



## Fryeburg Water Company

24 Portland Street, Suite #1

Fryeburg, ME 04037

1-800-287-1643

March 7, 2018

Ms. Katie Haley  
Code Enforcement Officer  
Town of Fryeburg  
16 Lovewell Pond Road  
Fryeburg, ME 04037

Re: Ward's Pond Aquifer Monitoring Plan

Dear Ms. Haley:

Enclosed please find monitoring data for the fourth quarter of 2017. The enclosed data has been collected by Aric Odone, Lead Field Service Representative, Stephen Cox, Director of Service Delivery, and Helen Newman, Supervisor of Engineering, of Maine Water Company. Maine Water Company has been retained by the Fryeburg Water Company to assist with the operation and management of the Fryeburg public water system.

### **BACKGROUND**

An aquifer monitoring plan (hereafter referred to as the "Ward's Pond Aquifer Monitoring Plan") was created as a condition of approval by the Fryeburg Planning Board as part of its Notice of Decision for Land Use Authorization in April 2003.

### **WARDS POND AQUIFER MONITORING PLAN**

This monitoring plan has been prepared at the request of the Fryeburg Planning Board as a means of documenting the long term trend in water elevation within the Aquifer surrounding the production well on Porter Road in the Town of Fryeburg, Maine.

### **MONITORING LOCATIONS**

Six locations established to measure groundwater levels include four monitoring wells (MW-1, 2, 3, 4) and two surface monitoring locations (SG-1, 2) as shown on the attached map. Three monitoring locations (MW-2, MW-3 and MW-4) monitor groundwater elevation within the aquifer associated with production well #3, located off Porter Road. MW-2 monitors groundwater elevation down gradient of Well #3 and MW-3 and MW-4 monitor up gradient water elevation. MW-1 monitors groundwater elevation associated with Wells #1 and #2, located off Portland Street. Because MW-1 is located in the immediate vicinity of the existing production wells, this well will be monitored at a time when each of the existing wells has not been operating for a minimum of one hour.

## 2017 GROUNDWATER ELEVATION DATA IN FEET

Monitoring Well	November 2015 Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	6/13/17 Depth to Water	6/13/17 Elevation of Water	9/28/17 Depth to Water	9/28/17 Elevation of Water	12/18/17 Depth to Water	12/18/17 Elevation of Water
MW-1	393.47	1.9*	391.57	0.25	393.22	3.3	390.17	3.61	389.86
MW-2	419.50	20.1	399.40	16.44	403.06	18.7	400.80	18.3	401.20
MW-3	407.07	3.7	403.37	0.01	407.06	2.2	404.87	1.2	405.87
MW-4	410.06	3.4*	406.66	1.35	408.71	.8	409.26	.1*	409.96

\*Frozen

The elevation of water reported each quarter for the individual monitoring wells is based on the depth of water measured at each well subtracted from the November 2015 survey reference elevation.

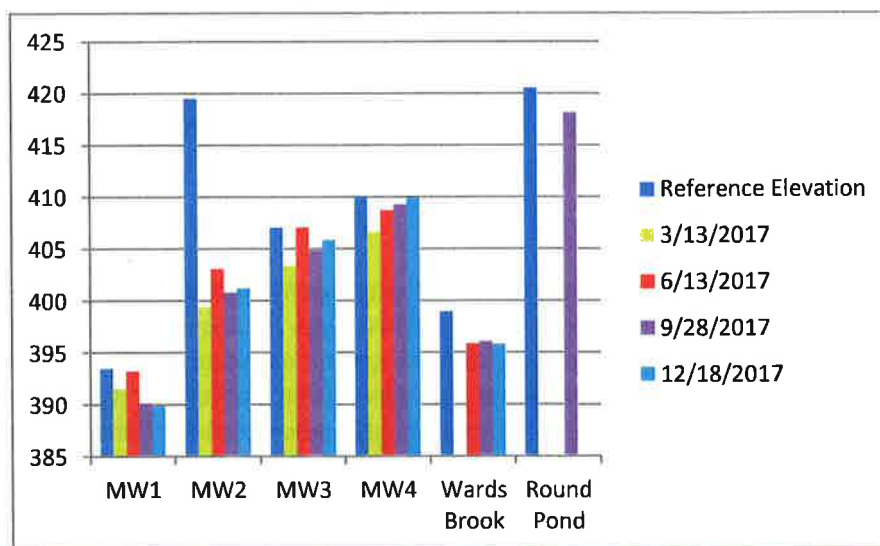
Two monitoring locations (SG-1 and SG-2) monitor surface water elevations of Round Pond and the headwaters of Wards Pond. There are staff gauges at each location and direct readings of surface water elevation are collected.

