Nobis
Engineering a Sustainable Future

February 2, 2018
File No. 90420.01
Via Email and U.S. Mail

Mr. Richard Novak, Chair
Zoning Board of Appeals, Town of Sherborn
Town Hall, 19 Washington Street
Sherborn, MA 01770
rnovak@PierceAtwood.com

Re: Report, Well Testing Proposal Review, Proposed 40B Housing Project
59 North Main Street
Sherborn, Massachusetts

Dear Mr. Novak:

Nobis Engineering, Inc. (Nobis) is pleased to present to the Town of Sherborn (Town) Zoning Board of Appeals (ZBA) this report on Nobis' review of proposals for pumping tests on two new wells intended to provide water supply for the proposed new 40B housing development at 59 North Main Street in Sherborn, Massachusetts. This report is the "deliverable" product of Nobis' work under a contract with the Town, dated January 16, 2018 and signed by the Town on January 17, 2018.

BACKGROUND

The project Applicant's team consists of The Heritage Company (developer), EDC (engineer), and Provencher Engineering (water system designer). This team is herein collectively referred to as the "Applicant". Nobis understands that Tom Houston is the ZBA's peer reviewer and that the Sherborn Board of Health (BOH) is also involved with reviewing the project.

Nobis' understands that the proposed development, called "Sherborn Village" (SV), will consist of 12 units intended for 24 people and will be age-restricted under the Massachusetts 40B program. Nobis understands that SV is to be served by two private wells, each intended to serve 6 housing units (12 people and 12 bedrooms). Nobis further understands that the proposed water systems fall below the threshold requirements for a Public Water System, which implies that permitting by the Massachusetts Department of Environmental Protection, for the water systems, will not be required and is to be done by the Town of Sherborn. The new SV housing development is to be served by on-site wastewater disposal systems, but this is not the subject of Nobis' review.

The wells have already been drilled and are located as shown on the attached plan (Attachment 1), provided by EDC and modified by Nobis. The wells are known as Well 1 (eastern well) and Well 2 (western well) and were permitted in 2015 for a previously-proposed 3-lot subdivision on Lot 1 and Lot 3, respectively. Drilling records (Attachment 1) show that Well 1 encountered bedrock at a depth of 9 feet below ground surface (ft bgs) and has a total depth of 700 ft.; the

Nobis Engineering, Inc.
18 Chenell Drive
Concord, NH 03301
T (603) 224-4182

reported airlift yield is 5 gallons per minute (gpm), from a water-bearing zone between 300 and 330 ft bgs. Well 2 encountered bedrock at a depth of 18 ft bgs and has a total depth of 800 ft; the reported airlift yield is 2 gpm, from a water-bearing zone between 280 and 300 ft bgs.

Both wells were hydrofractured in several zones, using a dual packer assembly, to enhance the well yields. Following hydrofracturing, Well 1 (labeled Well 2 on the hydrofracture log) was pumped at 15 – 16 gpm with a drawdown of 213 ft; Well 2 (labeled Well 1) was pumped at 17 gpm with a drawdown of 163.4 ft. The hydrofracturing contractor's logs are found in Attachment 1; *note that the hydrofracturing logs reverse the Well 1 and Well 2 names, relative to the drilling reports and the site plan shown in Attachment 1*. On November 15 and 16, 2017, each well was pumped for 6 hours at similar rates to those reported by the hydrofracturing contractor. According to EDC (email received from Provencher Engineering on January 30, 2018), when one of the wells was pumped, drawdown was not noted in the other well.

Based on information provided to Nobis by the Applicant, there are 5 abutter wells of note:

- 61 North Main St. (Marthinsen) – NE of site; about 170 ft from Well 1; about 400 ft from Well 2
- 60 North Main St. – E of site (across North Main St.), about 300 ft from Well 1; about 480 ft. from Well 2
- 58 North Main St. – E of site (across North Main St.), about 370 ft from Well 1; about 480 ft from Well 2
- 54 North Main St. – E of site (across North Main St.), about 430 ft from Well 1; about 520 ft from Well 2
- 55 North Main St – SE of site; about 500 ft from Well 1; about 500 ft from Well 1; about 470 ft from Well 2

These wells are shown on the plan in Attachment 1.

OBJECTIVE

A pumping test plan has been proposed by the Applicant, and alternatives to some elements of the proposed plan have been requested by the BOH. Nobis understands that the parties have not reached agreement. Duration of the pumping test, whether to monitor abutters' wells, and other aspects are not yet agreed upon. Nobis has been asked by the Town to review the Applicant pumping test plan, the BOH requests, and related materials and to recommend a pumping test plan that is appropriate for the situation.

Nobis' approach is to present a pumping test plan that balances the need for information, particularly on potential impacts to abutter wells, against feasibility and practical aspects of conducting well pumping tests. Nobis presents our opinion, from a technical standpoint, given the situation.

APPLICANT PUMPING TEST PLAN

The Applicant Pumping Test Plan was presented in a Technical Memorandum dated December 14, 2017 by Provencher Engineering and a cover letter dated December 20, 2017 by EDC (Attachment 2). Key elements of the Applicant Plan include:

- Separate 24-hour pumping tests on Well 1 and Well 2;
- The pumping rate for each test will be 5 gpm;
- Water level monitoring in both wells during both tests, including pumping and recovery phases;
- The second test starts only after water levels have recovered following the first test;
- No direct water level monitoring of abutter wells;
- Use graphical and analytical approaches to estimate the Zone of Contribution to Well 1 and Well 2 and to estimate the water level impact on abutter wells; and
- Collect water samples for required analyses near the end of the pumping phases.

The Applicant Plan stated that to monitor an abutter's well directly, the well would have to be off-line during the monitoring period, causing considerable disruption to the well owner. Also, the Applicant Plan discusses the risk of contamination to the abutter well that is monitored, along with a risk of mechanical malfunction and entanglement of the water level device with power cables in the well.

BOH REQUESTS

The BOH has requested a different pumping test from that proposed by the Applicant. Elements of the BOH request are summarized in an email from BOH Chair Daryl Beardsley to Ellen Hartnett of Sherborn on January 25, 2018 and forwarded to Nobis and other Town officials on the same date (Attachment 3). Key elements of the BOH request include:

- Simultaneous pumping test of at least 48 hours with both wells pumping;
- Monitor water levels and flow rates for each pumping well during the test;
- Monitor neighbors' wells water levels (BOH did not specify which wells or how many wells) during the test;
- Use the monitoring data to assess the potential impact on neighbors' wells; and
- Discharge pumped waters onto the ground to promote re-infiltration and not runoff.

