

January 11, 2016

Attn: Mr. Michael Lee
Code Enforcement Officer
Town of Denmark
62 East Main Street
Denmark, Maine 04022



**Subject: December 2015 Monthly Monitoring Report
Poland Spring Bottling Company
Cold Spring (Site): Denmark, Maine**

Dear Mr. Lee:

In accordance with the Town of Denmark Permit for Water Extraction from Cold Spring in Denmark, Maine (the Permit), Amec Foster Wheeler Environment and Infrastructure, Inc. (Amec Foster Wheeler) has prepared the attached December 2015 Monthly Monitoring Report on behalf of the Poland Spring Bottling Company. Water withdrawal for bottling purposes began on June 1, 2010 at the Cold Spring site. This monthly report includes the following information required by the noted conditions of the Permit:

- Borehole #1 and # 2 monitoring data (Schedule A1);
- Groundwater levels from onsite monitoring wells, and PZ-01 (Schedule A2);
- Domestic water levels and water quality (Schedule A3);
- Surface water levels from onsite staff gauges (Schedule A4);
- Stream flow from two locations along Beaver Brook (Schedule A5);
- Water levels and flow from onsite spring points (Schedule A6);
- Precipitation information (Schedule A7);
- Biological monitoring information (Schedule A8); and
- Action Levels and Responses (Schedule B).

Unless otherwise noted, these field data were collected on December 23, 2015.

BOREHOLE MONITORING

In total, the volume of water withdrawn by Boreholes # 1 and # 2 between December 1st and 31st was 8,668,085 gallons. Weekly borehole production volumes for the December time period of December 6, 2015 through January 2, 2016 are presented in **Appendix A**. The aggregate pumping rate from Boreholes # 1 and # 2 for this period was less than the short term maximum rate of 300 gallons per minute (gpm). The aggregate pumping rate for Boreholes # 1 and # 2 was above the average weekly rate of 200 gpm during week 2 of this period (Appendix A). In response, and pursuant to Schedule B, Condition B1 of the Permit, weekly monitoring was conducted. These data were included in a Weekly Monitoring Report dated December 28, 2015. The weekly extraction rates are shown in Appendix A.

Each tanker of water is tested for turbidity by Poland Spring personnel at the receiving bottling plants. Turbidity readings were below 0.5 Nephelometric Turbidity Units (NTU) for the month of December.

Correspondence:
Amec Foster Wheeler
511 Congress Street, Suite 200
Portland, Maine 04101
Tel 207-775-5401
Fax 207-772-4762

Water samples were collected for odor analysis on August 5, 2009, February 16, 2010, February 15, 2011, January 12, 2012, January 31, 2013, January 8, 2014, and February 18, 2015. Odor was detected in the February 2011, January 2014, and February 2015 water samples collected from Borehole # 2, and the January 2012, January 2014, and February 2015 water samples collected from Borehole # 1. Odor was detected in these samples at a level of 1.0 threshold odor number (TON) which is below the Environmental Protection Agency Secondary Drinking Water Standard of 3.0 TON.

MONITORING WELLS (WATER LEVELS)

Monitoring Point	12/23/2015 Water Elevation feet above mean sea level (ft amsl)
MW-1	382.84
MW-3	386.65
MW-5	386.15
MW-6	382.13
MW-8	394.76
MW-9	381.55
MW-10	382.63
MW-11	383.21
MW-12	382.00
MW-14	383.66
MW-16	380.45
MW-17	381.83
MW-18	384.65
MW-19	388.84
MW-21	391.59
MW-22	391.09
MW-23	384.63
PZ-01	399.89

DOMESTIC WELLS (WATER LEVELS AND WATER QUALITY)

The transducers deployed within the domestic monitoring locations are downloaded on a quarterly basis and data were retrieved on December 31, 2015. The domestic groundwater monitoring data (presented in graphical format) are included as **Appendix B**.

Water quality monitoring was conducted in December 2009, March 2010, November 2010, June 2012, and June 2013; approximately four months prior to beginning water withdrawal, one month prior to beginning water withdrawal, 6 months after startup, two years after startup, and three years after startup respectively, as required by Schedule A, Section 3 of the Permit. Letters and analytical reports were sent to the property owners who have taken part in Poland Spring's domestic monitoring program. A copy of these materials was also sent to the Town Manager and the Town consultant.

Based on monitoring to date, there have not been adverse impacts to domestic wells as a result of water withdrawal by Poland Spring.

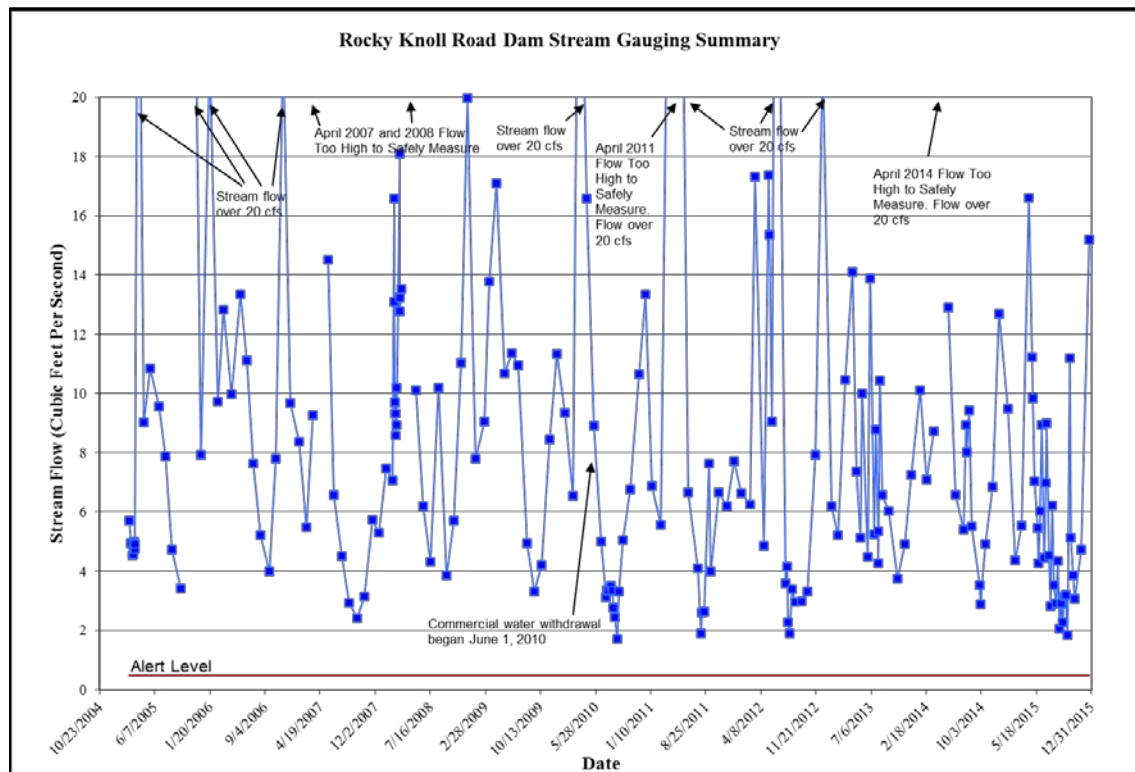
STAFF GAUGES (WATER LEVELS)

Monitoring Point	12/23/2015 Surface Water Elevation (ft amsl)
SG02	379.41
SG03	378.51
SG05	400.76
SG07	378.89
SG08	378.30

STREAM FLOW (FLOW)

Monitoring Point	12/23/2015 Flow cubic feet per second (cfs)
Upstream at Denmark Road	8.43
Downstream at Rocky Knoll Road Dam	15.19

The field data utilized to calculate the stream flows are included as **Appendix C**. The following graph summarizes the downstream gauging results at the Rocky Knoll Road Dam since February 2005. The naturally occurring fluctuations shown in the graph below are expected to continue during site operation.



