

# 2023 Annual Aquifer Monitoring Report

## Evergreen Spring

### Fryeburg, Maine

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Prepared for:

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(d/b/a Poland Spring)  
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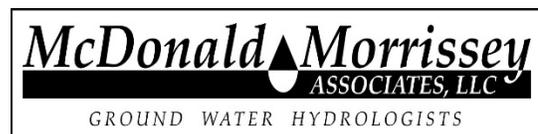
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March 2024

**2023 ANNUAL AQUIFER MONITORING REPORT  
EVERGREEN SPRING  
FRYEBURG, MAINE**

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## 1.0 INTRODUCTION

Blue Triton Brands, Inc. (d/b/a/ Poland Spring) has contracted with Luetje Geological Services (LGS) of Freeport, Maine, and McDonald Morrissey Associates, LLC. (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 from Evergreen Spring 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.

In 2018, Emery & Garrett updated and re-calibrated the numerical model of the Wards Brook Aquifer, incorporating the latest groundwater and surface water information. They concluded that “the original permissible [commercial withdrawal] limit of 603,000 gallons per day [i.e. 220 million gallons per year] is sustainable and ensures that groundwater discharge to Wards Brook will exceed 400 gallons per minute under any non-extreme climatic scenario<sup>1</sup>”. In 2023, Poland Spring purchased approximately 79 million gallons, or approximately 36% of the sustainable yield for commercial withdrawal.

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1. EGGI (2018), Recalibration and Application of the Numerical Model of the Wards Brook Aquifer, Fryeburg, Maine, submitted to the Town of Fryeburg.

## 2.0 AQUIFER MONITORING PROGRAM

This annual report is a compilation of data for the period from January 2023 through December 2023. Also included is the entire record of water elevations (2003 – present) measured at MW-108 (**Figure 3**), showing typical seasonal groundwater fluctuations in the Wards Brook Aquifer as discussed further in Section 4.0. Data are presented for:

- Ten monitoring wells;
- Six surface water stations;
- Two rain gauges (an on-site rain gauge located at the load-out facility and data obtained from the Fryeburg Eastern Slopes Airport (ICAO Station KIZG, Northeast Regional Climate Center);
- Withdrawal data from PBH-1; and,
- Two stream flow locations along Wards Brook.

Locations of all data collection stations are shown in **Figure 1**. **Table 1** summarizes data collection stations and monitoring frequency.

## 3.0 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 a heat tape that melts snowfall and allows measurement of liquid precipitation through the winter months.

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 2023 precipitation data available and used in the monthly reports.

From 1992 to 2023 (32 total years), the Fryeburg area has received an average of approximately 47 inches of precipitation per year. This average was calculated from data primarily recorded at the Fryeburg Eastern 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.

The Fryeburg Eastern Slopes Airport gauging station recorded 53.68 inches of precipitation in 2023. This was 9.08 inches more than was recorded in 2022, and 6.39 inches greater than the 32-year mean. During 2023, monthly precipitation recorded at KIZG was below the 32-year monthly mean for five out of twelve months.

Examination of **Table 2** shows that there is a correlation between precipitation data collected at both locations from month to month. For the 2023 calendar year, the on-site rain gauge recorded

a total of 52.57 inches of precipitation. This value is 1.11 inches less than was recorded at station KIZG, and 5.28 inches greater than the 32-year mean of 47.29 inches.

The Palmer Hydrological Drought Index measures hydrological impacts of drought which take longer to develop and longer to recover from, characterizing groundwater conditions more accurately. According to the Palmer Hydrological Drought Index<sup>2</sup>, the Fryeburg area experienced ‘mid-range’, or normal conditions, to ‘very moist’ conditions through the 2023 calendar year.

## 4.0 GROUNDWATER LEVELS

Groundwater levels were measured monthly in ten monitoring wells during the 2023 calendar year. All monitoring well locations are 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**.

**Figures 2A** through **2C** show groundwater elevations measured from the monitoring well network for the 2023 calendar year. All elevations are referenced to the 1988 North American Vertical Datum (NAVD88). **Figure 2A** shows groundwater elevations ranging from 410-430 feet NAVD88, **Figure 2B** shows groundwater elevations ranging from 390-415 feet NAVD88, and **Figure 2C** shows groundwater elevations ranging from 375-395 feet NAVD88. Each hydrograph is accompanied by a bar graph showing 2023 monthly precipitation and monthly mean precipitation.

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. Groundwater levels tend to decline through the summer months, when evapotranspiration is greatest, and lowest groundwater levels generally occur near the end of the summer or early fall. After the trees drop their leaves and evapotranspiration decreases, groundwater levels generally rise until extreme cold conditions persist. Groundwater levels typically drop through the winter months, caused by the majority of precipitation being stored as snow and ice, coupled with irregular frozen ground conditions limiting subsurface recharge capabilities. Data tables showing all groundwater and surface water elevation data appear in **Appendix B**.

Groundwater levels as seen in **Figures 2A** thru **2C** show groundwater level trends typically observed across the aquifer. 2023 groundwater levels began with the seasonal fall recharge in progress. This recharge period ended at most monitoring locations in January, after which a decrease in groundwater elevations was observed representing winter conditions. From the March 2023 monitoring event to the May 2023 monitoring event, groundwater levels increased via recharge in response to snowpack melt and precipitation. Groundwater levels generally declined through the summer, reaching seasonal low levels primarily in November 2023. At most monitoring well locations, groundwater levels began to rise again in response to late fall/early winter recharge prior to the end of 2023.

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2. NOAA National Centers for Environmental Information, <https://www.ncei.noaa.gov/access/monitoring/historical-palmer/>.

The water levels in TW-2 and 9 have consistently been above ground surface and water occasionally will freeze in the well casing during the winter months if water is not overflowing the well casing. Throughout 2023, groundwater continued to overflow the well casing and remained thawed and measurable.

**Figure 3** shows the entire record of groundwater elevations for MW-108 (November 2003 – present) and demonstrates the typical seasonal groundwater fluctuations observed across the aquifer. **Figure 3** also shows the 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 level fluctuations at both locations.

In addition on **Figure 3**, precipitation data are displayed in two plots below the hydrographs. Precipitation data is presented as monthly, annual totals, annual cumulative departure from the 32-year mean (reset annually), and total cumulative precipitation departure from the 32-year mean since 2000.

## 5.0 SURFACE WATER LEVELS

Surface water elevation is measured at six 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;
- 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; and,
- SG-2 and SG-3: These staff gauges are in Wards Brook at the upstream and downstream gauging locations, and are discussed further in Section 6.0.

**Appendix A** includes a photograph (Photograph B) showing a typical staff gauge used to measure surface water stage. 2023 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. Surface water levels across the site exhibited this general trend during 2023. Frozen conditions were observed at WPSG-2A during the January and February 2023 monitoring rounds. Conditions at LPSG-1, SRMP-1, and WPMP-1 remained unfrozen throughout 2023. Flooded conditions were observed at LPSG-1 during the April, July, and December 2023 monitoring events caused by snowpack melt in April, and above average precipitation received during July and December.