DISCUSSION

Well 1 and Well 2 are drilled bedrock wells in which the overburden (soil) deposits are cased off and sealed so as not to allow overburden groundwater to enter the wells. Nobis has not reviewed drilling records or other information on the abutters' wells but assumes that all these wells are bedrock wells. For the bedrock in Sherborn, porosity in the rock matrix is close to zero, so that the only way water can flow through bedrock is along fractures in the rock. Thus, groundwater flow in bedrock (i.e. from one well to another) typically occurs only in highly discrete fracture zones. This can result in groundwater flowing long distances to pumping wells in some directions, while in other directions, two wells can be close together and have no impact on each other.

Based on the above, the graphical, analytical approach proposed by the Applicant for estimating potential impacts on abutters' wells cannot be relied upon to provide accurate predictions. The method proposed would be very good for an isotropic aquifer such as stratified drift sand and gravel. However, in fractured bedrock, such theoretical approaches are less reliable than direct monitoring and might under-estimate impacts for two wells connected by a fracture zone and over-estimate impacts on wells in other directions.

When operational, each well will be serving a different water system, and the wells may pump simultaneously at times. To mimic the greatest expected stress on the aquifer, a test with simultaneous pumping is more advantageous and will provide the needed information more quickly than separate pumping tests.

On the other hand, the planned pumping rates of 5 gpm for each well are greater than the sustained average withdrawals that will occur over a 24-hour period. This is true whether Title 5 flow rates are used to design the water systems or a 300 gallons-per-day-per-bedroom criterion is used. Because the operational water withdrawal volumes will be relatively modest and the pumping test rate will be the same as the short-term peak withdrawals and because the water system design includes storage tanks, 24 hours will probably be an adequate duration to determine if there is a significant impact on abutters' wells, due to pumping Well 1 and/or Well 2. In many pumping tests, the easiest way to determine impact is examining water levels at the time when the pump is shut down and recovery begins.

The Applicant's concern that meaningful water level measurements in domestic wells can only be obtained if the well is taken out of service (not pumped) can be addressed by using pressure transducers, programmed to take measurements at one-minute intervals, in the wells. This monitoring should begin at least one day before the start of the pumping test and continue through the pumping and recovery phases. By measuring water levels prior to pumping, the water level cycles due to normal domestic use can be determined. Upon request, Nobis can provide examples of pumping tests that included this type of monitoring, both with and without impacts on abutters' wells.

Nobis agrees that monitoring water levels in a domestic well risks introducing bacteria into the well. Although steps can be taken to lower the risk, the risk cannot be eliminated. The value of the information to be gained should be weighed against the risk. Should bacteria be introduced into a domestic well during monitoring, the well should be disinfected by a licensed well driller, pump installer, or plumber, at the Applicant's expense.

The Applicant also expressed concern that physical damage could occur to the well or that the water level monitoring device could become tangled with pump wires. This risk can be addressed by installing a Stilling Well for monitoring purposes. This would consist of ¾-inch (or greater) flush-mounted PVC tubing or 1-inch (or greater) black polyethylene tubing installed to several feet below the water level in the well. A transducer or water level probe can then be lowered safely into the Stilling Well for monitoring purposes. The Stilling Well should be installed by a licensed well driller, pump installer, or plumber.

NOBIS PROPOSED PUMPING TEST PLAN

Based on the above discussion and the information provided to Nobis, Nobis proposes the following pumping test plan for consideration by the ZBA, BOH, and Applicant:

- Well 1 and Well 2 should be pumped at 5 gpm each, simultaneously (see next bullet), for at least 24 hours.
- Optionally, Nobis recommends a staggered start in which one of the wells begins pumping one hour before the other, and stops pumping one hour before the other.
- Both flow rates and water levels should be monitored regularly during pumping and recovery phases. Recovery monitoring should occur for at least 24 hours, unless 95% of the drawdown is recovered sooner. If flow monitoring indicates that flow has dropped below 5 gpm, a valve adjustment should be made to maintain the 5 gpm flow.
- Pumped water should be discharged onto the ground at least 100 feet from the wells, in the down-gradient direction. Plastic sheeting or plywood may be needed beneath the end of the discharge hose to dissipate flow.
- Informational letters with permission forms (see sample in Attachment 4) should be sent, by the Applicant, via certified mail, to the owners of each of the 5 abutter wells listed above. The letters should explain the pumping test and provide the owner with the option to request that his/her well be monitored, at no expense to the owner. The letter should explain the risk of introducing bacteria into the well, and the owner should be aware that he/she can refuse the monitoring. Also, it should be made clear that the well will be sampled by the Applicant and tested for bacteria before and after the monitoring. If the post-test sample is positive, the well will be disinfected, at the Applicant's expense, and bottled water will be provided until the well is flushed and a "clean" sample is obtained. Also, the well owner, the ZBA, and the BOH will be provided with the results of any bacteria testing.
- The letters should also explain that if the owner grants permission for monitoring, this does not guarantee that monitoring will occur. For example, Nobis believes that monitoring one of the 3 wells on the other side of North Main Street will be sufficient, even if all 3 owners say "yes".
- The Applicant should be asked to monitor up to 3 abutter wells, in the following priority:
    1. 61 North Main St. – This well is the closest to the SV wells and should be monitored if permission is granted and monitoring is feasible, as described above.
    2. 55 North Main St. – This well is the second closest well to Well 2 and in a different direction from the site than the other wells under consideration.
    3. One of the 3 wells on the other side of North Main St.
- Also, if a Stilling Well cannot be installed "easily", the Applicant should not be expected to proceed with monitoring that well. For example, if the driller installing the Stilling Wells believes that the Stilling Well can only be installed if the well pump is pulled, then this well should not be monitored. Any action that may disrupt the abutter's water supply or that the driller feels is too risky should not be undertaken.
- The Applicant should provide copies of the certified mail receipts to the ZBA and the BOH. After 10 days following the mailing to the abutters, the Applicant should inform the ZBA and the BOH regarding the responses to the mailing (permission granted, permission denied, or no response), and pumping test plans, including monitoring up to 3 abutter wells, should be finalized.
- Abutter well monitoring should include the installation of a pressure transducer, programed to collect a water level measurement once per minute. This monitoring should begin at

least 24 hours before the pumping phase of the test and should continue for at least 24 hours after pump shut down.

- For abutter well monitoring, Nobis can provide a detailed, recommended procedure that Nobis has used in similar situations, upon request. The procedure should include sampling and analysis for bacteria both before and after the monitoring procedure, at no expense to the well owner.
- Water level data from the transducers should be plotted vs. time (arithmetic) for each abutter well monitored. The data should be interpreted by a qualified professional to assess the amount of impact, if any, on the abutter well due to the pumping test. The graphs should be provided to the ZBA, BOH, and well owners.
- Other data analyses and water sampling activities, that are not in dispute, should still be conducted as proposed.

