

**2010 Annual Aquifer Monitoring Report
Evergreen Spring
Fryeburg, Maine**

Prepared for



Nestle Waters North America Inc.
(Poland Spring)
123 Preservation Way
Poland Spring, Maine 04274

by



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and



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280 Pleasant Street
Concord, New Hampshire 03301

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**2010 ANNUAL AQUIFER MONITORING REPORT
EVERGREEN SPRING
FRYEBURG, MAINE**

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1.0 INTRODUCTION

Nestle Waters North America Inc. (Poland Spring) purchases its spring water in Fryeburg from the Fryeburg Water Company (FWC). FWC also services other residential, commercial, industrial, municipal and education water users in Fryeburg. 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 year summarizing final data and drawing conclusions about hydrologic conditions in the Wards Brook Aquifer.

Hydrogeologic data collection from locations in and around the Wards Brook Aquifer began in 2003 by Woodard & Curran for Pure Mountain Springs Company. 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 reports and the annual report. 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:

- Pure Mountain Springs (PMS) and Woodard & Curran (W&C);
- Poland Spring;
- Fryeburg Water Company (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 Pure Mountain Springs 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 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, on average, purchases well below the 'discretionary expense' value. In 2010, water pumped

from Borehole-1 totaled approximately 99 million gallons, or 45% of discretionary water available. Poland Spring is unaware of any other significant use of discretionary water.

2.0 AQUIFER MONITORING PROGRAM

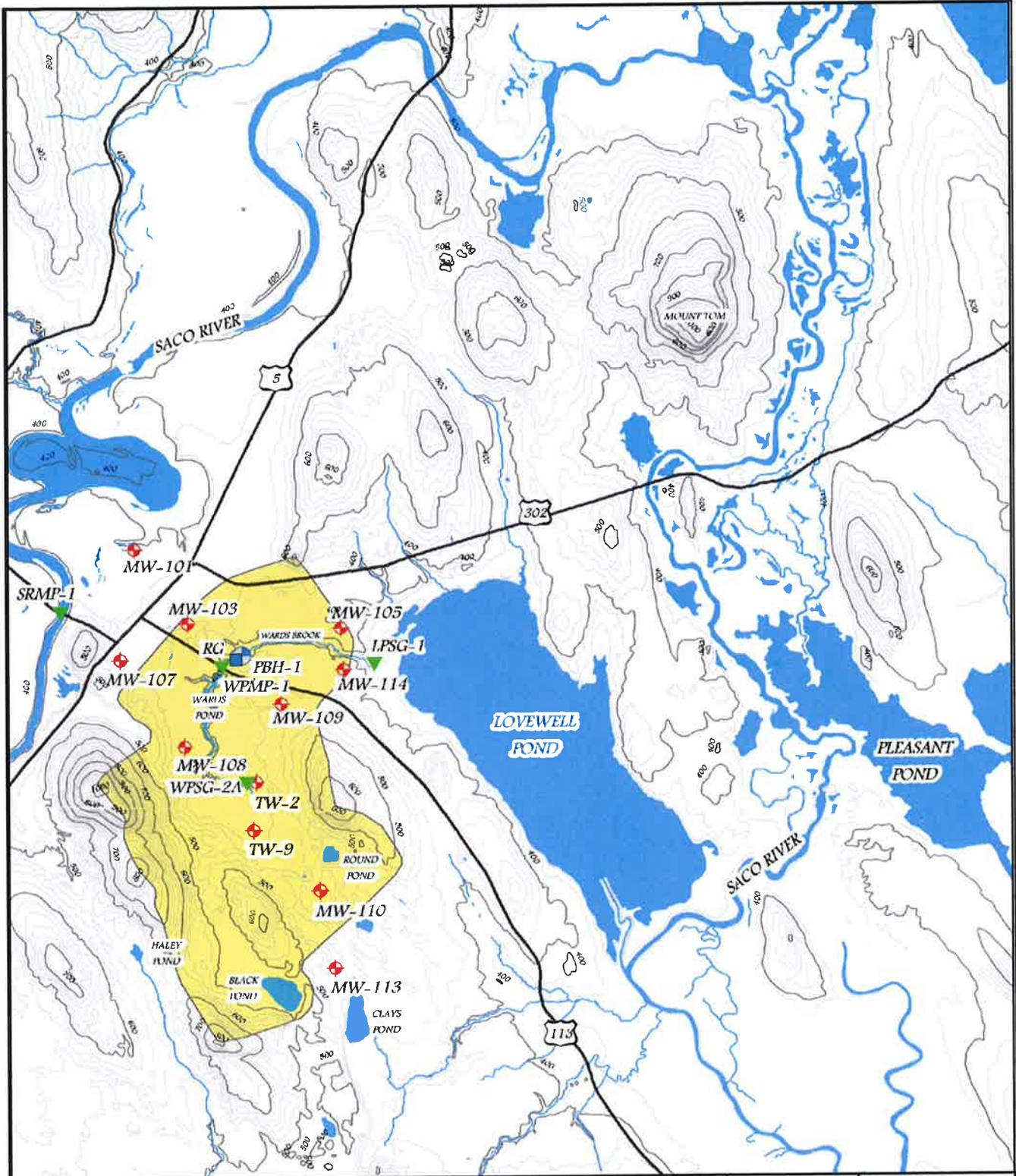
This annual report is a compilation of data for the period from January 2010 through December 2010. The entire record of water elevations measured at MW-108 is also included showing recent groundwater trends in the Wards Brook Aquifer and is discussed further in Section 3.0