## 6.0 WARDS BROOK STREAM FLOW

Beginning with the June 2020 monitoring round, stream flow and surface water elevation have been measured at two locations along Wards Brook. As seen on **Figure 1**, SG-2 (~200' downstream from Rt 113) is the upstream location, and SG-3 (at a former grist mill site) is the downstream location. Surface water elevation is measured at these locations to potentially create a 'rating curve' that may establish a relationship between surface water stage and stream flow. Between SG-2 and SG-3, Wards Brook gains flow from spring discharge, including those associated with the Evergreen Spring site.

Flow is measured using a HACH FH950 current meter. Velocity measurement protocols are based upon United States Geological Survey (USGS) stream gaging methods. Flow rates are measured in 'cells' along a cross-section of the stream. Calculation of cell area and measurement of flow rate through each cell allows for the computation of total flow through the cross-section. Units are generally in cfs (cubic feet per second; 1 cfs = 448.8 gallons per minute).

During 2023, the average gain in stream flow between SG-2 and SG-3 was 3.05 cfs (January through November 2023). Highest flows were measured during the December 2023 monitoring round; 17.03 cfs was measured at SG-2 and the stream levels were too high to gauge at SG-3. These high stream flows and levels were a result of nearly four inches of liquid precipitation received on December 17<sup>th</sup> and 18<sup>th</sup>. The December 2023 monitoring event was conducted on December 20<sup>th</sup>. Lowest flows were measured during the October monitoring round; 1.43 cfs was recorded at SG-2 and 4.21 cfs was recorded at SG-3. Seasonal high stream flow and stage typically occur during the spring timeframe of March through May, and seasonal low flow and stage typically occur during the August/September timeframe. **Figure 5** is a graphical representation of Wards Brook discharge measurements from June 2020 to the end of 2023. All stream flow and stage data appear in **Appendix B**.

## 7.0 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 2023 monthly withdrawal volumes. Spring water withdrawals from PBH-1 totaled 79,173,140 gallons for the 2023 calendar year.

## 8.0 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, now conducted on an every-three-year schedule, was last completed by Stantec in 2022. Therefore, bio-monitoring is next scheduled to be conducted in 2025 and will appear in the 2025 annual report.

## 9.0 FINDINGS

This annual report prepared on behalf of Poland Spring is a summary of hydrologic data collected from the Wards Brook Aquifer through the 2023 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 2023 include the following:

- In 2023, Poland Spring purchased 79,173,140 gallons of spring water from the FWC;
- 79,143,140 gallons represents approximately 36% of the sustainable amount of water available for commercial withdrawal as determined by Emery & Garrett Groundwater, Inc.;
- Normal seasonal variations of groundwater levels were observed through 2023 at all monitoring well locations;
- Highest groundwater elevations for 2023 were primarily observed during the April/May timeframe, while the lowest groundwater elevations were generally recorded during the November monitoring event;
- The average gain between Wards Brook discharge monitoring locations was 3.05 cfs from January through November 2023. Stream levels were too high to gauge at SG-3 during the December 2023 monitoring event;
- Surface water levels showed normal seasonal variation in 2023; and,
- Total precipitation for the 2023 calendar year was 53.68 inches, as recorded at station KIZG, 9.08 inches more than in 2022, and approximately 6.4 inches greater than the 32-year mean.

## 10.0 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



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Ed Luetje L.G.

McDonald Morrissey Associates, LLC



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Michael Mobile, Ph.D., CGWP

cc: Fryeburg Water Company (Mr. George Weston)  
Emery & Garrett Groundwater, Inc. (Mr. Dan Tinkham)  
Poland Spring (Mr. Mark Dubois)  
Poland Spring (Mr. Iain Kurry)  
Town of Fryeburg (Ms. Katie Haley)  
Maine Water Company (Mr. Mark Vannoy)  
Maine Water Company (Mr. Dillon Dougherty)

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Table 2	2023 Precipitation Summary
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**TABLE 1**  
**FRYEBURG MONITORING PROGRAM PLAN**

<b>Monitoring Station</b>	<b>Frequency</b>
<b><i>Monitoring Wells</i></b>	
TW-2 <sup>1</sup>	Monthly
TW-9	Monthly
MW-101 <sup>2</sup>	Monthly
MW-105	Monthly
MW-107	Monthly
MW-108	Monthly
MW-109	Monthly
MW-110	Monthly
MW-113	Monthly
MW-114	Monthly
<b><i>Surface Water Stations</i></b>	
WPMP-1 <sup>3</sup>	Monthly
WPSG-2A <sup>4</sup>	Monthly
SRMP-1 <sup>5</sup>	Monthly
LPSG-1 <sup>6</sup>	Monthly
SG-2 (Upstream gauging location)	Monthly
SG-3 (Downstream gauging location)	Monthly
<b><i>Precipitation</i></b>	
RG – On-site Rain Gauge	Continuous
ICAO Station KIZG (Fryeburg Airport)	Continuous
<b><i>Withdrawal Data</i></b>	
PBH-1	Continuous
<b><i>Stream Flow Measurement (Wards Brook)</i></b>	
SG-2 (upstream)	Monthly
SG-3 (downstream)	Monthly

- 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  
2023 PRECIPITATION SUMMARY**

<i><b>MONTH</b></i>	<i><b>ON-SITE RAIN GAUGE DATA (inches)</b></i>	<i><b>FRYEBURG EASTERN SLOPES AIRPORT (ICAO STATION KIZG)<sup>1</sup> (inches)</b></i>
Jan 2023	4.67	4.65
Feb 2023	1.57	1.55
Mar 2023	2.00	2.28
Apr 2023	4.36	4.34
May 2023	4.37	4.04
Jun 2023	6.17	5.47
Jul 2023	7.48	8.23
Aug 2023	5.45	5.92
Sep 2023	3.77	4.13
Oct 2023	2.80	2.91
Nov 2023	2.63	2.61
Dec 2023	7.30	7.55
<b>2023 Total</b>	<b>52.57</b>	<b>53.68</b>

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 WITHDRAWAL SUMMARY  
2023

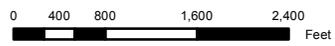
Month	Monthly Total (gal)
Jan 2023	5,808,450
Feb 2023	5,952,215
Mar 2023	8,836,535
Apr 2023	7,927,310
May 2023	8,195,345
Jun 2023	4,634,135
Jul 2023	7,753,880
Aug 2023	9,437,185
Sep 2023	5,311,410
Oct 2023	3,141,020
Nov 2023	4,103,750
Dec 2023	8,071,905
<b>2023 Total</b>	<b>79,173,140</b>

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Figure 2B	Hydrograph for 2023 Groundwater Elevations (Elevation 390 – 415 Feet NAVD88)
Figure 2C	Hydrograph for 2023 Groundwater Elevations (Elevation 375 – 395 Feet NAVD88)
Figure 3	Hydrograph for MW-108 and OW-1214
Figure 4	Hydrograph for 2023 Surface Water
Figure 5	Wards Brook Discharge