It has been a pleasure to work with all parties on this project. Thank you for the opportunity to be of service. Nobis will be pleased to provide additional services regarding this project, if requested. If you require additional information, please contact us at (603) 224–4182.

Sincerely,

Nobis Engineering, Inc.

James H. Vernon, Ph.D., P.G.
Senior Hydrogeologist

Cc: Peter Bemis, EDC
Vin Gately, The Heritage Company
Don Provencher, Provencher Engineering
Ellen Hartnett, Town of Sherborn
Jeanne Guthrie, Town of Sherborn

Attachments:

Attachment 1: Site Plan with Wells; Well Drilling Permits and Reports; Hydrofracturing Notes
Attachment 2: Applicant Pumping Test Plan (12/20/17)
Attachment 3: BOH Pumping Test Email (1/25/18)
Attachment 4: Sample Well Monitoring Letter and Permission Form

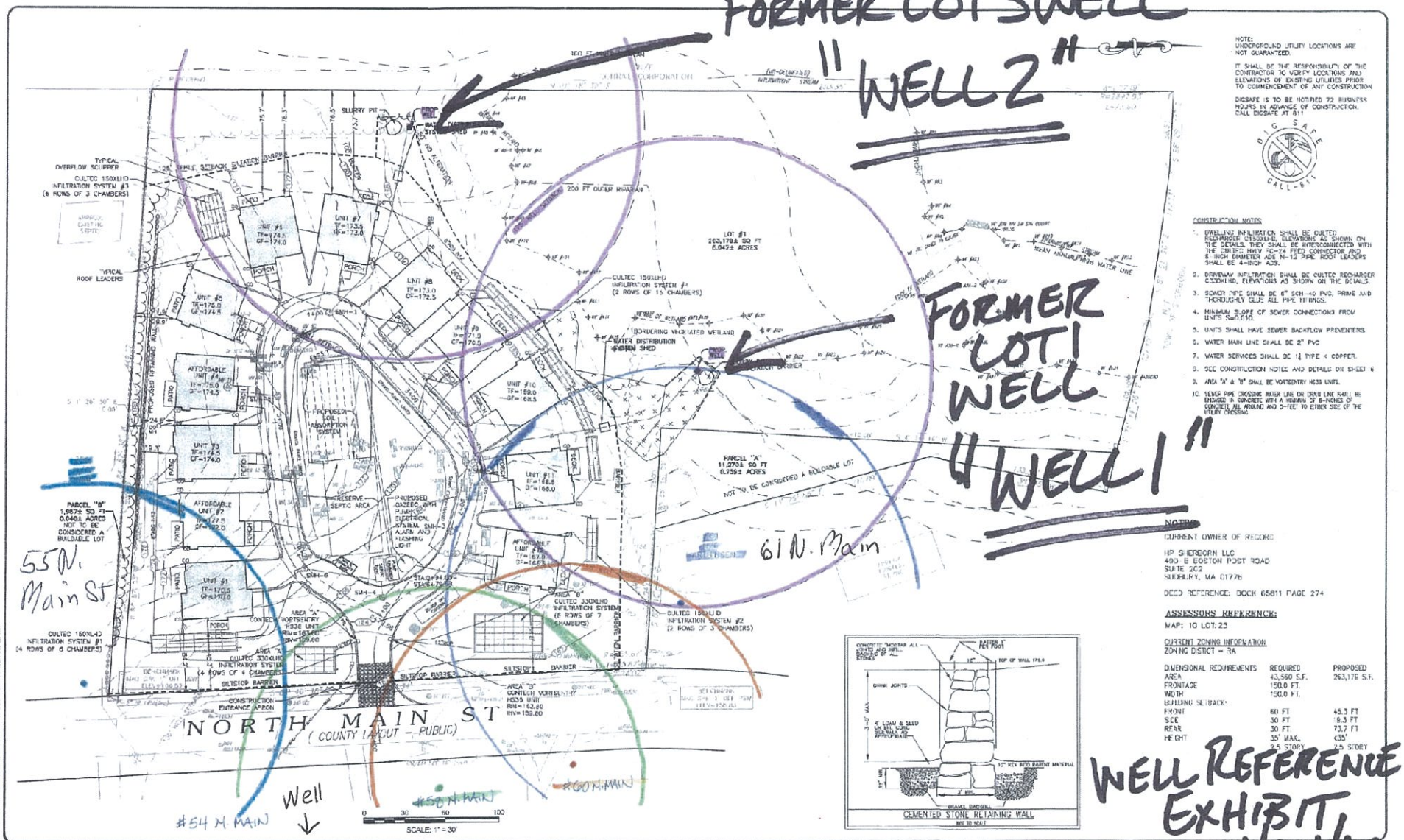
ATTACHMENTS

Attachment 1

Site Plan with Wells

Well Drilling Permits and Reports

Hydrofracturing Notes



North is to the right

Rec'd by Nobis from EDC 1/24/18
Notations added by Nobis 1/29/18

Fee: $400.00 Application No.: 15-24

SHERBORN BOARD OF HEALTH
APPLICATION FOR WELL CONSTRUCTION PERMIT

Application is hereby made for a permit to: (✓)Construct; or ( )Repair and Individual Well at:

LOCATION – ADDRESS NORTH MAIN ST. **or LOT NO.** LOT 1

OWNER JULIANI LABRONI PROPERTIES, LLC **ADDRESS** ONE HOLLIS ST. SUITE 207 WELLESLEY, MA **TELEPHONE** 781-727-1015

TYPE OF BUILDING RESIDENTIAL **SIZE LOT** _____ **sq. ft.**

WELL CONTRACTOR _____
ADDRESS _____
TELEPHONE _____

TYPE OF WELL CONSTRUCTION: **(✓)Rotary Drilled;** **( )Percussion Drilled;** **( )Bored**

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DISTANCE FROM DISPOSAL SYSTEM _____ **feet**

Agreement: The undersigned agrees to construct the aforementioned well in accordance with the provisions set forth by the Sherborn Board of Health and latest sanitary engineering requirements. The undersigned further agrees not to place the well in operation until the quantity and quality of the water supply has been presented to said Board of Health to their satisfaction.

SIGNED: _____ **DATE:** 3-26-15

This form must be submitted to the Sherborn Board of Health after it has been properly completed in order to obtain a Building Permit after well construction.

TO BE COMPLETED BY BOARD OF HEALTH:
DATE RECEIVED: 4/1/15 feh ***DATE APPROVED:*** _____

Application No.: 15-24 Date: 7/23/15

SHERBORN BOARD OF HEALTH
WELL CONSTRUCTION PERMIT

Permission is hereby granted to Licensed Well Driller

to: (X)construct; or ( )repair a well at: Lot 1 @ 59 North Main Street

_____ or Lot. No. _____

as shown on the application for well permit.

