2016 Annual Aquifer Monitoring Report
Evergreen Spring
Fryeburg, Maine

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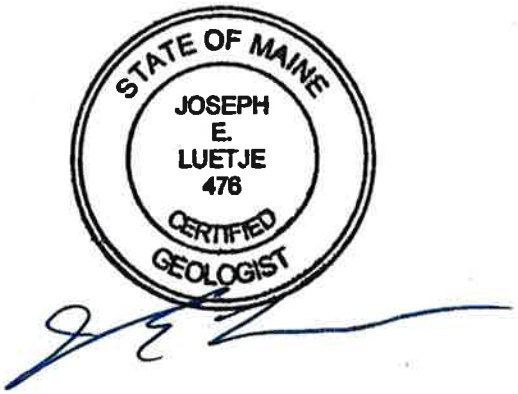

March 2017

2016 ANNUAL AQUIFER MONITORING REPORT
EVERGREEN SPRING
FRYEBURG, MAINE

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1.0 INTRODUCTION

Nestle Waters North America Inc. (d/b/a/ Poland Spring) has contracted with Luetje Geological Services (LGS) of Portland, Maine, and McDonald Morrissey Associates, Inc. (MMA) of Concord, New Hampshire, independent hydrogeologic consulting firms, to collect and compile data from the Wards Brook Aquifer. Poland Spring is not required to submit these data to the Town of Fryeburg, but started to do so voluntarily with the December 2008 monthly report. Annual reports are compiled after the end of each calendar year summarizing final data and drawing conclusions about hydrologic conditions in the Wards Brook Aquifer. Poland Spring purchases spring water in Fryeburg from the Fryeburg Water Company (FWC). The FWC also services other residential, commercial, industrial and public water users in Fryeburg.

Hydrogeologic data collection from locations in and around the Wards Brook Aquifer began in 2003 by Woodard & Curran (W&C) for Pure Mountain Springs Company (PMS). LGS assumed responsibility for the monthly monitoring program in July 2008, and continues to conduct monitoring of the Wards Brook Aquifer on behalf of Poland Spring. The primary role for LGS is monthly data collection and preparation of monthly and annual reports. MMA was contracted to perform data analysis, program review, and general oversight of site monitoring and reporting.

In August 2005, Emery & Garrett Groundwater, Inc. submitted a report (*Groundwater Flow Model, Wards Brook Aquifer, Fryeburg, Maine, 2005)* to the Town of Fryeburg Planning Board. This report was funded by the Fryeburg Aquifer Resource Committee (FARC). To date, this appears to be the most comprehensive investigation and report pertaining to the Wards Brook Aquifer. Emery & Garrett used groundwater and geologic data collected by several entities including:

- PMS and W&C;
- Poland Spring;
- FWC;
- WE Corporation (WE);
- SF Corporation, LLC (SF); and
- U.S. Geological Survey (USGS).

As part of its effort, Emery & Garrett created a groundwater model of the Wards Brook Aquifer. To simplify the report and present findings to the public, Emery and Garrett likened the Wards Brook Aquifer to a bank account, with income (groundwater recharge), fixed expenses (FWC needs for its customers other than PMS and appropriate minimum flow through Wards Brook drainage), and discretionary expenses (water used for other FWC customers, other water users of the aquifer, and excess flow through Wards Brook drainage). Emery & Garrett concluded that available discretionary expenses (withdrawals) from the Wellhead Protection Area as delineated, after all other "fixed expenses" were met, totaled approximately 293 million gallons per year (equivalent to 804,000 gallons per day over the course of a calendar year) during an average precipitation year. Emery & Garrett then imposed an arbitrary safety factor of 25%, arriving at a conservative "discretionary expense" value of 220 million gallons per year (equivalent to 603,000 gallons per day over the course of a calendar year). Poland Spring, as a sustainable guideline, purchases well below the "discretionary expense" value. In 2016, water pumped from Borehole-1 (PBH-1) totaled approximately 144 million gallons.

2.0 AQUIFER MONITORING PROGRAM

This annual report is a compilation of data for the period from January 2016 through December 2016. The entire record of water elevations (2003 – present) measured at MW-108 is included, showing typical seasonal groundwater fluctuations in the Wards Brook Aquifer and is discussed further in Section 3.0.

