THE COMMONWEALTH OF MASSACHUSETTS

WATER RESOURCES COMMISSION

100 CAMBRIDGE STREET, BOSTON MA 02114

REPORT OF THE FINDINGS, JUSTIFICATIONS AND DECISION OF THE WATER RESOURCES COMMISSION
Town of Foxborough
Witch Pond Wells
2022 Amendment to the September 3, 2001
Interbasin Transfer Act Approval
Pursuant to M.G.L. Chapter 21 § 8C

DECISION

On November 10, 2022, by a unanimous roll call vote of the ten (10) voting members present at a public meeting, the Water Resources Commission (WRC), as described in this document, approved a limited number of Foxborough's requests to reduce monitoring and also approved additional Conditions to address concerns regarding existing impacts, potential new impacts from increased pumping, and Foxborough's compliance with Conditions outlined in past Decisions of the WRC. This vote was taken after review of the facts provided by the applicant, analysis of the associated data, and consideration of comments received concerning this proposal.

BACKGROUND

On September 13, 2001, the WRC approved, with conditions, the Town of Foxborough's request for an Interbasin Transfer for two proposed wells adjacent to Witch Pond (the Pond or SG-1), in the Ten Mile River basin. Wells 14 and 15 (the Wells) are shown on the site map below (Figure 1). The transfer was approved for a *daily maximum* of 1.44 million gallons per day (MGD) with water level thresholds that trigger reduced or no pumping. The area where these Wells are located is an Atlantic white cedar swamp (the Swamp), which provides habitat for the then-state-listed spotted turtle and the rare Hessel's hairstreak butterfly. The thresholds were designed to protect the wetlands habitat and the nectar sources for the Hessel's hairstreak butterfly. Since the establishment of the thresholds, the area has been further identified as habitat for the blue-spotted salamander which is a state-listed species of special concern.

The Interbasin Transfer Act (ITA) was triggered because the wastewater generated from these Wells would be discharged to the Mansfield-Foxborough-Norton Regional Wastewater Facility in the Town of Norton, in the Taunton River basin. The 2001 WRC Decision (the Decision) that approved the transfer outlined conditions (the Conditions) including the requirement for a monitoring program to verify the hydrologic conditions at Witch Pond, and the establishment of threshold water table levels to control the impacts of pumping on nearby surface water resources. The Decision also required that when the reduced-pumping thresholds are approached, pumping

Figure 1. Site map

will be reduced and that when the no-pumping thresholds are reached, pumping will cease until the water table recovers. Hydrologic monitoring requirements included a one-year baseline monitoring period prior to the use of the Wells and on-going monitoring for the operational life of the Wells. In addition, a wetland vegetation monitoring plan was required to verify that invasive species are not increasing and that the nectar sources utilized by the Hessel's hairstreak butterfly are not impacted by pumping. The Conditions also required one-time and on-going water conservation activities.

During the initial approval process, the WRC recommended additional pump tests to quantify the complex hydrogeologic relationships at the site, specifically, the hydrologic connection between the Swamp and the underlying aquifer, but Foxborough did not complete such tests.

The first monitoring plan was approved in 2007 with baseline monitoring through 2009. Foxborough constructed the Witch Pond water treatment facility (the WTF) with 1.44 MGD capacity. MassDEP under the Water Management Act (WMA) approved each Well for an *annual average daily* withdrawal of 0.48 MGD and the two Wells for a total of 0.96 MGD. MassDEP's Drinking Water Program (DWP) approved a *maximum daily* pump rate of 0.48 MGD each and 0.72 MGD total. These rates are summarized in Table 1 below.

Table 1. Summary of Flows for Wells 14 and 15

Description	**Total Flow (MGD)**
ITA *maximum daily*	1.44
DEP WMA *annual average daily* at 0.48 MGD each, 0.96 MGD total	0.96
DEP DWP *maximum daily* at 0.48 MGD each, 0.72 MGD total	0.72
2015-2020 combined *average annual daily* at Wells 14 and 15	0.47

In 2013, the WRC approved an amendment to the Conditions outlined in the 2001 Decision. The Amendment was initiated because of a hydraulic response to pumping occurring in the wetland peat (0.6-foot decline since baseline) that could lead to permanent compaction if continued and a shift in wetland plant species to plants which tolerate a drier regime. The Amendment required Foxborough to alter its monitoring plan to provide reduced and no pumping thresholds at one additional site (F-7PD, a deep peat monitoring location). However, on July 17, 2013, MassDEP issued a formal Emergency Declaration allowing Foxborough to use the Witch Pond Wells even if thresholds are triggered while treatment plants were completed elsewhere for alternative water supply sources. Operations under an Emergency Declaration are specifically exempt from the ITA and any conditions imposed as a result. However, the 2013 Amendment incorporated language from the Emergency Declaration as follows for conditions when an Emergency Declaration is in place and Witch Pond wells are still proposed to be used.
Foxborough must:

- Exhaust options to purchase water from other surrounding communities via the existing emergency connections;
- Maximize pumpage from Foxborough's other sources which are currently in operation;
- Impose tighter restrictions on outdoor water use, up to a total ban on any outdoor water use. A total outdoor water ban will be implemented when Witch Pond wells are used and the thresholds are exceeded.

This introduced an important new requirement of a total outdoor water ban when Witch Pond wells are used under an Emergency Declaration and thresholds are surpassed. Although this was not followed during the 2013-2014 Emergency Declaration, it was followed during the subsequent 2016 and 2020 Emergency Declarations.

The Emergency Declaration in 2013 was extended to March 17, 2014 to allow for the completion and startup of the Oak Street water treatment plant. The allowed pumping resulted in extensive periods spent below the thresholds established to protect the ecosystem.

In February 2016, the WRC approved Foxborough's September 2015 request to eliminate monitoring and groundwater thresholds for site F-4A. The purpose of site F-4A was to monitor conditions in a replicated wetland that was intended to replace the Swamp area lost due to construction of the WTF. However, it was demonstrated that the replicated wetland was not functioning as an Atlantic white cedar swamp. Foxborough was required to update its monitoring plan to reflect the additional 2013 threshold requirements, the elimination of the monitoring site in the replicated wetland, and the previous monitoring requirements that remained in effect. The 2016 monitoring plan is the latest and is in effect.