APPROVED BY: _____ DATE: 7/23/15
Ethan Mascoop, Supplemental Health Agent

APPLICATION FOR APPROVAL OF WELL

Application is hereby made for approval of the well constructed under Permit # _____

Located at: _____
DEPTH OF WELL: _____ feet DEPTH OF CASING: _____
YIELDING CAPACITY OF WELL PER MINUTE: _____ gallons.

Enclosed herein is a laboratory analysis of a sample taken from the well and analyzed by an approved laboratory.

SIGNATURE: _____ DATE: _____

WELL APPROVED BY: _____ DATE: _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Well Driller Program
Well Completion Reports(General)

Driller	ANDY BREWER	Registration #	862	Monitoring [M]	Supervising Driller Signature	BREWER, ANDREW, W
Firm	BAY STATE PUMP CO., INC.	Rig Permit #	178		Date Job Complete	11162017

NOTE: Well Completion Reports must be filed by the registered well driller within 30 days of well completion.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Well Driller Program
Well Completion Reports(General)

From	To	Type	Slot Size	Diameter
		--- Choose Screen Type ---		

WATER-BEARING ZONES ☐ DRY WELL

From	To	Yield (gpm)
300	330	5

PERMANENT PUMP (IF AVAILABLE)

Pump Description: --- Choose Pump Description ---

Horsepower: --- Choose Horsepower ---

Pump Intake Depth (ft)

Nominal Pump Capacity (gpm)

ANNULAR SEAL / FILTER PACK

From	To	Material 1	Weight	Material 2	Weight	Water (gal)	Batches (count)	Method Of Placement
0	29	Cement/Bentonite Grout		Choose Material				Tremie

WELL TEST DATA

Date	Method	Yield (gpm)	Time Pumped (HH:MM)	Pumping Level (ft BGS)	Time To Recover (HH:MM)	Recovery (ft BGS)
11162017	Constant Rate Pump	15	06:00	213	00:15	13
09192017	Air Blow With Drill Stem	5	00:30	800	24:00	54

WATER LEVEL

Date Measured	Static Depth BGS (ft)	Flowing Rate (gpm)
11162017	6	

COMMENTS

WELL DRILLERS STATEMENT

This well was drilled or altered under my direct supervision, according to the applicable rules and regulations, and this report is complete and accurate to the best of my knowledge.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Well Driller Program
Well Completion Reports(General)

Well Driller - General Well Form

DRILLING METHOD

Overburden	Bedrock
Mud Rotary	Air Hammer

WELL LOG OVERBURDEN LITHOLOGY

From(ft)	To(ft)	Code	Color	Comment	Drop in drill stem	Extra fast or slow drill rate	Loss or addition of fluid
0	2	Organics	Black		YES NO	Fast Slow	Loss Addition
2	9	Organics	Yellowish Brown		YES NO	Fast Slow	Loss Addition

WELL LOG BEDROCK LITHOLOGY

From(ft)	To(ft)	Code	Comment	Drop in drill stem	Extra fast or slow drill rate	Loss or addition of fluid	Visible Rust Staining	Extra Large Chips
9	29	Gneiss	CASED	YES NO	Fast Slow	Loss Addition	Yes	Yes
29	100	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
100	200	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
200	300	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
300	400	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
400	500	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
500	600	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
600	700	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes

ADDITIONAL WELL INFORMATION

Developed: Yes No

Disinfected: Yes No

Total Well Depth: 700

Depth to Bedrock: 9

Surface Seal Type: Concrete

Fracture Enhancement: Yes No

CASING Is Casing above ground? From: 2 To: 0

From	To	Type	Thickness	Diameter	Driveshoe
0	29	Steel	17#	6.625	Yes

SCREEN No Screen

Well Driller

Please specify work performed:
New Well

Please specify well type:
Domestic

Number Of Wells:

Well Location

In public right-of-way:
○ Yes ○ No

Subdivision/Property/Description:
55 AND OVER HOUSING

Property Owner:
H P SHERBORN LLC

Engineering Firm:
ENGINEERING DESIGN CONSULTANTS

Address at well location:

Street Number:	Street Name:
59	NORTH MAIN STREET
Building Lot#:	Assessor's Map #:
1	
Assessor's Lot#:	ZIP Code:
	01770

City/Town:
SHERBORN

GPS

North:	West:
42.25164	71.37015

Mailing Address:
☐ click here if same as well location address

Street Number:	Street Name:
490	BOSTON POST ROAD
City/Town:	State:
SUDBURY	MASSACHUSETTS
ZIP Code:	
01776	

Board of health permit obtained:
◉ Yes ○ Not Required

Permit Number:	Date Issued:
17 67	07/19/2017

Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

To retain a copy of this file you must save and/or print.

Username:	**BSPCI**
Transaction ID:	**978022**
Document:	**Well Driller**
Size of File:	**398.00K**
Status of Transaction:	**In Process**
Date and Time Created:	**12/13/2017:1:10:13 PM**

Note: This file only includes forms that were part of your transaction as of the date and time indicated above. If you need a more current copy of your transaction, return to eDEP and select to “Download a Copy” from the Current Submittals page.

Fee: $400.00 Application No.: 15-28

SHERBORN BOARD OF HEALTH
APPLICATION FOR WELL CONSTRUCTION PERMIT

Application is hereby made for a permit to: (✓)Construct; or ( )Repair and Individual Well at:

LOCATION – ADDRESS NORTH MAIN ST. **or LOT NO.** LOT 3

OWNER JULIANI LABDONI PROPERTIES, LLC **ADDRESS** ONE HOLLIS ST. SUITE 207 WELLESLEY, MA **TELEPHONE** 781-727-1015

TYPE OF BUILDING RESIDENTIAL **SIZE LOT** _____ **sq. ft.**

RECEIVED
APR 01 2015
SHERBORN BOARD OF HEALTH

WELL CONTRACTOR _____
ADDRESS _____
TELEPHONE _____

TYPE OF WELL CONSTRUCTION: **(✓)Rotary Drilled;** **( )Percussion Drilled;** **( )Bored**

DISTANCE FROM DISPOSAL SYSTEM _____ **feet**

Agreement: The undersigned agrees to construct the aforementioned well in accordance with the provisions set forth by the Sherborn Board of Health and latest sanitary engineering requirements. The undersigned further agrees not to place the well in operation until the quantity and quality of the water supply has been presented to said Board of Health to their satisfaction.

SIGNED: _____ **DATE:** 3-26-15

This form must be submitted to the Sherborn Board of Health after it has been properly completed in order to obtain a Building Permit after well construction.