SPRING POINTS (WATER LEVEL AND FLOW)

Monitoring Point	12/23/2015 Water Elevation (ft amsl)	Alert Level (one foot above ground surface)*	Action Level (below ground surface)*
SP-01S	382.21	380.62	379.62
SP-01D	382.52	380.70	379.70
SP-02S	382.33	380.93	379.93
SP-02D	382.37	380.95	379.95
SP-03S	380.07	378.84	377.84
SP-03D	380.65	378.88	377.88

* Spring Point Alert and Action Level elevations are based on ground surface elevations surveyed in April 2010.

Monitoring Point	Spring Flow (yes or no)
SP-01S	Yes
SP-01D	Yes
SP-02S	Yes
SP-02D	Yes
SP-03S	Yes
SP-03D	Yes

PRECIPITATION (RATE)

Precipitation data from the Fryeburg E. Slopes NOAA Station ID: KIZG and the on-site weather station are presented below:

Precipitation Station	December 2015 Total Precipitation
Fryeburg E. Slopes AP NOAA Station ID: KIZG	5.41 inches
On-site rain gauge	5.39 inches

WETLAND MONITORING (PLANT SPECIES)

Stantec Consulting conducted biological monitoring during August 2014. This represents the fifth year of long-term wetland biomonitoring at the Cold Spring site. The results of the 2014 monitoring were summarized in the 2014 Long-Term Biological Monitoring Report included as Appendix C of the February 2015 Monthly Monitoring Report dated March 12, 2015. Biomonitoring is conducted in the summer months and the results are submitted early in the following year once the biomonitoring results have been tabulated and the report has been completed.

Stantec Consulting concludes that the data collected to date continue to demonstrate that Poland Spring's operations have not had an adverse impact on wetland vegetation or hydrology.

ACTION LEVELS AND RESPONSES

Pumping Rates

As summarized above, the aggregate pumping rate for Boreholes # 1 and # 2 was above the average weekly rate of 200 gpm during week 2 of this period (Appendix A). In response, weekly monitoring and reporting was completed pursuant to Schedule B, Condition B1 of the Permit.

Monitoring Wells

The water level measured at MW-16 was 380.45 ft amsl. This elevation is greater than the alert level of 379.0 ft amsl and action level of 378.0 ft amsl. No response actions were required.

Spring Points

Water levels were above the ground surface during this monitoring period. Spring point water elevations were greater than the alert level of one foot above the ground surface. Therefore, no response actions were required.

Stream Flow

The stream flow measured at the Rocky Knoll Road Dam was 15.19 cfs. This flow is greater than the alert level of 0.48 cfs and action level of 0.40 cfs. Therefore, no response actions were required.

Domestic Wells

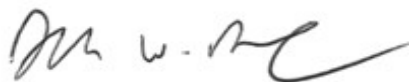
No response actions were required.

CONCLUSIONS

Based on the monitoring results summarized in this report, water withdrawals by Poland Spring at the Cold Spring site in Denmark have not resulted in adverse impacts to groundwater, surface water, or other natural resources.

If you have any questions regarding the information contained in this monitoring report, please call me at 207-828-3289.

Sincerely,



Joshua W. Bowe, C.G., P.G.
Senior Geologist
Project Manager

Attachments

Appendix A – Water Withdrawal Summary
Appendix B – Domestic Groundwater Monitoring
Appendix C – Stream Gauging Calculations

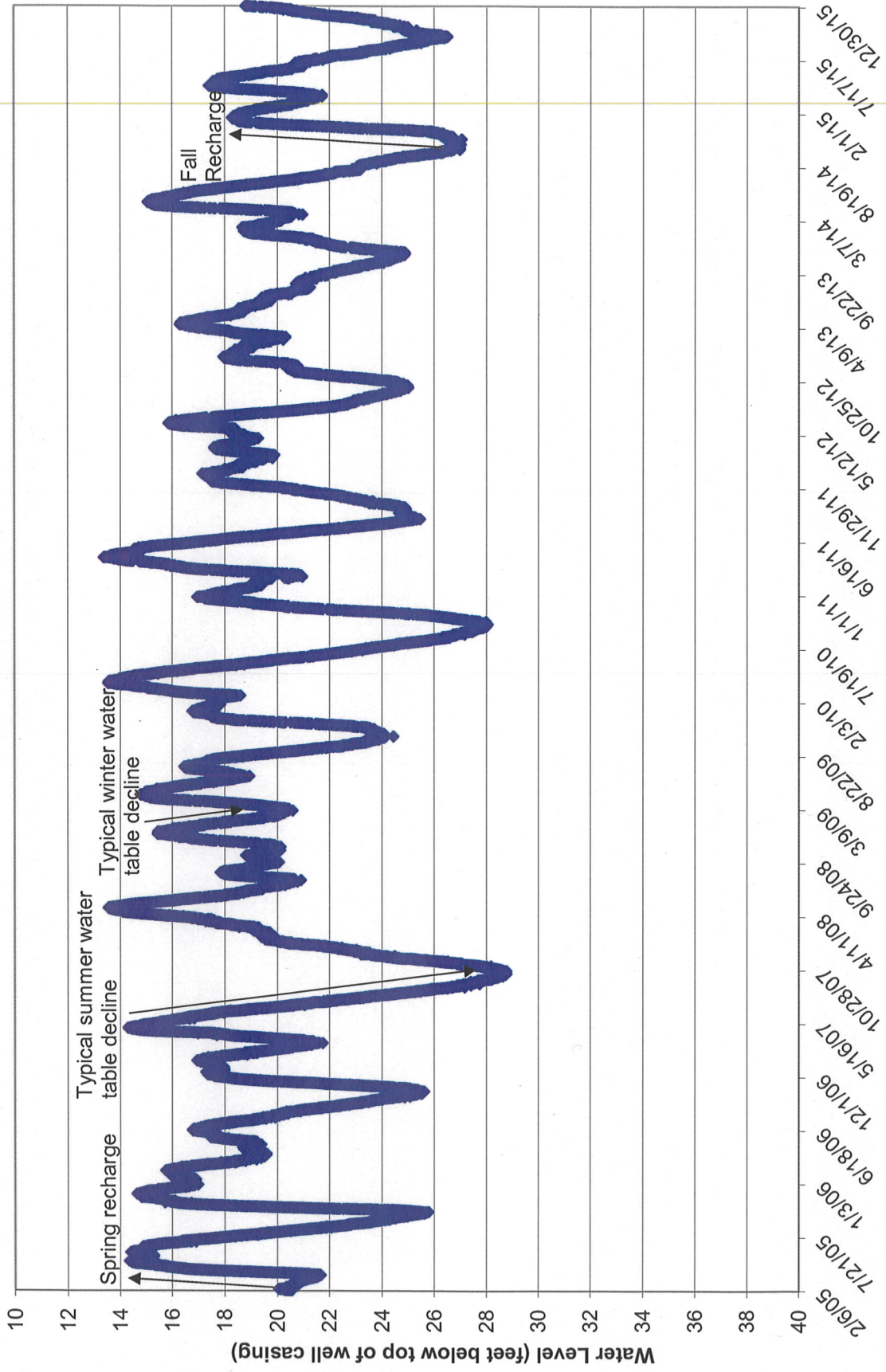
cc: Mr. Keith Taylor, St. Germain Collins
Mr. Mark Dubois, Poland Spring Bottling Company
Mr. Brian Rayback, Pierce Atwood
Project File (3617157358)