FIGURE 1  
 2023 ANNUAL AQUIFER MONITORING REPORT  
 EVERGREEN SPRING  
 FRYEBURG, MAINE



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

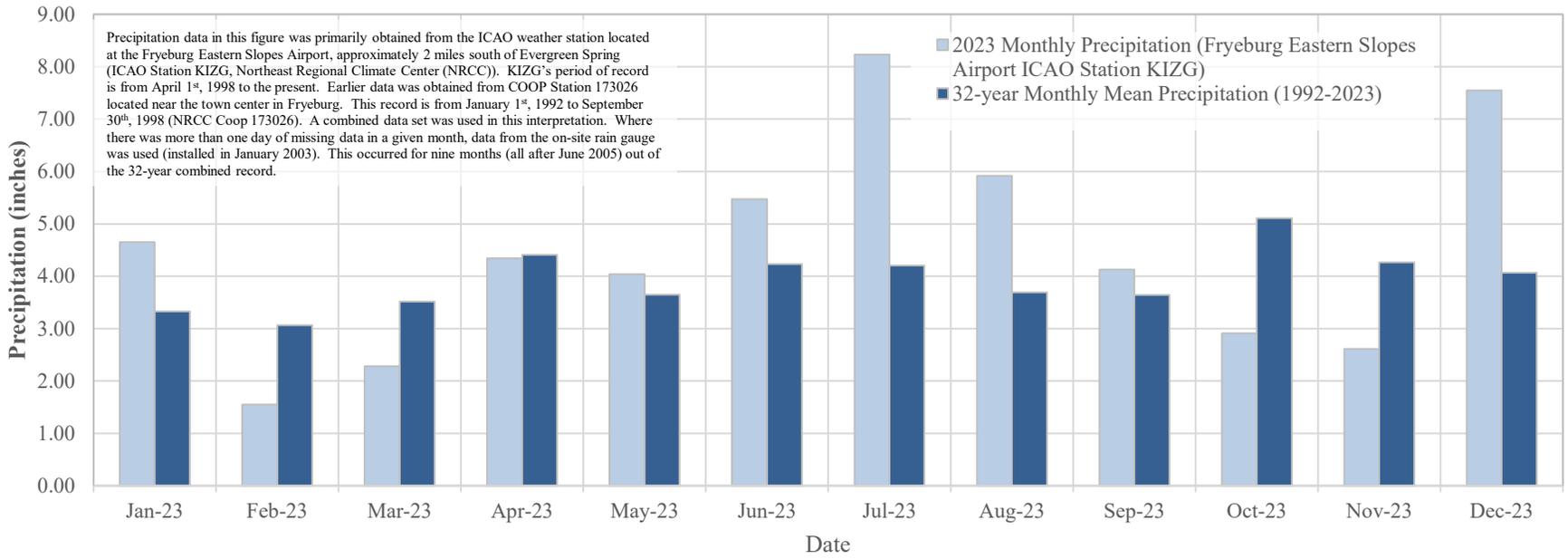
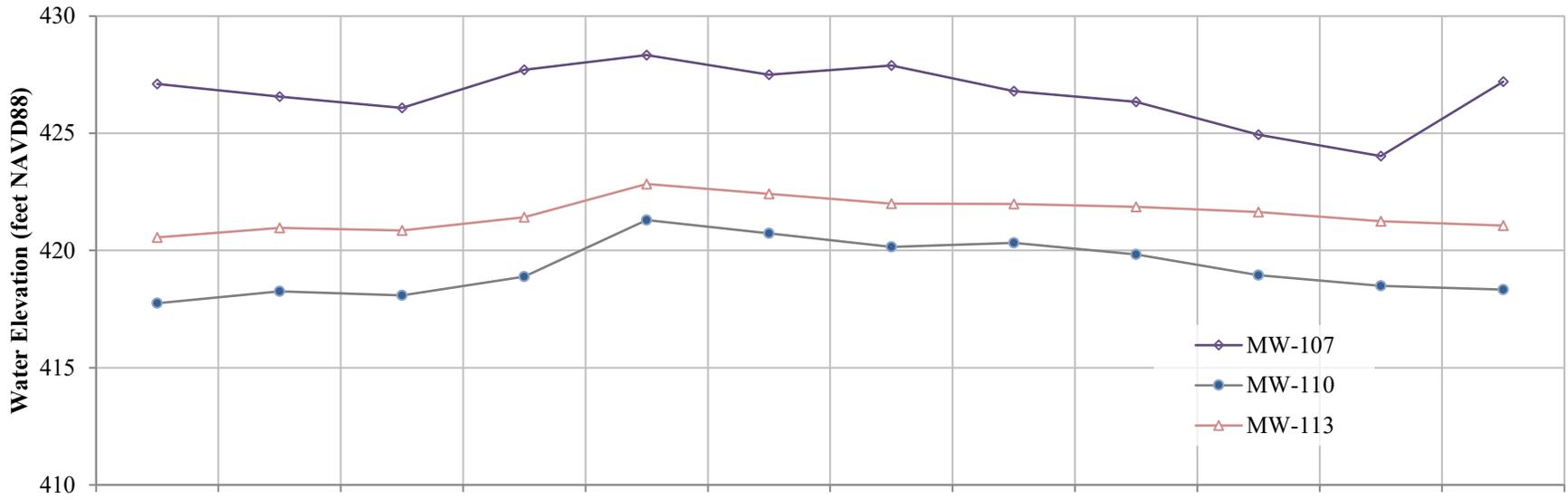
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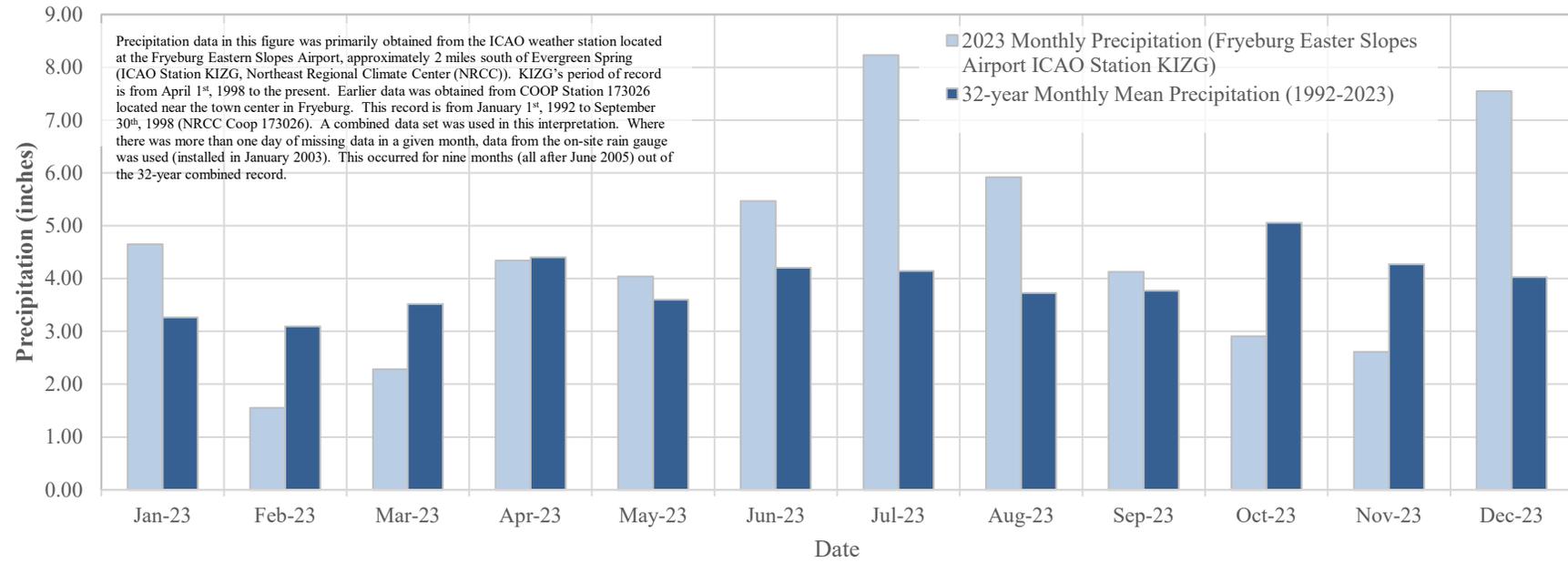
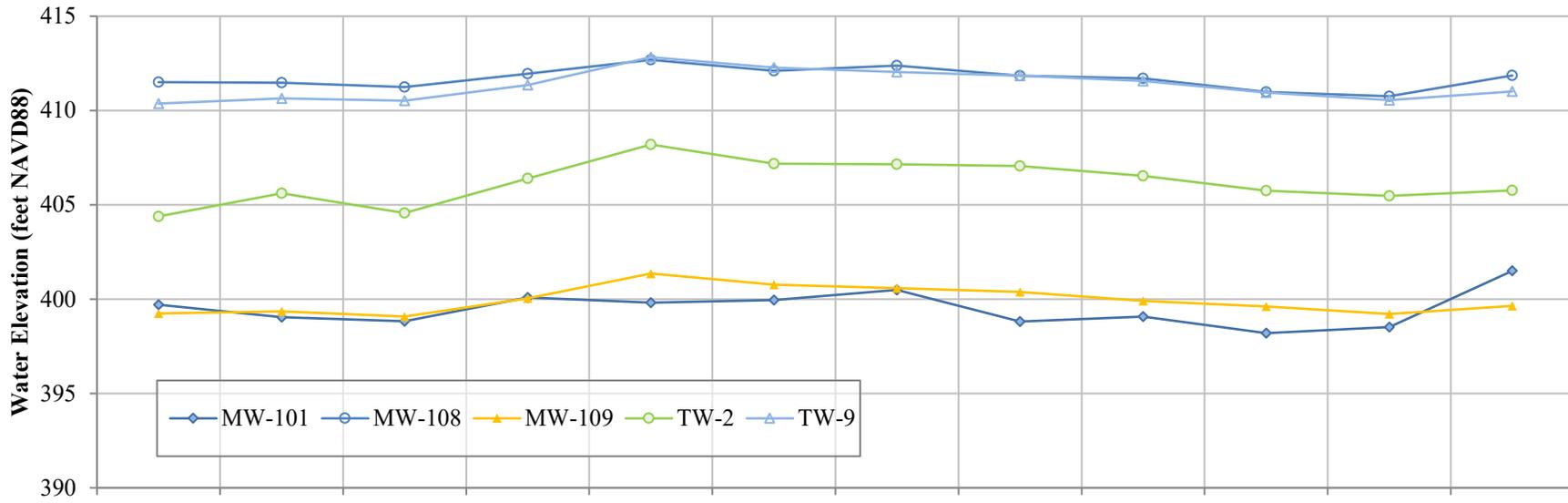
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-  BOREHOLE
-  MONITORING WELL
-  RAIN GAUGE
-  SURFACE WATER STATION
-  STREAM FLOW AND STAGE
-  WARDS BROOK WATERSHED (APPROXIMATE)