In July 2020, Foxborough submitted a 48-hour pump test report as part of a permit application to MassDEP to replace Well 14. The replacement well, Well 14R, has the same well construction (e.g., total depth of 40 feet, screened at the bottom 10 feet) and accesses the same hydrostratigraphic unit as Well 14. Therefore, Well 14R should draw from the same location in the aquifer. According to the pump test report, the pumping rate was selected to evaluate whether Well 14R can replace the combined capacity of Well 14 and 15. The pump test showed that Well 14R can replace both Wells 14 and 15 with a proposed approvable yield of 1.56 MGD. On January 7, 2021, MassDEP DWP approved Well 14R for a *maximum daily* withdrawal of 0.48 MGD because the rate of a replacement well cannot exceed that of the well being replaced. On March 12, 2021, MassDEP approved the decommissioning of Well 14. The *maximum daily* withdrawal for Wells 14R and 15 remains at 0.72 MGD. To increase pumping at Well 14R beyond the limits specified in Table 1, Foxborough would need to apply for a New Source Approval from the DWP and an amendment for its WMA permit and likely for its ITA Decision based on a change in conditions. MassDEP WMA Program also expects to reduce the *annual average daily* allocation volume during either the amendment process or as part of the permit renewal in the Ten Mile basin. The reduction is to reflect the fact that the annual allocation volume should not reflect the maximum daily approval rate for the well.

According to Foxborough, the practical limit from Well 14 and 15 for *annual average daily* yield has been approximately 0.49 MGD due to reduced yields at both Wells. This is approximately half the permitted volume and is reflected in the 6-year annual average daily pumping rate of 0.47 MGD (Table 2). With Well 14R, Foxborough can double its recent historical withdrawals from Well 14 from a recent *average annual* daily pumping rate of 0.24 MGD to 0.48 MGD. The new potential total withdrawals from the two Wells may increase from 0.47 MGD to 0.72 MGD (Well 15 at 0.23 MGD plus Well 14R at 0.48 MGD). Therefore, the total *average annual* pumping at Witch Pond may increase by 51%.

Historically, Foxborough's reduced and no pumping thresholds have been triggered multiple

Table 2. Pumping from 2015 through 2020

Year	Annual Average Daily Withdrawal (MGD)				Maximum Day (MGD)*	
	Well 14	Well 15	Total		Well 14	Well 15
2015	0.18	0.20	0.38		0.43	0.48
2016	0.27	0.21	0.48		0.47	0.44
2017	0.31	0.31	0.63		0.43	0.50
2018	0.20	0.30	0.49		0.27	0.42
2019	0.25	0.17	0.42		0.38	0.34
2020	0.23	0.18	0.41		0.33	0.27
Average	0.24	0.23	**0.47**			
Maximum	0.31	0.31	*		**0.47**	**0.50**

* Since maximum pumping days rarely occur on the same day, total maximum day is not calculated. Total values may not be the exact sum of individual values due to rounding.

times. The triggers that occurred from January 2011 through December 2020 are summarized in Table 3 by site and are highlighted in gray. The triggered thresholds include periods of Emergency Declarations. Foxborough requested and MassDEP granted Emergency Declarations three times out of the past eight years - 2013 with an extension to 2014, 2016 ending in early 2017[1] and 2020. During an Emergency Declaration, Foxborough may continue to pump even if the ITA thresholds are triggered. Triggers during Emergency Declarations are summarized in Table 4.

During the concurrent events of the 2016 drought and 2016 Emergency Declaration, thresholds were triggered 64% of the time during the 5-month period of August through December. Water levels dropped 1.26 feet below the peat surface whereas triggers were set to keep water within 1 foot of the wetland hollow surface as recommended by experts on Atlantic white cedar swamps. Of this period, August, September and October are the natural dry periods which were exacerbated by the drought and by continued pumping beyond the protective thresholds. Such extended dry conditions favor invasive species and can affect native species' and the Swamp ecosystem's health.

A similar situation occurred during the 2020 drought with an Emergency Declaration that coincided with the drought. This time water levels reached historical lows and water levels dropped 2 feet below the peat surface. The dry conditions lasted 6 months from June through November with water levels below the no pumping thresholds 57% of the time. Due to the Emergency Declaration, the wells were not shut off until September 29th when the new treatment facility on Chestnut Street was activated. Water levels at some sites took over 2 months to recover above the thresholds and the Pond took over a year until October 2021 to recover to above its no pumping threshold. Despite the heavy rains in July 2021, the expected recovery of

[1] On January 5, 2017, Foxborough requested to end the 2016 Emergency Declaration. For the rest of the document, 2017 is not considered as a year with an Emergency Declaration.

Table 3. Summary of Triggered Thresholds from January 2011 through December 2020

Threshold Sites	Hours spent* below reduced or no pumping threshold, January 2011 through December 2020												
	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
F1AS	0	0	0	0	0	0	0	0	0	0	0	0	0
F1APD	690	0	0	0	0	0	0	18	0	576	96	0	0
F1AD	0	0	0	0	0	0	0	0	0	0	0	0	0
F2S	2,484	0	0	0	0	0	0	0	324	1,440	720	0	0
F2AD	0	0	0	0	0	0	0	0	0	0	0	0	0
F7D	72	0	0	0	0	0	0	0	0	0	66	0	6
SG1	8,448	0	0	0	0	0	186	96	1,950	3,102	2,238	876	0
F7PD	4,026	0	0	0	0	0	0	0	456	2,052	1,146	372	0

Table 4. Triggered Thresholds During Years of Emergency Declarations

Year	Hours spent* below either reduced or no pumping threshold									Comments
	Total	F1AS	F1APD	F1AD	F2S	F2AD	F7D	SG1	F7PD	
2013/ 2014	600	0	0	0	0	0	0	600	0	Declaration 7/17/13-3/17/14 until new treatment plant completed for alternative water supply sources. Triggers in October & November 2013.
2016	2,274	0	90	0	1,422	0	72	2,022	2,268	Declaration 9/20/16-1/5/17. June was start of the 2016 Drought. Triggers August through December.
2020	2,496	0	552	0	948	0	0	2,496	846	Declaration 7/2/20 to 10/8/20. June was start of the 2020 Drought. Triggers June through November.