Data are presented for eleven monitoring wells, four surface water stations, two rain gauges (one at the load-out facility and the other from the Fryeburg Eastern Slopes Airport (ICAO Station KIZG, Northeast Regional Climate Center), and withdrawal data from PBH-1. Locations of all data collection stations are shown in Figure 1. Table 1 summarizes data collection stations and monitoring frequency.

3.0 GROUNDWATER LEVELS

Groundwater levels are measured in eleven monitoring wells at locations shown in Figure 1. These wells provide groundwater level data across and adjacent to the Wards Brook watershed. Photographs A and AA show a typical monitoring well in Fryeburg and the device used to measure the depth to water (water level indicator). Photographs appear in Appendix A.

Figure 2 shows groundwater elevations measured from the monitoring well network for the 2016 calendar year. Groundwater elevations range from approximately 380 to 430 feet NAVD88 (North American Vertical Datum 1988). Frozen conditions were observed at TW-2 and TW-9 through the winter months of 2016 as seen in Figure 2 and Appendix B. The water level in these wells is above ground surface and will freeze in the well casing during the winter months if water is not overflowing the well casing. Figure 3 shows the entire record of groundwater elevations for MW-108 (November 2003 – present) and demonstrates the typical general seasonal groundwater fluctuations observed across the aquifer. Also included on Figure 3 is a hydrograph of OW-1214, a well located in Oxford, Maine and monitored by the United States Geological Survey. OW-1214 is a six inch diameter well screened from 35-38 feet below ground surface in stratified sand and gravel, and shows groundwater level fluctuations outside of the Fryeburg area but in the same general region and in a similar geologic environment. Inclusion of OW-1214 demonstrates the close correlation between water levels at both locations.

Groundwater level fluctuations are primarily driven by the timing and amount of precipitation in a given region. In general, the highest groundwater levels occur in the spring in response to recharge from spring rain and snow melt after the ground thaws. Groundwater levels tend to decline through the summer months, when evapotranspiration is greatest, and lowest groundwater levels occur near the end of the summer or early fall. After the trees drop their leaves and evapotranspiration decreases, groundwater levels generally rise until the ground freezes. Another period of low groundwater levels then occurs in late winter after the ground has been frozen for several months. Data tables showing all groundwater and surface water elevation data appear in Appendix B.

Groundwater levels for 2016 show general seasonal trends. A rise in groundwater elevations was observed in the spring caused by snowpack melt and precipitation. This followed a winter (2015-16) where only a slight decline in aquifer levels were observed. Groundwater levels reached their seasonal maximum during the months of March through May 2016, after which elevations began to decline. Groundwater levels continued to decline throughout the summer, reaching seasonal

low levels by October and November 2016. At most locations, groundwater levels began to rise again in response to late fall/early winter recharge.

It should be noted that southern Maine, according to the Palmer Hydrological Drought Index[1], experienced moderate drought conditions that began in late September and extended into early November 2016. These conditions led to fairly low groundwater levels throughout southern Maine by October 2016. Since water level observations began at MW-108 in 2003, October 2016 represented the lowest groundwater level recorded at that location. The steady decline in water elevations observed in Figures 2 and 3 from March through October are directly related to these drought conditions.

4.0 SURFACE WATER LEVELS

Surface water elevation is measured at four locations in and around the Wards Brook Aquifer watershed as seen in Figure 1. The surface water measuring locations are as follows:

- Saco River Monitoring Point (SRMP-1): surface water elevation is measured at the Route 113 bridge;
- Wards Pond Monitoring Point (WPMP-1): surface water elevation is measured at the Route 113 crossing;
- Lovewell Pond Staff Gauge (LPSG-1): surface water elevation is measured at the inlet from Wards Brook; and
- Wards Pond Staff Gauge (WPSG-2A): surface water elevation is measured near the center of the watershed in a bog located to the south of Wards Pond.

Appendix A includes a photograph (Photograph B) showing a typical staff gage used to measure surface water stage and a view of Lovewell Pond (Photograph BB) facing north from the boat ramp located off Route 113. The Lovewell Pond photograph is taken every month during regular monitoring if access is available. 2016 surface water elevations from surface water stations appear in Figure 4. A data table summarizing surface water elevation data appears in Appendix B.