**FIGURE 2A**  
**HYDROGRAPH FOR 2023 GROUNDWATER ELEVATIONS (ELEVATION 410 - 430 FEET NAVD88)**



**FIGURE 2B**  
**HYDROGRAPH FOR 2023 GROUNDWATER ELEVATIONS (ELEVATION 390 - 415 FEET NAVD88)**



**FIGURE 2C**  
**HYDROGRAPH FOR 2023 GROUNDWATER ELEVATIONS (ELEVATION 375 - 395 FEET NAVD88)**

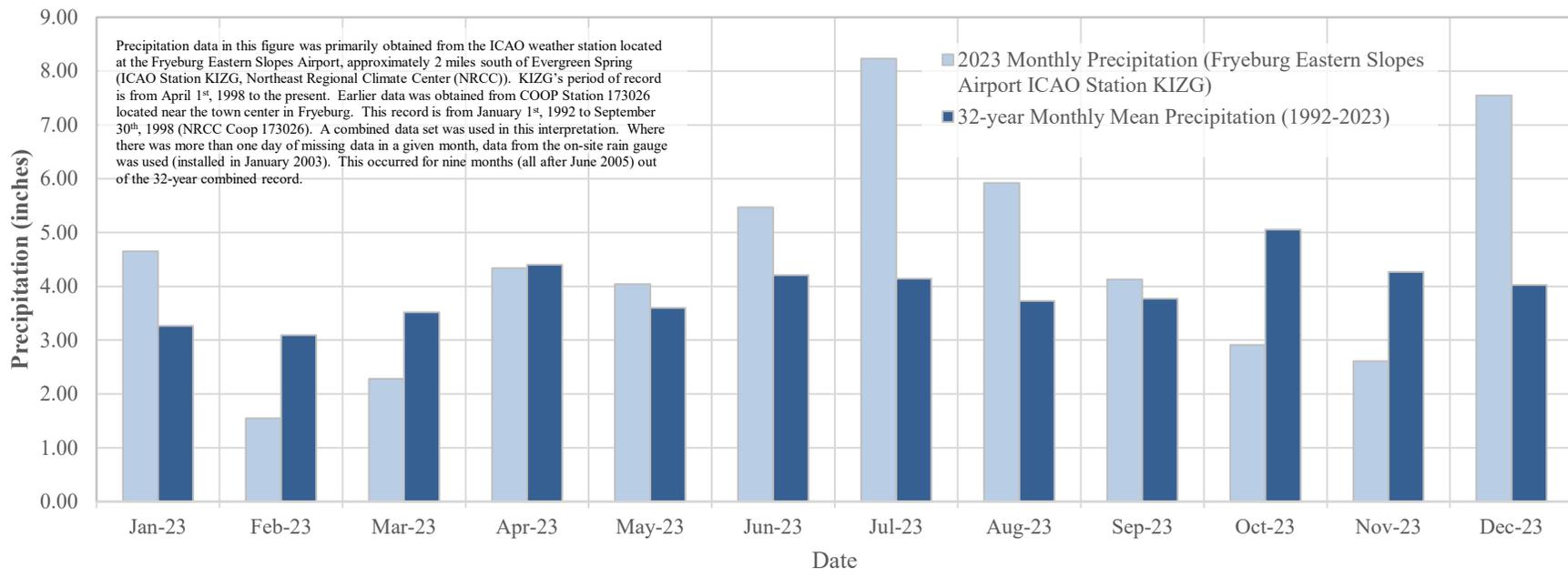
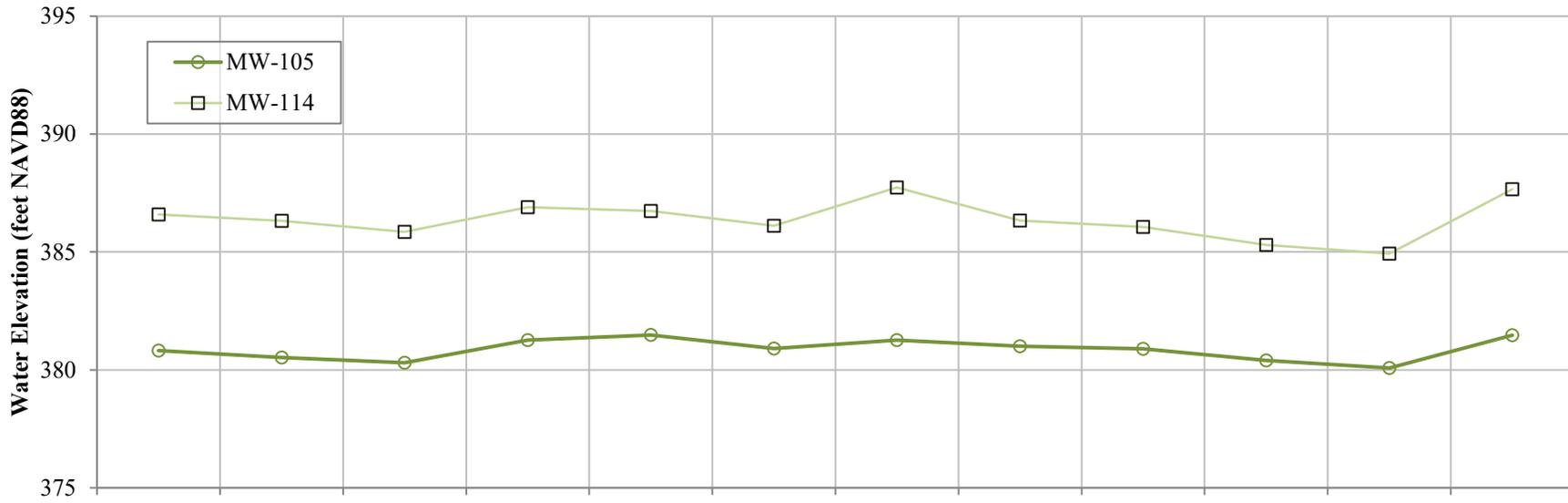


FIGURE 3  
HYDROGRAPH FOR MW-108 AND OW-1214

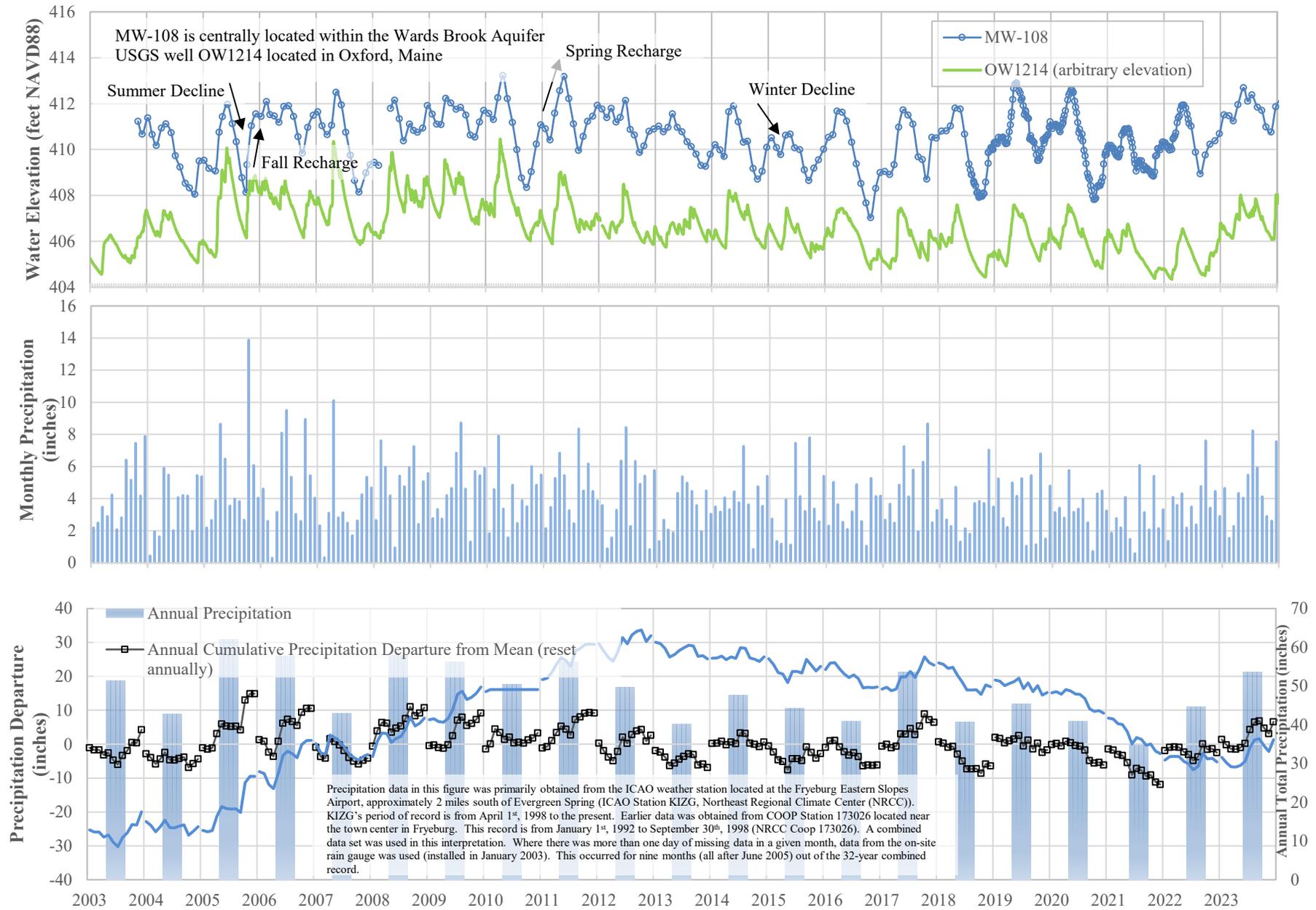
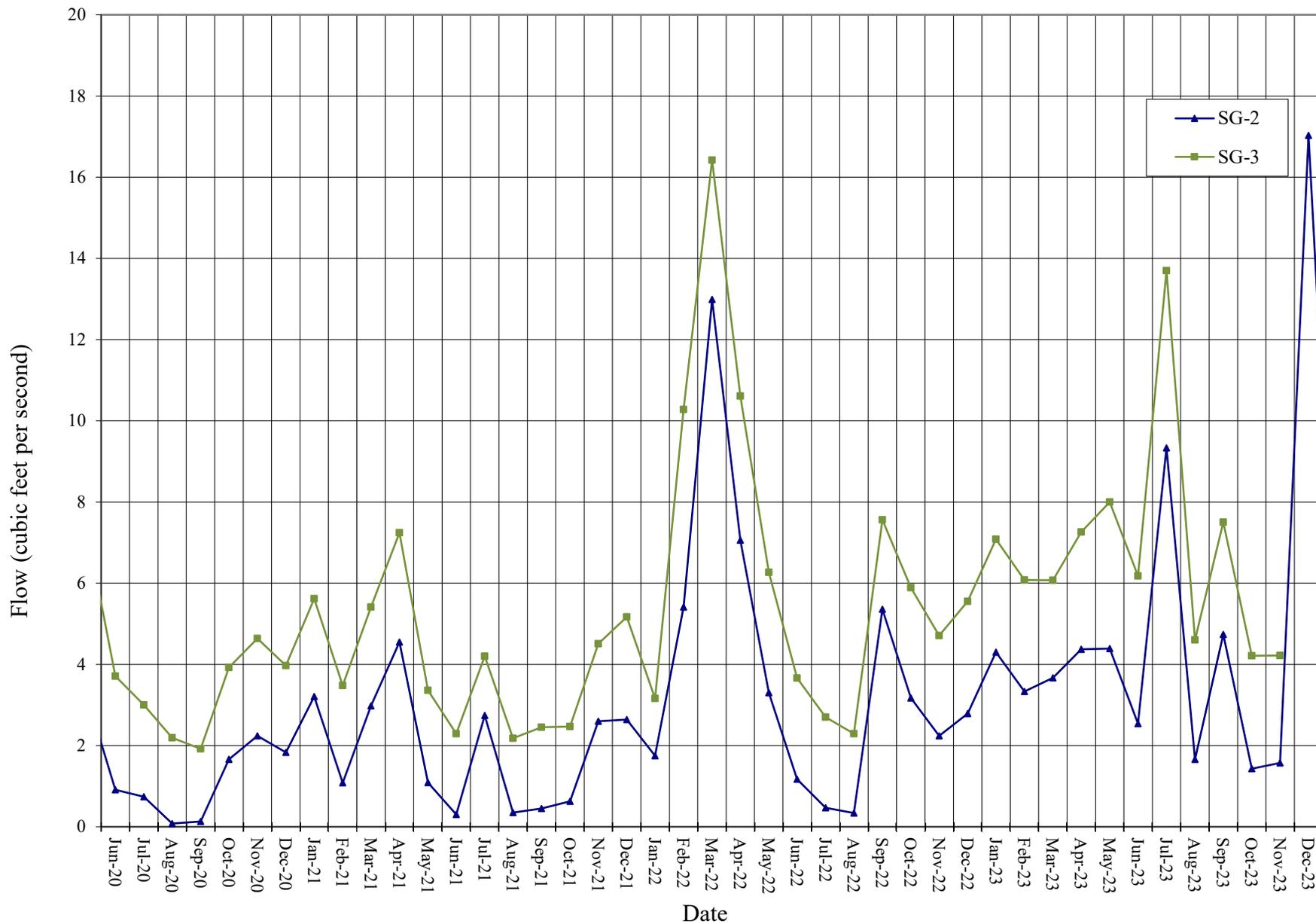