TO BE COMPLETED BY BOARD OF HEALTH:
DATE RECEIVED: 4/1/15 /ch ***DATE APPROVED:*** _____

Application No.: 15-28 Date: 7/23/15

SHERBORN BOARD OF HEALTH
WELL CONSTRUCTION PERMIT

Permission is hereby granted to Licensed Well Driller

to: (X)construct; or ( )repair a well at: Lot 3 @ 59 North Main St.

_____ or Lot. No. _____

as shown on the application for well permit.

APPROVED BY: _____ DATE: 7/23/15
Ethan Mascoop, Supplemental Health Agent

APPLICATION FOR APPROVAL OF WELL

Application is hereby made for approval of the well constructed under Permit # _____

Located at: _____
DEPTH OF WELL: _____ feet DEPTH OF CASING: _____
YIELDING CAPACITY OF WELL PER MINUTE: _____ gallons.

Enclosed herein is a laboratory analysis of a sample taken from the well and analyzed by an approved laboratory.

SIGNATURE: _____ DATE: _____

WELL APPROVED BY: _____ DATE: _____

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Well Driller Program
Well Completion Reports(General)

and accurate to the best of my knowledge.

Driller	ANDY BREWER	Registration #	862	Monitoring [M]	Supervising Driller Signature	BREWER, ANDREW, W
Firm	BAY STATE PUMP CO., INC.	Rig Permit #	178		Date Job Complete	11152017

NOTE: Well Completion Reports must be filed by the registered well driller within 30 days of well completion.

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Well Driller Program
Well Completion Reports(General)

0	39	Steel	17#	6.625	☑ Yes

SCREEN ☑ No Screen

From	To	Type	Slot Size	Diameter
		--- Choose Screen Type ---		

WATER-BEARING ZONES ☐ DRY WELL

From	To	Yield (gpm)
280	300	2

PERMANENT PUMP (IF AVAILABLE)

Pump Description: --- Choose Pump Description ---
Horsepower: --- Choose Horsepower ---
Pump Intake Depth (ft)
Nominal Pump Capacity (gpm)

ANNULAR SEAL / FILTER PACK

From	To	Material 1	Weight	Material 2	Weight	Water (gal)	Batches (count)	Method Of Placement
0	39	Cement/Bentonite Grout		Choose Material				Tremie

WELL TEST DATA

Date	Method	Yield (gpm)	Time Pumped (HH:MM)	Pumping Level (ft BGS)	Time To Recover (HH:MM)	Recovery (ft BGS)
11152017	Constant Rate Pump	16	06:00	168	00:15	11
09132017	Air Blow With Drill Stem	2	00:30	800	24:00	68

WATER LEVEL

Date Measured	Static Depth BGS (ft)	Flowing Rate (gpm)
11152017	6	

COMMENTS

WELL DRILLERS STATEMENT

This well was drilled or altered under my direct supervision, according to the applicable rules and regulations, and this report is complete

Massachusetts Department of Environmental Protection
Bureau of Resource Protection – Well Driller Program
Well Completion Reports(General)

Well Driller - General Well Form

DRILLING METHOD

Overburden	Bedrock
Mud Rotary	Air Hammer

WELL LOG OVERBURDEN LITHOLOGY

From(ft)	To(ft)	Code	Color	Comment	Drop in drill stem	Extra fast or slow drill rate	Loss or addition of fluid
0	2	Organics	Black		YES NO	Fast Slow	Loss Addition
2	18	Silty Sand And G	Yellowish Brown	BOULDERS,COBBLES	YES NO	Fast Slow	Loss Addition

WELL LOG BEDROCK LITHOLOGY

From(ft)	To(ft)	Code	Comment	Drop in drill stem	Extra fast or slow drill rate	Loss or addition of fluid	Visible Rust Staining	Extra Large Chips
18	39	Gneiss	CASED	YES NO	Fast Slow	Loss Addition	Yes	Yes
39	100	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
100	200	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
200	300	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
300	400	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
400	500	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
500	600	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
600	700	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes
700	800	Gneiss		YES NO	Fast Slow	Loss Addition	Yes	Yes

ADDITIONAL WELL INFORMATION

Developed: Yes No

Disinfected: Yes No

Total Well Depth: 800

Depth to Bedrock: 18

Surface Seal Type: None

Fracture Enhancement: Yes No

CASING Is Casing above ground? From: 2 To: 0

From	To	Type	Thickness	Diameter	Driveshoe

Well Driller

Please specify work performed:
New Well

Please specify well type:
Domestic

Number Of Wells:

Well Location

In public right-of-way:
○ Yes ○ No

Subdivision/Property/Description:
55 AND OVER HOUSING

Property Owner:
H P SHERBORN LLC

Engineering Firm:
ENGINEERING DESIGN CONSULTANTS

Address at well location:

Street Number:	Street Name:
59	NORTH MAIN STREET
Building Lot#:	Assessor's Map #:
3	
Assessor's Lot#:	ZIP Code:
	01770

City/Town:
SHERBORN

GPS

North:	West:
42.25144	71.37045

Mailing Address:
☐ click here if same as well location address

Street Number:	Street Name:
490	BOSTON POST ROAD
City/Town:	State:
SUDBURY	MASSACHUSETTS
ZIP Code:	
01776	

Board of health permit obtained:
◉ Yes ○ Not Required

Permit Number:	Date Issued:
17 71	07/19/2017

Massachusetts Department of Environmental Protection

eDEP Transaction Copy

Here is the file you requested for your records.

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Username:	**BSPCI**
Transaction ID:	**977932**
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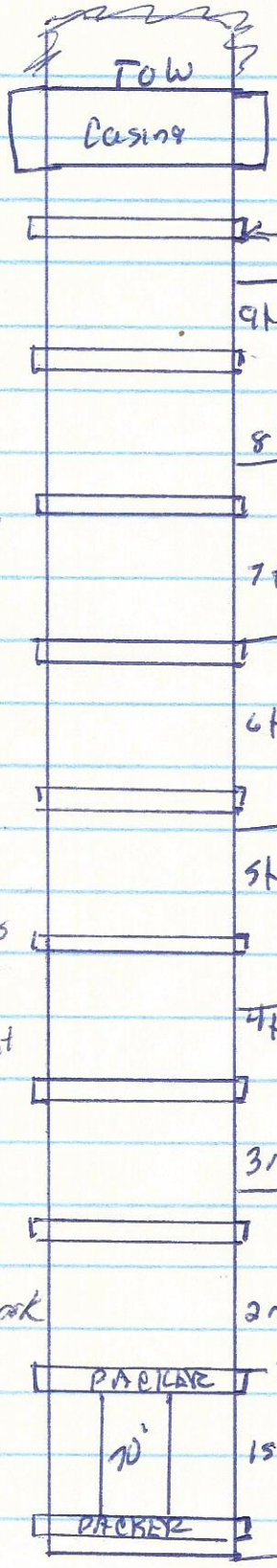
~~70' Casing~~ 59 North Main St. Sherborn MA