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

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'.



-  BOREHOLE
-  MONITORING WELL
-  RAIN GAGE
-  SURFACE WATER STATION
-  CONTOUR LINES
-  WARDS BROOK WATERSHED (APPROXIMATE)

FIGURE 1
ANNUAL AQUIFER MONITORING REPORT

NOTES:
 ALL GENERAL DATA LAYERS ACQUIRED FROM THE OFFICE OF GIS.
 CONTOURS ARE 20' INTERVALS

LGS REF# 08-011
 DATE: 1/28/2011

0 0.25 0.5 Miles



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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 2010 calendar year. Groundwater elevations range from approximately 380 to 430 feet NAVD88 (North American Vertical Datum 1988). Figure 3 shows the entire record of groundwater elevations for MW-108 (record November 2003 – present). The presentation of this record was included because it is representative of the recent rising groundwater trend in the Wards Brook Aquifer and is centrally located within the aquifer. Data tables showing all groundwater and surface water elevation data appear in Appendix B.

Examination of Figures 2 and 3 shows the typical seasonal variations in groundwater levels at all of the monitoring wells around the site. 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.

In April 2010, groundwater levels reached an all-time high for the period of observation (2003-present), as seen in the record for MW-108 (Figure 3). A steady decline in groundwater levels was then observed starting in April and ending in September due to lower than average precipitation for the months of April, May, July, August, and September. A rebound in groundwater levels was observed from October through December due to above average precipitation.

