Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

One Winter Street Boston, MA 02108 • 617-292-5500

Charles D. Baker
Governor

Karyn E. Polito
Lieutenant Governor

Matthew A. Beaton
Secretary

Martin Suuberg
Commissioner

May 8, 2015

Sheila Vanderhoef, Town Administrator
Eastham Town Offices
2500 State Highway
Eastham, MA 02642-2544

RE: Town of Eastham
PWS ID#: 4086095
Water Management Permit 9P2-4-22-086.01
Action: WMA Final Withdrawal Permit
Transmittal ID X262593

Dear Ms. Vanderhoef:

Please find attached the following:

- Findings of Fact in Support of the Final Permit Decision, and
- Water Management Act Final Permit #9P2-4-22-086.01 for the Eastham Water System, Eastham, Massachusetts.

If you have any questions regarding the Final permit, please contact Richard Friend (617) 654-6522.

Very truly yours,

Douglas Fine, Assistant Commissioner
Bureau of Water Resource

Cc: R. Rondeau, MassDEP, SERO
Eastham Board of Selectmen, 2500 State Highway, Eastham, MA 02642-2544

Ecc:
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Findings of Fact in Support of Final Permit Decision
Town of Eastham
Water Management Permit #9P2-4-22-086.01

The Massachusetts Department of Environmental Protection (MassDEP) has completed its review of the Town of Eastham's (Eastham's) Water Management Act (WMA) Permit Application of September 24, 2014 to authorize withdrawals from the Cape Cod watershed.

In response to your application in the Cape Cod Watershed, and after reviewing the information that you have provided, MassDEP hereby issues this Final Water Management Act permit 9P2-4-22-086.01 in accordance with the Water Management Act, M.G.L. c. 21G ("the Act"). MassDEP makes the following Findings of Fact in support of the attached Final permit, and includes herewith its reasons for approving the Final permit and for the conditions of approval imposed, as required by the Act and the "Massachusetts Water Resources Management Program Regulations", 310 CMR 36.00 ("the Regulations").

Eastham Water System Withdrawal Summary
Eastham does not have a municipal public water supply system and has not held a WMA registration or permit authorizing water withdrawals. All water is supplied by on-site wells. This Final WMA permit authorizes Eastham to withdraw water year-round from three municipal supply wells. A pumping, storage and distribution system is scheduled to be built in phases, starting in 2015.

The WMA permit application included information on the estimated projected water use using parcel information from the town and assuming rates of water use according to parcel type. The analysis included all existing developed properties with wells and all non-developed properties that could become customers of the new municipal supply. The projections also account for seasonal water use patterns based on the pumping records of nearby existing municipal suppliers.

Demand Projections for Average Daily Water Withdrawals
Town of Eastham

Permit Period	Estimated Demand (MGD)
2016-2020	0.378
2021-2025	0.415
2026-2030	0.415

The Water Management Act
Section 7 of the WMA requires that the Department issue permits that balance a variety of factors including:

- Reasonable protection of existing water uses, land values, investments and enterprises;
- 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
Among the minimum permit factors Section 7 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 water sources to be the river basins delineated by the MA Water Resources Commission at 313 CMR 4.03. A map of the major river basins has been developed by the Department of Conservation and Recreation and can be viewed in their guidance document "A Guide to the Interbasin Transfer Act and Regulations" or at http://www.mass.gov/eea/images/dcr/watersupply/intbasin-ipswichriver/basin.jpg.

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. The Department has used the methodology described in the Regulations to calculate the safe yield for each river basin, and has calculated the remaining safe yield by subtracting total registered and permitted withdrawals in each basin from the safe yield.

Under Section 11 of the Act, MassDEP cannot issue permits when the combined existing, permitted and proposed withdrawal volumes exceed the safe yield of the water source. As of the date of issuance for this permit, the safe yield for the Cape Cod basin water source is 266.0 million gallons per day (MGD), and total allocated withdrawals are 51.8 MGD, leaving 214.2 MGD in safe yield. The maximum withdrawals that will be authorized in this permit, and all other permits currently under review by the Department within the Cape Cod basin, will be within the remaining safe yield of the water source.

Findings of Fact for Performance Standards
To better achieve the balance of competing water uses mandated by the WMA, the Regulations at 310 CMR 36.28 incorporate the requirements of the Water Conservation Standards adopted by the MA Water Resources Commission.