No House. Old Property but paved apron off road into grassy area



5th 2 min low 1700-1300~1100
10 min High 1100-900
low return no color, may broke around packer

4th 10 min low 1400 No change
no color med return

3rd 5 min low 2000+~1800, 1500, 1100
10 min High 1100~850
small return-no color/no sediment

2nd 10 min low 2000+~1100
High 1100-800
med return light grey/dark
lots Sediment

1st 10 min low 1300-900
High 1200-800
med return/~~no color~~ lt grey

6th 10 min low ?-1400~1100
High 1100-700/11~9 At 5 min
low return/no color

7th 10 min low 0-700
High 1100-900
no color/low return

8th 7 min low 1700-600~400
High 600-300
light Grey/med return/no sediment

9th low 1700-1200~1000
High 1100-900~500
med return/green grey no sediment

Static 6' 9:20 AM
17 gpm
163.4' Drawdown

2nd well Drilled

Well Depth 700 Ft Casing Depth 30 Ft

1st 4min low 1500-1000
10 min High 1100-700
med return/No color

2nd 5 min Low 2000+/1500~1000
10 min High 1100-1000
Low return No color

3rd 2min Low 2000+ - 1800~1000
↓ High 1000
med return No color

4th Low 1500-1300~1000
10 min High 1200-900
low return No color

5th Low 1800-1500~1000
10min High 1200~800
Low return No color

6th Low 1500-900
10min High 1200~800
med return No color

well #2

7th Low 2000-900
5min High 1100~600 fractured around top packer
Low return No color

8th Low 200
3min High 300
Low return No color/low flow over top of well

Drawdown post Frack
213 Ft at 15-16 GPM

Attachment 2

Applicant Pumping Test Plan (12/20/17)

Engineering Design Consultants, Inc.

32 Turnpike Road
Southborough, MA 01772
Phone: (508) 480-0225

E-mail: mail@edcma.com
FAX: 1-800-832-5781

December 20, 2017

Board of Health
Town Hall
Sherborn, Massachusetts 01770

Reference: 59 North Main Street
Sherborn Village
Sherborn, Massachusetts
EDC Job No.: 3438

Dear Board Members:

On behalf of Heritage Properties, we writing to request recognition and/or transfer of the existing well permits previously issued for 5-bedroom residence on Lots 1 and 3 at 59 North Main Street to the current 12-unit Sherborn Village 40B project. Each well will serve 6-units that are age-restricted 55 and older with each unit containing only 2-bedrooms. The wells have been drilled by Bay State Pump Company of Holden Massachusetts, however only well development has been completed to date with no quality or quantity testing. As previously presented to the Sherborn Zoning Board of Appeals, EDC has contracted with Provencher Engineering in order to provide for well testing and analysis services. In a separate memo dated 12/14/17 to Mark Oram and the Board, Mr. Provencher outlines his recommended procedure for well testing. We are hopeful that the Board will agree to this well testing procedure so that we can begin the process in order to permit these new potable water sources to serve the Sherborn Village project. Thank you for your consideration of this request.

Very truly yours,

ENGINEERING DESIGN CONSULTANTS, INC.

Peter Bemis

MEMORANDUM

PROVENCHER ENGINEERING, LLC

Donald A. Provencher, PE
6 Wasserman Heights
Merrimack, NH 03054

Phone / fax: (603) 883-4444
E-mail: Don@Provencher.com

TO: Mark Orham, Sherborn Board of Health

FROM: Donald A. Provencher, P.E.

DATE: December 14, 2017

REFERENCE: Proposed Pump Test / Water Sampling Procedure, & Water System Concept
Sherborn Village, 59 North Main Street, Sherborn, Massachusetts
Project No. PE320.01

PURPOSE:

The purpose of this memorandum is to present our proposal for pump testing and water quality sampling of two on-site bedrock water supply wells, and to describe the conceptual water system design, proposed to serve potable water to the above site.

PROPOSED CONCEPTUAL WATER SUPPLY DESCRIPTION:

Sherborn Village includes 12 age-restricted (55+ year old) single-family dwelling units, each with 2 bedrooms. The total daily water demand, based on Title 5 sewage flow estimates of 150 gallons per day (GPD) per unit is 1,800 GPD, or a 24-hour average demand of 1.25 GPM. Two wells were installed, and each well is proposed to serve 6 units, 12 bedrooms, and no more than 24 people. Each well will therefore supply 900 GPD of estimated water demand in each separate water system.

Wells-1 & 2 were drilled to 700 and 800 feet, respectively; achieved air-test yields at the end of drilling using the drill rods of 5 and 2 GPM, respectively; and subsequently achieved constant pump test rates of 15 and 16 GPM, at drawdowns of 162 and 207 feet, respectively, after 6-hours of pumping. While it would be possible to supply the short-duration peak flow at each water system directly by high capacity well pumps, by using stored water in the well column above the well pumps as a buffer, we propose a more conservative approach of pumping the well water into an atmospheric storage tank of between 750 – 1,000 gallons for each water system, so that each well can pump at a lower 5 GPM pumping rate over a longer run time, to slowly replenish well water into each respective storage tank. Maintaining low well pumping rates in the permanent systems creates less drawdown fluctuation and stress on the aquifer and well, and will reduce the size of any treatment vessels or filters, should treatment be required.

We propose to install dual booster pumps for each water system. The boosters will draw the stored water from the storage tank and pressurize a distribution system to deliver the peak flow demand throughout each system. We propose to locate the atmospheric tank, booster pumps, any required water treatment, and well controls inside a dedicated water supply room. This water supply room is proposed to be a partitioned section of a basement in a selected dwelling in each water systems. This is a similar water supply design concept as what was constructed at Abbey Road in Sherborn, also designed by us.

We propose a separate dedicated entrance access from the outside into each water supply room to allow access for maintenance personnel, while not disturbing the residents. The distribution line will leave the water supply room and run underground with service connections to each of the six dwellings in each water system. No interconnections are proposed. Power consumption will be metered separately from the rest of the dwellings, and the water system costs will be divided equally among the six homeowners in each of the two water systems.

PROPOSED PUMP TEST AND WATER QUALITY SAMPLING:

Based on our review of the Sherborn Board of Health (BOH) Regulations, (herein referenced as "the regs"), regarding Section II (Domestic Water Supply), and Section III (Public and Environmental Health Review Regulations and Standards for Other Than a Single family Dwelling on a Single Lot), Sherborn Village would fall under Section III, and not Section II of the regs, if Sherborn Village was not otherwise exempt under a Comprehensive Permit. However, we will attempt to comply with both sections to the extent feasible and practicable.