Figure 2 - Hydrograph for 2010 Groundwater Elevations

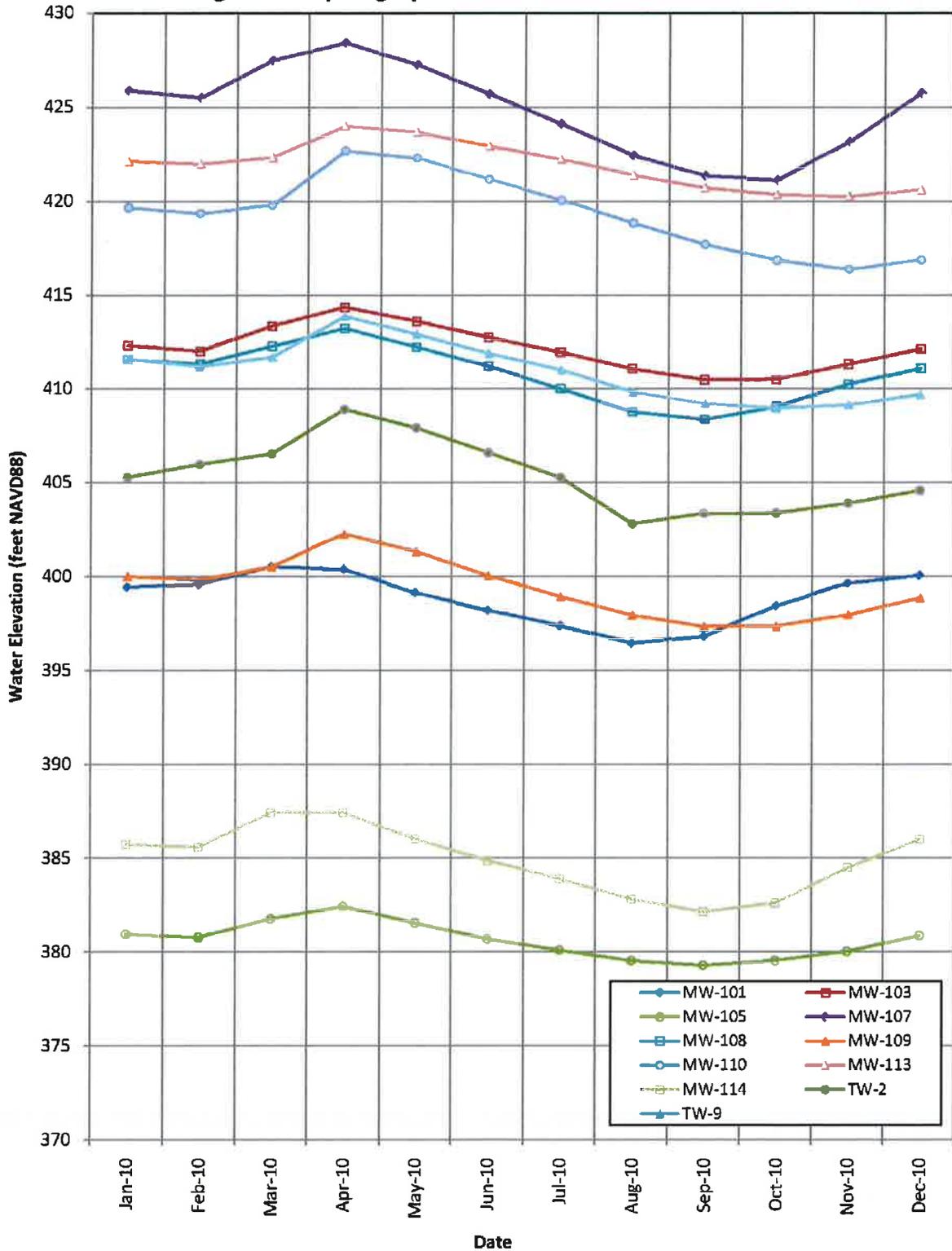
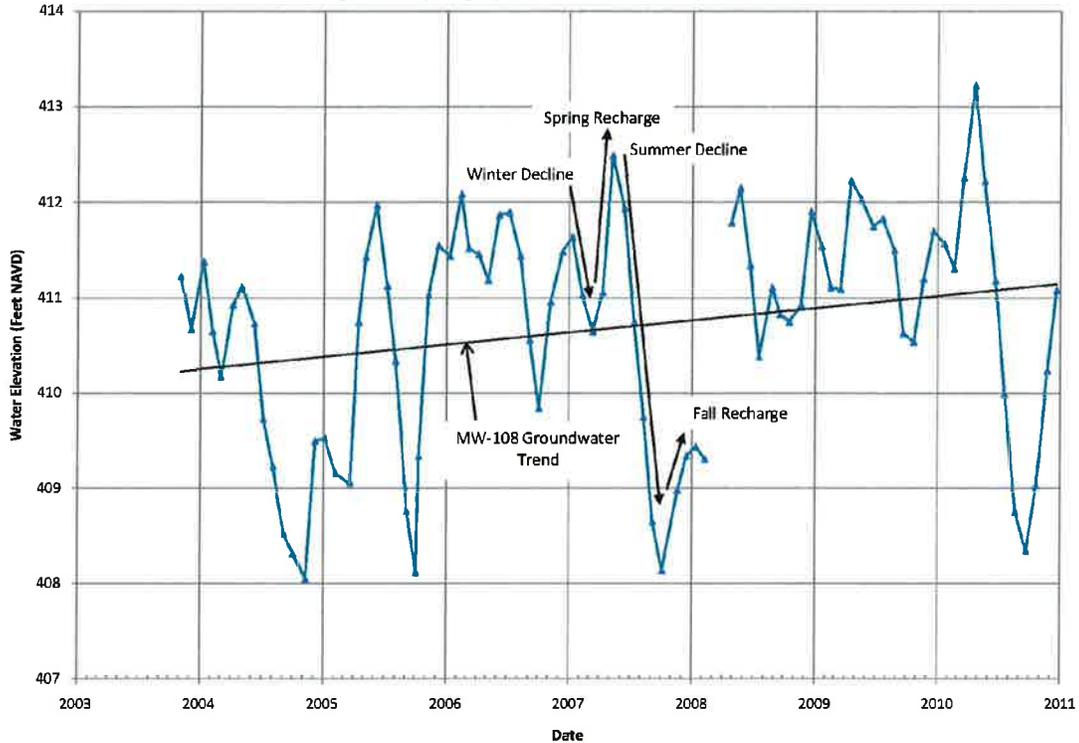