Specific performance standards and conditions have been identified to be applied to new Water Management permits and to existing permits at the time they are amended, during 5-year permit review or permit renewal. MassDEP has applied these performance standards and conditions to Eastham's permit.

In issuing permits in the Cape Cod Basin, MassDEP considers the site-specific environmental impacts of individual points of withdrawal, the capacity of individual points, the presence or absence of other users,

and the basis for any long-term demand projections. The intent of all permit conditions is to ensure the efficient use of water and mitigate any negative impacts of withdrawals that may occur.

To further the goals of the Water Management Program, promote the reasonable and appropriate use of water, and protect the environmental resources of the Commonwealth of Massachusetts, MassDEP has the authority to modify permits at any time when it determines that such action is necessary for the promotion of the purposes of the Act, 310 CMR 36.29(1)(b).

Performance Standards for Cape Cod Water Management Permits

As referenced above, MassDEP applies the Water Conservation Standards approved in July 2006 and updated in 2012 by the MA Water Resources Commission to all new WMA permits and existing WMA permits at either the time they are amended, during 5-year permit review, or when the permit is renewed. MassDEP considers these Performance Standards as reasonable in light of the fact that average values in 2013 for Massachusetts were 58 RGPCD, and 14% UAW. These standards can be found at: http://www.mass.gov/eea/agencies/massdep/water/watersheds/water-conservation.html.

Unaccounted-for Water (UAW): Eastham's UAW performance standard will be 10% in conformance with the Massachusetts Water Conservation Standards. Eastham currently has no water system and therefore no record of UAW.

While the Performance Standard for UAW represents a minimum standard required for compliance with this permit condition, the Department believes that the cumulative effect of complying with all the terms and conditions of its permit will enable Eastham to maintain values well within the required parameters, especially given that the distribution and metering systems will be new.

Residential Gallons per Capita Day (RGPCD): In areas that experience significant seasonal fluctuations in population, as is the case in Cape Cod communities, calculation of an accurate RGPCD is difficult and has not been standardized to date. Therefore, at this time, MassDEP does not require that permittees on Cape Cod meet a specific RGPCD performance standard. The omission of a numerical standard from Eastham's permit does not imply that water conservation is not important for resource protection, and Eastham should still take every opportunity to encourage water conservation, especially during the high use summer season. The permit requires Eastham to implement water conservation and fully enforce seasonal limits on nonessential outdoor water use.

MassDEP will consider any permittee that has been unable to meet the UAW performance standard within 5 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 any required limits on nonessential outdoor water use, and
- are making demonstrable efforts to finance, implement and enforce a MassDEP-approved compliance plan.

Appendix A outlines the requirements for and contents of an Unaccounted for Water Compliance Plan. Because permittees' 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 (See Appendix A).

MassDEP will review permittees' detailed, written cost effectiveness analysis to determine whether unique circumstances make specific Best Management Practices (BMPs) less cost-effective than alternatives, or not feasible for a particular Public Water Supplier (PWS) when developing the compliance plan.

Findings of Fact for Specific Permit Conditions

Special Condition 1, Maximum Authorized Annual Average Withdrawal Volume is based on the current and future water needs estimated from an analysis of water use at developed and undeveloped parcels in Eastham and on the seasonal demand patterns of water systems in nearby towns. MassDEP may adjust these authorized withdrawal volumes when the system is operating and actual pumping records become available.

Special Condition 2, Maximum Authorized Daily Withdrawals from Each Withdrawal Point, specifies the maximum daily volume expressed in millions of gallons per day that may be withdrawn from each of Eastham's permitted sources. The maximum authorized daily withdrawal for any of Eastham's sources is equal to the approved Zone II rate for that source.

Special Condition 3, Zone II Delineations, all of Eastham's permitted sources have approved Zone II's delineated.

Special Condition 4, Wellhead Protection requires Eastham to implement appropriate wellhead protection zoning or non-zoning controls for those areas that lie outside the Cape Cod National Seashore and are not covered by the Town of Eastham's Water Resource Protection Districts G and H.