Examination of Figure 4 shows normal seasonal surface water fluctuations near the site. In general, there is typically a rise in surface water levels during spring melt, a decline through the summer months, another rise in the fall and early winter followed by frozen conditions during winter months. Frozen conditions were observed at all locations except for LPSG-1 during the winter months of 2016. LPSG-1 remained unfrozen due to moving water at this station.

5.0 PRECIPITATION

Precipitation is recorded on-site adjacent to PBH-1 using an Onset Data Logging Rain Gauge (RG). The location of the on-site rain gauge is shown in Figure 1. A photograph showing the on-site rain gauge (Photograph C) appears in Appendix A. The on-site rain gauge has a self-tipping bucket that is activated with every 0.01 inches of precipitation. The gauge is also wrapped with heat tape that melts snowfall and allows measurement of precipitation through the winter months.

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[1] NOAA National Centers for Environmental Information, https://www.ncdc.noaa.gov/temp-and-precip/drought/weekly-palmers/.

Precipitation data are also recorded at the Fryeburg Eastern Slopes Airport (ICAO Station KIZG, Northeast Regional Climate Center) and compared to precipitation measurements taken by the on-site rain gauge. The Fryeburg Eastern Slopes Airport is approximately two miles to the south of the on-site rain gauge. Table 2 summarizes 2016 precipitation data available and used in the monthly reports.

Examination of Table 2 shows that there is a correlation between precipitation data collected at both locations. For the 2016 calendar year, the on-site rain gauge recorded a total of 38.21 inches of precipitation, 3.91 inches less than was recorded in 2015. The Fryeburg Eastern Slopes Airport gauging station recorded 40.89 inches of precipitation, 3.41 inches less than was recorded in 2015.

Since 1999, the Fryeburg area has received an average of approximately 48 inches of precipitation per year. This average was calculated from data primarily recorded at the Fryeburg Easter Slopes Airport weather station (ICAO Station KIZG, Northeast Regional Climate Center). Data from the on-site rain gauge was used where gaps in the KIZG record occurred.

As mention in Section 3.0, moderate drought conditions (according to the Palmer Hydrological Drought Index) began to occur in southern Maine in late September 2016 and extended into early November 2016. At the KIZG station, below average precipitation was recorded for each month in 2016, except for February, July, and October, and was directly associated with the moderate drought conditions observed in southern Maine over that time period.

6.0 WITHDRAWALS

In accordance with the contract with the Fryeburg Water Company, spring water volume withdrawn from PBH-1 is presented as total gallons recorded as offloaded at bottling facilities. Table 3 summarizes the 2016 monthly withdrawal volumes. Spring water withdrawals from PBH-1 totaled 143,799,303 gallons for the 2016 calendar year.

7.0 BIOLOGICAL MONITORING

To complement the biological investigations conducted by Normandeau Associates in the 2006 and 2008 field seasons, Poland Spring initiated a long-term biological monitoring program of Wards Brook beginning in 2009. Bio-monitoring, conducted every other year, was not conducted in 2016, and will be conducted again in 2017.

8.0 FINDINGS

This report represents the eighth annual report for Fryeburg, Maine prepared on behalf of Poland Spring and is a summary of hydrologic data collected from the Wards Brook Aquifer through the 2016 calendar year. Poland Spring also provides these data voluntarily to the Town of Fryeburg, Fryeburg Water District and the Fryeburg Water Company on a monthly basis in the form of a monthly report that began with the December 2008 report. These data provide an on-going comprehensive summary of hydrologic conditions in the Wards Brook Aquifer. Findings for 2016 include the following:

- Spring water withdrawal from PBH-1 for 2016 totaled 143,799,303 gallons;
- 143,799,303 gallons represents approximately 65% of the discretionary water available as determined by Emery & Garrett Groundwater, Inc.;
- Although normal seasonal variations of groundwater levels were observed through 2016 at all monitoring well locations, a steady decline in water levels was observed through the summer months caused by below average precipitation (>1 inch deficit per month) in April, May, June, August and September;
- The Fryeburg area experienced moderate drought conditions in the fall of 2016, according to the Palmer Hydrological Drought Index. Southern Maine was experiencing average conditions at the time this report was drafted;
- Highest groundwater elevations for 2016 were observed in March through May, while the lowest groundwater elevations were recorded primarily in October;
- Surface water levels showed normal seasonal variation in 2016;
- Total precipitation for the 2016 calendar year was 38.21 inches, as recorded by the on-site rain gauge, 3.91 inches less than 2015.