## 2017 SURFACE WATER ELEVATION DATA

Surface Well Elevation	May 11, 2016 Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	6/13/17 Depth to Water	6/13/17 Elevation of Water	9/28/17 Depth to Water	9/28/17 Elevation of Water	12/18/17 Depth to Water	12/18/17 Elevation of Water
Wards Brook	398.97	Frozen	Frozen	3.1	395.87	2.88	396.09	3.14	395.83
Round Pond	420.52	Frozen	Frozen	*	*	2.40	418.12	Frozen	Frozen

\* June 13, 2017 the Round Pond gauge was deeper than accessible with boots

## GROUNDWATER AND SURFACE WATER ELEVATIONS



The Reference Elevation is the measuring point elevation in feet NAVD (North American Vertical Datum (1988). Bliss Associates surveyed and provided new reference elevations in November 2015.

## **MONITORING PROCEDURES**

Each monitoring location will be visited quarterly. At each monitoring well location an electronic water level meter will be lowered into the well. The depth to water from the top of the well casing will be recorded. This depth will be subtracted from a USGS vertical elevation derived from the survey to determine the elevation of the water table. At each staff gauge location the water level will be read directly from the staff gauge and the water elevation will be calculated from the known elevation of the top of each staff gauge.

## **REPORTING**

Data from the four monitoring wells and the surface monitoring locations are reported on a quarterly basis. At the end of each water year a monitoring report is to be submitted to the planning board, in care of the Code Enforcement Officer, for review. The report will document the condition of each monitoring location, a narrative describing the monitoring results including an interpretation of the results, and time series graphs of the water elevation associated with each monitoring location. The data will be presented such that the planning board can interpret the results without outside input.

In addition to the data from the six monitoring locations, we have included water withdrawal data from the three wells. Well #1 is the dedicated well for bulk water withdrawal and Wells #2 and #3 supply the Town's distribution system.

### **2017 WATER WITHDRAWAL DATA IN GALLONS**

<b>2017</b>	<b>PMS</b>	<b>Pump #2</b>	<b>Pump #3</b>	<b>Total</b>
<b>January</b>	15,704,366	76,750	5,355,495	<b>21,136,611</b>
<b>February</b>	9,096,746	15,169	4,769,658	<b>13,881,573</b>
<b>March</b>	12,579,407	169,381	5,637,363	<b>18,386,151</b>
<b>April</b>	11,918,042	120,108	6,038,746	<b>18,076,896</b>
<b>May</b>	9,300,735	199,088	8,722,044	<b>18,221,867</b>
<b>June</b>	4,976,114	222,789	10,825,630	<b>16,024,533</b>
<b>July</b>	10,958,737	472,961	13,939,667	<b>25,371,365</b>
<b>August</b>	5,924,857	443,921	15,476,288	<b>21,845,066</b>
<b>September</b>	7,296,332	131,062	10,210,585	<b>17,637,979</b>
<b>October</b>	10,705,224	199,997	11,811,585	<b>22,716,806</b>
<b>November</b>	8,152,840	267,705	5,920,828	<b>14,341,373</b>
<b>December</b>	11,261,675	4,911,090	1,513,220	<b>17,685,985</b>
<b>Totals</b>	<b>117,875,075</b>	<b>7,230,021</b>	<b>100,221,109</b>	<b>225,326,205</b>

The comprehensive Emery & Garrett Groundwater Inc. study undertaken on behalf of the Town of Fryeburg in 2005 concludes that above the amount of water withdrawn by the Fryeburg Water Company to serve its residential and other commercial customers, the Ward's Brook aquifer can reasonably sustain discretionary withdrawals of 220 million gallons per year.

Based on our observation and review of additional monitoring reports submitted by Luetje Geological Services, LLC, we have not observed any adverse impact to the Ward's Brook Aquifer.

Please contact our office with any questions at (800) 287-1643.

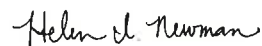
Respectfully submitted,



Stephen Cox, PE  
Director of Service Delivery



Aric Odone  
Lead Field Service Representative



Helen Newman  
Supervisor of Engineering





**Fryeburg Water Company  
Monitoring Well Locations**

**Scale: 1" = 750'**  
**Date: October 6, 2016**

**Legend**

-  Monitoring Well
-  Staff Gauge







## Fryeburg Water Company

24 Portland Street, Suite #1

Fryeburg, ME 04037

1-800-287-1643

May 2, 2017

Ms. Katie Haley  
Code Enforcement Officer  
Town of Fryeburg  
16 Lovewell Pond Road  
Fryeburg, ME 04037

Re: Ward's Pond Aquifer Monitoring Plan

Dear Ms. Haley:

Enclosed please find monitoring data for the first quarter of 2017. The enclosed data has been collected by Aric Odone, Project Coordinator, for Maine Water Company and Stephen Cox, Director of Engineering for Maine Water Company. Maine Water Company has been retained by the Fryeburg Water Company to assist with the operation and management of the Fryeburg public water system.