Figure 3: Hydrograph for MW-108 - Complete Record



4.0 SURFACE WATER LEVELS

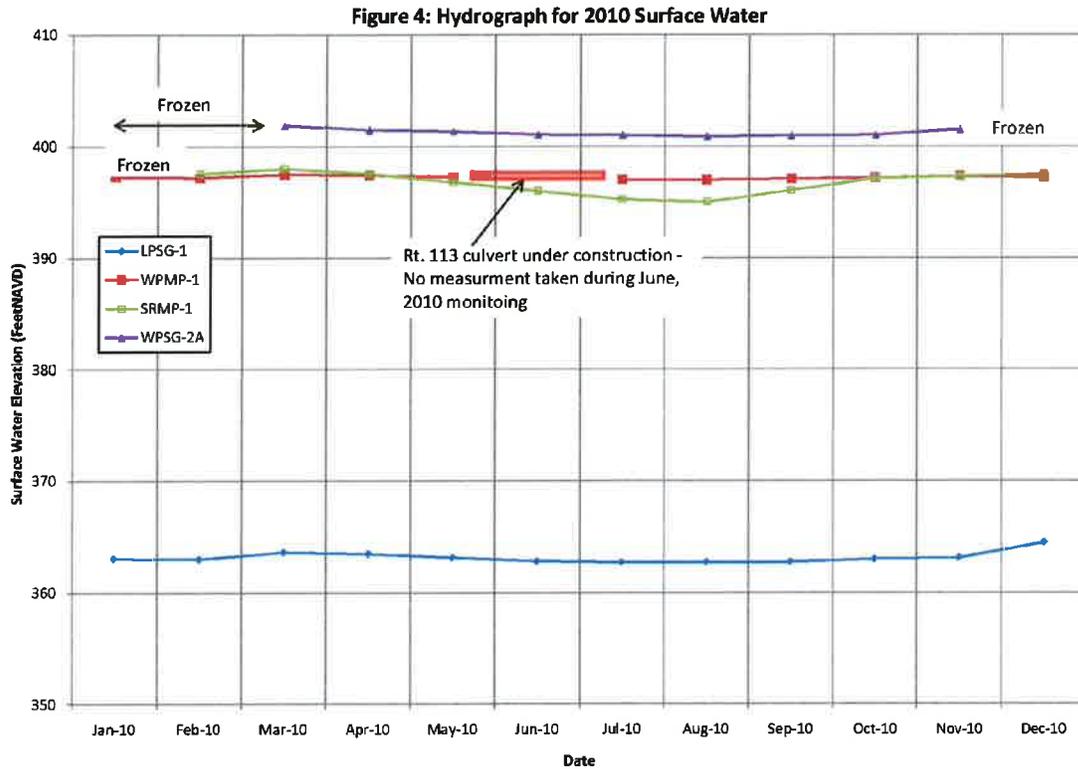
Surface water elevation is measured at four locations in and around the Wards Brook Aquifer watershed as seen in Figure 1. The surface water measuring locations are as follows:

- 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 will be taken every month during regular monitoring. 2010 surface water stage from surface water stations appears 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 typically followed by frozen conditions during winter months. Frozen conditions were observed at WPSG-2A and SRMP-1 during winter