Consequently, to address section 3.1 of the regs, which requests the applicant to estimate the project's effects on public and private water supply sources; and to address section 4.0 of the regs, which requires the applicant to provide evidence that the project will not have unacceptable effects upon the public or environmental health, we are proposing a 24-hour pump test procedure to address those concerns. Our pump test proposal exceeds the requirements contained in the regs, which only require a 4-hour pump test.

Our proposal is to conduct individual 24-hour pump tests on each well, while monitoring water levels in both wells (i.e. the pumping well and the non-pumping "observation" well). Following water level recovery from the first pump test, we propose to perform the same pump test procedure switching the wells, using the observation well as the pumping well, and the prior pumping well as the observation well. This will allow us to calculate drawdown at each pumping well, as well as the induced drawdown at each observation well. Then, using drawdown versus log distance graphs of the distance between the two on-site wells, we can then estimate the induced drawdown from both pumping wells, onto abutting wells, using the distance between the abutting wells and the on-site wells.

We propose to develop a drawdown versus log time graph from both pump tests, and to extrapolate the time-drawdown line from the graphs, out to 180 days, to determine the 180-day projected drawdown at the pumping and observation wells. This method is used for public wells as governed by the Department of Environmental Protection (DEP). With the 180-day projected drawdowns, we can then develop a 180-day drawdown versus log distance graph from both pump tests, and determine the projected 180-day drawdown at any abutting well, due to the pumping of both wells, by adding both induced drawdowns together, based on a hydrogeologic principle called superposition. If those induced drawdowns at the abutting wells are not problematic to those wells, the project would be considered to not have unacceptable effects upon public and private water supply sources. Using the drawdown versus log distance graphs, we can also determine the distances to zero drawdown, also known as the zones of contribution to the wells, pursuant to section 7.0 of the regs.

Section 11.1 of the regs suggests a 300 GPD per bedroom minimum well yield. If we consider each well serving 12 bedrooms, that implies a minimum yield of 3,600 GPD, or a 24-hour average of 2.5 GPM. Since we propose to pump the wells at approximately 5 GPM in each permanent water system, we propose a pump test rate of 5 GPM (7,200 GPD). This is double the required well yield based on section 11.1 of the regs, and is eight times greater than the total daily water demand of 900 GPD (0.625 GPM). We believe this is more than conservative.

Specifically, we propose the following pump test and water sampling procedure:

1. Set up the pumping well with a discharge line at the top of the well, including a sample tap, totalizing flow meter, ball valve, and discharge hose directed to discharge at the closest edge of the existing wetland, where a constant head surface water body already exists.
2. Record initial (pre-pumping) depths to static water level in both on-site wells.
3. Record the initial (pre-pumping) flow meter reading.
4. Begin pumping the pumping well at 5 GPM. Maintain 5 GPM throughout the 24-hour test.
5. Record water levels in the pumping well every 5 minutes for the first hour.
6. Record water levels in the pumping and observation wells hourly, and record the flow meter reading hourly for the remainder of the test. Adjust the ball valve to maintain 5 GPM.
7. Just prior to 24 hours, collect water samples from the pumping well for all parameters listed in section 17.3 of the regs, and deliver to Nashoba Analytical Lab in Ayer, Massachusetts.
8. Cease pumping after the 24-hour readings are completed, and begin recovery readings every 5 minutes for one hour at the pumping well, and then hourly at both wells.
9. Return to the site after 95% recovery is achieved, and commence second pump test on the previous observation well, using the previous pumping well as an observation well, following the steps above.

After both pump tests are completed, we propose to prepare the graphs described above, conduct 180-day projections on both pumping and both observation wells, estimate the zone of contribution to the wells, and estimate the projected 180-day induced drawdowns on abutting wells. We will prepare a Pump Test Report summarizing the above analyses, and provide an opinion of the acceptability of the projected 180-day drawdowns for on-site and abutting wells.

We believe using on-site wells as observation wells, and estimating drawdown projections on abutting wells is a far more reasonable approach than attempting to physically monitor abutting wells, for several reasons. First, an abutting well would need to be off-line to provide any meaningful data. Consider an active abutting well, where the water level fluctuates by as much as 25 to 75 feet, or more during individual pumping cycles under its own normal water use. It would be impossible to discern induced drawdowns from another pumping well. Instead, the abutting well would need to be turned off prior to, during, and between both 24-hour pump tests to obtain any meaningful data. This would be a significant inconvenience to the abutter. Additionally, opening up an active abutting well, and inserting a water level measuring probe opens up the potential for introducing contamination into the well, mechanical malfunction, and entanglement of the measuring device with power cables inside the well. In lieu of this, we believe we have proposed a sound pump test proposal that exceeds the requirements of the regs.

Attachment 3

BOH Pumping Test Email (1/25/18)

James Vernon

From: Ellen Hartnett <ellen.hartnett@sherbornma.org>
Sent: Thursday, January 25, 2018 1:23 PM
To: James Vernon; Richard S. Novak
Cc: Jeanne Guthrie
Subject: FW: Contract - 59 North Main

See below information from the BOH Chair.

Ellen Hartnett, BOH Administrator
Sherborn Board of Health
508-651-7852
Ellen.hartnett@sherbornma.org

From: Daryl Beardsley, Town of Sherborn [mailto:darylsherborn@gmail.com]
Sent: Thursday, January 25, 2018 1:17 PM
To: Ellen Hartnett <ellen.hartnett@sherbornma.org>; 'Lisa Campe' <lisa.campe.sherbornboh@gmail.com>
Subject: RE: Contract

Hi Ellen:

You can let the ZBA and Jim Vernon know that what the BOH has described verbally at several ZBA and BOH meetings is that the following approaches or equivalent/greater be employed:

- &#61623 the 2 wells be pumped simultaneously for at least 48 hours;
- &#61623 the dynamics of the wells (levels, GPM yields, etc. over time) be tracked during the pumping;
- &#61623 neighboring wells be monitored for impacts during the 48 hour pump test; and
- &#61623 pumped waters be discharged to the ground on-site in a manner that promotes re-infiltration rather than run-off off site.

The BOH described these pre-existing protocols (see below) early on when the applicant was uncertain about how to proceed for what is essentially a well field for the project. However, standard practice is for the project proponent to present plans to the BOH for consideration, not for the BOH to develop such plans for each project. Once the applicant presented their pump test plans, the BOH raised these issues again because the proposed methods did not:

- &#61623 address the BOH's request for information clearly demonstrating how use of each well would affect the other on-site well; nor
- &#61623 enable confirmation that neighbors' wells would not be rendered insufficient by full use of the two new wells.