APPENDIX A – WATER WITHDRAWAL SUMMARY

		Borehole #1		Borehole #2	
Week	Dates	Total Gallons	Average gpm	Total Gallons	Average gpm
1	12/06-12/12	976485	96.87	971685	96.40
2	12/13-12/19	1086825	107.82	1082030	107.34
3	12/20-12/26	790365	78.41	785920	77.97
4	12/27-01/02	878875	87.19	889245	88.22
Total (12/06/15-01/02/16)		3732550	92.57	3728880	92.48
Monthly Water Withdrawal Summary (12/01/15 – 12/31/15)		4336685	97.15	4331400	97.03

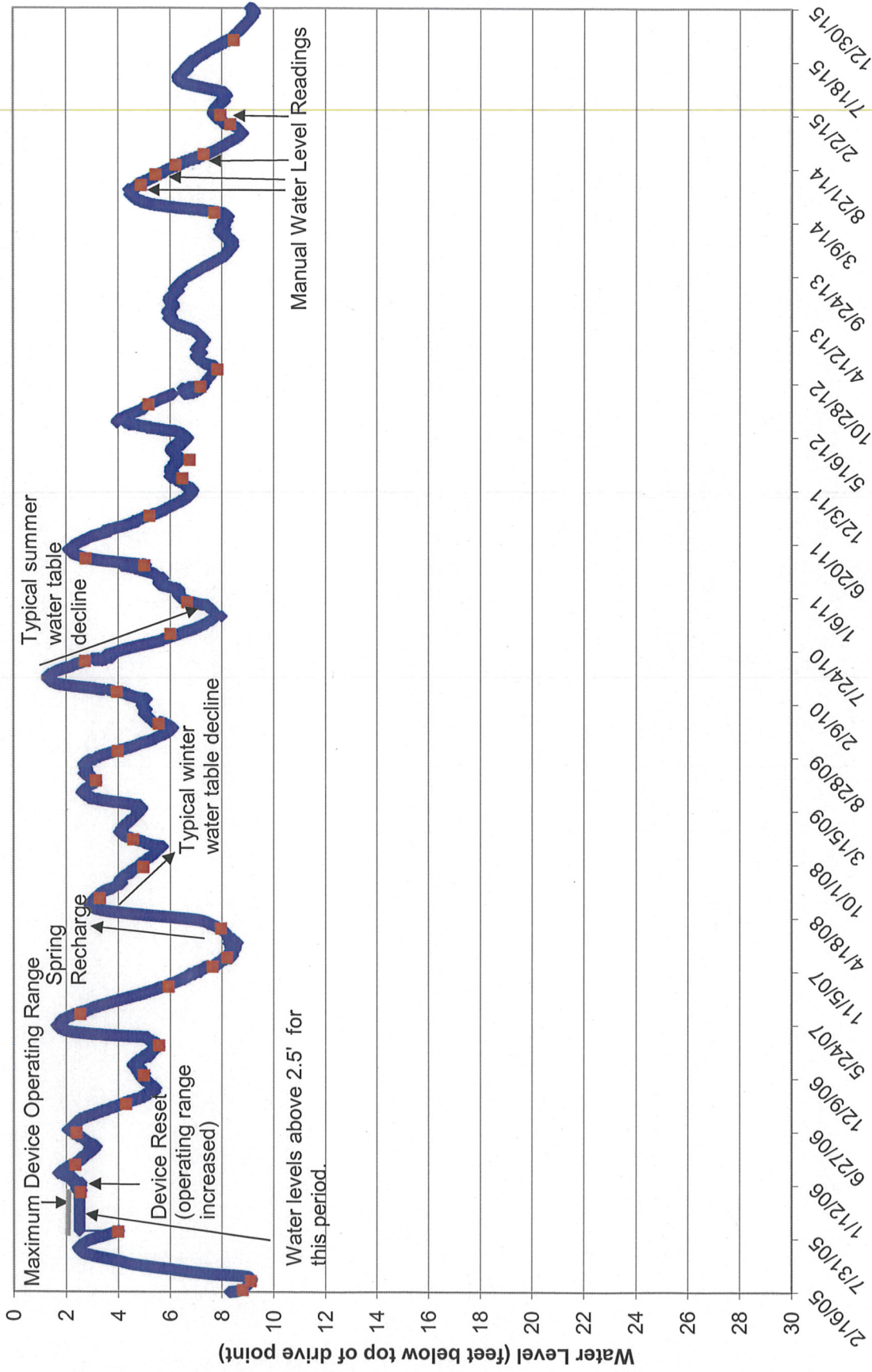
APPENDIX B – DOMESTIC GROUNDWATER MONITORING

DW01 (Bedrock Well)



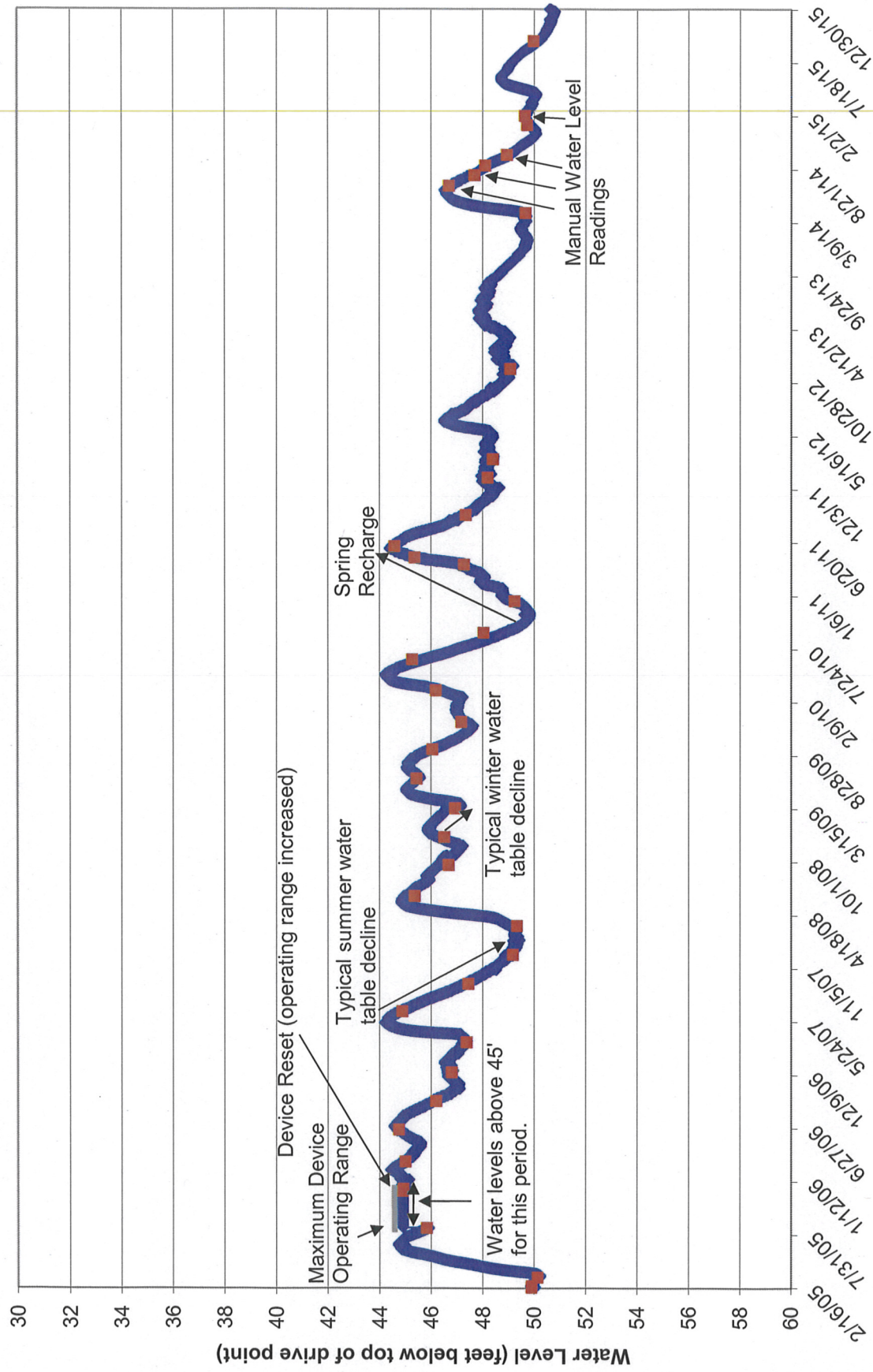
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