Special Condition 5, Performance Standard for Unaccounted for Water Discussed above under "Performance Standards for Cape Cod Water Management Permits", the Regulations provide that Eastham's permit s comply with the 10% performance standard by December 31, 2017.

Special Condition 6, Water Conservation Requirements, incorporates the Water Conservation Standards for the Commonwealth of Massachusetts adopted by the MA Water Resources Commission in July 2006 (updated in 2012) and required by the Regulations at 310 CMR 36.28.

Special Condition 7, Seasonal Limits on Nonessential Outdoor Water Use, requires Eastham to implement nonessential outdoor water use restrictions from May 1 to September 30. The town can choose to implement the restrictions based on either the calendar (all summer) or only when groundwater levels in a U.S. Geological Survey monitoring well fall below certain defined levels for at least 60 consecutive days.

Special Condition 8, Vernal Pool Monitoring requires Eastham to conduct monitoring of water levels in and around five vernal pools at the District H well. Vernal pool monitoring is being conducted to confirm the predicted modeled impact on vernal pools from pumping the District H supply well, and includes monitoring for six months prior to placing the well on-line to characterize pre-pumping conditions.

Special Condition 9, Mitigation – Eastham may meet this requirement through implementation of its 2014 bylaw restricting the use of fertilizers. If Eastham fails to implement and enforce its fertilizer bylaw, MassDEP may require Eastham to undertake other mitigation activities.

Eastham's Baseline withdrawal rate is zero, since the municipal supply system did not exist during the 2003-2005 Baseline period. Therefore all water withdrawals requested by Eastham are above the Baseline rate.

With current water usage supplied by private wells, small transient non-community (TNC) wells and small non-transient non-community (NTNC) public supply wells, connecting existing properties to the municipal system is not expected to result in an overall increase in pumping from the aquifer or the Cape Cod basin. The volume of water pumped from the new municipal wells is expected to be offset gallon-for-gallon by the reduction in pumping from existing on-site private wells. Therefore, the Department does not require mitigation for the estimated 378,000 gallons per day (gpd) of existing use that will switch from private wells onto the municipal system.

Full build-out of undeveloped properties is estimated to require a maximum additional 39,000 gpd (not currently supplied by existing on-site wells). Because Eastham is entirely served by on-site septic systems, the Department assumes that 85% of that additional water withdrawn is returned to the aquifer via septic systems and thus only 15% of the 39,000 gpd of future use (5,850 gpd) must be mitigated.

Pursuant to the Regulations at 310 CMR 36.22, permittees must first consider direct mitigation for increased withdrawals above Baseline, but Eastham has no apparent opportunities for the three direct mitigation options (stormwater recharge, inflow/infiltration activities, or surface water releases). Eastham's 2014 fertilizer bylaw is expected to result in surface water and groundwater quality improvements by restricting the release of nutrients such as nitrogen and phosphorus to groundwater. The fertilizer bylaw meets the requirement to mitigate estimated future increased water demand.

Special Condition 10, Requirement to Report Raw and Finished Water Volumes ensures that the information necessary to evaluate compliance with the conditions included herein is accurately reported.

The summary of permit conditions above as part of MassDEP's findings of fact is not intended to, and should not be construed as, modifying any of the permit conditions. In the event of any ambiguity between the summary and the actual permit conditions, the permit language shall be controlling.

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Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

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Final WATER WITHDRAWAL PERMIT
M.G.L. c. 21G

This Final permit is issued pursuant to the Massachusetts Water Management Act 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: 9P2-4-22-086.01 **BASIN:** Cape Cod

PERMITTEE: Town of Eastham
2500 State Highway
Eastham, MA 02642

EFFECTIVE DATE: May 8, 2015
EXPIRATION DATE: November 30, 2030

NUMBER OF WITHDRAWAL POINTS: Groundwater: 3 Surface Water: 0

USE: Public Water Supply

DAYS OF OPERATION: 365

SOURCE LOCATIONS:

Authorized Withdrawal Points

Source Name	PWS Source ID*
District G Well	4086095-##G
District H Well	4086095-##G
NRHS Well	4086095-##G

*Individual PWS Source IDs will be assigned to each well when final approval to use the wells for public water supply is granted by MassDEP's Drinking Water Program.

SPECIAL CONDITIONS

1. **Maximum Authorized Annual Average Withdrawal Volume**
This permit authorizes the Town of Eastham to withdraw water from the Cape Cod Basin at the rate described in Table 1.