### **BACKGROUND**

An aquifer monitoring plan (hereafter referred to as the "Ward's Pond Aquifer Monitoring Plan") was created as a condition of approval by the Fryeburg Planning Board as part of its Notice of Decision for Land Use Authorization in April 2003.

### **WARDS POND AQUIFER MONITORING PLAN**

This monitoring plan has been prepared at the request of the Fryeburg Planning Board as a means of documenting the long term trend in water elevation within the Aquifer surrounding the proposed new production well on Porter Road in the Town of Fryeburg, Maine.

### **MONITORING LOCATIONS**

Six locations established to measure groundwater levels include four monitoring wells (MW-1, 2, 3, 4) and two surface monitoring locations (SG-1, 2) as shown on the attached map. Three monitoring locations (MW-2, MW-3 and MW-4) monitor groundwater elevation within the aquifer associated with production well #3, located off Porter Road. MW-2 monitors groundwater elevation down gradient of Well #3 and MW-3 and MW-4 monitor up gradient water elevation. MW-1 monitors groundwater elevation associated with Wells #1 and #2, located off Portland Street. Because MW-1 is located in the immediate vicinity of the existing production wells, this well will be monitored at a time when each of the existing wells has not been operating for a minimum of one hour.

### 2017 GROUNDWATER ELEVATION DATA IN FEET TO DATE

Monitoring Well	Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	Depth to Water	Elevation of Water	Depth to Water	Elevation of Water	Depth to Water	Elevation of Water
MW-1	393.47	1.9*	391.57						
MW-2	419.50	20.1	399.40						
MW-3	407.07	3.7	403.33						
MW-4	410.06	3.4*	406.66						

\*Frozen

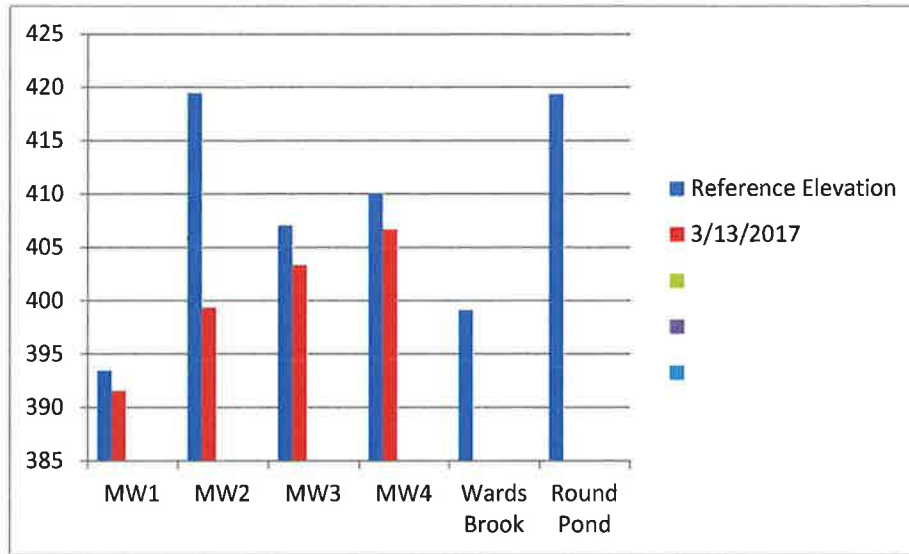
Two monitoring locations (SG-1 and SG-2) monitor surface water elevations of Round Pond and the headwaters of Wards Pond. There are staff gauges at each location and direct readings of surface water elevation are collected.

### 2017 SURFACE WATER ELEVATION DATA IN FEET TO DATE

Surface Well Elevation	Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	Depth to Water	Elevation of Water	Depth to Water	Elevation of Water	Depth to Water	Elevation of Water
Wards Brook	399.12	Frozen							
Round Pond	419.38	Frozen							



## GROUNDWATER AND SURFACE WATER ELEVATIONS



The Reference Elevation is the measuring point elevation in feet NAVD (North American Vertical Datum (1988)). Bliss Associates surveyed and provided new reference elevations in November 2015.

### MONITORING PROCEDURES

Each monitoring location will be visited quarterly. At each monitoring well location an electronic water level meter will be lowered into the well. The depth to water from the top of the well casing will be recorded. This depth will be subtracted from a USGS vertical elevation derived from the survey to determine the elevation of the water table. At each staff gauge location the water level will be read directly from the staff gauge and the water elevation will be calculated from the known elevation of the top of each staff gauge.

### REPORTING

Data from the four monitoring wells and the surface monitoring locations are reported on a quarterly basis. At the end of each water year (January) a monitoring report is to be submitted to the planning board, in care of the Code Enforcement Officer, for review. The report will document the condition of each monitoring location, a narrative describing the monitoring results including an interpretation of the results, and time series graphs of the water elevation associated with each monitoring location. The data will be presented such that the planning board can interpret the results without outside input.