DW02 (Drive Point Adjacent to Water Supply)



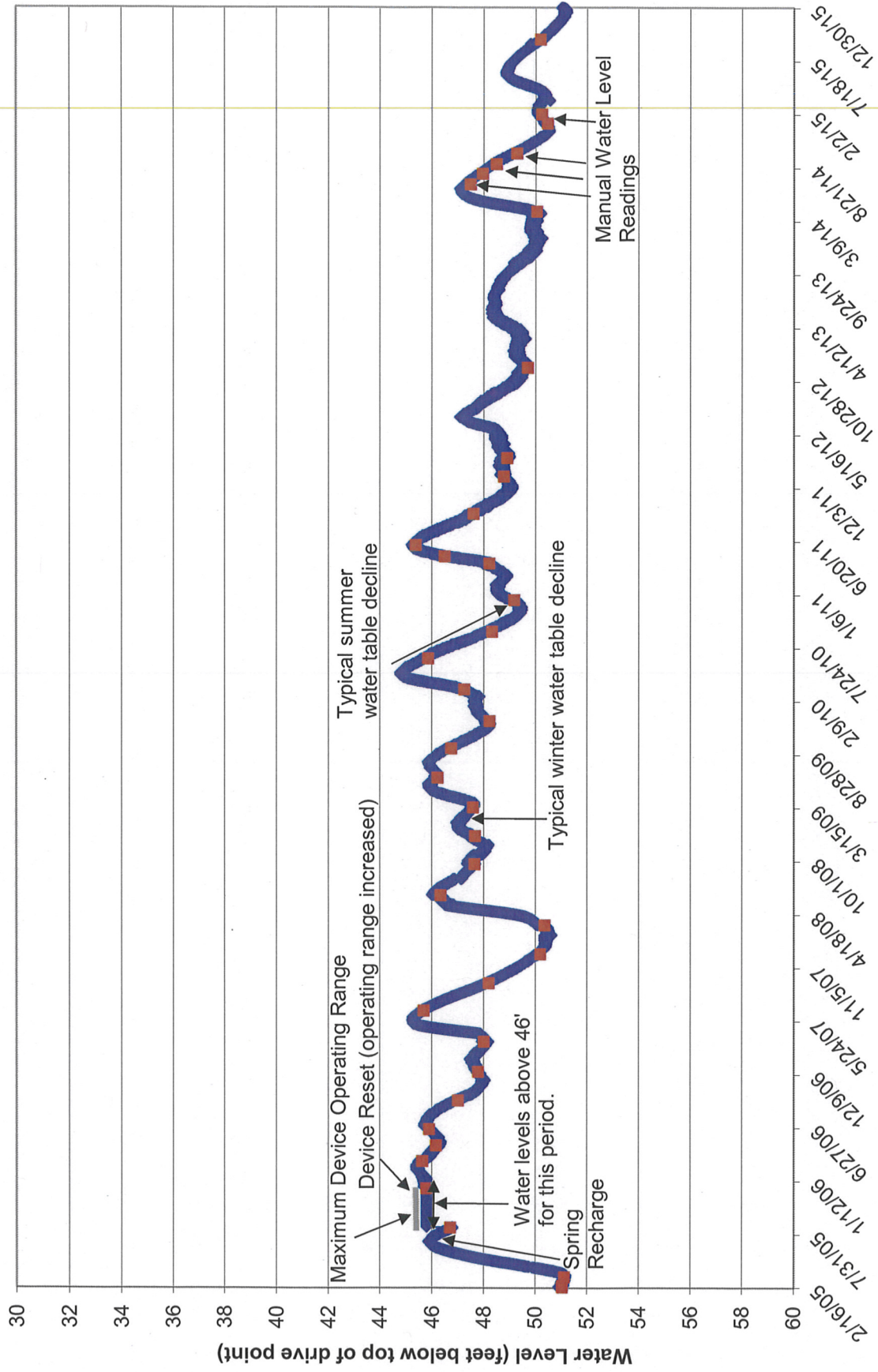
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

DW03 (Drive Point Adjacent To Water Supply)