The permitted volume is expressed in millions of gallons, both as an average daily withdrawal rate per year and as a total annual withdrawal volume for each year of the period of the permit term. The Department of

Environmental Protection will use the raw water withdrawal volume from all authorized withdrawal points to assess compliance with the permitted withdrawal volumes.

Table 1: Maximum Authorized Withdrawal Volumes

5-Year Periods		Total Permitted Raw Water Withdrawal Volumes	
		Daily Average (MGD)	Total Annual (MGY)
Period One / Years 1-5	5/8/2015 -11/30/2020	0.378	138.0
Period Two / Years 6-10	12/1/2020 - 11/30/2025	0.415	151.5
Period Three / Years 11-15	12/1/2026 - 11/30/2030	0.415	151.5

2. **Maximum Authorized Daily Withdrawals from Each Withdrawal Point**
Withdrawals from individual withdrawal points are not to exceed the approved maximum daily volumes listed in Table 2 without specific advance written approval from the Department. 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: Authorized Maximum Daily Withdrawal Volumes

Well Name	PWS Source ID*	Maximum Daily Rate (MGD)
District G Well	4086095-##G	0.955
District H Well	4086095-##G	1.310
NRHS Well	4086095-##G	0.833

*Individual PWS Source IDs will be assigned to each well when final approval to use the well for public water supply is granted by MassDEP's Drinking Water Program.

3. **Zone II Delineations**
All three of Eastham's permitted wells have Zone II areas and Zone II pumping rates approved by the Department. Because these rates are designated by the WMA program as maximum daily rates, they are specified above in Table 2. No further Zone II work is required as a condition of this permit.

4. **Wellhead Protection**
Prior to operating the District G, District H and NRHS wells, Eastham must implement appropriate wellhead protection zoning or non-zoning controls of the District G well, the District H well and the NRHS well Zone II areas that lie outside the Cape Cod National Seashore (District F) and not covered by Eastham's Water Resources Protection Districts G and H (see 310 CMR 22.21(2)). Wellhead protection for the portion of Eastham's Zone II areas within the Cape Cod National Seashore is provided in accordance with the United States Department of Interior regulations and polices documented in the "Comprehensive Source Protection Plan, Cape Cod National Seashore" dated 2006.

5. **Performance Standard for Unaccounted for Water**
Eastham's Performance Standard for Unaccounted for Water (UAW) is 10% of overall water withdrawal. Eastham shall be in compliance with the Performance Standard by December 31, 2017. Eastham shall report its UAW annually in its Annual Statistical Report (ASR) and document compliance with this Performance Standard in its ASR annually.

The MA Water Conservation Standards defines UAW as "the residual resulting from the total amount of water supplied to a distribution system as measured by master meters, minus the sum of all amounts of water measured by consumption meters in the distribution system, and minus confidently estimated and documented amounts used for certain necessary purposes as specified by the MassDEP." UAW is the difference between finished water entering the distribution system and metered or confidently estimated water leaving the system. UAW shall include, without limitation, water that cannot be accounted for due to meter problems, unauthorized hydrant openings, unavoidable leakage, recoverable leakage, illegal connections, stand pipe

overflows, and fire protection where it cannot be confidently estimated. Eastham shall report its UAW and the calculation used to derive that figure as part of its Annual Statistical Report (ASR). The need for water main flushing and the use of water in construction or meter calibration shall be metered or estimated as appropriate to assist in determining actual demand. Volumes flushed to waste shall be reported on Eastham's ASR. See Appendix A for additional information on requirements if the Performance Standard for UAW is not met.

6. **Water Conservation Requirements**

At a minimum, Eastham shall implement conservation measures listed in Table 3. Compliance with the water conservation requirements shall be reported to the Department upon request or at the time of permit renewal unless otherwise noted below.