FIGURE 4  
HYDROGRAPH FOR 2023 SURFACE WATER



FIGURE 5  
WARDS BROOK DISCHARGE



## Appendices

- Appendix A    Photographs
- Appendix B    Groundwater and Surface Water Elevation Data, and Wards Brook Stream Flow Data

# **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 C: On-site Rain Gage



## **APPENDIX B**

### **Groundwater and Surface Water Elevation Data, And Wards Brook Stream Flow Data Fryeburg, Maine**

APPENDIX B  
GROUNDWATER AND SURFACE WATER ELEVATION DATA, AND WARDS BROOK STREAM FLOW DATA  
FRYEBURG, MAINE

<i>Monitoring Wells</i>	<b>MW-101</b> <sup>2</sup>	<b>MW-105</b>	<b>MW-107</b>	<b>MW-108</b>	<b>MW-109</b>	<b>MW-110</b>	<b>MW-113</b>	<b>MW-114</b>	<b>TW-2</b>	<b>TW-9</b>
<b>Reference Elevation (feet NAVD88)</b> <sup>1</sup>	408.32	404.98	432.05	419.88	420.08	461.84	441.11	405.25	404.19	409.17
1/19/2023	399.71	380.82	427.11	411.51	399.25	417.75	420.56	386.59	404.39	410.37
2/21/2023	399.05	380.53	426.56	411.47	399.35	418.26	420.97	386.32	405.62	410.64
3/21/2023	398.83	380.31	426.08	411.25	399.08	418.09	420.86	385.86	404.57	410.53
4/20/2023	400.09	381.26	427.71	411.96	400.05	418.89	421.42	386.90	406.40	411.36
5/25/2023	399.81	381.48	428.34	412.69	401.36	421.30	422.84	386.74	408.20	412.83
6/21/2023	399.95	380.91	427.50	412.11	400.77	420.73	422.42	386.11	407.18	412.27
7/18/2023	400.49	381.27	427.90	412.38	400.59	420.15	422.00	387.74	407.15	412.04
8/23/2023	398.82	381.01	426.80	411.84	400.39	420.32	421.99	386.33	407.06	411.85
9/21/2023	399.08	380.90	426.34	411.70	399.91	419.83	421.87	386.07	406.54	411.57
10/18/2023	398.20	380.40	424.94	410.98	399.61	418.95	421.64	385.30	405.75	410.95
11/20/2023	398.52	380.08	424.03	410.76	399.21	418.49	421.25	384.93	405.47	410.55
12/20/2023	401.50	381.47	427.20	411.86	399.64	418.33	421.07	387.66	405.77	411.01