9.0 CONCLUSIONS

Based on our analysis of groundwater and surface water data collected in Fryeburg, Luetje Geological Services and McDonald Morrissey Associates have not observed any adverse impact to waters of the State, water-related natural resources and existing uses as a result of the sale of water by the Fryeburg Water Company to Poland Spring.

If you have any questions regarding the data, explanations, or interpretations included in this report, please do not hesitate to contact Ed Luetje (207) 415-9898.

Sincerely,

Luetje Geological Services, LLC

Ed Luetje C.G.

McDonald Morrissey Associates, Inc.

Daniel J. Morrissey

cc: Fryeburg Water Company (Mr. George Weston)
Emery & Garrett Groundwater, Inc. (Mr. Peter Garrett)
Poland Spring (Mr. Joshua Bowe)
Town of Fryeburg (Ms. Sharon Jackson)
Maine Water Company (Mr. Rick Knowlton)

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TABLE 1
FRYEBURG MONITORING PROGRAM PLAN

Monitoring Station	Frequency
Monitoring Wells	
TW-2 [1]	Monthly
TW-9	Monthly
MW-101 [2]	Monthly
MW-103	Monthly
MW-105	Monthly
MW-107	Monthly
MW-108	Monthly
MW-109	Monthly
MW-110	Monthly
MW-113	Monthly
MW-114	Monthly
Surface Water Stations	
WPMP-1 [3]	Monthly
WPSG-2A [4]	Monthly
SRMP-1 [5]	Monthly
LPSG-1 [6]	Monthly
Precipitation	
RG – On-site Rain Gauge	Continuous
ICAO Station KIZG (Fryeburg Airport)	Continuous
Withdrawal Data	
PBH-1	Continuous

Notes:
1. TW refers to 'test well'.
2. MW refers to 'monitoring well'.
3. WPMP refers to 'Wards Pond Monitoring Point'.
4. WPSG refers to 'Wards Pond Staff Gauge'.
5. SRMP refers to 'Saco River Monitoring Point'.
6. LPSG refers to 'Lovewell Pond Staff Gauge'.

TABLE 2
2016 PRECIPITATION SUMMARY

MONTH	*ON-SITE RAIN GAUGE DATA*	*FRYEBURG EASTERN SLOPES AIRPORT (ICAO STATION KIZG)[1]*
Jan 2016	2.31	2.31
Feb 2016	4.96	5.03
Mar 2016	3.59	3.64
Apr 2016	2.53	2.54
May 2016	1.82	2.10
Jun 2016	3.20	3.20
Jul 2016	4.18	4.88
Aug 2016	2.20	2.59
Sep 2016	0.97	1.06
Oct 2016	4.68	5.28
Nov 2016	3.76	4.14
Dec 2016	4.01	4.12
2016 TOTAL	**38.21**	**40.89**

Notes: 1. KIZG station updated data. KIZG data presented in the monthly reports is preliminary, and is rechecked for this annual report.

TABLE 3
PBH-1 2016 WITHDRAWAL SUMMARY

Month	Monthly Total (gal)
Jan 2016	9,163,580
Feb 2016	9,328,597
Mar 2016	11,587,615
Apr 2016	8,598,405
May 2016	12,352,113
Jun 2016	15,018,327
Jul 2016	19,587,724
Aug 2016	19,368,220
Sep 2016	12,335,564
Oct 2016	9,996,898
Nov 2016	5,860,652[1]
Dec 2016	10,601,608
2016 Total	**143,799,303**