Table 3: Minimum Water Conservation Requirements

System Water Audits and Leak Detection
• 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 start-up of the system, anticipated for the summer of 2016. • Perform a leak detection survey on those sections of the distribution system that have not been surveyed within the last year whenever the percentage of system-wide 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, the Water Department shall submit to the Department for its review 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.
• Conduct field surveys for leaks and repair programs in accordance with AWWA Manual 36.
• Repair reports shall be kept available for inspection by the Department. The permit holder shall establish a schedule for repairing leaks that is at least as stringent as the following: o Leaks of 3 gallons per minute or more shall be repaired within 3 months of detection. o Leaks of less than 3 gallons per minute at hydrants and appurtenances shall be repaired as soon as possible. o 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 the permit holder's priority schedule including leaks up to the property line, curb stop or service meter, as applicable. The Town shall have water use regulations in place that require property owners to expeditiously repair leaks on their property.
Metering
• Calibrate all source and finished water master meters at least annually and report date of calibration on the ASR.
• 100% metering of the system is required. 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.
• Develop a plan to regularly inspect individual service meters to ensure that all service meters accurately measure the volume of water used by customers. The metering plan 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 the system's annual water budget to calibrate, repair, or replace meters as necessary.

Table 3: Minimum Water Conservation Requirements
Pricing
• Prior to system start-up, anticipated for the summer of 2016, establish a water pricing structure that includes the full cost of operating the water supply system. Evaluate rates every three to five years and adjust costs as needed. Full Cost Pricing factors all costs – operations, maintenance, capital, and indirect costs (environmental impacts, watershed protection) into prices.
• Decreasing block rates which charge lower prices as water use increases during the billing period, are not allowed by M.G.L. c. 40, s. 39L.
Residential and Public Sector Conservation
• All standards set forth in the Federal Energy Policy Act, 1992 and the Massachusetts Plumbing Code shall be met.
• Meter or estimate water used by contractors using fire hydrants for pipe flushing and construction.
• Eastham's Water Conservation Questionnaire (2/9/2015) states that water saving devices have been installed in all public buildings including schools.
Industrial and Commercial Water Conservation
• Upon request by the Department, the permit holder 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, the Department will take whatever action it deems appropriate to promote the interests of the Water Management Act, including requiring additional actions of the permit holder to reduce industrial, commercial and institutional water use.
Lawn and Landscape
• Eastham must develop and adopt a water use restriction bylaw, ordinance or regulation that authorizes enforcement of any seasonal limits on nonessential outdoor water use required by the Water Management permit by May 1, 2016.
Public Education and Outreach
• Implement a Water Conservation Education Plan designed to educate water customers of ways to conserve water. The plan may include the following actions: o Inclusion of a work sheet in bill stuffers and/or bills designed to enable customers to track water use and conservation efforts and estimate the dollar savings; o Public space advertising/media stories on successes (and failures); o Conservation information centers perhaps run jointly with electric or gas company; o Speakers for community organizations; o Public service announcements; radio/T.V./audio-visual presentations; o Joint advertising with hardware stores to promote conservation devices; o Use of civic and professional organization resources; o Special events such as Conservation Fairs; o Develop materials targeted to school children, including materials on water resource projects and field trips and make multilingual materials available as needed.
• Upon request of the Department, report on 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.

7. Seasonal Limits on Nonessential Outdoor Water Use

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

Eastham shall be responsible for tracking groundwater levels and drought advisories and recording and reporting when restrictions are implemented if groundwater level triggered restrictions are implemented. See Table 4 for *Instructions for Accessing U.S. Geologic Survey Groundwater Level and Massachusetts Drought Advisory Website Information.* Eastham shall also document compliance with the summer limits on nonessential outdoor water use annually in its Annual Statistical Report (ASR).

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
- irrigation of 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

Permittee must at a minimum implement the following outdoor water use restrictions:

Groundwater level Triggered Restrictions from May 1st through September 30th

Nonessential outdoor water use is allowed no more than TWO DAYS per week before 9 am and after 5 pm **whenever:**

a) Groundwater levels at USGS Monitoring Well 415353069585401 (WNW 17) Wellfleet, MA decline to or below the groundwater trigger for 60 consecutive days. The monthly trigger levels are listed below and are the period of record monthly 25th percentile depth to water level values, as determined and published by the USGS. Restrictions could start on May 1, so monitoring of WNW 17 begins on March 1 of each year.

Trigger Values for Outdoor Water Use Restrictions (feet below land surface)

March	April	May	June	July	Aug	Sept
10.93	10.55	10.48	10.51	10.98	11.18	11.39

Once implemented, the restrictions shall remain in place until the daily value of the groundwater levels at the assigned USGS monitoring well have recovered to less than the trigger for 30 consecutive days (when the water table elevation has risen above the trigger level).