<i>Surface Water Stations</i>	<b>LPSG-1</b> <sup>3</sup>	<b>WPMP-1</b> <sup>4</sup>	<b>SRMP-1</b> <sup>5</sup>	<b>WPSG-2A</b> <sup>6</sup>	<b>SG-2</b>		<b>SG-3</b>	
<b>Reference Elevation (feet NAVD88)</b>	365.57 365.51	401.22	418.85	402.13 402.04	389.42		370.70	
					elevation	flow (cfs) <sup>7</sup>	elevation	flow (cfs)
1/19/2023	363.31	397.13	396.75	ice	387.12	4.30	367.94	7.08
2/21/2023	363.33	397.07	396.60	ice	387.05	3.33	367.83	6.08
3/21/2023	363.33	397.03	396.55	401.62	387.07	3.67	367.78	6.07
4/20/2023	flooded	397.16	398.60	401.66	387.14	4.37	367.86	7.26
5/25/2023	363.32	397.13	397.05	401.78	387.13	4.39	367.84	8.00
6/21/2023	364.32	397.08	397.23	401.68	387.01	2.54	367.61	6.18
7/18/2023	flooded	397.40	398.80	401.96	387.42	9.33	368.09	13.70
8/23/2023	364.15	397.02	396.60	401.88	386.83	1.66	367.64	4.60
9/21/2023	364.16	397.22	397.10	402.03	387.16	4.74	367.81	7.50
10/18/2023	364.21	397.04	396.35	401.95	387.02	1.43	367.89	4.21
11/20/2023	364.23	397.08	396.45	401.96	387.12	1.57	367.85	4.22
12/20/2023	flooded	397.67	400.95	402.24	387.98	17.03	flooded	NA

NOTES:

1. NAVD88 is the North American Vertical Datum 1988. Elevations are in feet NAVD. Measuring points were re-surveyed in November 2015 by Bliss Associates.

2. 'MW' refers to 'monitoring well'.

3. 'LPSG' refers to 'Lovewell Pond Staff Gauge'.  
365.57 = old reference elevation (May, 2022)  
365.51 = new reference elevation (May, 2023)

4. 'WPMP' refers to 'Wards Pond Monitoring Point'.  
401.22 = reference elevation (November 2015, Bliss)

5. 'SRMP' refers to 'Saco River Monitoring Point'.  
418.85 = reference elevation (November 2015, Bliss)

6. 'WPSG' refers to 'Wards Pond Staff Gauge'.  
402.13 = old reference elevation (May, 2022)  
402.04 = new reference elevation (May, 2023)

7. cfs = cubic feet per second.

APPENDIX B  
GROUNDWATER AND SURFACE WATER ELEVATION DATA, AND WARDS BROOK STREAM FLOW DATA  
FRYEBURG, MAINE

MW-108 DATA

Date	Groundwater Elevation (NAVD88)										
11/6/2003	411.23	2/8/2007	411.03	6/21/2010	411.18	10/21/2013	409.31	2/21/2017	408.91	12/13/2018	410.05
12/4/2003	410.67	3/12/2007	410.65	7/19/2010	409.99	11/20/2013	409.27	3/21/2017	409.34	12/19/2018	410.02
1/9/2004	411.38	4/10/2007	411.06	8/19/2010	408.76	12/20/2013	409.79	4/19/2017	410.97	12/20/2018	409.99
2/6/2004	410.65	5/8/2007	412.49	9/20/2010	408.35	1/20/2014	410.21	5/18/2017	411.72	12/27/2018	410.30
3/4/2004	410.18	6/12/2007	411.94	10/20/2010	409.03	2/20/2014	409.98	6/19/2017	411.50	1/2/2019	410.32
4/6/2004	410.93	7/11/2007	410.75	11/22/2010	410.24	3/19/2014	409.70	7/20/2017	411.11	1/8/2019	410.33
5/4/2004	411.12	8/9/2007	409.75	12/20/2010	411.08	4/18/2014	411.64	8/23/2017	409.68	1/16/2019	410.28
6/8/2004	410.73	9/5/2007	408.65	1/19/2011	410.90	5/19/2014	411.89	9/19/2017	409.56	1/17/2019	410.26
7/5/2004	409.73	10/4/2007	408.14	2/18/2011	410.42	6/19/2014	411.21	10/18/2017	408.71	1/25/2019	410.53
8/3/2004	409.23	11/18/2007	408.98	3/21/2011	411.58	7/21/2014	410.32	11/20/2017	410.53	2/9/2019	410.52
9/7/2004	408.53	12/14/2007	409.34	4/22/2011	412.56	8/18/2014	410.36	12/19/2017	410.50	2/15/2019	410.50
10/4/2004	408.33	1/11/2008	409.44	5/20/2011	413.18	9/22/2014	409.17	1/22/2018	410.80	2/18/2019	410.50
11/8/2004	408.05	2/8/2008	409.31	6/20/2011	412.22	10/20/2014	408.71	2/21/2018	410.81	2/23/2019	410.54
12/6/2004	409.50	3/20/2008	nr	7/20/2011	411.12	11/20/2014	409.05	3/19/2018	411.02	3/5/2019	410.33
1/6/2005	409.53	4/25/2008	411.79	8/22/2011	409.96	12/19/2014	410.09	4/18/2018	411.80	3/12/2019	410.25
2/7/2005	409.17	5/22/2008	412.15	9/21/2011	410.57	1/19/2015	410.51	5/21/2018	411.76	3/19/2019	410.29
3/21/2005	409.06	6/20/2008	411.34	10/19/2011	411.23	2/20/2015	410.08	6/19/2018	410.67	3/20/2019	410.27
4/14/2005	410.75	7/17/2008	410.38	11/21/2011	411.45	3/19/2015	409.78	7/18/2018	409.37	3/28/2019	410.47
5/5/2005	411.43	8/25/2008	411.11	12/21/2011	411.92	4/20/2015	410.62	7/27/2018	409.11	4/4/2019	410.77
6/6/2005	411.97	9/19/2008	410.83	1/20/2012	411.76	5/20/2015	410.67	8/2/2018	408.90	4/11/2019	411.08
7/8/2005	411.13	10/15/2008	410.75	2/20/2012	411.39	6/18/2015	410.07	8/6/2018	408.90	4/16/2019	411.42
8/2/2005	410.34	11/19/2008	410.93	3/20/2012	411.79	7/21/2015	409.99	8/16/2018	408.62	4/19/2019	411.62
9/7/2005	408.77	12/19/2008	411.91	4/20/2012	411.20	8/19/2015	409.11	8/20/2018	408.56	4/26/2019	412.18
10/5/2005	408.13	1/19/2009	411.54	5/18/2012	411.40	9/17/2015	408.65	8/21/2018	408.51	5/2/2019	412.66
10/11/2005	409.34	2/16/2009	411.11	6/20/2012	412.14	10/19/2015	409.18	8/30/2018	408.42	5/10/2019	412.85
11/8/2005	411.03	3/17/2009	411.09	7/20/2012	410.87	11/18/2015	409.55	9/7/2018	408.11	5/20/2019	412.91
12/7/2005	411.55	4/16/2009	412.23	8/17/2012	410.63	12/22/2015	410.01	9/13/2018	408.14	5/22/2019	412.82
1/10/2006	411.44	5/18/2009	412.03	9/18/2012	409.87	1/22/2016	410.53	9/19/2018	407.97	6/6/2019	412.56
2/13/2006	412.09	6/22/2009	411.75	10/17/2012	410.16	2/19/2016	410.64	9/20/2018	407.91	6/14/2019	412.46
3/7/2006	411.52	7/20/2009	411.83	11/19/2012	410.79	3/18/2016	411.67	9/29/2018	407.95	6/19/2019	412.16
4/5/2006	411.46	8/24/2009	411.50	12/20/2012	410.89	4/20/2016	411.62	10/7/2018	407.97	6/26/2019	412.23
5/5/2006	411.19	9/21/2009	410.63	1/21/2013	411.01	5/18/2016	411.24	10/10/2018	407.96	7/3/2019	411.91
6/6/2006	411.87	10/22/2009	410.54	2/20/2013	410.77	6/20/2016	410.32	10/19/2018	408.10	7/11/2019	411.52
7/6/2006	411.90	11/20/2009	411.20	3/22/2013	410.96	7/19/2016	409.38	10/23/2018	408.07	7/18/2019	411.69
8/8/2006	411.44	12/18/2009	411.70	4/19/2013	411.55	8/19/2016	408.52	11/2/2018	408.58	7/19/2019	411.64
9/5/2006	410.56	1/19/2010	411.57	5/20/2013	410.96	9/20/2016	407.67	11/18/2018	409.40	7/24/2019	411.46
10/4/2006	409.84	2/18/2010	411.31	6/19/2013	410.77	10/21/2016	407.03	11/19/2018	409.86	7/31/2019	411.38
11/7/2006	410.96	3/18/2010	412.26	7/22/2013	410.34	11/22/2016	408.30	11/20/2018	409.88	8/6/2019	411.35
12/12/2006	411.49	4/20/2010	413.22	8/19/2013	410.12	12/21/2016	408.99	11/30/2018	409.95	8/14/2019	410.46
1/10/2007	411.64	5/19/2010	412.22	9/19/2013	409.80	1/20/2017	409.04	12/6/2018	410.08	8/19/2019	410.60

