjust costs as needed. Full cost pricing factors all costs - operations, maintenance, capital, and indirect costs (environmental impacts, watershed protection) - into prices.
2. Pembroke reports using an increasing block rate structure and shall continue to do so.
Residential and Public Sector Conservation
1. Pembroke shall meet the standards set forth in the Federal Energy Policy Act, 1992 and the Massachusetts Plumbing Code.
2. Pembroke reports metering water used by contractors using fire hydrants for pipe flushing and construction and shall continue to do so.
3. Pembroke shall ensure that water savings devices are installed in all municipal buildings as they are renovated, and shall ensure water conserving fixtures and landscaping practices are incorporating into the design of new municipal capital projects.
Industrial and Commercial Water Conservation
1. Pembroke shall ensure water conservation practices in all development proposals, particularly low flow devices and water-wise landscaping practices.
Public Education and Outreach
1. Pembroke shall continue to implement its water conservation and education efforts designed to educate the Town`s water customers on ways to conserve water. Without limitation, Pembroke's plan may include the following actions:

• Include in bill stuffers and/or bills, a work sheet 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; • Public service announcements; radio/T.V./audio-visual presentations; • Joint advertising with hardware stores to promote conservation devices; • 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 • Provide multilingual materials as needed.
2. Upon request of MassDEP, Pembroke 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.

9. Coldwater Fish Resource (CFR) Protection

Pembroke`s sources 4231000-01G, 02G, 04G and 05G are located in Subbasin 22023, which supports a coldwater fishery in Herring Brook. Review shows that only Hobomock Well 01G is close enough to Herring Brook to impact streamflow at the CFR. Well 01G has been off-line since 2009 due to water quality concerns, but it is still maintained as an active source.

The Swanberg Wellfield is located in Subbasin 22022, which includes a coldwater fishery in Pudding Brook. Review shows that the Swanberg Wellfield is located downstream of the identified CFR and its prolonged pumping test did not show significant impacts to the water levels at the nearby surface water sources.

Should Pembroke anticipate resuming withdrawals from Well 01G, prior to resuming withdrawals, Pembroke shall notify MassDEP and develop an optimization plan to minimize impacts to Herring Brook by managing the timing and magnitude of pumping at Well 01G in order to minimize streamflow impacts, to the extent feasible, using Pembroke`s other available sources.

10. Minimization of Groundwater Withdrawal Impacts in Stressed Subbasins

Pembroke shall minimize the impacts of its groundwater withdrawals from sources 4231000-01G, 02G, 04G and 05G, located in Subbasin 22023, as follows:

- Implement and enforce seasonal limits on nonessential outdoor water use as outlined in Special Condition 7;
- Continued implementation of the Town by-law prohibiting automatic irrigation systems connecting to the town’s water distribution system;
- Continue evaluating rate structure every two years;
- Continue to provide customers with water consumption information in gallons and their consumption history;

- Continue to implement and maintain the automatic drive-by meter reading system.

11. Mitigation of Impacts for Withdrawals that Exceed Baseline

Pembroke Water Department is required to mitigate 0.099 MGD for its permitted withdrawals over the baseline. Pembroke`s mitigation will be met with the direct mitigation credits achieved through the Town`s purchase and decision to cease cranberry cultivation of the Edgewood Bogs, the Andruk Bogs and the Oldham Bog. The qualified acreage associated with calculating the direct mitigation credits during the period of 2003-2005 for these three bogs was 84.5 acres, 25.53 acres and 6 acres respectively. The qualified irrigation areas for the Edgewood bogs are located in the Taunton Basin. The qualified irrigation areas for the Andruk Bogs and the Oldham Bog are located in the South Coastal Basin. Therefore Pembroke Water Department receives a total of 0.148 MGD direct mitigation credits from the acquisition and decision to cease cultivating these three cranberry bogs. Please see Appendix C for details.

12. Water Conservation Levels

Groundwater withdrawals from Windswept Well #05G shall be constrained by water levels in Great Sandy Bottom Pond as described below:

- When water levels in Great Sandy Bottom Pond fall below the base level of 52.1 feet above mean sea level (MSL), surveyed to National Geodetic Vertical Datum (NGVD), all withdrawals from Windswept Well #5 shall cease, and shall not resume until such time as the level of the pond has returned to 52.1 feet above MSL.
- Pembroke shall request to receive either electronically or by U.S. Mail, reservoir water level readings for Great Sandy Bottom Pond from the Abington Rockland Joint Water Works on the first of each month.
- Pembroke shall keep a record of all monthly reservoir water level readings for Great Sandy Bottom Pond and shall provide them to the Department annually as an attachment to Pembroke`s Annual Statistical Report (ASR), or upon request of the Department.
- Should a catastrophic event occur causing the level of the pond to drop significantly for an extended period, the Town would no longer be able to operate the Windswept Well #5 without the permission of MassDEP. In such an event, MassDEP agrees to respond to any reasonable request for relief by the Town of Pembroke from this permit condition as expeditiously as possible consistent with existing rules and regulations.

13. Reporting Requirements

Pembroke shall report annually as required by completing the electronic Annual Statistical Report (eASR) for public water suppliers, and shall provide other reporting as specified in the Special Conditions above.