Or;

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

Instructions for Accessing U.S. Geologic Survey Groundwater Level and Massachusetts Drought Advisory Website Information

Groundwater level information is available at the USGS National Water Information System (NWIS): Web Interface. The USGS NWIS default shows Massachusetts groundwater levels in real time, i.e., the most recent, usually hourly, water level measured and recorded at each USGS monitoring well.

Seasonal Limits on Nonessential Outdoor Water Use are implemented when the daily mean depth to water level exceeds the designated trigger for 60 consecutive days (*i.e.*, when the depth to water becomes larger than the trigger value as the water table elevation declines). The daily water level is compared to the trigger for that month. To determine if restrictions must be implemented on May 1 it is necessary to monitor the daily water level in March and April.

Mean daily groundwater level readings are available at the USGS NWIS Web Interface at http://waterdata.usgs.gov/ma/nwis/current/?type=gw&group_key=county_cd

- Scroll down to 415353069585401 MA-WNW 172, Wellfleet, MA.
- Click on the station number.
- On the pull-down menu "Available data for this site" choose "Daily data".
- Under "Available Parameters " click on "WaterLevel, BelowLSD (Mean)".
- Under "Output Format" click on "Table" and enter the number of days of records (the default is 7 days; entering 60 will give you 60 days of data) and hit "GO".

- The table provides the "Daily Mean Depth to water level, feet below land surface" for the most recent number of days chosen.
- Compare each day's value to its month's trigger value (25th percentile) in your permit. Outdoor water use restrictions must be implemented when the daily depth to water level is at or below the trigger for 60 consecutive days.

Drought Advisory information is available at the Massachusetts Department of Conservation and Recreation (DCR) Drought Status Website at
http://www.mass.gov/eea/agencies/dcr/water-res-protection/water-data-tracking/drought-status.html

- 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

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

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

Notice to customers shall include the following:

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

Notice that restrictions have been put in place shall be filed each year with MassDEP within 14 days of the restriction's effective date by completing and submitting to MassDEP the **Notification of Water Use Restrictions** form, which can be found at http://www.mass.gov/eea/agencies/massdep/water/watersheds/municipal-water-use-restrictions.html Notice to customers and MassDEP need not be provided if Eastham has already implemented water use restrictions that conform to the applicable restrictions and those restrictions are still in force.

8. Vernal Pool Monitoring

Vernal pool monitoring must be performed in accordance with Section 12.2 of the April 2013 report "Well Field Protection Zoning District H – Eastham, MA" prepared by Environmental Partners Group (attached). The monitoring plan includes collecting data for at least six months prior to District H well going on-line.

9. Mitigation

Mitigation Plan

Eastham is required to mitigate 5,850 gpd for the entire estimated maximum increase from connecting newly developed properties to the municipal system. Direct mitigation (stormwater infiltration, inflow/infiltration removal, or surface water releases) do not appear to be feasible for Eastham. Therefore Eastham must implement indirect mitigation that is expected to make an environmental improvement (1 point of indirect mitigation credit = 10,000 gpd).

Eastham's fertilizer bylaw, passed by the town on November 20, 2014, and approved by the Cape Cod Commission on December 18, 2014, is expected to reduce the amount of nitrogen and phosphorous that enters groundwater and surface water and thus result in an environmental improvement. Implementation of Eastham's fertilizer bylaw qualifies for 1 mitigation point as it is aimed at improving water quality. Eastham must implement and enforce its 2014 fertilizer bylaw. If Eastham fails to implement and enforce its fertilizer bylaw MassDEP may require other mitigation activities.

10. Requirement to Report Raw and Finished Water Volumes

Eastham shall report annually on its ASR the raw water volumes and finished water volumes for the entire water system. Monthly raw water volumes for individual water withdrawal points shall be reported annually in the ASR.

GENERAL 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 the Department at reasonable times to enter and examine any property or inspect and copy any 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 the Department pursuant to M.G.L. c. 21G, s. 15-17, M.G.L. c. 111, s. 160, or any other enabling authority.