In addition to the data from the six monitoring locations, we have included water withdrawal data from the three wells. Well #1 is the dedicated well for bulk water withdrawal and Wells #2 and #3 supply the Town's distribution system.

### 2017 WATER WITHDRAWAL DATA IN GALLONS

2017	PMS	Pump #2	Pump #3	Total
Jan	15,704,366	7,675	5,355,495	21,067,536
Feb	9,096,746	15,169	4,769,658	13,881,573
March	12,579,407	169,381	5,637,363	18,386,151
April				
May				
June				
July				
Aug				
Sept				
<b>Totals</b>	<b>37,380,519</b>	<b>192,225</b>	<b>15,762,516</b>	<b>53,335,260</b>

The comprehensive Emery & Garrett Groundwater Inc. study undertaken on behalf of the Town of Fryeburg in 2005 concludes that above the amount of water withdrawn by the Fryeburg Water Company to serve its residential and other commercial customers, the Ward's Brook aquifer can reasonably sustain discretionary withdrawals of 220 million gallons per year.

Based on our observation and review of additional monitoring report submitted by Luetje Geological Services, LLC, we have not observed any adverse impact to the Ward's Brook Aquifer.

Please contact our office with any questions at (800) 287-1643.

Respectfully submitted,

*Stephen Cox*

Stephen Cox, PE  
Director of Engineering



A handwritten signature in black ink, appearing to read "Aric Odone".

Aric Odone  
Project Coordinator



## Fryeburg Water Company

24 Portland Street, Suite #1

Fryeburg, ME 04037

1-800-287-1643

July 25, 2017

Ms. Katie Haley  
Code Enforcement Officer  
Town of Fryeburg  
16 Lovewell Pond Road  
Fryeburg, ME 04037

Re: Ward's Pond Aquifer Monitoring Plan

Dear Ms. Haley:

Enclosed please find monitoring data for the second quarter of 2017. The enclosed data has been collected by Aric Odone, Project Coordinator, for Maine Water Company and Stephen Cox, Director of Engineering for Maine Water Company. Maine Water Company has been retained by the Fryeburg Water Company to assist with the operation and management of the Fryeburg public water system.

### **BACKGROUND**

An aquifer monitoring plan (hereafter referred to as the "Ward's Pond Aquifer Monitoring Plan") was created as a condition of approval by the Fryeburg Planning Board as part of its Notice of Decision for Land Use Authorization in April 2003.

### **WARDS POND AQUIFER MONITORING PLAN**

This monitoring plan has been prepared at the request of the Fryeburg Planning Board as a means of documenting the long term trend in water elevation within the Aquifer surrounding the proposed new production well on Porter Road in the Town of Fryeburg, Maine.

### **MONITORING LOCATIONS**

Six locations established to measure groundwater levels include four monitoring wells (MW-1, 2, 3, 4) and two surface monitoring locations (SG-1, 2) as shown on the attached map. Three monitoring locations (MW-2, MW-3 and MW-4) monitor groundwater elevation within the aquifer associated with production well #3, located off Porter Road. MW-2 monitors groundwater elevation down gradient of Well #3 and MW-3 and MW-4 monitor up gradient water elevation. MW-1 monitors groundwater elevation associated with Wells #1 and #2, located off Portland Street. Because MW-1 is located in the immediate vicinity of the existing

production wells, this well will be monitored at a time when each of the existing wells has not been operating for a minimum of one hour.

#### 2017 GROUNDWATER ELEVATION DATA IN FEET TO DATE

Monitoring Well	Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	6/13/17 Depth to Water	6/13/17 Elevation of Water	Depth to Water	Elevation of Water	Depth to Water	Elevation of Water
MW-1	393.47	1.9*	391.57	0.25	393.22				
MW-2	419.50	20.1	399.40	16.44	403.06				
MW-3	407.07	3.7	403.33	0.01	407.02				
MW-4	410.06	3.4*	406.66	1.35	410.33				

\*Frozen

Two monitoring locations (SG-1 and SG-2) monitor surface water elevations of Round Pond and the headwaters of Wards Pond. There are staff gauges at each location and direct readings of surface water elevation are collected.