*Tables are in hours because levels are measured every 6 hours. Therefore, 24 hours spent below a threshold is not necessarily on a single calendar day as the measurements could have been collected on multiple days.

water levels did not occur for multiple months indicating that the peat may have been permanently compacted. This impact was part of the concern in 2010 and 2011 that resulted in the 2013 Amendment. Future monitoring and surveys will show whether this has occurred.

Since the 2013 Amendment, four years – 2015, 2017, 2018 and 2019 – did not have Emergency Declarations and in two of those years reduced pumping and no pumping thresholds for the Swamp were triggered for significant periods of time. In 2015, thresholds were triggered on roughly half of the days in a 3-month period. In 2019, thresholds were triggered on 65% of the days in a 4-month period as shown in Table 5. This may indicate that the thresholds are not protective enough because once they are triggered, they remain triggered for an extended period. It may be that thresholds are triggered during the naturally dry period and, therefore, take a long time to recover. More protective measures may be needed to initiate earlier reduced pumping year-round or at least during the naturally dry period. For example, reduced pumping thresholds may need to be set at higher elevations so that they trigger earlier, prevent the no pumping threshold from being reached, and ensure that the levels can recover more readily. In addition, the term reduced pumping may need to be defined at a lower withdrawal rate than in the 2007 monitoring plan.

Table 5. Time Spent Beyond Thresholds

Year	Count of months with triggers at one or more sites	Percent of time spent beyond thresholds during months with triggers	Other relevant conditions
2013	2	41	Emergency Declaration
2014	3	19	Emergency Declaration
2015	3	46	N/A
2016	5	64	Emergency Declaration, Drought
2017	2	4	N/A
2018	2	16	N/A
2019	4	65	N/A
2020	6	57	Emergency Declaration, Drought

However, in examining the below threshold periods outside of Emergency Declarations, a discrepancy was identified in actual well operations data and the allowed well operations per Foxborough's WMA permit. A clarification letter from MassDEP regarding the permit and well operations dated July 26, 2013 stated the following:

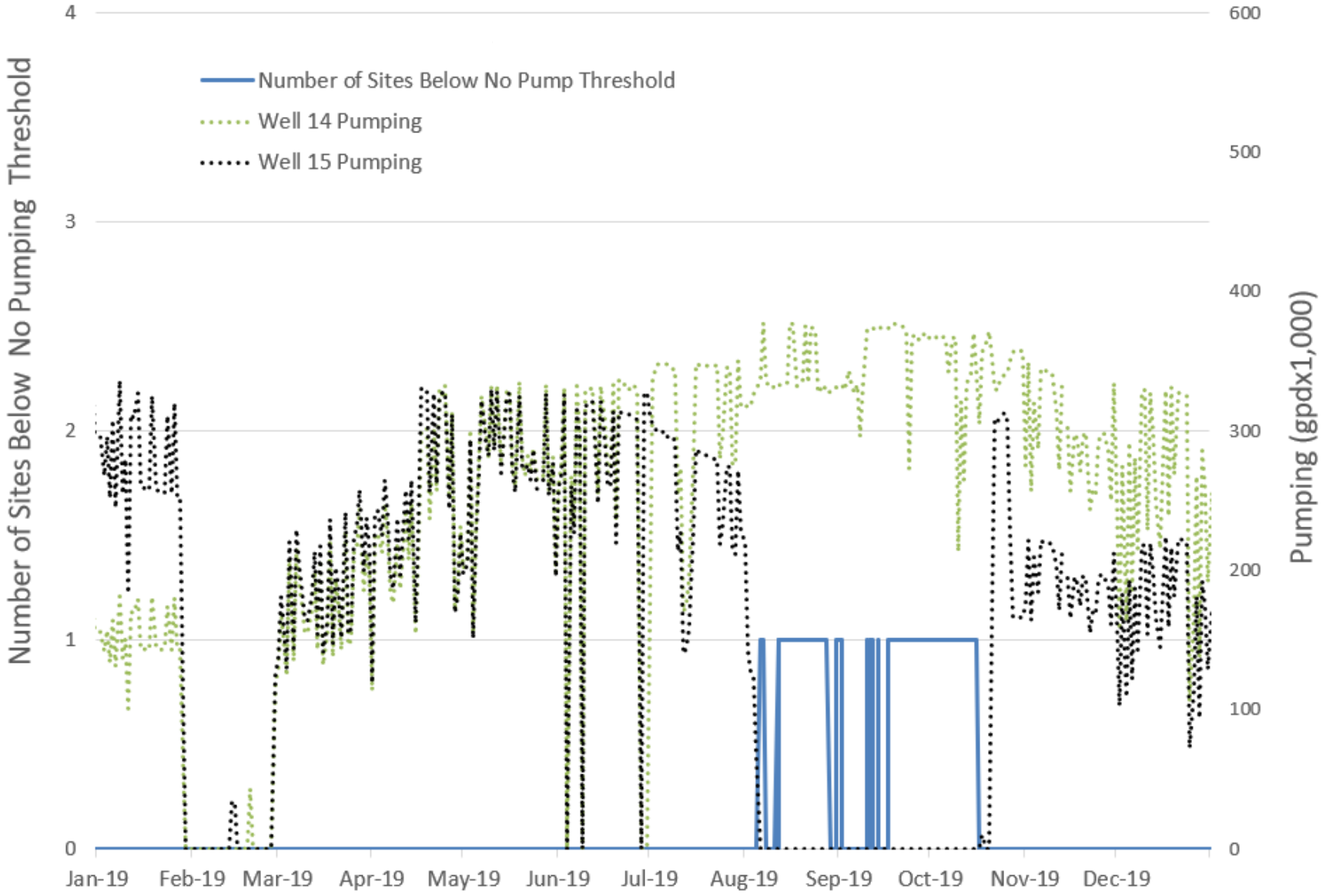
> "The following requirements outlined in Special Condition 3 of WMA Permit #9P2427099.01 have not been revised and remain in effect:
>
> If the groundwater elevation at one or more monitoring wells listed in the table above [table of threshold wells] declines to the Threshold to Reduce Pumping elevation, then pumping of the wells shall be reduced to no more than one half the average daily pumping rate for those days that the wells were operated during the previous seven days or 0.4 MGD if the wells were not operated during the previous seven days.