5. **Transfer of Permits** This permit shall not be transferred in whole or in part unless and until the Department approves such transfer in writing, pursuant to a transfer application on forms provided by the Department requesting such approval and received by the Department 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 the electronic Annual Statistical Report (eASR) accessed through the Department's eDEP website, a statement of the withdrawal. Such report must be submitted annually by the date identified on eDEP each year, unless the permittee has explicit permission from the MassDEP Drinking Water program for an extension of time.

7. **Duty to Maintain Records** The permittee shall be responsible for maintaining withdrawal records in sufficient detail to assess compliance with the conditions of this permit.

8. **Metering** All withdrawal points included within the permit shall be metered. Meters are to be calibrated annually.

9. **Amendment, Suspension or Termination** The Department 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 the Department. Any person aggrieved by this decision and any person who has been allowed pursuant to 310 CMR 1.01(7) to intervene in the adjudicatory proceeding that resulted in this decision may request an adjudicatory hearing. Any such request must be made in writing, by certified mail or hand delivered, and received by the Department within twenty-one (21) days of the date of receipt of this permit. 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 city or town 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 the Department.

CONTENTS OF HEARING REQUEST
The request for a hearing shall state specifically, clearly and concisely the facts which are the grounds for the appeal, the relief sought, and any additional information required by 310 CMR 1.01(6)(b) or other applicable law or regulation. For any person appealing this decision who is not the applicant, the request must include sufficient written facts to demonstrate status as a person aggrieved and documentation to demonstrate previous participation where required.

FILING FEE AND ADDRESS
The hearing request, 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 city or town (or municipal agency), county, district of the Commonwealth of Massachusetts, or a municipal housing authority.

WAIVER
The Department may waive the adjudicatory hearing filing fee for any person who demonstrates to the satisfaction of the Department 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.

Appendix A – Unaccounted for Water

I. Compliance Plan Requirement

If Eastham fails to document compliance with the UAW Performance Standard in its 2017 ASR, or in any ASR thereafter, then Eastham must file with that ASR an Unaccounted for Water Compliance Plan (UAW Plan) which shall:

a. meet the requirements 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 a UAW Plan shall not constitute a return to compliance, nor shall if affect the Department's authority to take action in response to Eastham's failure to meet the Performance Standard.

If a UAW Plan is required, Eastham must:

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

II. Contents of an Unaccounted for Water Compliance Plan

Eastham has the choice to file a UAW Plan with measures tailored to the specific needs of its water supply system (Individualized UAW Plan) or a UAW Plan that includes Best Management Practices (BMP UAW Plan).

At a minimum, all UAW Plans must include a detailed:

a. description of the actions taken during the prior calendar year to meet the UAW Performance Standard;
b. analysis of the cause of the failure to meet the UAW Performance Standard;
c. description and schedule of the actions that will be taken to meet the UAW 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 UAW Performance Standard.

UAW Plans may be amended to revise the actions that will be taken to meet the Performance Standard. Amended UAW Plans must include the information set forth in the paragraph above.

Individualized UAW Compliance Plan

Without limitation, Individualized UAW Compliance Plans for failure to meet the UAW Performance Standard may include any of the actions set forth in the BMP UAW Compliance Plan below.

BMP UAW Compliance Plan

At a minimum, all BMP UAW Plans for failure to meet the UAW Performance Standard must include all of the following actions:

a. within one year of filing the UAW Plan, complete a water audit and leak detection survey of the entire system and submit completed audit and survey to the Department; within one year of completing the audit and leak detection survey, conduct sufficient repairs to reduce by 75% (by water volume) all leaks detected in the survey; and within one year of completing such repairs, conduct additional repairs of leaks detected in the survey as may be necessary to reduce permittee's UAW to 10% or less;
b. implementation of a program that ensures the inspection and evaluation of all water meters and, as appropriate, the repair, replacement and calibration of water meters in accordance with the following schedule:
   - Large Meters (2" or greater) - within one year of filing the BMP UAW Plan
   - Medium Meters (1" or greater and less than 2") - within two years of filing the BMP UAW Plan
   - Small Meters (less than 1") - by the next permit review date;
c. implementation of monthly or quarterly billing by the next permit review date; and
d. within one year of filing the UAW Plan, implementation of a water pricing structure that achieves sufficient revenues to pay the full cost of operating the system including, without limitation, the costs of repairs under paragraph a., the costs of meter repairs, replacements and calibrations under paragraph b., the costs of employees and equipment, and ongoing maintenance and capital costs.