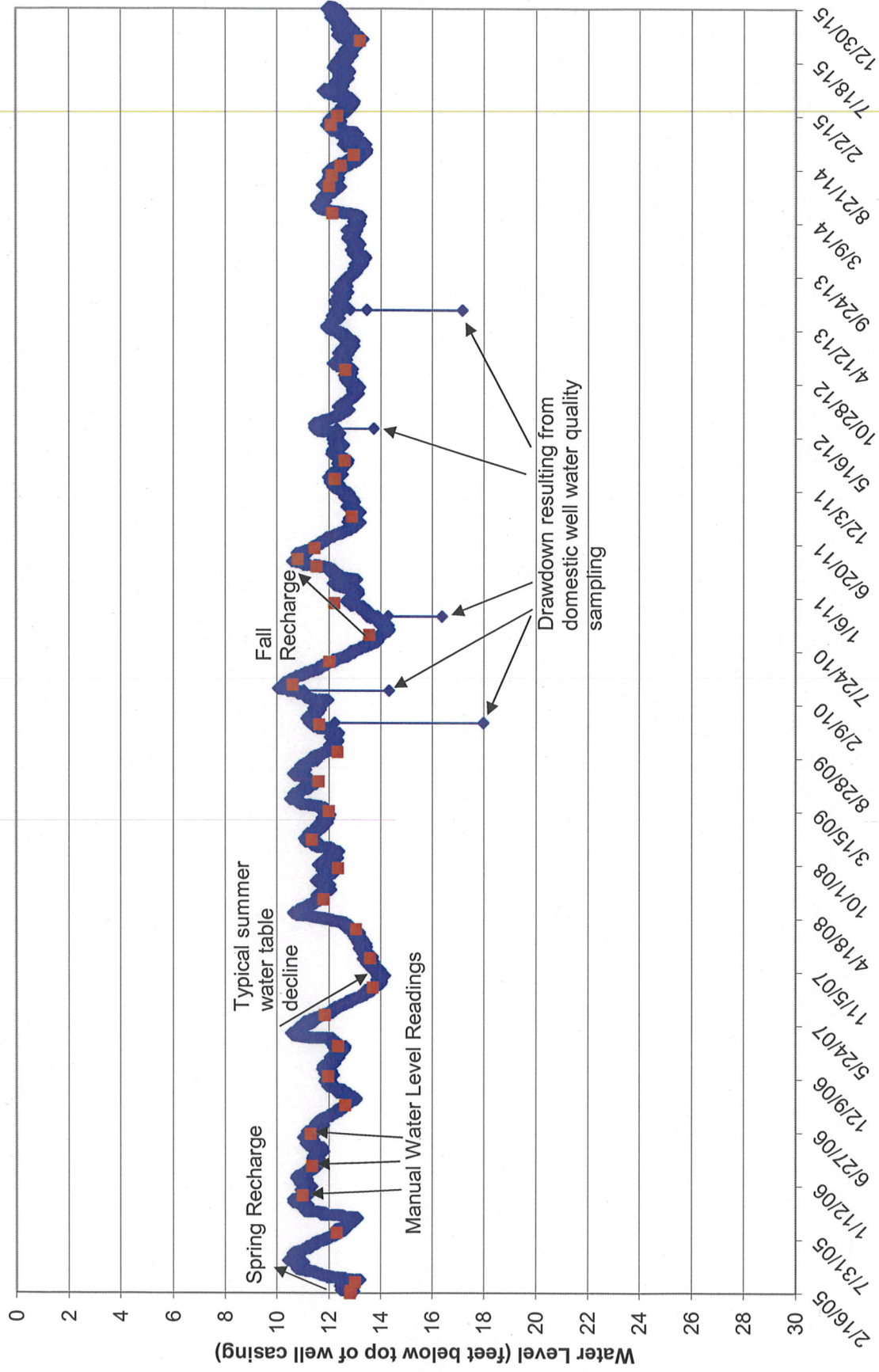
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

DW04 (Drive Point Adjacent To Water Supply)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

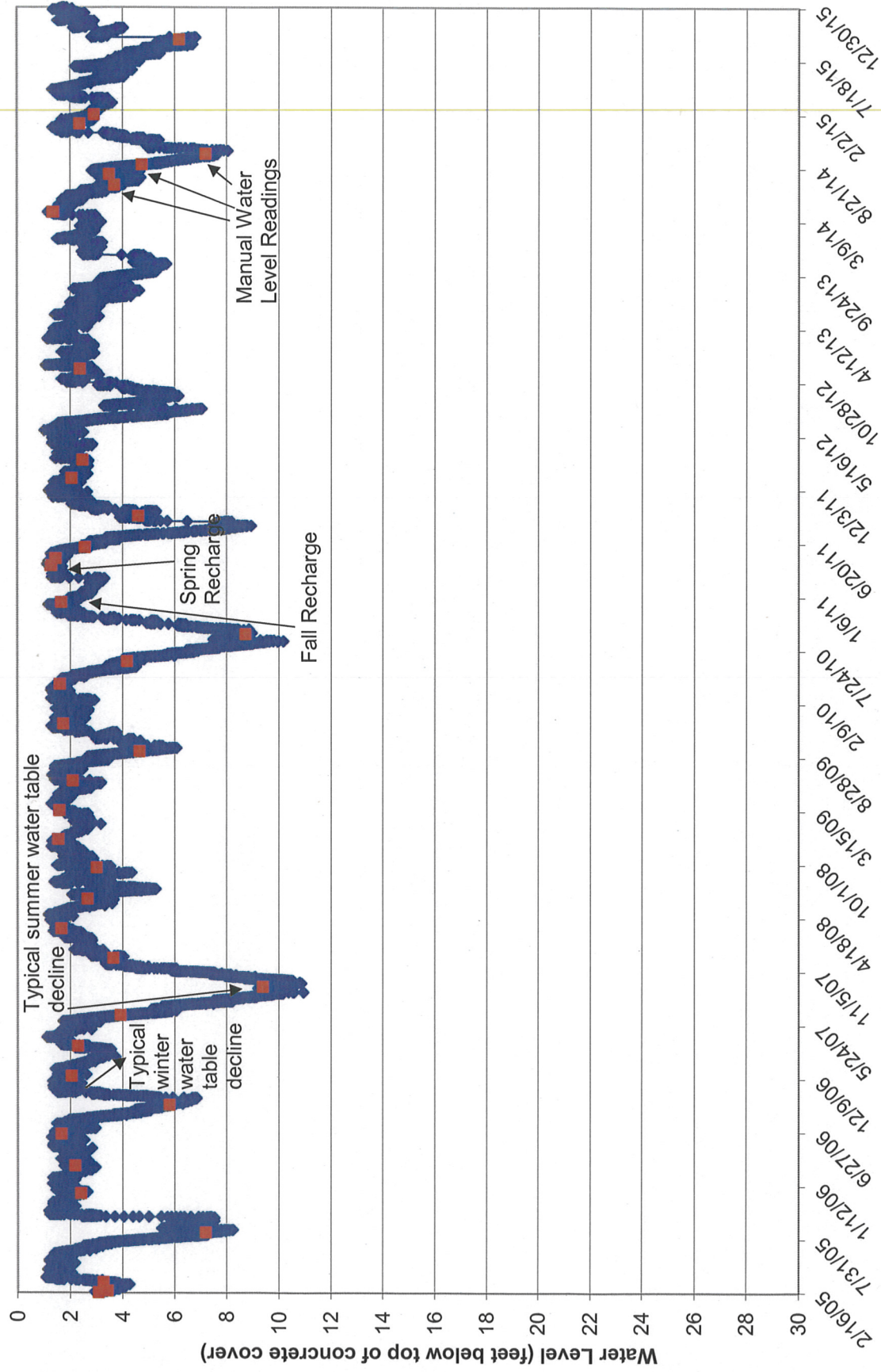
DW05 (Bedrock Well)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