> The reduced pumping rate determined by averaging the flows over the preceding seven days is a one-time determination that shall apply until the water level recovers to an elevation above the elevation to reduce pumping or drops to the threshold to shut off the well. The reduced pumping rate is not to be a rolling seven-day average.
>
> If the groundwater elevation at one or more of the monitoring wells listed in the table above [table of threshold wells] declines to the Threshold to Shut Off Wells, then pumping of Wells 1-70 (now designated as Well #14, Source Code #4099000-14G) and 3-87 (now designated as Well #15, Source Code #4099000-15G) will cease. Pumping of 1-70 and 3-87 cannot resume until the groundwater elevations at the monitoring wells listed above have returned to, and been maintained for seven (7) days, at elevations above the Threshold to Shut Off Wells elevations. When the groundwater elevation recovers above the threshold to shut off the wells, but is below the threshold to reduce pumping, then the wells shall be operated at the reduced pumping rate no greater than 0.4 MGD. Response action shall be taken within 36 hours following a threshold being reached."

Figure 2 below shows that only one well was shut off during 2019 when the no pumping threshold was surpassed. It took a few months to sustainably recover likely because both wells were not shut off as required per the WMA permit. In addition, the 7-day waiting period before resuming pumping for Well 15 that was shut off was not followed. Pumping was resumed after 4 days. Therefore, if the existing requirements of the WMA permit are met, there may not be a need to modify the reduced pumping threshold or the reduced pumping rate in order to reduce time spent below no pumping thresholds.

The impact on vegetation from extended periods beyond thresholds has not been adequately assessed. Wetland vegetation monitoring reports should provide a clear understanding of the wetland ecosystem health relative to baseline and whether prolonged dry periods have affected wetland health. Any assessments in trends have been complicated by a change in monitoring methods in 2014. The new monitoring methods were supposed to provide statistically significant results but had to be reduced in scope and frequency because the new methods impaired the vegetation. Therefore, conclusions cannot be made about the impact of below-threshold events described above. More background on this topic and reporting of vegetation monitoring are discussed in the Recommendations section.

Figure 2. 2019 Pumping and Number of No Pump Thresholds Surpassed



In addition to following well operations requirements, the prolonged times spent beyond thresholds may be reduced and potentially eliminated by meeting the water conservation Conditions outlined in the ITA Decision. Only two water conservation metrics are being tracked for Foxborough – residential gallons per capita per day (rgpcd) and unaccounted-for water (UAW). While residential use is mainly below the 65 rgpcd standard, UAW has significantly increased above the 10% standard and remains steady above 30% as shown in Table 6 below. Foxborough is currently not meeting the Conditions on UAW as outlined in the 2001 WRC Decision.

Table 6. Historical Unaccounted-for Water and Residential Use

Year	Unaccounted-for Water (%)	Residential Use (gallons)
2021	34	56
2020	32	59
2019	35	53
2018	36	54
2017	42	56
2016	23	55
2015	17	68
2014	19	60
2013	12	58
2012	20	59
2011	17	62
2010	5	77
2009	11	65

If all losses are actual losses rather than paper losses and UAW was reduced by 20% to near the 10% standard, then the need to use the Witch Pond Wells could be nearly eliminated during the highest triggering months of July through October which are the naturally drier months and when demand is generally higher. Table 7 below shows that meeting the UAW standard with a 20% reduction in system-wide demand is roughly equivalent to the annual average daily withdrawals from the Witch Pond Wells over the period of 2015-2020 (0.47 MGD as outlined in Table 2).

Table 7. 2020 Pumping from All Sources

Month of 2020	Pumping All Sources (MGD)	20% of All Pumping (MGD)
January	2.01	0.40
February	1.95	0.39
March	1.99	0.40
April	1.87	0.37
May	2.15	0.43
June	2.53	0.51
July	2.42	**0.48**
August	2.45	**0.49**
September	2.33	**0.47**
October	2.20	**0.44**
November	2.09	0.42
December	2.03	0.41

In summary, thresholds set in the Conditions of the ITA Decision have been triggered on many occasions, resulting in reduced pumping and no pumping. WRC staff anticipates that with a 51% potential increase in pumping at the site, thresholds will be triggered more often depending on the timing of the additional withdrawals. For example, increased withdrawals outside of the naturally dry period would minimize the potential for additional triggering of thresholds. In addition, the frequency of Emergency Declarations, especially during droughts, which allow pumping beyond the thresholds, and significant time spent beyond thresholds even in years without droughts or Emergency Declarations have resulted in prolonged, dry conditions that are a concern for the health of this ecosystem.

FOXBOROUGH'S REQUEST TO MODIFY THE 2016 MONITORING PLAN

On September 17, 2019, WRC staff received a letter from Foxborough requesting consideration of monitoring reductions. On November 19, 2019, Mr. Roger Hill, the then-Director of Foxborough's DPW, sent a letter updating staff on water supply improvement activities, a plan to send the 2019 Annual Report with a summary of data collected to date (10-year summary) and recommendations for monitoring and reporting. The letter summarized the following challenges and plans for the Witch Pond Wells:

1) Over the ten years of operating and pumping Wells 14 and 15, less than half of the approved yield has been achieved. This precludes the efficient operation of the WTF even with both Wells pumping. In addition, pumping both Wells results in the volume falling off after a few hours.
2) Current Wells are located too close to the Pond and both encountered peat at installation. Replacement Well 14 will be located further from the Swamp in a gravel esker and will replace the total yield from both Wells 14 and 15.
3) Foxborough appropriated funding for the design and installation of a transmission pipeline from three pumping wells located off Sprague Road (Wells 4, 5, and 6) to bring raw water to the WTF and allow for increased utilization of the plant.

4) Replacement for wells served by the Oak Street water treatment plant is also planned so that the facility can be more fully utilized.
5) With these upgrades, pumping the well that replaces Wells 14 and 15 can be eliminated during the growing season.