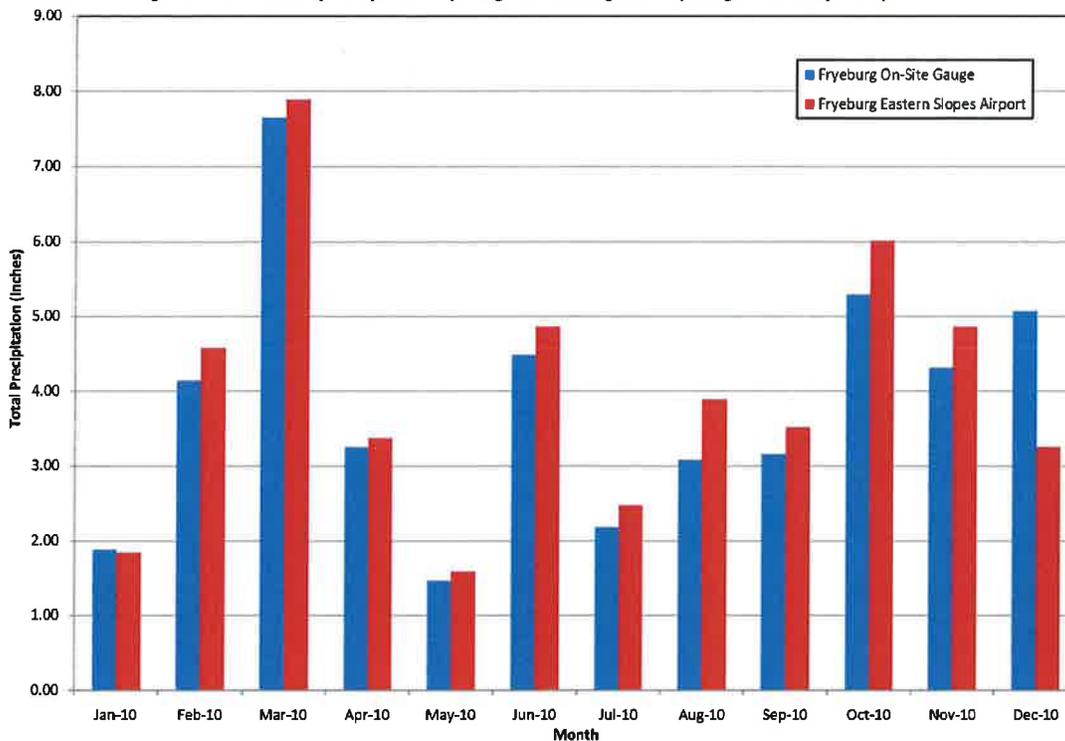
months. LPSG-1 and WPMP-1 remained unfrozen due to moving water at these stations. The Route 113 culvert at the outlet to Wards Pond was under construction in June; therefore, no measurement was taken at WPMP-1 during the June 2010 monitoring round.



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.

Figure 5: 2010 Monthly Precipitation - Fryeburg On-Site Gauge and Fryeburg Eastern Slopes Airport



Precipitation data are also recorded at the Fryeburg Eastern Slopes Airport (ICAO Station KIZG, Northeast Regional Climate Center) to compare 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. Figure 5 shows monthly precipitation data collected at both rain gauge locations during 2010. A data table summarizing 2010 precipitation appears in Appendix C.

Examination of Figure 5 shows that there is a reasonably close correlation between precipitation data collected at both locations. The Fryeburg area receives an average of approximately 49 inches of precipitation per year. This average was calculated from data collected at two long term National Weather Service Cooperative stations:

- East Hiram NWS Coop Station 173794 (1967 – 2008)
- North Conway NWS Coop Station 275995 (1975 – 2009)

For the 2010 calendar year, the on-site rain gauge recorded a total of 45.98 inches of precipitation, which is 4.48 inches less than was recorded in 2009. The Fryeburg Eastern Slopes Airport gauging station recorded 48.11 inches of precipitation, 2.13 inches more than was recorded by the on-site rain gauge.

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 2010 monthly withdrawal volumes below. Spring water withdrawals from PBH-1 totaled 99,105,447 gallons for the 2010 calendar year.

Table 2: PBH-1 2010 Withdrawal Summary

Month	Monthly Total (gal)
Jan-10	4,487,390
Feb-10	4,235,897
Mar-10	3,707,585
Apr-10	10,084,608
May-10	11,984,016
Jun-10	13,608,790
Jul-10	17,620,087
Aug-10	15,159,394
Sep-10	9,154,616
Oct-10	5,208,356
Nov-10	1,771,928
Dec-10	2,082,780
2010 Total	99,105,447

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 is performed by Stantec every two years and will be conducted in 2011 and included in the 2011 Annual Report.

8.0 CONCLUSIONS

This report represents the third annual report for Fryeburg, Maine prepared voluntarily on behalf of Poland Spring and is a summary of hydrologic data collected from the Wards Brook Aquifer through the 2010 calendar year. In addition, Poland Spring provides these data 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 2010 include the following:

- Spring water withdrawal from PBH-1 for 2010 totaled 99,105,447 gallons;
- 99,105,447 gallons represents approximately 45% of the discretionary water available as determined by Emery & Garrett Groundwater, Inc.;
- Normal seasonal variations of groundwater levels were observed at all monitoring well locations. After an all-time high, steady groundwater level decline was observed

APPENDIX A

Photographs

Photographs A and AA: Measuring depth to water using a water level indicator at MW-114.



Photograph A



Photograph AA

Photograph B: WBSG-2 – Typical staff gage used for measuring surface water elevation.
Photograph BB: Lovell Pond from boat ramp off Rt. 113 facing north (6/21/2010.)