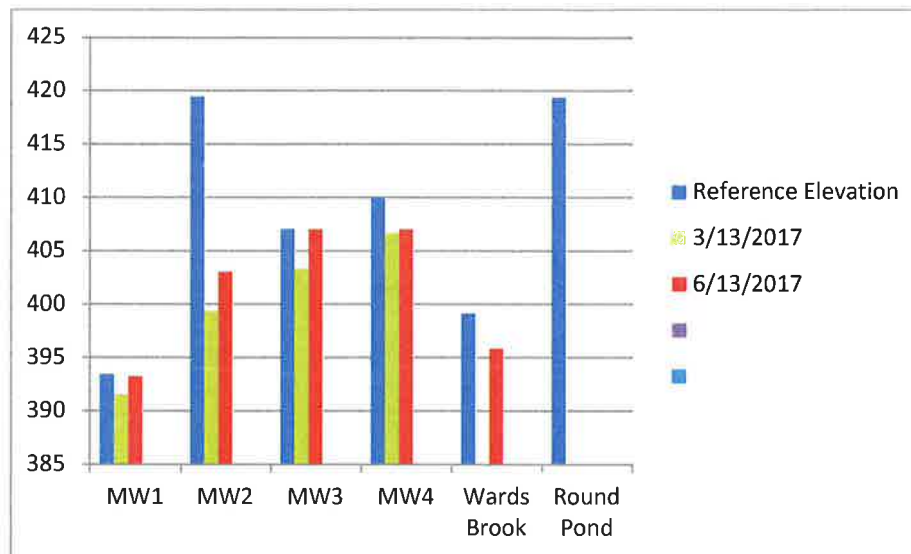
#### 2017 SURFACE WATER ELEVATION DATA IN FEET TO DATE

Surface Well Elevation	Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	6/13/17 Depth to Water	6/13/17 Elevation of Water	Depth to Water	Elevation of Water	Depth to Water	Elevation of Water
Wards Brook	399.12	Frozen		3.1	395.87				
Round Pond	419.38	Frozen							

\*June 13, 2017 the Round pond gauge was deeper than accessible with boots



## GROUNDWATER AND SURFACE WATER ELEVATIONS



The Reference Elevation is the measuring point elevation in feet NAVD (North American Vertical Datum (1988)). Bliss Associates surveyed and provided new reference elevations in November 2015.

### MONITORING PROCEDURES

Each monitoring location will be visited quarterly. At each monitoring well location an electronic water level meter will be lowered into the well. The depth to water from the top of the well casing will be recorded. This depth will be subtracted from a USGS vertical elevation derived from the survey to determine the elevation of the water table. At each staff gauge location the water level will be read directly from the staff gauge and the water elevation will be calculated from the known elevation of the top of each staff gauge.

### REPORTING

Data from the four monitoring wells and the surface monitoring locations are reported on a quarterly basis. At the end of each water year (January) a monitoring report is to be submitted to the planning board, in care of the Code Enforcement Officer, for review. The report will document the condition of each monitoring location, a narrative describing the monitoring results including an interpretation of the results, and time series graphs of the water elevation associated with each monitoring location. The data will be presented such that the planning board can interpret the results without outside input.

In addition to the data from the six monitoring locations, we have included water withdrawal data from the three wells. Well #1 is the dedicated well for bulk water withdrawal and Wells #2 and #3 supply the Town's distribution system.

### 2017 WATER WITHDRAWAL DATA IN GALLONS

2017	PMS	Pump #2	Pump #3	Total
Jan	15,704,366	7,675	5,355,495	21,067,536
Feb	9,096,746	15,169	4,769,658	13,881,573
March	12,579,407	169,381	5,637,363	18,386,151
April	11,918,042	120,108	6,428,188	18,466,338
May	9,300,734	199,088	8,722,044	18,221,866
June	18,553,805	222,789	10,825,630	29,602,224
July				
Aug				
Sept				
<b>Totals</b>	<b>77,153,100</b>	<b>734,210</b>	<b>41,738,378</b>	<b>119,625,688</b>

The comprehensive Emery & Garrett Groundwater Inc. study undertaken on behalf of the Town of Fryeburg in 2005 concludes that above the amount of water withdrawn by the Fryeburg Water Company to serve its residential and other commercial customers, the Ward's Brook aquifer can reasonably sustain discretionary withdrawals of 220 million gallons per year.

Based on our observation and review of additional monitoring report submitted by Luetje Geological Services, LLC, we have not observed any adverse impact to the Ward's Brook Aquifer.

Please contact our office with any questions at (800) 287-1643.

Respectfully submitted,

*Stephen Cox*

Stephen Cox, PE  
Director of Engineering



A handwritten signature in black ink, appearing to read "Aric Odone".

Aric Odone  
Project Coordinator



**Fryeburg Water Company**  
24 Portland Street, Suite #1  
Fryeburg, ME 04037  
1-800-287-1643

July 25, 2017  
Revised 9/14/2017

Ms. Katie Haley  
Code Enforcement Officer  
Town of Fryeburg  
16 Lovewell Pond Road  
Fryeburg, ME 04037

Re: Ward's Pond Aquifer Monitoring Plan

Dear Ms. Haley:

Enclosed please find monitoring data for the second quarter of 2017. The enclosed data has been collected by Aric Odone, Project Coordinator, for Maine Water Company and Stephen Cox, Director of Engineering for Maine Water Company. Maine Water Company has been retained by the Fryeburg Water Company to assist with the operation and management of the Fryeburg public water system.