Subsequently, on March 4, 2020, Foxborough submitted additional information and a request to significantly reduce the number of sites for monitoring and reporting including some threshold sites. Staff responded on August 18, 2020 to seek clarity on actions outlined in Mr. Hill's November 2019 letter that were not included in the monitoring reduction request including the potential for increased pumping due to Well 14R's higher capacity. After a period of consultation, Foxborough's final request on December 1, 2020 and a follow up letter commenting on a draft Staff Recommendation on May 28, 2021 included the following information and a reduced list of requested changes to the 2016 monitoring plan:

1) Foxborough has appropriated funding for the design and installation of a transmission pipeline from non-Witch Pond wells to the Witch Pond WTF to deliver raw water at about 500 – 600 gpm. This eliminates the need to construct a new WTF for those wells, which are in an endangered turtle habitat and allows Foxborough to maximize the treatment capacity of the Witch Pond WTF. Foxborough anticipates that the use of water from the Witch Pond Wells can be significantly reduced or eliminated during the dry periods of the growing season once the project is completed.
2) Well 14R was installed 40 feet west of Well 14 (farther from Witch Pond). Subsurface geology was described as sand and gravel from the surface to 45 feet below the surface. The peat that underlies Witch Pond and the Atlantic white cedar swamp was not observed at this location. Although Well 14 and 14R were constructed within the same aquifer, Well 14R was sited and designed to draw water from the aquifer in and beneath the esker, and not from the aquifer directly beneath the Swamp which has poor water quality due, in part, to anoxic conditions that exist there.
3) Water sampling results suggest that water quality is better at Well 14R than Well 14 and Well 15, particularly with respect to per- and polyfluoroalkyl substances (PFAS). Therefore, Well 14R may be relied on more than Well 15.
4) The following activities have been conducted by Foxborough as part of reducing its unaccounted-for water.
    a. At least 4 system wide leak detection surveys with two different consultants have been completed. The surveys in 2014, 2018, 2020, and 2021 detected losses of 29.95, 129.2, 36.3 and 36.6 MGY, respectively. The water determined to be lost in 2020 and 2021 represents approximately 5% of the finished water produced. All detected leaks have been repaired.
    b. All master meters are tested and calibrated annually. At the same time, SCADA engineers verify SCADA totalization, for these are the values reported in the Annual Statistical Report that is submitted to MassDEP each year.
    c. Foxborough has been measuring and recording water use from hydrants for flushing and any other uses.
    d. The Town annually inspects interconnections and water gates, as part of the leak detection and flushing programs.
    e. The results of a water audit completed on June 14, 2014, identified few non-metered water users, and no obvious issues resulting in high amounts of UAW.

f. A hydraulic model of Foxborough's water system has been calibrated and updated and will assist the Town with developing an efficient flushing program to improve water quality, and system evaluations, such as the effect on system pressure due to reduced levels in storage tanks. With additional sensors, the hydraulic model could help in identifying system inconsistencies, which could identify system losses as part of a district metering program.
g. Foxborough's residential meter replacement program and inspection/replacement program at Patriot Place were interrupted by the recent public health emergency and will continue when conditions allow.
h. There are approximately 30, 3-inch or greater meters in the water distribution system. Each of them has been inspected and assessed and needs to be retested every 3 years.
i. There are approximately 42, 2-inch meters in the water distribution system. Those that have not been tested in the last 4 years need to be inspected and assessed or replaced by the end of 2021. Each 2-inch meter needs to be retested every 4 years.
j. There are approximately 20, 1.5-inch meters in the water distribution system. Each of them is to be inspected and assessed by 2022. Each 1.5-inch meter needs to be retested every 4 years.
k. There are approximately 200, 1-inch meters in the water distribution system. Each of them is to be replaced or assessed by 2023.
l. There are approximately 5,200, less than 1-inch meters in the water distribution system. Those that have been in service for more than 10 years are to be replaced by 2025.

Changes originally requested by Foxborough in their letter dated November 19, 2019:

1) Ambient monitoring wells DP-4, 8-97 and 9-97 on Mansfield property have been compromised by age. DP-4 also serves as the monitoring point for vegetation transect C. The request was to replace DP-4 at its current location and replace Wells 8-97 and 9-97 with an existing well couplet at Site F-4A near the constructed wetland on property owned by the Town of Foxborough. Site F-4A has 7 years of historical data. Monitoring was discontinued in 2015 because the project to replace the Atlantic white cedar wetlands lost to the construction of the WTF had failed to recreate Atlantic white cedar wetlands.
2) Eliminate daily water level readings at staff gauge SG-3 which measures the water level in the Atlantic white cedar swamp adjacent to the walkway to Witch Pond approximately 15 feet east of F-1A.
3) Eliminate recording water levels in monitoring Well F2D.
4) Remove transducers installed in non-threshold monitoring wells from December through April to protect the equipment.
5) Reduce content in the annual monitoring report.

On March 21, 2022, Foxborough requested to withdraw the monitoring reduction request and provided further information.

1) Due to recent PFAS detections and ongoing testing, Foxborough intends to keep all viable sources in working order to meet peak demand and potential emergencies.
2) A full system leak detection program is underway (Spring 2022) by an outside contractor.
3) Foxborough is currently bidding a project to replace up to 3,000 residential meters that are more than 10 years old which are anticipated to be contributing to a significant amount of the UAW over the last 4-5 years.

4) Foxborough still requested that the ambient monitoring wells 8-97 and 9-97 be replaced by wells at F-4A.
5) Foxborough noted that nutrient-rich water from Lake Mirimichi overflows through the Route 106 embankment when the Lake is at or near full pool. The effect of this water quality on the Witch Pond Atlantic white cedar community is unknown. Atlantic white cedar swamps are nutrient-poor environments, therefore, an influx of nutrient-rich water from the lake may be negatively affecting the Swamp.

ADDITIONAL RELEVANT INFORMATION

1) **Lake Mirimichi Levels:** During dry periods, the Attleborough Water Department (AWD) may release significant volumes of water from Lake Mirimichi hereafter referred to as the Lake (site SG-2 in Figure 1). Flow from the Lake goes down the Wading River for water supply withdrawals further downstream. During these times, the Plainville Water Department (PWD) is required to curtail pumping to prevent unacceptable drawdown and maintain water for release by AWD. Historical data in Foxborough's reports show more than one occasion (e.g., 2007, 2010, 2012, 2015 and 2016) when the lowering of Lake levels significantly and swiftly lowered the Pond water levels and groundwater levels. Looking at the timeseries graphs in those reports, the influence of the Lake levels is evident at two downstream monitoring locations – the Pond and the deep peat monitoring location closest to the Pond (F-7PD). Lake levels seem to be predictive of the Pond and the deep peat monitoring location levels. Low elevations in Lake Mirimichi explain the below threshold values seen prior to the start of pumping at this site in the baseline data as well as the low elevations seen in summer of 2010 which triggered the subsequent threshold imposed on F-7PD.