Every five years, the monitoring data will be compared to water quality and head distributions computed using the most current version of the Nauset lens model. The results of the comparison can be used to modify or update the model.

12.2 Vernal Pool Monitoring

The goal of the vernal pool monitoring program is to confirm, under actual operating conditions of the wellfield, the results of the SEAWAT model as it relates to water level drawdown at nearby vernal pools and vernal pool stage levels as predicted by the vernal pool model. As summarized in Sections 8.4 and 8.5, the vernal pool model shows that normal pumping conditions at District H would have a very small effect on the vernal pool stage (average drop of 2.5 inches), based on monitoring data collected from December 2010 to December 2011. The model was based on a SEAWAT calculated groundwater level decline of approximately 7.4 inches in the vicinity of vernal pool VP-E11, in response to a pumping rate of 0.5 MGD at TPW-3B.

A series of vernal pools and observation wells will be monitored to confirm that the effects to vernal pool water levels from production well pumping are consistent with those predicted in the vernal pool model. The vernal pool monitoring plan will include the following four components:

1. Vernal pool water level monitoring
2. Observation well water level monitoring
3. Precipitation monitoring
4. Progress meetings

The monitoring will be initiated prior to pumping operations for the collection of background data (i.e., pre-pumping conditions), and a semi-annual schedule of monitoring is proposed for the long-term monitoring plan.

Water level measurements will be performed at the following locations:

- Within the vernal pool and in a piezometer installed within the water table beneath the vernal pool at vernal pool locations VP-E1, VP-E9, VP-E11, VP-E6, and VP-E5 or VP-E5a
- Observation wells screened in the Zone A (water table), Zone B (shallow aquifer), and Zone C (intermediate aquifer) aquifers of well clusters OW-1, OW-2, OW-3 and OW-4.

Water levels will be collected hourly with data logging pressure transducers. Manual water-level measurements will be taken each quarter just prior to downloading the data loggers. The data will be

adjusted to NGVD, plotted on graphs (water levels vs. time) and evaluated against model-predicted water levels. The frequency of monitoring and the monitoring network will be evaluated on an biennial basis.

After a sufficiently long record of water level measurements has been developed, measured pumping effects on water levels and vernal pool stage levels will be compared with those predicted in the vernal pool model, to revise and update as necessary the SEAWAT and vernal pool model. Water level data trends, along with other operational and hydrologic factors, will be evaluated from time to time as a basis for implementing any required modifications to well field operational practices.

The monitoring will begin after the permit is issued and a minimum of six months before pumping begins (for municipal supply) to allow for the collection of baseline data (i.e., pre-pumping conditions) and to allow for the comparison of background water levels to water levels during municipal pumping operations. Once the well field has been placed in operation, water level monitoring will be performed in accordance with the schedules outlined in the sections below.

12.2.1 Monitoring Network

The water level monitoring network will include vernal pools and observation wells.

The vernal pool water level monitoring network will include the vernal pools located closest to production wells TPW-3B and TPW-2C, including VP-E1, VP-E9, VP-E11 and either VP-E5 or VP-E5a. The selection of vernal pool VP-E5 or VP-E5a will be based on discussions with the NPS personnel. Water levels will also be collected from one background vernal pool, VP-E6. At a minimum, water levels will be monitored within the vernal pool and from a piezometer installed in the water table beneath the vernal pool (5 surface water and 5 water table locations total).

Observation well water level monitoring will be performed in wells screened within the Zone A (water table aquifer) and Zones B and C pumping zone aquifers at observation well clusters OW-1, OW-2, OW-3 and OW-4 (12 wells total).

12.2.2 Water Level and Rainfall Data Collection

Water levels will be monitored with data logging pressure transducers in the Zone A, Zone B, and Zone C of the OW-1, OW-2, OW-3, and OW-4 clusters and within the vernal pool and the water table beneath the vernal pool at vernal pools VP-E1, VP-E9, VP-E11, VP-E5 or VP-E5a, and VP-E6. The data loggers will be programmed to collect a water level and water temperature reading once per hour. The water level