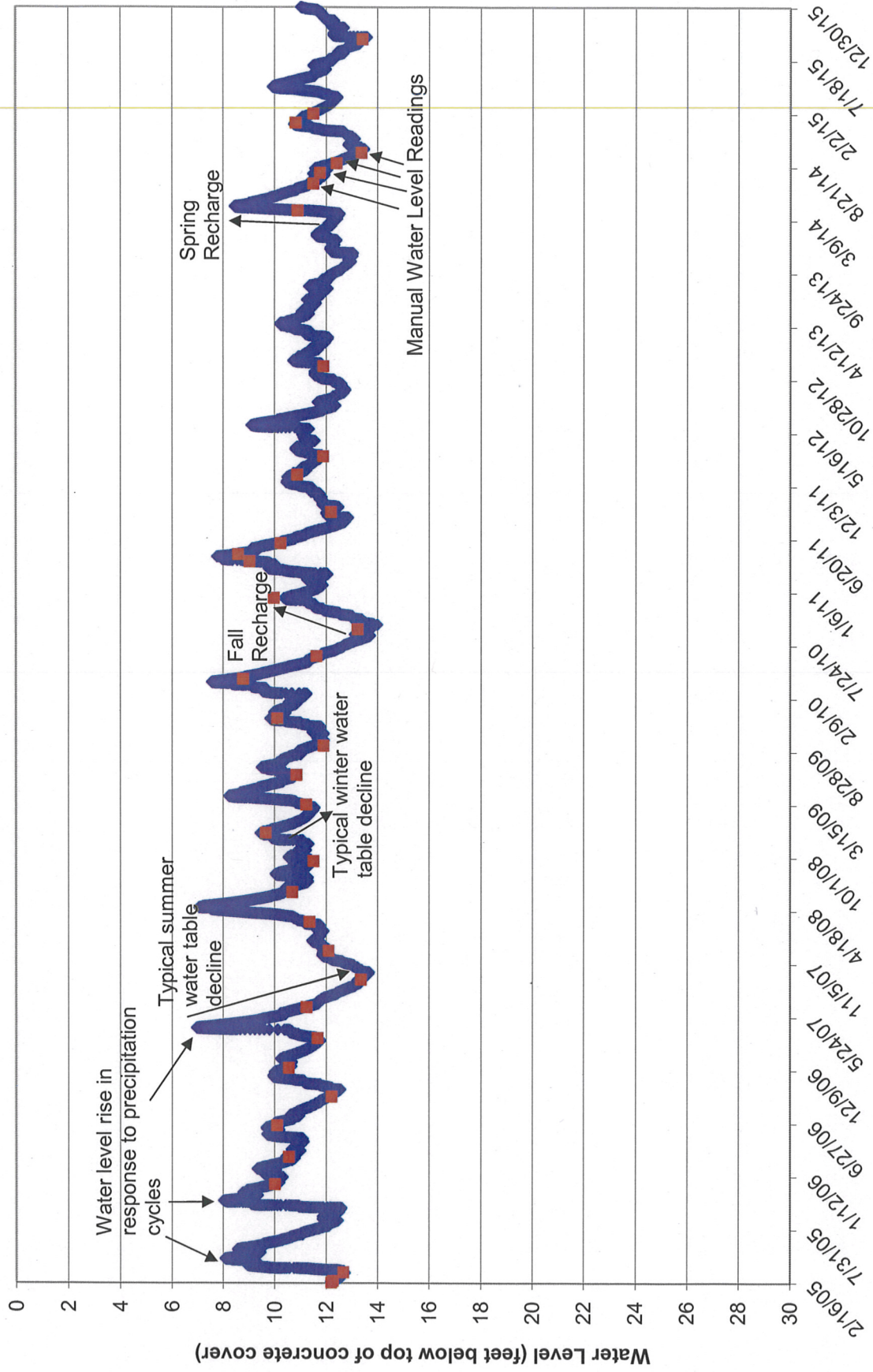
The lower diamond shapes reflect drawdown observed during domestic well water quality sampling.

DW06 (Dug Well)



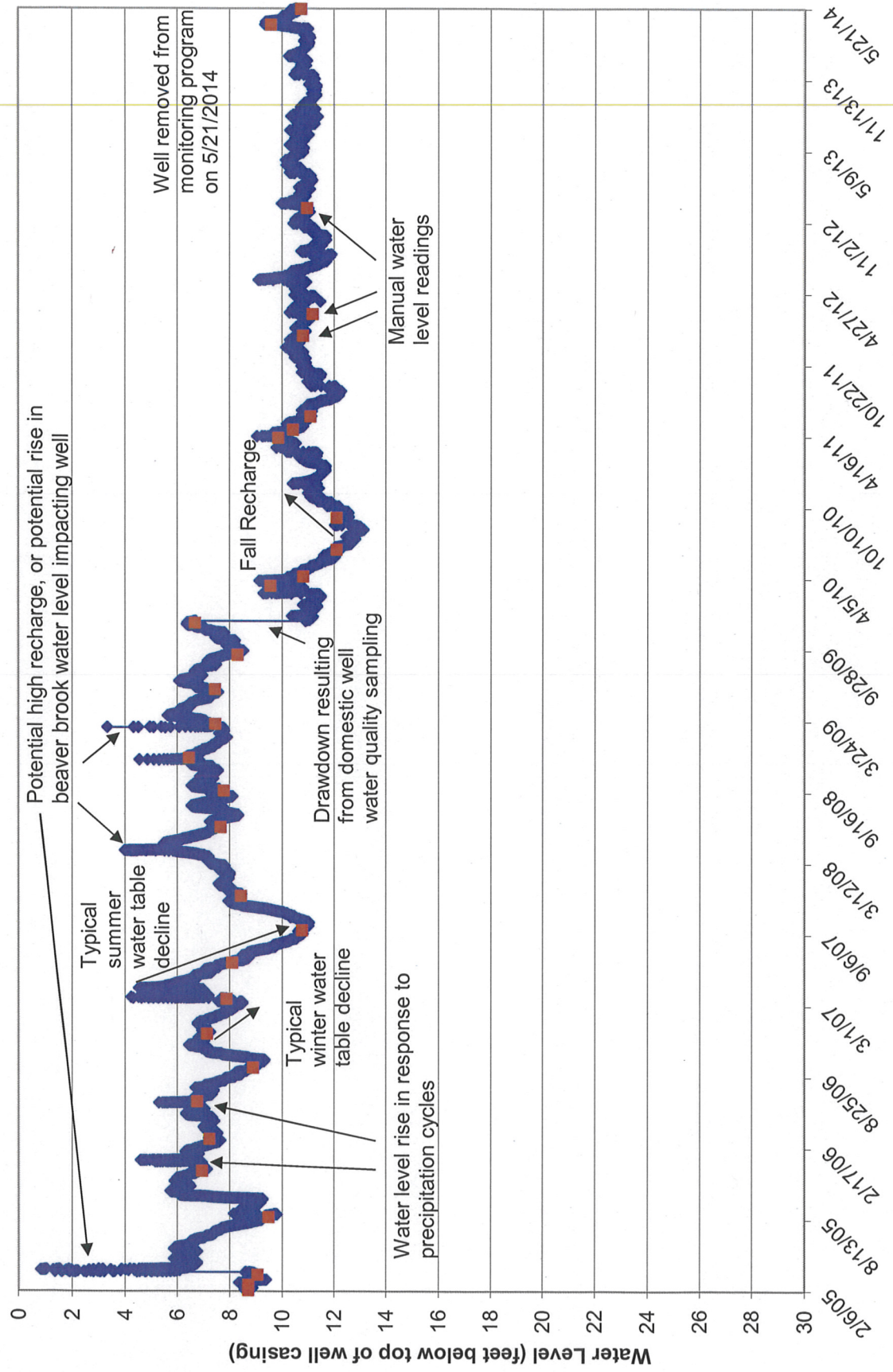
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

DW07 (Dug Well)