   As Foxborough wrote in its request, monthly reports from PWD are not useful given the swift and significant impacts of Lake Mirimichi levels on Witch Pond. Rather, Foxborough (and other public water supplies downstream from AWD – i.e., PWD and Mansfield) needs to have advance notice of the Lake releases. On May 5, 2021, MassDEP issued a final permit renewal for AWD which includes Bob Worthley from Foxborough Water Department on the list of people to receive notification of releases. In addition, it outlines a Standard Operating Procedure in Appendix E – Communication Plan that has four steps in the operation of the valve. In Step 2, when the level of Blake's Pond is 10 inches down, the valve will be initially opened at 5 turns. The valve is fully open at 112 turns. Notification at this step may be sufficient for Foxborough to modify its operations. Staff provided comment on the draft permit requesting that notifications to Foxborough should occur at Step 2 and to include the number of turns. Further, changes in the number of turns should also be communicated to Foxborough. AWD has information for converting number of turns to rates of flow.

2) **Vegetation Monitoring:** Foxborough changed the consultant performing wetland monitoring and the methods in 2014. Monitoring rounds in 2014 and 2015 used new methods that were intended to provide statistically significant data; however, the foot traffic to conduct the monitoring caused damage to the wetland and so monitoring was not conducted in 2016 and 2018 while limited monitoring was conducted in 2017 and 2019[2]. The 2017 report concluded

[2] New or full monitoring refers to the WRC-approved 2016 Hydrologic and Vegetative Monitoring Plan that is currently in effect. The plan includes assessing 50 quadrats of one square meter along each of the three transects

that no significant changes were noted from 2014 and 2015 monitoring rounds. However, the report did not compare conditions to baseline (2007) or pre-2011 conditions when a shift in wetland species composition to more dry tolerant species was noted, as described in the Background as one reason for the amendment of Conditions in 2013. In addition, the 2017 report stated that some native species showed new crown dieback or had died completely though they were being replaced by vigorous sprouts from the same root masses. The cause of the dieback was foot traffic from the new monitoring methods. The report showed the percent of individuals that have grown since the last monitoring but did not present data for the abundance of native species relative to invasive species. One general statement is provided that *native species remain dominant*. In contrast, baseline reporting by the previous contractor provided dominance ratios for the two main species and *explicitly noted that no invasive species were present in the sampled locations*. The more recent reports discuss various species without reference to native or invasive status or relative abundance.

Phragmites is one invasive species that raises particular concerns. Foxborough has been monitoring the colonization of a floating vegetation mat and a patch growing in the ditch near the access road to Well 15. Over time, this colony likely will spread to the pond shores and compromise habitat quality more broadly. At that point, it will also become far more difficult and expensive to address as it continues to spread.

3) **Mansfield's ITA Decision:** The neighboring Town of Mansfield has one water supply well, Well 10, near the Witch Pond area which is subject to the ITA. Figure 1 shows this well is significantly farther south from Witch Pond than Foxborough's Wells. After 11 years of monitoring the area under the conditions of its ITA Decision, Mansfield submitted a proposal for monitoring reduction for Well 10. Mansfield showed that the vast majority of threshold triggers resulting in reduced or no pumping were during the usual summer dry period. Mansfield proposed to cease pumping during that period in exchange for reduced monitoring. On April 14, 2016, the WRC approved a modification of Mansfield's monitoring plan for Mansfield's Well 10, subject to the following conditions: a) no pumping during August, September, and October each year, b) no alterations noted in the Atlantic white cedar swamp vegetation in the continued but less frequent vegetation monitoring, and c) continued eradication of invasive species. In addition, the MassDEP WMA Program issued a modified permit showing a reduction of permitted allocation from an average annual of 1.57 to 1.00 MGD.

EVALUATION OF THE PROPOSED MONITORING REDUCTION

This request was reviewed by Executive Office of Energy and Environmental Affairs (EEA), the staff at the Department of Conservation and Recreation's (DCR) Office of Water Resources, Department of Environmental Protection (MassDEP), and Department of Fish and Game's (DFG) Division of Fisheries and Wildlife.

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for number and species of herbaceous plants, coverage, and any tree, vine, or shrub seedlings. Limited monitoring refers to assessing the tree and shrub layers. Tree health and diameter at breast height are recorded, and species composition and coverage of the shrub layer is recorded, as well as any observations of mammal or insect damage. Limited monitoring reduces the amount of time spent in the bog and has not caused the shrub dieback previously observed with full monitoring.

The initial monitoring reduction request that was later withdrawn and subsequent information received through communication with Foxborough were reviewed on their own merits and are applicable solely to Well 14, its replacement Well 14R, and Well 15 located next to Witch Pond in Foxborough. This Decision is made based on facts contained in Foxborough's request, additional information submitted at the staff's request, Annual Monitoring Reports and quarterly data submissions. The request was evaluated against the requirements set forth in the 2001 Decision to Approve the Interbasin Transfer, the 2013 Amendment, the 2016 Hydrologic and Wetland Long Term Monitoring Plans (AECOM, 2016), MassDEP Water Management Act permit, Annual Statistical Reports submitted to MassDEP, MassDEP-BRP WS 19 Pump Test Report for Permit Application #286487 for Well 14R and its subsequent approval by MassDEP, and the MassDEP approval for abandoning and decommissioning Well 14.