1. Previously reported as 5,771,073 gallons in the November 2016 monitoring report.

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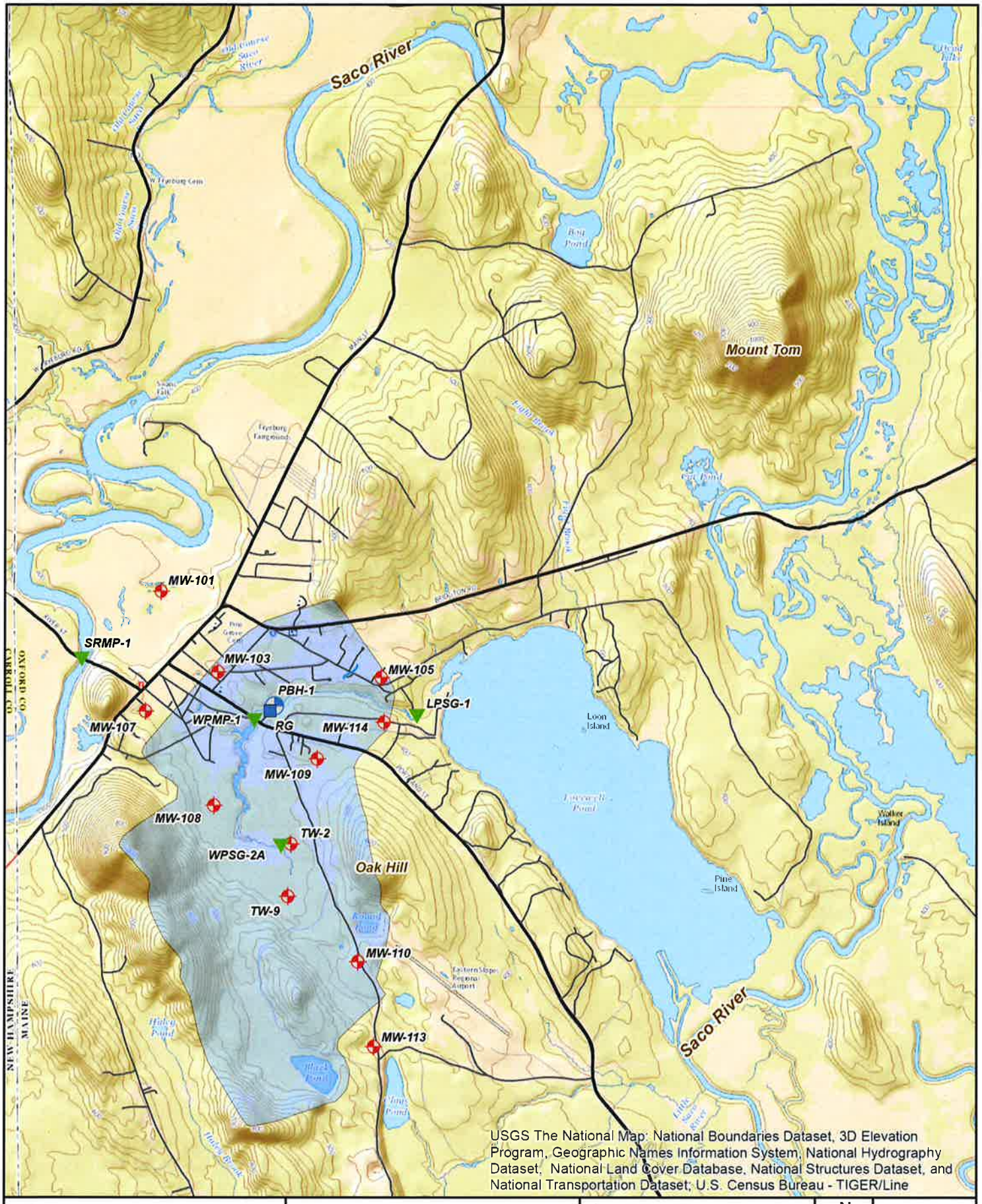

BOREHOLE
MONITORING WELL
RAIN GAUGE
SURFACE WATER STATION
WARDS BROOK WATERSHED (APPROXIMATE)

FIGURE 1
2016 ANNUAL AQUIFER MONITORING REPORT
EVERGREEN SPRING
FRYEBURG, MAINE

0 0.25 0.5 1 Miles

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NOTES:
1. ALL GENERAL DATA LAYERS ACQUIRED FROM THE MAINE OFFICE OF GIS AND/OR ESRI ONLINE.