Photograph B



Photograph BB



Photograph C: On-site Rain Gage

APPENDIX B

**2010 Groundwater and Surface Water Elevation Data
Fryeburg, Maine**

Monitoring Wells	MW-101 ²	MW-103	MW-105	MW-107	MW-108	MW-109	MW-110	MW-113	MW-114	TW-2	TW-9
Reference Elevation (feet NAVD88) ¹	408.35	421.58	404.98	431.95	419.89	420.11	461.86	441.13	405.20	404.18	409.24
1/19/2010	399.42	412.28	380.94	425.87	411.57	400	419.65	422.11	385.73	405.28	411.59
2/18/2010	399.57	411.99	380.75	425.49	411.31	399.8	419.33	421.97	385.56	405.96	411.18
3/18/2010	400.51	413.34	381.75	427.46	412.26	400.5	419.77	422.33	387.40	406.52	411.68
4/20/2010	400.38	414.34	382.42	428.37	413.22	402.24	422.68	423.96	387.41	408.9	413.87
5/19/2010	399.14	413.59	381.53	427.23	412.22	401.32	422.28	423.65	386.01	407.91	412.91
6/21/2010	398.19	412.72	380.68	425.68	411.18	400.03	421.14	422.91	384.87	406.59	411.87
7/19/2010	397.38	411.92	380.08	424.11	409.99	398.92	420.05	422.24	383.88	405.26	411.01
8/19/2010	396.47	411.04	379.52	422.44	408.76	397.93	418.83	421.38	382.80	402.81	409.82
9/20/2010	396.82	410.47	379.27	421.35	408.35	397.32	417.69	420.7	382.13	403.35	409.22
10/20/2010	398.44	410.5	379.53	421.15	409.03	397.34	416.84	420.33	382.60	403.37	408.96
11/22/2010	399.62	411.29	380.01	423.17	410.24	397.96	416.36	420.23	384.47	403.89	409.14
12/20/2010	400.04	412.08	380.86	425.72	411.08	398.85	416.85	420.62	385.99	404.56	409.67

Surface Water Stations	LPSG-1 ³	WPMP-1 ⁴	SRMP-1 ⁵	WPSG-2A ⁶
Reference Elevation (feet NAVD88) ¹	364.83 364.85 ³	401.27	418.79	405.27 404.95 ⁶
1/19/2010	363.06	397.23	frozen	frozen
2/18/2010	362.98	397.16	397.54	frozen
3/18/2010	363.6	397.46	397.99	401.87
4/20/2010	363.46	397.4	397.54	401.47
5/19/2010	363.12	397.23	396.78	401.32
6/21/2010	362.81	const.	395.99	401.03
7/19/2010	362.7	396.97	395.21	400.99
8/19/2010	362.7	396.96	395	400.84
9/20/2010	362.72	397.04	395.99	400.95
10/20/2010	362.98	397.13	397.11	400.98
11/22/2010	363.09	397.29	397.28	401.46
12/20/2010	364.44	397.21	397.48	frozen

- Notes:
1. NAVD88 is the North American Vertical Datum 1988. Elevations are in feet NAVD. Measuring points were re-surveyed in the summer 2009 by Bliss Associates and new reference elevations are reflected in this chart.
 2. MW refers to monitoring well
 3. LPSG refers to Lovewell Pond Staff Gauge; new reference elevation (April 2010)
 4. WPMP refers to Wards Pond Monitoring Point
 5. SRMP refers to Saco River Monitoring Point
 6. WPSG refers to Wards Pond Staff Gauge; New reference elevation (April 2010)

APPENDIX C

**PRECIPITATION DATA
ON-SITE RAIN GAUGE &
FRYEURG EASTERN SLOPES AIRPORT (ICAO STATION KIZG)**

2010 Monthly Precipitation	ON-SITE RAIN GAUGE DATA	FRYEBURG EASTERN SLOPES AIRPORT (ICAO STATION KIZG)
Jan 2010	1.88	1.84
Feb 2010	4.14	4.58
Mar 2010	7.65	7.89
Apr 2010	3.25	3.37
May 2010	1.46	1.58
Jun 2010	4.49	4.86
Jul 2010	2.18	2.47
Aug 2010	3.08	3.89
Sep 2010	3.16	3.51
Oct 2010	5.29	6.01
Nov 2010	4.32	4.86
Dec 2010	5.08	3.25
2010 TOTAL	45.98	48.11