CONDITIONS

Well 14R has the capacity to pump its full allocated volume which is significantly greater than the volume that was pumped historically from Well 14. The WRC has determined that there is significant concern regarding existing impacts and, with this increased pumping, potential new impacts to the Swamp. An additional concern is the extended periods the Swamp spent below target water levels during Emergency Declarations. **Accordingly, and despite Foxborough's withdrawal of its request for monitoring reduction, the WRC approved a limited number of Foxborough's initial requests to reduce monitoring as described in this Decision. Additional Conditions are stated below to address concerns regarding existing impacts, potential new impacts from increased pumping and Foxborough's meeting of Conditions outlined in past Decisions.**

Meeting Existing Conditions

1) Data presented in the Background section (Table 5) indicate that existing reduced or no pumping thresholds may be protective enough if all Conditions are followed. Specifically, reduced pumping and no pumping must be implemented at both wells if thresholds are surpassed at any threshold monitoring site. **A three-year monitoring period will commence with this Decision during which Foxborough will follow the well operations requirements and all other Conditions including the 2001 Decision and the 2013 Amendment.** If this does not prove to be sufficient to reduce the amount of time spent below no pumping elevations, then WRC will consider further action such as modifying the reduced pumping elevations and/or reduced pumping rates.

2) Foxborough initially requested discontinuing monitoring at Well F2D on the basis that it is the same as monitoring Well F2AD. However, the two wells are measuring water levels at different depths and different locations in the subsurface relative to Wells 14 and 14R. (Well F2D is located approximately 35 feet northeast of Well 14 and is screened at 5 to 7 feet below ground surface. This contrasts with Well F2AD that is 18 feet east from Well 14 and screened at 15.5 to 17.5 feet below ground surface.) Given the differences between the two wells and potential changes in hydrologic response due to increased pumping**, Foxborough must continue water level monitoring in Well F2D for a period of three years, to fully assess the impacts of pumping changes. After three years, the data will be evaluated by the staff and monitoring may potentially be discontinued with approval by the WRC.**

3) Monitoring Wells DP-4, 8-97 and 9-97A (all located in the Town of Mansfield) were installed at various depths (shallow peat, deep peat and aquifer) and were deemed sufficient to provide data on background/ambient conditions. For the 2013 Amendment, data from these wells were used to confirm that impacts in deep peat observed at monitoring wells closer to the pumping wells were not observed in these ambient wells and, therefore, the impacts were not climate related. There are no other monitoring wells with historical data within the Atlantic white cedar swamp that could serve as ambient wells; therefore, these three wells at multiple depths are an important piece of the monitoring effort. All three wells have corroded, requiring replacement.

   Foxborough has already replaced DP-4 at its current location. Foxborough has an agreement with Mansfield that provides access to Mansfield's property for monitoring site DP-4. Foxborough proposed switching from using Wells 8-97 and 9-97A to wells located at site F-4A - the site of the previously attempted constructed wetland on property owned by the Town of Foxborough. However, site F-4A is close to the pumping wells and the wetland reconstruction was later terminated because the area did not represent Atlantic white cedar swamp conditions. Therefore, site F-4A would not represent ambient conditions for groundwater levels and wetland conditions. Existing wells 8-97 and 9-97A continue to be the best sites with historical data for monitoring ambient conditions. **Foxborough must amend its agreement with Mansfield to access 8-97 and 9-97A and replace them at their current locations, and install transducers in these wells to collect continuous measurements. The staff will work with Mansfield to coordinate amending the agreement.**

4) **Foxborough must work with MassDEP and the staff to meet water conservation Conditions including reducing UAW, working with Industrial, Commercial and Institutional users to reduce water use, and continuing existing residential water conservation measures to keep RGPCD below 65, and during Emergency Declarations, follow water conservation Conditions outlined in the 2013 Amendment.**
   a) With UAW greater than 10%, Foxborough must:
      - Complete annual American Water Works Association Level 1 validated M36 water audits[3]. Validation should be done by a qualified person. If there are data validity issues, Foxborough should take steps to consistently improve its data.
      - Submit to the WRC documentation that an annual M36 water audit has been completed.
      - Develop and implement a Water Loss Control Program in accordance with standard industry best management practices. The intent is to use the annual M36 audits to help inform the selection of water loss strategies best suited for Foxborough. Elements of a Water Loss Control Program can be found in the 2018 Water Conservation Standards and EPA guidance. Water Loss Control Strategies can be found in the AWWA guidance associated with M36 audits as well as EPA guidance.

[3] Foxborough received a Water Management Act Grant from MassDEP to perform an M36 audit in 2022. Foxborough may apply for this grant in subsequent years to assist with conducting an M36 Water Audit annually and implementing the actions recommended by the audit.

- Provide annual summaries of progress in the annual monitoring report and make all documents such as M36 audit results available upon request to the staff for review.

b) To complete meeting Massachusetts Water Conservation Standard #10 - Industrial, Commercial and Institutional (ICI) Use, Foxborough must monitor water use on its metering system for high usage and suspected leaks, and notify the users as needed. Foxborough must reach out annually to the top users to direct them to EPA's WaterSense website that has information regarding conservation strategies applicable to the top users to help implement appropriate water conservation measures and track their use over time. These activities must be documented in the Annual Monitoring Report.

c) Foxborough must continue with its successful residential water conservation program. These activities must be documented in the Annual Monitoring Report.

d) As stated in the 2013 Amendment, during Emergency Declarations, Foxborough must:
   - Exhaust options to purchase water from other surrounding communities via the existing emergency connections;
   - Maximize pumpage from Foxborough's other sources which are currently in operation;
   - Impose tighter restrictions on outdoor water use, up to a total ban on any outdoor water use. A total outdoor water ban will be implemented when Witch Pond wells are used and the thresholds are exceeded.

e) Based on the items above, Foxborough shall submit a revised, detailed water conservation plan for WRC review and approval.

Reducing Actions under an Existing Condition

5) Staff gage SG-3 measures water levels in the Swamp to monitor potential impacts to Bungay Brook. It has provided data on the seasonal flooding cycle. Given the potential increase in pumping at the site, and without a commitment by Foxborough to keep pumping to within historical limits or eliminate pumping during the dry season, **Foxborough must continue water level readings at staff gage SG-3 year-round at weekly intervals (a reduction from the current daily readings) for a period of three years, after which the data will be evaluated by the staff and monitoring may be further reduced with approval by the WRC.**

6) As Table 3 shows, thresholds were only triggered once in December and zero times January through June for the period of 2011 through 2019. Therefore, eliminating monitoring at the non-threshold sites during these months is reasonable. This decision aligns with Foxborough's 2018 Annual Report recommendation to remove transducers only from non-threshold wells for the winter. **Transducers installed in non-threshold monitoring wells may be removed from December 1st through May 31st to protect the equipment. However, if reduced pumping or no pumping thresholds are triggered between**

December 1st and May 31st at any of the threshold monitoring locations then monitoring at non-threshold sites must be re-started as soon as possible. If this occurs, then the WRC may require additional months of monitoring at non-threshold sites in subsequent years.