DATE:
3/10/2017

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FIGURE 2
HYDROGRAPH FOR 2016 GROUNDWATER ELEVATIONS

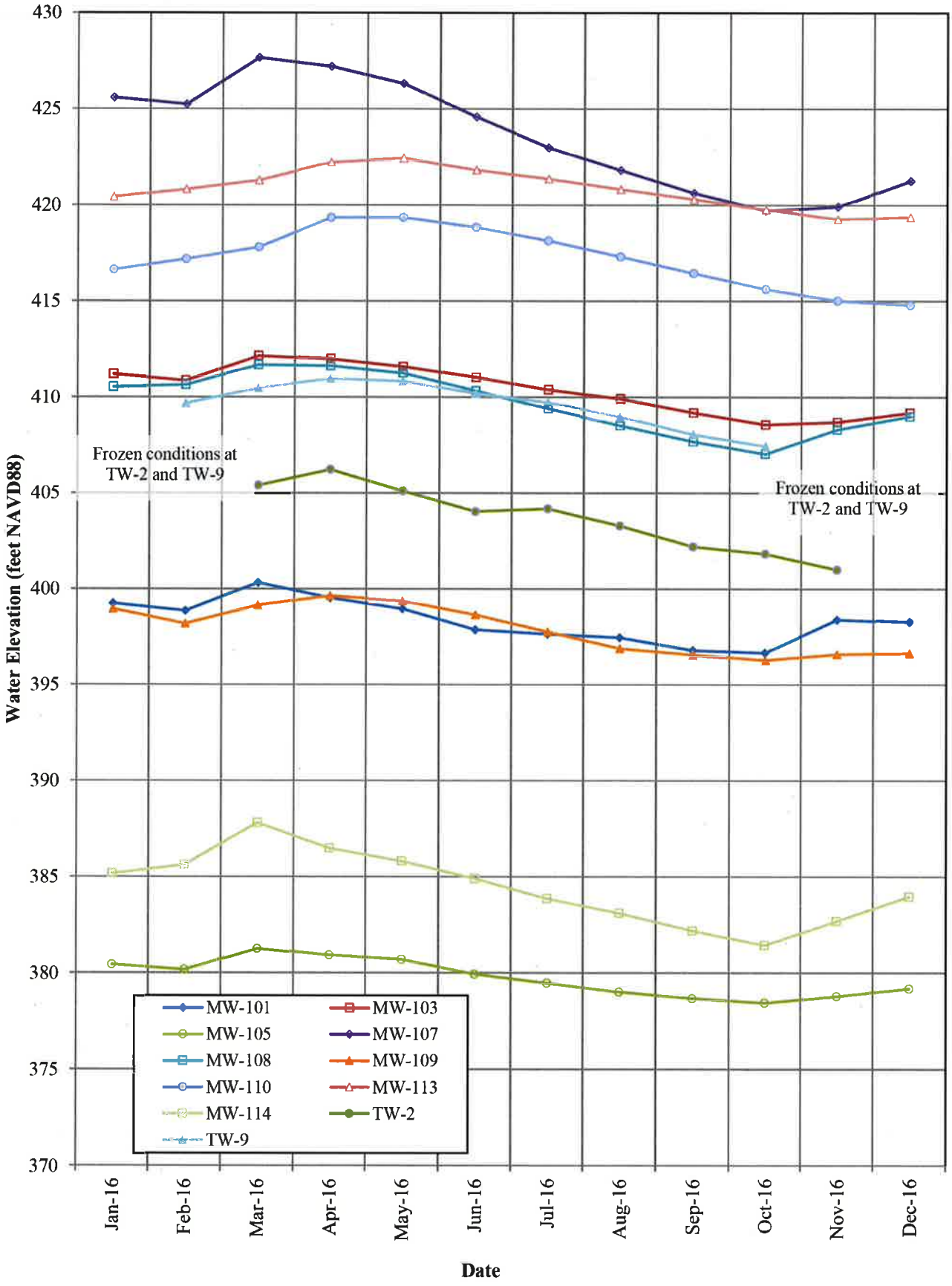