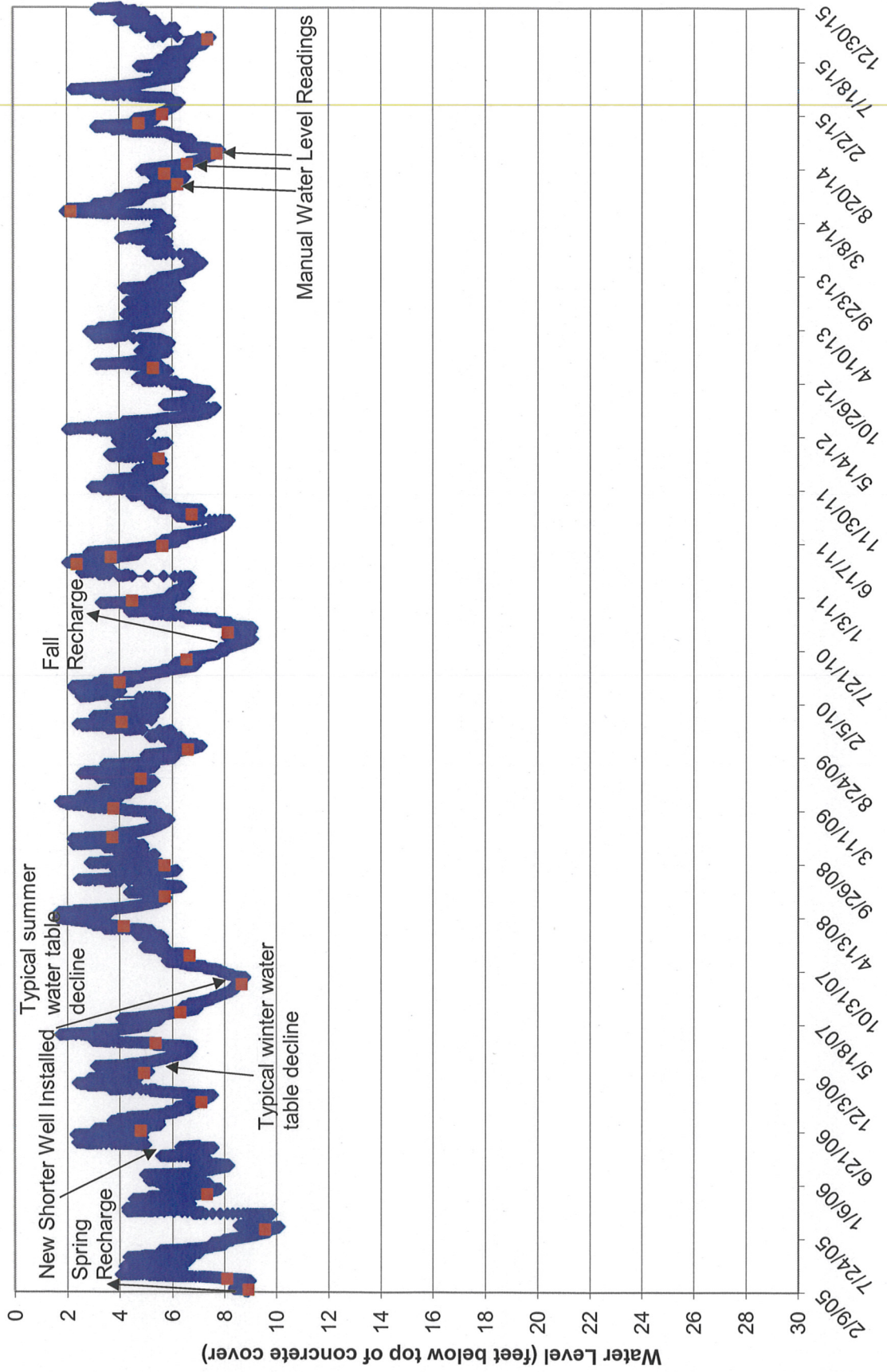
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

DW08 (Bedrock Well - removed from monitoring program)



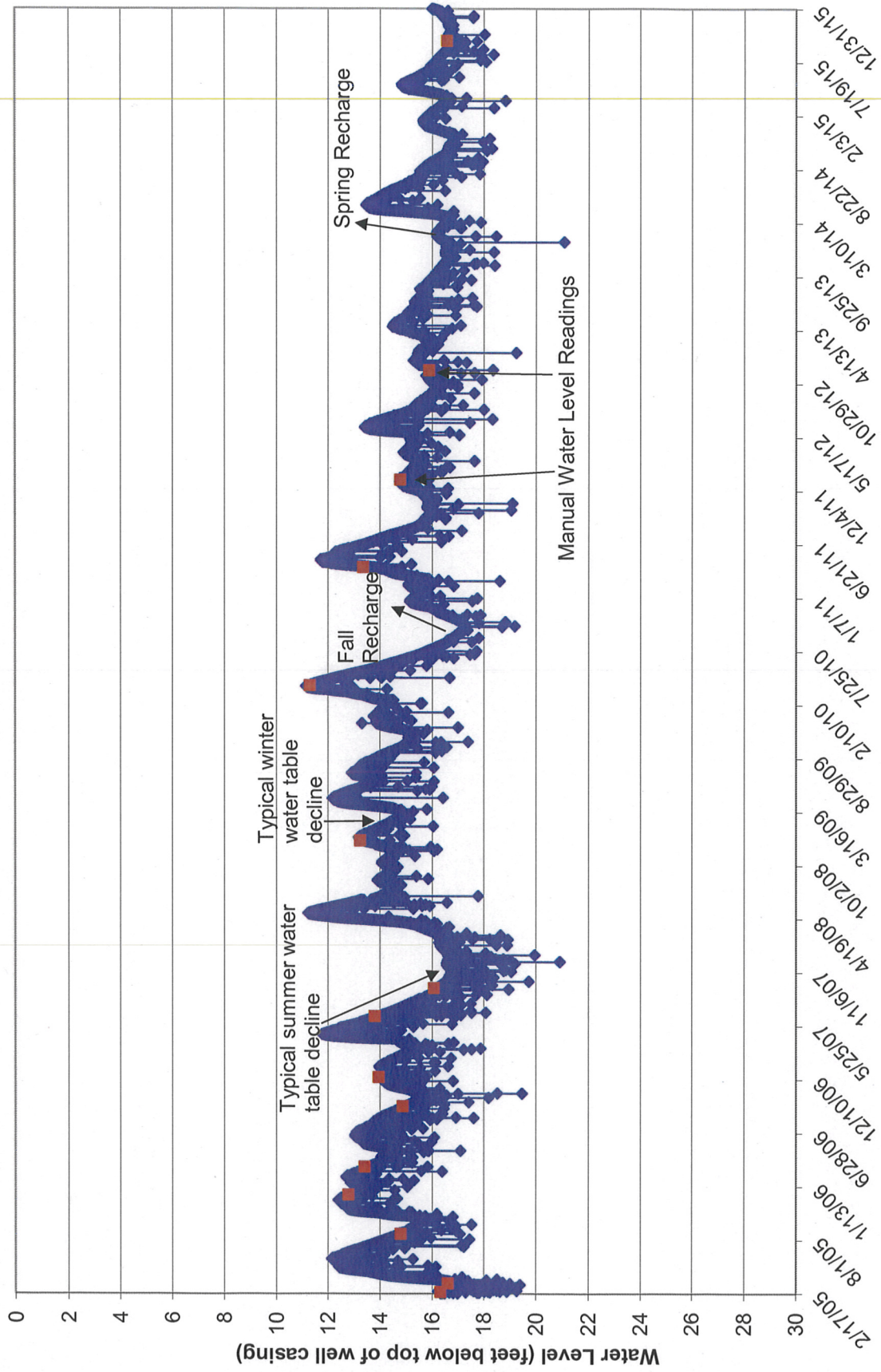
Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