APPENDIX B  
GROUNDWATER AND SURFACE WATER ELEVATION DATA, AND WARDS BROOK STREAM FLOW DATA  
FRYEBURG, MAINE

MW-108 DATA, cont.

Date	Groundwater Elevation (NAVD88)	Date	Groundwater Elevation (NAVD88)								
8/21/2019	410.49	4/30/2020	412.48	12/30/2020	410.10	8/18/2021	409.14	4/13/2022	411.73		
8/28/2019	410.41	5/8/2020	412.61	1/5/2021	410.19	8/19/2021	409.10	4/21/2022	411.89		
9/4/2019	410.36	5/14/2020	412.58	1/13/2021	410.08	8/26/2021	409.27	4/22/2022	411.91		
9/11/2019	410.31	5/19/2020	412.50	1/20/2021	410.18	9/2/2021	409.16	4/28/2022	411.93		
9/19/2019	410.05	5/21/2020	412.48	1/28/2021	410.04	9/10/2021	409.17	5/5/2022	411.93		
9/26/2019	409.77	5/30/2020	412.11	2/4/2021	410.06	9/17/2021	409.12	5/18/2022	411.80		
10/4/2019	409.52	6/5/2020	411.84	2/12/2021	409.89	9/20/2021	409.07	5/27/2022	411.54		
10/11/2019	409.53	6/11/2020	411.60	2/18/2021	409.82	9/23/2021	409.06	6/3/2022	411.31		
10/18/2019	409.63	6/19/2020	411.18	2/24/2021	409.74	10/1/2021	409.04	6/8/2022	411.14		
10/24/2019	409.91	6/26/2020	410.73	3/3/2021	409.70	10/8/2021	408.91	6/21/2022	411.01		
10/31/2019	410.02	7/1/2020	410.88	3/10/2021	409.67	10/14/2021	408.87	7/20/2022	409.88		
11/8/2019	410.44	7/10/2020	410.49	3/15/2021	409.77	10/20/2021	408.84	8/19/2022	408.94		
11/14/2019	410.27	7/17/2020	410.67	3/22/2021	409.98	10/21/2021	408.85	9/21/2022	409.76		
11/19/2019	410.41	7/22/2020	410.37	3/23/2021	410.03	10/29/2021	409.02	10/20/2022	410.23		
11/21/2019	410.43	7/29/2020	409.96	3/30/2021	410.63	11/4/2021	409.71	11/22/2022	410.38		
11/26/2019	410.55	8/6/2020	409.72	4/9/2021	410.77	11/11/2021	409.75	12/21/2022	410.69		
12/5/2019	410.60	8/12/2020	409.39	4/14/2021	410.73	11/18/2021	410.03	1/19/2023	411.51		
12/12/2019	410.66	8/20/2020	408.95	4/19/2021	410.89	11/19/2021	410.03	2/21/2023	411.47		
12/19/2019	410.95	8/26/2020	408.80	4/21/2021	410.85	11/22/2021	410.04	3/21/2023	411.25		
12/20/2019	411.00	9/3/2020	408.71	4/28/2021	410.87	12/2/2021	409.98	4/20/2023	411.96		
12/24/2019	411.21	9/10/2020	408.43	5/4/2021	410.89	12/10/2021	410.11	5/25/2023	412.69		
1/2/2020	411.03	9/17/2020	408.20	5/12/2021	410.91	12/17/2021	410.32	6/21/2023	412.11		
1/8/2020	410.91	9/24/2020	407.97	5/19/2021	410.76	12/21/2021	410.33	7/18/2023	412.38		
1/17/2020	411.04	10/1/2020	407.82	5/20/2021	410.67	12/28/2021	410.26	8/23/2023	411.84		
1/22/2020	411.07	10/7/2020	407.83	5/27/2021	410.48	1/4/2022	410.30	9/21/2023	411.7		
1/30/2020	411.10	10/13/2020	407.88	6/4/2021	410.31	1/11/2022	410.18	10/18/2023	410.98		
2/3/2020	411.05	10/21/2020	408.36	6/9/2021	410.08	1/20/2022	410.17	11/20/2023	410.76		
2/12/2020	411.02	10/28/2020	408.43	6/17/2021	409.76	1/21/2022	410.06	12/20/2023	411.86		
2/21/2020	410.84	11/4/2020	408.43	6/21/2021	409.55	2/1/2022	409.97				
2/26/2020	410.77	11/11/2020	408.43	6/24/2021	409.40	2/11/2022	410.09				
3/4/2020	411.00	11/18/2020	408.56	7/1/2021	409.06	2/16/2022	410.00				
3/12/2020	411.11	11/19/2020	408.60	7/7/2021	409.24	2/24/2022	410.46				
3/17/2020	411.17	11/27/2020	408.78	7/16/2021	409.41	3/1/2022	410.51				
3/18/2020	411.33	12/4/2020	409.37	7/19/2021	409.45	3/8/2022	410.59				
3/24/2020	411.48	12/13/2020	409.75	7/22/2021	409.52	3/14/2022	410.72				
3/31/2020	411.69	12/16/2020	409.87	7/29/2021	409.37	3/23/2022	411.17				
4/15/2020	412.16	12/21/2020	409.78	8/5/2021	409.51	3/31/2022	411.38				
4/23/2020	412.38	12/22/2020	409.92	8/13/2021	409.31	4/7/2022	411.46				