FIGURE 3
HYDROGRAPH FOR MW-108 AND OW-1214

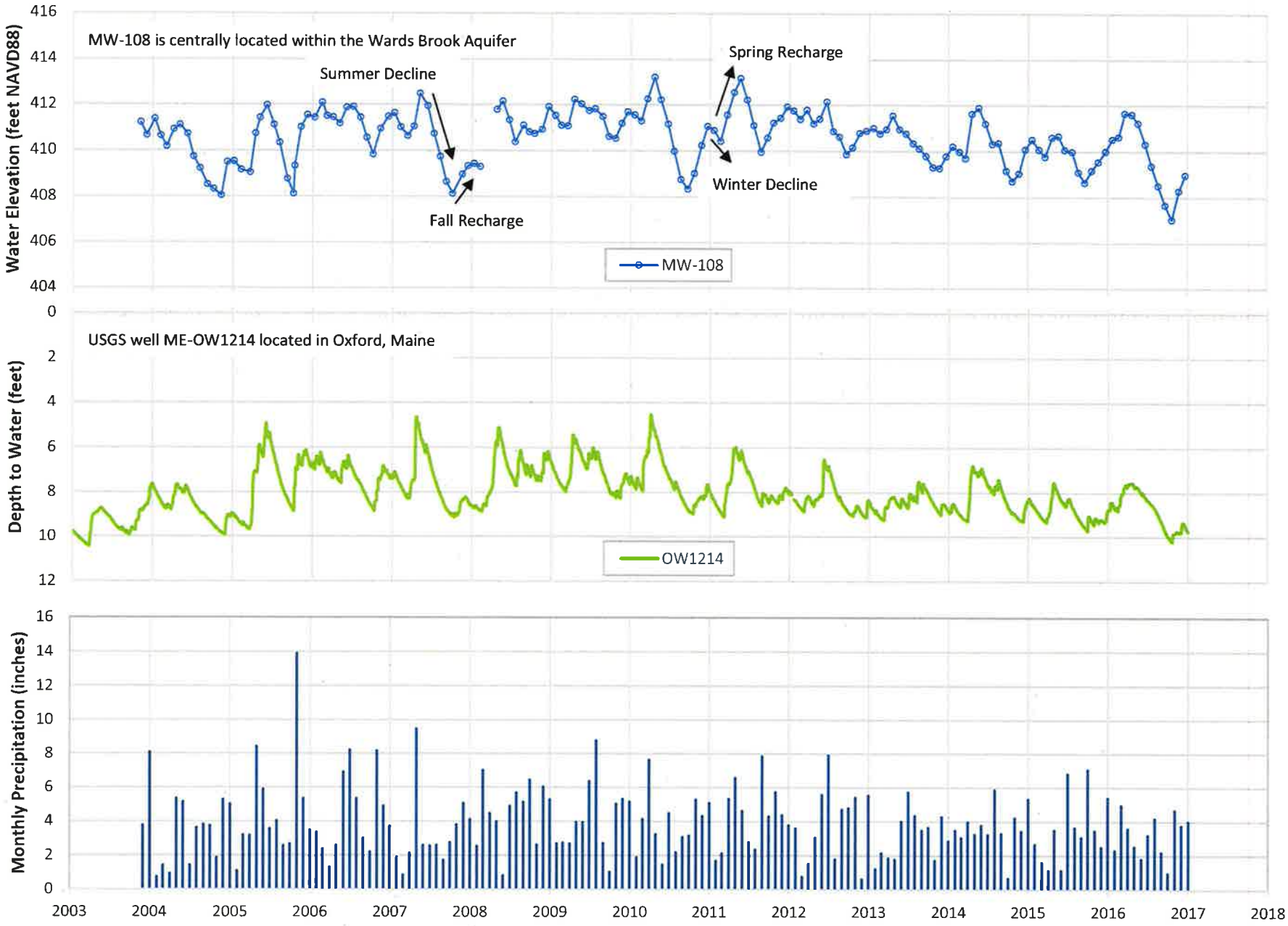

FIGURE 4
HYDROGRAPH FOR 2016 SURFACE WATER