DW09 (Dug Well)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

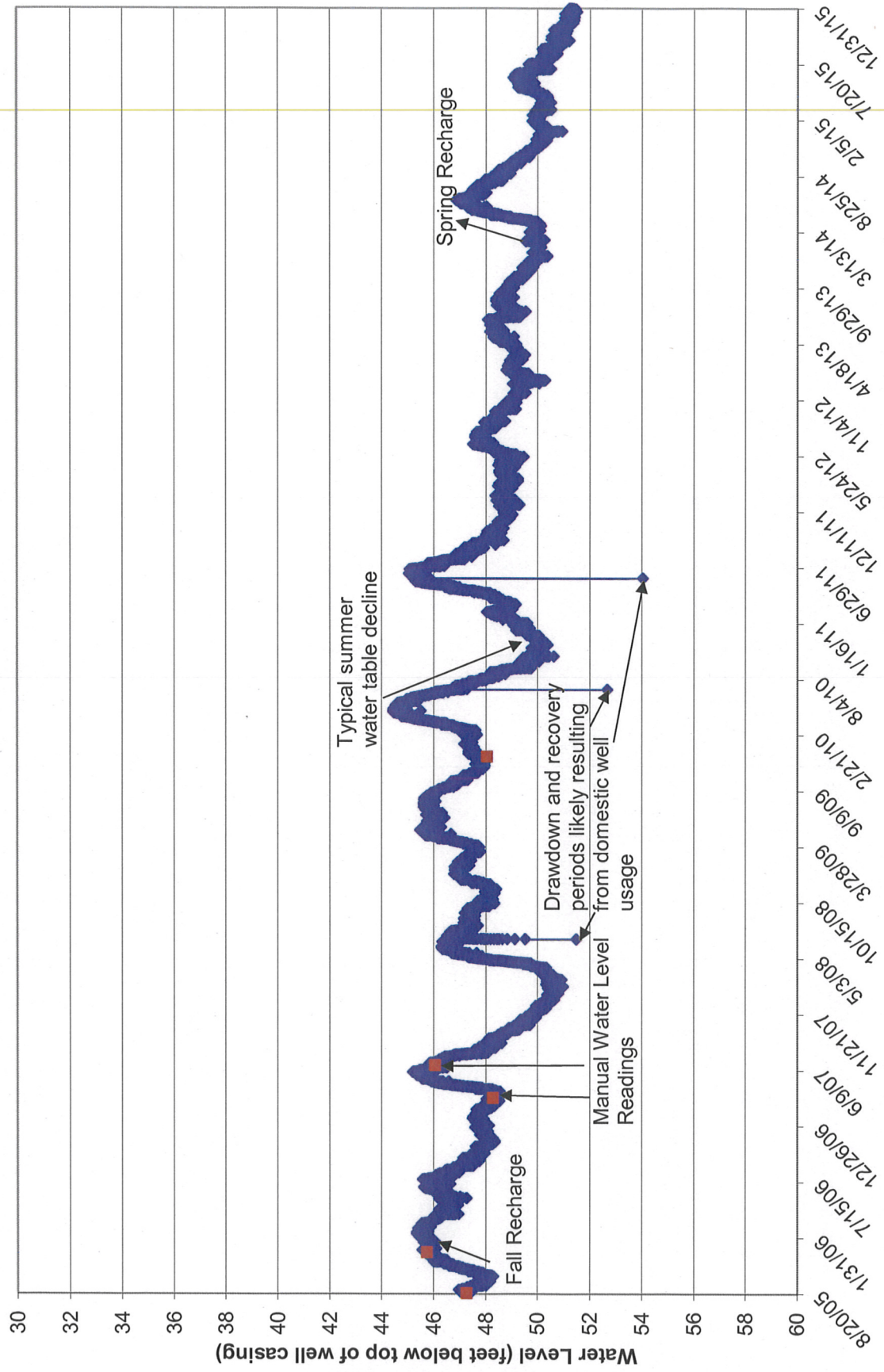
DW10 (Bedrock Well)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

The lower diamond shapes reflect drawdown observed during domestic well usage.

DW11 (Bedrock Well)



Commercial water withdrawal by Poland Spring began on June 1, 2010 at the Cold Spring site.

The lower diamond shapes reflect drawdown observed during domestic well usage.

APPENDIX C – STREAM GAUGING CALCULATIONS

Beaver Brook Stream Gauging Denmark, Maine

Upstream Station at Denmark Road

12/23/2015 12:00

Tape (ft)	Int Width (ft)	Depth (ft)	Area (ft ²)	Velocity (ft/s)	Volume (cfs)
1					
1.33	0.34	1.31	0.44	0.08	0.04
1.67	0.34	1.38	0.46	0.15	0.07
2	0.33	1.41	0.47	0.45	0.21
2.33	0.34	1.41	0.47	0.71	0.34
2.67	0.34	1.41	0.47	0.74	0.35
3	0.33	1.39	0.46	0.70	0.32
3.33	0.34	1.37	0.46	0.78	0.36
3.67	0.34	1.35	0.45	0.91	0.41
4	0.33	1.31	0.43	0.98	0.42
4.33	0.34	1.35	0.45	1.04	0.47
4.67	0.34	1.40	0.47	1.08	0.51
5	0.33	1.40	0.46	1.06	0.49
5.33	0.34	1.43	0.48	1.18	0.57
5.67	0.34	1.48	0.50	1.12	0.56
6	0.33	1.55	0.51	1.10	0.56
6.33	0.34	1.60	0.54	0.98	0.53
6.67	0.34	1.60	0.54	0.87	0.47
7	0.33	1.62	0.53	0.75	0.40
7.33	0.34	1.65	0.55	0.76	0.42
7.67	0.34	1.66	0.56	0.60	0.33
8	0.33	1.71	0.56	0.50	0.28
8.33	0.34	1.70	0.57	0.59	0.34
8.67					

*Air T = 34°F, Water T = 37°F

Total 8.43

Notes:

cfs - cubic feet per second

ft - feet

ft² - square feet

ft/s - feet per second

Int - Interval

Downstream Location At Rocky Knoll Road Dam

12/23/2015 13:00

Tape (ft)	Int Width (ft)	Depth (ft)	Area (ft ²)	Velocity (ft/s)	Volume (cfs)
3.5					
4	0.75	0.70	0.53	-0.03	-0.02
5	1.00	0.92	0.92	0.15	0.14
6	1.00	0.92	0.92	0.21	0.19
7	1.00	1.00	1.00	0.14	0.14
8	1.00	0.98	0.98	0.20	0.20
9	1.00	1.00	1.00	0.25	0.25
10	1.00	0.95	0.95	0.64	0.61
11	1.00	1.00	1.00	0.54	0.54
12	1.00	1.05	1.05	0.62	0.65
13	1.00	1.21	1.21	0.50	0.61
14	1.00	1.32	1.32	0.48	0.63
15	1.00	1.41	1.41	0.41	0.58
16	1.00	1.62	1.62	0.67	1.09
17	1.00	1.70	1.70	0.75	1.28
18	1.00	1.82	1.82	0.85	1.55
19	1.00	2.00	2.00	0.69	1.38
20	1.00	1.91	1.91	0.84	1.60
21	1.00	1.80	1.80	0.91	1.64
22	1.00	1.61	1.61	0.61	0.98
23	1.00	1.40	1.40	0.16	0.22
24	1.00	1.35	1.35	0.29	0.39
25	1.00	1.40	1.40	0.21	0.29
26	1.50	0.51	0.77	0.33	0.25
28					

*Air T = 34°F, Water T = 33°F

Total 15.19