## **BACKGROUND**

An aquifer monitoring plan (hereafter referred to as the "Ward's Pond Aquifer Monitoring Plan") was created as a condition of approval by the Fryeburg Planning Board as part of its Notice of Decision for Land Use Authorization in April 2003.

## **WARDS POND AQUIFER MONITORING PLAN**

This monitoring plan has been prepared at the request of the Fryeburg Planning Board as a means of documenting the long term trend in water elevation within the Aquifer surrounding the proposed new production well on Porter Road in the Town of Fryeburg, Maine.

## **MONITORING LOCATIONS**

Six locations established to measure groundwater levels include four monitoring wells (MW-1, 2, 3, 4) and two surface monitoring locations (SG-1, 2) as shown on the attached map. Three monitoring locations (MW-2, MW-3 and MW-4) monitor groundwater elevation within the aquifer associated with production well #3, located off Porter Road. MW-2 monitors groundwater elevation down gradient of Well #3 and MW-3 and MW-4 monitor up gradient water elevation. MW-1 monitors groundwater elevation associated with Wells #1 and #2, located off Portland Street. Because MW-1 is located in the immediate vicinity of the existing

production wells, this well will be monitored at a time when each of the existing wells has not been operating for a minimum of one hour.

### 2017 GROUNDWATER ELEVATION DATA IN FEET TO DATE

Monitoring Well	Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	6/13/17 Depth to Water	6/13/17 Elevation of Water	Depth to Water	Elevation of Water	Depth to Water	Elevation of Water
MW-1	393.47	1.9*	391.57	0.25	393.22				
MW-2	419.50	20.1	399.40	16.44	403.06				
MW-3	407.07	3.7	403.33	0.01	407.02				
MW-4	410.06	3.4*	406.66	1.35	410.33				

\*Frozen

Two monitoring locations (SG-1 and SG-2) monitor surface water elevations of Round Pond and the headwaters of Wards Pond. There are staff gauges at each location and direct readings of surface water elevation are collected.

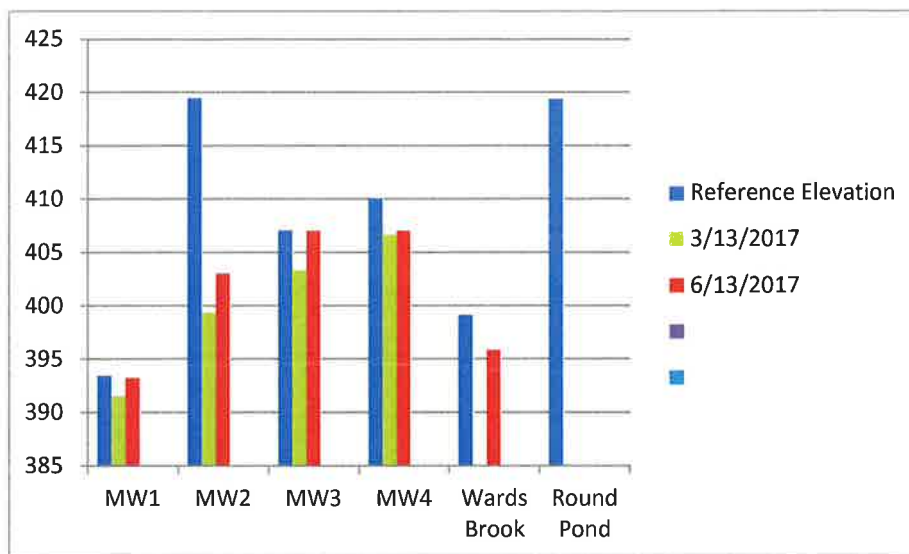
### 2017 SURFACE WATER ELEVATION DATA IN FEET TO DATE

Surface Well Elevation	Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	6/13/17 Depth to Water	6/13/17 Elevation of Water	Depth to Water	Elevation of Water	Depth to Water	Elevation of Water
Wards Brook	399.12	Frozen		3.1	395.87				
Round Pond	419.38	Frozen							

\*June 13, 2017 the Round pond gauge was deeper than accessible with boots



## GROUNDWATER AND SURFACE WATER ELEVATIONS



The Reference Elevation is the measuring point elevation in feet NAVD (North American Vertical Datum (1988)). Bliss Associates surveyed and provided new reference elevations in November 2015.

### MONITORING PROCEDURES

Each monitoring location will be visited quarterly. At each monitoring well location an electronic water level meter will be lowered into the well. The depth to water from the top of the well casing will be recorded. This depth will be subtracted from a USGS vertical elevation derived from the survey to determine the elevation of the water table. At each staff gauge location the water level will be read directly from the staff gauge and the water elevation will be calculated from the known elevation of the top of each staff gauge.