7) **Vegetation monitoring methods must be modified as follows.** Foxborough must continue to monitor the three existing transects, conduct limited monitoring (as defined in the Background), and complete such monitoring every three (3) years through 2030 (i.e., 2024, 2027, and 2030). This reduction in frequency and scope relative to current Conditions will reduce damage to the vegetation while providing sufficient data to note changes. The WRC will evaluate the three rounds of data and modify the monitoring scope and frequency, as needed.

New or Modified Conditions Requiring Actions to Reduce Impacts to the Swamp

8) **Foxborough must coordinate with the Attleborough Water Department (AWD), as required in AWD's WMA permit, to get notifications of water releases to the Wading River so that Foxborough may plan appropriately to minimize the severity and duration of the groundwater dropping below the reduced and no pumping thresholds** and to manage the remainder of its water supply resources accordingly. AWD has the formula for converting number of turns to rate of flow. Although AWD is not required to give advanced notice, staff will work with Foxborough and AWD to determine if advance notice is possible.

9) Evidence of invasive species since baseline has been documented, however steps to remove invasive species have not been addressed. **Foxborough must address invasive species as follows:**
   - Foxborough must follow the Massachusetts Invasive Plant Advisory Group's list of invasive, likely invasive and potentially invasive species list to identify invasive species at the Witch Pond site. (https://www.massnrc.org/mipag/speciesreviewed_category.htm).
   - Foxborough must include a new section in the wetlands reporting document for Invasive Species that discusses each invasive species, the physical extent, potential threat to the habitat, and recommendations for management.
   - Specifically, for phragmites, Foxborough must commit to managing the floating phragmites mat and the patch growing in the ditch near access road to Well #15. In cooperation with MassDEP Drinking Water Program, DFG, and the staff, Foxborough must develop a plan to manage invasive species within 90 days of this Decision. The plan must be implemented after approval by staff. Foxborough must provide updates on the success of treatments and any recommendations for modifying the management plan as part of the 2024 and 2027 monitoring reports.

10) Foxborough must meet Water Conservation Standard #6, a drought/emergency contingency plan, by updating its drought plan. Foxborough should review the 2019 (or most recent) Massachusetts Drought Management Plan and incorporate applicable recommended elements from the state plan into its drought plan. It must tie its drought plan to the Secretary of EEA's drought declaration as a secondary trigger for nonessential outdoor water use restrictions and

incorporate recommended actions by the Secretary of EEA for the Southeast Drought Region or any of the basins that Foxborough is in, whichever applies.

Foxborough shall submit a revised drought plan for WRC review and approval. After approval, Foxborough shall seek WRC approval prior to making any changes to its drought plan regarding nonessential outdoor water use that would make it less environmentally protective than the approved, revised plan.

In addition, if nonessential outdoor water use from private wells is an issue in Foxborough, the Town should consider implementing outdoor water use restrictions on private wells, in line with what is required of customers on the Town's water supply. WRC staff is available to assist with template bylaws or other resources to enable the establishment of such authority.

11) Because of the freeze and thaw cycle, the wells and their measuring points can shift. In addition, well replacement can result in a new measuring point. Foxborough must survey elevations as soon as possible after the wetlands thaw out and/or after well replacement. **Foxborough must provide the survey elevations of all sites and proposed adjustments to data within 2 weeks after the survey is completed.** This submission must be two data tables – one showing the elevation of sites over time and the other showing adjustments over time. Foxborough must provide a description of any challenges and their proposed resolutions**.** Foxborough may proceed with implementing adjustments. **Staff will review and provide approval of the proposed adjustments, and will notify Foxborough with any concerns, as soon as possible.**

12) **Foxborough must submit the tables below within 30 days of the WRC's Decision. When activities have been completed to meet Conditions, Foxborough must send revised tables noting completed activities.**
Foxborough must submit:
- a summary table of all monitoring sites' condition (e.g., current total depth, original total depth) and anticipated date of necessary replacements of wells, transducers and other equipment,
- a summary table of all Conditions associated with its ITA Decisions and compliance status with those Conditions including documentation of on-going water conservation measures and a timeline for correcting any deviations from Conditions (Staff will provide a template for this table),
- summary table of the 2020 and 2021 survey elevations and resulting adjustments to data, and
- as much as possible, well replacements should take place before the growing season starts or during low water conditions; timing can be discussed with the staff based on conditions.

13) **Foxborough must change its annual report to follow an outline to be provided by staff**. The new format will significantly streamline and restructure the annual report submitted to the WRC to include summary data in tables and graphs within the text. The text must refer to such tables or graphs and discuss trends or anomalies reflected in the tables or graphs but not

list the values within the text. Staff will provide a report outline to Foxborough within a month of the Decision.

14) Based on information in the annual report and in the monitoring reduction request, there are multiple locations that have been compromised for years and not monitored contrary to Foxborough's ITA Conditions outlined in the 2001 Decision. The monitoring plan in effect at any given time, currently the 2016 version, must be followed. Changes cannot be made without prior approval from the WRC. Written notification to the WRC does not constitute approval. Current deviations from the Conditions outlined in this and prior WRC Decisions must be corrected as soon as possible.

    In the case of unforeseen deviations from Conditions such as equipment failure Foxborough must provide written notification to the WRC within 48 hours of discovery of any deviation(s). Within 1 week of notice of any deviation(s), Foxborough must provide a written description of activities for resolving the deviations and a timeline for completing the activities. Depending on the type of deviation and nature of the required resolution, the timeline for providing an action plan may be extended upon consultation with staff. When activities are completed, a written notification must be provided to the WRC within a week. Written notification may be provided via email to staff.

15) **Foxborough must revise the Hydrologic and Vegetation Monitoring Plan to reflect the above Recommendations.**

EXECUTIVE ORDER 385

This Decision is consistent with Executive Order 385, which has the dual objective of resource protection and sustainable development. This recommendation does not encourage growth in areas without adequate infrastructure nor does it cause a loss of environmental quality or resources.