General Permit Conditions (applicable to all Permittees)

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 up to the authorized volume 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, inspect and monitor the withdrawal, and inspect and copy any relevant records, 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. 111, § 160, 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 36.37.
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 mailed or hand delivered to the address specified on the report form.
7. **Duty to Maintain Records** The Permittee shall be responsible for maintaining withdrawal records as specified by this permit.
8. **Metering** Withdrawal points shall be metered. Meters shall be calibrated annually. Meter shall be maintained and replaced as necessary to ensure the accuracy of the withdrawal records.
9. **Amendment, Suspension or Termination** The Department may amend, suspend or terminate this permit in accordance with M.G.L. c. 21G or 310 CMR 36.29.

APPEALS

Any person aggrieved by this decision may request an adjudicatory hearing on this Permit by timely filing a Notice of Claim for an Adjudicatory Appeal ("Notice of Claim") in accordance with 310 CMR 36.37 and 310 CMR 1.01 within twenty-one (21) days of its receipt of this Permit. The Notice of Claim shall state specifically, clearly and concisely the facts that are grounds for the appeal, the relief sought, and any additional information required by applicable law or regulation. A copy of this Permit shall be included with a Notice of Claim. No request for an appeal of this Permit shall be validly filed unless a copy of the request is sent at the same time 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 Permittee, unless such person notifies the Permittee of the appeal in writing by certified mail or by hand within five (5) days of mailing the appeal to the Department.

The Notice of Claim and supporting documentation must be sent by certified mail or hand delivered to:

Case Administrator
Office of Appeals and Dispute Resolution
Department of Environmental Protection
100 Cambridge Street, Suite 900
Boston, MA 02114

In addition, the Department's fee transmittal form, together with a valid check made payable to the Commonwealth of Massachusetts in the amount of $100 for the appeal filing fee, if required, must be mailed to:

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

The Notice of Claim may be dismissed if the filing fee is not paid, unless the appellant is exempt or granted a waiver. The filing fee is not required if the appellant is a city, town (or municipal agency), county, district of the Commonwealth of Massachusetts, or a municipal housing authority. The Department may waive the adjudicatory filing fee for a person who shows that paying the fee will create an undue financial hardship. A person seeking a waiver must file, along with the hearing request, an affidavit setting forth the facts believed to support the claim of undue financial hardship.

Duane LeVangie

September 6, 2023

Duane LeVangie
Water Management Program Chief
Bureau of Water Resources

Date

Appendix A – Functional Equivalence with the 65 Residential Gallons Per Capita Day Performance Standard

MassDEP will consider PWS permittees who cannot meet the 65 RGPCD 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 residential water use as described below.

If the permittee fails to document compliance with the RGPCD performance standard in its Annual Statistical Report (ASR), or in any ASR thereafter, then the permittee must file with that ASR a Residential Gallons Per Capita Day Compliance Plan (RGPCD Plan) which shall include, at a minimum:

1. A description of the actions taken during the prior calendar year to meet the performance standard;
2. An analysis of the cause of the failure to meet the performance standard;
3. A description of the actions that will be taken to meet the performance standard which must include, at a minimum, at least one of the following:
    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, by-law or regulation to require the installation of moisture sensors or similar climate related control technology on all automatic irrigation systems;

    and may include, without limitation, the following:
    d) the use of an increasing block water rate or a seasonal water rate structure as a tool to encourage water conservation;
    e) a program that provides rebates or other incentives for the installation of moisture sensors or similar climate related control technology on automatic irrigation systems;
    f) the adoption and enforcement of an ordinance, by-law or regulation to require that all new construction include water saving devices and low water use appliances;
    g) the adoption and enforcement of an ordinance, by-law or regulation to require that all new construction minimize lawn area and/or irrigated lawn area, maximize the use of drought resistant landscaping, and maximize the use of top soil with a high water retention rate;
    h) the implementation of a program to encourage the use of cisterns or rain barrels for outside watering;
    i) the implementation of monthly or quarterly billing.
4. A schedule for implementation; and
5. An analysis of how the planned actions will address the specific circumstances that resulted in the failure to meet the performance standard.

If the permittee is already implementing one or more of these programs, it must include in its 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.

RGPCD plans may be amended to revise the actions that will be taken to meet the performance standard. Amended RGPCD plans must include the information set forth above.

If a RGPCD plan is required, the permittee must:

1. submit information and supporting documentation sufficient to demonstrate compliance with its RGPCD plan annually at the time it files its ASR, and
2. 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.

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 the Department.
3. Continued implementation will be a condition of the permit in place of meeting the 10% UAW performance standard.
4. Upon request of the Department, 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.

Appendix C
Direct Mitigation Credit
Acreage Purchased by Pembroke Where Cranberry Cultivation Has Ended

Bog Name	Basin	End Date	WMA Registered/ Permitted Number	Registered Acres	Registered Volume (MGD)	Consumptive Use (22.5% of total) (MGD)
Edgewood Bog	Taunton	3/24/2009	42505220	84.5	0.75	0.085 (50% credit as withdrawals are outside of South Coastal basin)
Andruk Bog-Indian Head Bog	South Coastal	6/30/2009	42112302	18.61	0.166	0.037
Andruk Bog-Nine Owls Bog	South Coastal	7/1/2015	42112302	6.92	0.062	0.014
Oldham Bog	South Coastal	6/30/2012	42123921	6	0.05	0.012
Total						0.148