### REPORTING

Data from the four monitoring wells and the surface monitoring locations are reported on a quarterly basis. At the end of each water year (January) a monitoring report is to be submitted to the planning board, in care of the Code Enforcement Officer, for review. The report will document the condition of each monitoring location, a narrative describing the monitoring results including an interpretation of the results, and time series graphs of the water elevation associated with each monitoring location. The data will be presented such that the planning board can interpret the results without outside input.

In addition to the data from the six monitoring locations, we have included water withdrawal data from the three wells. Well #1 is the dedicated well for bulk water withdrawal and Wells #2 and #3 supply the Town's distribution system.

### 2017 WATER WITHDRAWAL DATA IN GALLONS

2017	PMS	Pump #2	Pump #3	Total
Jan	15,704,366	7,675	5,355,495	21,067,536
Feb	9,096,746	15,169	4,769,658	13,881,573
March	12,579,407	169,381	5,637,363	18,386,151
April	11,918,042	120,108	6,428,188	18,466,338
May	9,300,734	199,088	8,722,044	18,221,866
June	4,976,114	222,789	10,825,630	29,602,224
July				
Aug				
Sept				
<b>Totals</b>	<b>63,575,409</b>	<b>734,210</b>	<b>41,738,378</b>	<b>106,047,997</b>

The comprehensive Emery & Garrett Groundwater Inc. study undertaken on behalf of the Town of Fryeburg in 2005 concludes that above the amount of water withdrawn by the Fryeburg Water Company to serve its residential and other commercial customers, the Ward's Brook aquifer can reasonably sustain discretionary withdrawals of 220 million gallons per year.

Based on our observation and review of additional monitoring report submitted by Luetje Geological Services, LLC, we have not observed any adverse impact to the Ward's Brook Aquifer.

Please contact our office with any questions at (800) 287-1643.

Respectfully submitted,



Stephen Cox, PE  
Director of Engineering



Aric Odone  
Project Coordinator



## Fryeburg Water Company

24 Portland Street, Suite #1

Fryeburg, ME 04037

1-800-287-1643

October 9, 2017

Ms. Katie Haley  
Code Enforcement Officer  
Town of Fryeburg  
16 Lovewell Pond Road  
Fryeburg, ME 04037

Re: Ward's Pond Aquifer Monitoring Plan

Dear Ms. Haley:

Enclosed please find monitoring data for the second quarter of 2017. The enclosed data has been collected by Aric Odone, Project Coordinator, for Maine Water Company and Stephen Cox, Director of Engineering for Maine Water Company. Maine Water Company has been retained by the Fryeburg Water Company to assist with the operation and management of the Fryeburg public water system.

### **BACKGROUND**

An aquifer monitoring plan (hereafter referred to as the "Ward's Pond Aquifer Monitoring Plan") was created as a condition of approval by the Fryeburg Planning Board as part of its Notice of Decision for Land Use Authorization in April 2003.

### **WARDS POND AQUIFER MONITORING PLAN**

This monitoring plan has been prepared at the request of the Fryeburg Planning Board as a means of documenting the long term trend in water elevation within the Aquifer surrounding the proposed new production well on Porter Road in the Town of Fryeburg, Maine.

### **MONITORING LOCATIONS**

Six locations established to measure groundwater levels include four monitoring wells (MW-1, 2, 3, 4) and two surface monitoring locations (SG-1, 2) as shown on the attached map. Three monitoring locations (MW-2, MW-3 and MW-4) monitor groundwater elevation within the aquifer associated with production well #3, located off Porter Road. MW-2 monitors groundwater elevation down gradient of Well #3 and MW-3 and MW-4 monitor up gradient water elevation. MW-1 monitors groundwater elevation associated with Wells #1 and #2, located off Portland Street. Because MW-1 is located in the immediate vicinity of the existing

production wells, this well will be monitored at a time when each of the existing wells has not been operating for a minimum of one hour.

### 2017 GROUNDWATER ELEVATION DATA IN FEET TO DATE

Monitoring Well	Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	6/13/17 Depth to Water	6/13/17 Elevation of Water	9/28/17 Depth to Water	9/28/17 Elevation of Water	Depth to Water	Elevation of Water
MW-1	393.47	1.9*	391.57	0.25	393.22	3.3	390.17		
MW-2	419.50	20.1	399.40	16.44	403.06	18.7	400.80		
MW-3	407.07	3.7	403.33	0.01	407.02	2.2	404.83		
MW-4	410.06	3.4*	406.66	1.35	410.33	.8	409.34		

\*Frozen

Two monitoring locations (SG-1 and SG-2) monitor surface water elevations of Round Pond and the headwaters of Wards Pond. There are staff gauges at each location and direct readings of surface water elevation are collected.

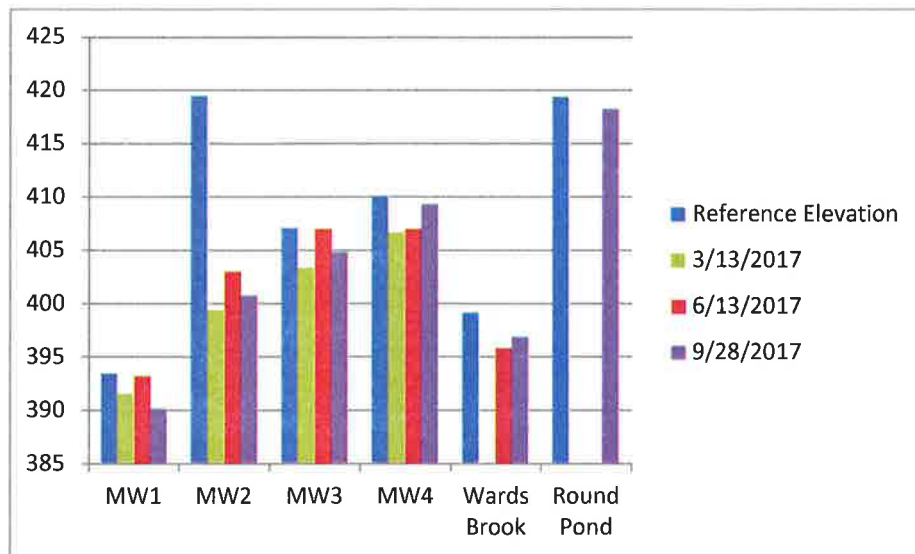
### 2017 SURFACE WATER ELEVATION DATA IN FEET TO DATE

Surface Well Elevation	Reference Elevation	03/13/17 Depth to Water	03/13/17 Elevation of Water	6/13/17 Depth to Water	6/13/17 Elevation of Water	9/28/17 Depth to Water	9/28/17 Elevation of Water	Depth to Water	Elevation of Water
Wards Brook	399.12	Frozen		3.1	395.87	2.88	396.9		
Round Pond	419.38	Frozen				2.40	418.3		

\*June 13, 2017 the Round pond gauge was deeper than accessible with boots



## GROUNDWATER AND SURFACE WATER ELEVATIONS



The Reference Elevation is the measuring point elevation in feet NAVD (North American Vertical Datum (1988)). Bliss Associates surveyed and provided new reference elevations in November 2015.

### MONITORING PROCEDURES

Each monitoring location will be visited quarterly. At each monitoring well location an electronic water level meter will be lowered into the well. The depth to water from the top of the well casing will be recorded. This depth will be subtracted from a USGS vertical elevation derived from the survey to determine the elevation of the water table. At each staff gauge location the water level will be read directly from the staff gauge and the water elevation will be calculated from the known elevation of the top of each staff gauge.

### REPORTING

Data from the four monitoring wells and the surface monitoring locations are reported on a quarterly basis. At the end of each water year (January) a monitoring report is to be submitted to the planning board, in care of the Code Enforcement Officer, for review. The report will document the condition of each monitoring location, a narrative describing the monitoring results including an interpretation of the results, and time series graphs of the water elevation associated with each monitoring location. The data will be presented such that the planning board can interpret the results without outside input.

In addition to the data from the six monitoring locations, we have included water withdrawal data from the three wells. Well #1 is the dedicated well for bulk water withdrawal and Wells #2 and #3 supply the Town's distribution system.

### 2017 WATER WITHDRAWAL DATA IN GALLONS

2017	PMS	Pump #2	Pump #3	Total
Jan	15,704,366	7,675	5,355,495	21,067,536
Feb	9,096,746	15,169	4,769,658	13,881,573
March	12,579,407	169,381	5,637,363	18,386,151
April	11,918,042	120,108	6,428,188	18,466,338
May	9,300,734	199,088	8,722,044	18,221,866
June	4,976,114	222,789	10,825,630	29,602,224
July	10,958,737	472,961	13,939,667	25,371,365
Aug	5,924,857	443,921	15,476,288	21,845,066
Sept	7,296,332	131,006	10,210,585	17,637,923
<b>Totals</b>	<b>87,755,335</b>	<b>1,782,098</b>	<b>67,435,918</b>	<b>184,480,042</b>

The comprehensive Emery & Garrett Groundwater Inc. study undertaken on behalf of the Town of Fryeburg in 2005 concludes that above the amount of water withdrawn by the Fryeburg Water Company to serve its residential and other commercial customers, the Ward's Brook aquifer can reasonably sustain discretionary withdrawals of 220 million gallons per year.

Based on our observation and review of additional monitoring report submitted by Luetje Geological Services, LLC, we have not observed any adverse impact to the Ward's Brook Aquifer.

Please contact our office with any questions at (800) 287-1643.

Respectfully submitted,

*Stephen Cox*

Stephen Cox, PE  
Director of Engineering



A handwritten signature in black ink, appearing to read "Aric Odone".

Aric Odone  
Project Coordinator