The pump test methods and concerns arise from:

- &#61623 protocols used at another multi-well EA project in Sherborn;
- &#61623 protocols identified for another 40B project in Sherborn (which has since changed to PWS status);
- &#61623 similar methods required by MassDEP for new PWSs (noting that the MassDEP requirements for systems serving 25+ people are more rigorous; this project is designed to house 48 people);
- &#61623 well issues raised by neighbors; and
- &#61623 BOH Regulations of Section III that call for environmental and health impact assessments for projects that are other than a single-family home on a single lot.

Please ask them to contact the BOH anytime with any questions or comments.

Daryl Beardsley
BOH Chair

-----Original Message-----
From: Ellen Hartnett [mailto:ellen.hartnett@sherbornma.org]
Sent: Wednesday, January 24, 2018 4:00 PM
To: 'Daryl Beardsley - Sherborn (darylsherborn@gmail.com)'; Lisa Campe (lisa.campe.sherbornboh@gmail.com)
Subject: FW: Contract
Importance: High

From: James Vernon [mailto:jvernon@nobiseng.com]
Sent: Wednesday, January 24, 2018 3:49 PM
To: Ellen Hartnett <ellen.hartnett@sherbornma.org>; Richard S. Novak <rnovak@pierceatwood.com>
Cc: Jeanne Guthrie <jeanne.guthrie@sherbornma.org>
Subject: RE: Contract

1/24/18

Thanks to all.

To clarify, it is my understanding that my primary role is to consider the BOH's required or proposed pumping test plan on the one hand, and the applicants proposed pumping test plan. My understanding is that the primary areas of dispute are: 1. Whether to monitor abutters' wells; 2. The duration of the test.

If I have misunderstood my charge, please let me know.

At this point, I have the applicant's proposal, but not the BOH's proposal/request/requirement.

Thanks,
Jim

From: Ellen Hartnett [mailto:ellen.hartnett@sherbornma.org]
Sent: Wednesday, January 24, 2018 3:40 PM
To: James Vernon <jvernon@nobiseng.com<mailto:jvernon@nobiseng.com>>; Richard S. Novak <rnovak@pierceatwood.com<mailto:rnovak@pierceatwood.com>>
Cc: Jeanne Guthrie <jeanne.guthrie@sherbornma.org<mailto:jeanne.guthrie@sherbornma.org>>
Subject: RE: Contract

I have forwarded your email below to BOH Chair Daryl Beardsley and BOH member Lisa Campe.

Ellen Hartnett, BOH Administrator
Sherborn Board of Health
508-651-7852
Ellen.hartnett@sherbornma.org<mailto:Ellen.hartnett@sherbornma.org>

From: James Vernon [mailto:jvernon@nobiseng.com]
Sent: Wednesday, January 24, 2018 3:34 PM

Attachment 4

Sample Well Monitoring Letter

Permission Form

_____ __, 2018

Well Owner Name
Mailing Address
Sherborn, MA 01770

Re: FORM LETTER REQUESTING ACCESS TO MONITOR WATER LEVELS IN A PRIVATE WATER SUPPLY WELL, Located at _____ (physical address), Sherborn Tax Lot _____

Dear Well Owner:

Provencher Engineering, LLC (Provencher), on behalf of Heritage Properties (Heritage), West Sudbury, Massachusetts is requesting information about, and permission to access your well because Heritage is proposing to develop two new wells intended to serve a proposed new housing development known as Sherborn Village and to be located at 59 North Main Street in Sherborn. The Sherborn Board of Health (BOH) requires an assessment of the possible impacts of these new wells on existing abutter wells in the area. Your well at the above referenced address has been identified as an existing abutter well for the project site.

You are not required to provide Provencher or Heritage information about your well, or to grant permission to access your well to collect water level measurements. However, any information you provide, or monitoring data that is collected from your well will allow our team and the Town of Sherborn to more fully assess if the withdrawal proposed by Sherborn Village will impact your water supply. In the absence of having information about, or having access to your well, the impact assessment will be completed using data collected from other nearby wells, or be based upon technical estimates.

The collection of water level measurements in your well will likely include the temporary installation of a water level measuring device that automatically records a water level measurement every few minutes. This device is installed in your well, above the pump. The device is generally left in the well for a period of three to seven days, so that the water level in your well can be measured prior to, during, and after an upcoming pumping test on Sherborn Village's new wells.

If you agree to allow Nobis and our project team to monitor your water well, Sherborn Village will be expected, by the Town of Sherborn, to meet the following requirements:

1) *Request permission from you in writing to access your well **(this letter)**.*

2) *The well monitoring will be conducted on behalf of **Provencher and Heritage by a licensed well water technician (driller, pump installer, or plumber). All investigations involving your well will be overseen by Provencher and/or Heritage.***

3) *The monitoring requirements will be as follows: Water level monitoring equipment will be installed in your well and will remain in your well for 3 – 7 days. Provencher or other project team member may take occasional manual water level measurements (during daylight hours only). The equipment will be removed from your well after the testing period. **The testing is scheduled to take place in _____(month) 2018.***

4) *In the event your well requires disinfection or you request this as a precautionary*

measure we will notify you via e-mail or USPS (in writing) when disinfection of the well will occur, and inform you that you should not drink or bathe in the water after the well is disinfected until it is completely flushed. ***(This letter constitutes an offer to disinfect your well if you grant permission for monitoring; if disinfection takes place, you will not be able to drink or bathe in the water until after the well is completely flushed; Heritage will supply bottled water for drinking in this case.)***

5) *If your water is adversely affected by the test,* ***testing of the new Sherborn Village wells will cease, and/or bottled water will be provided should your water needs be affected by the testing****;*

6) *The contact person in the event of water outage or other emergency during testing* ***is*** _____ ***(name and phone #).***

A primary concern of introducing foreign objects into a water well (the actual transducer) is that bacteria may be introduced into the well and impact water quality. The Town of Sherborn requires that Sherborn Village collect and analyze samples for total coliform bacteria, e-coli bacteria, and for non-coliform organisms. The Town of Sherborn requires that these biological water quality samples be collected prior to installing, and after removing monitoring equipment from the well to document pre- and post-monitoring water quality conditions. You may require that Sherborn Village collect these samples, and provide the laboratory results to you, and to no other third-party entity, if you allow your well to be monitored. If bacteria are introduced into your well during monitoring, Sherborn Village is required to disinfect the well (see Item 4 above).

Should you like more information (This paragraph optional; could put ZBA or BOH contact info here.)

Please contact _____, by return mail as to whether you wish to have your well monitored during testing of the Sherborn Village new wells, now planned for _____(date). Also, please complete the well information form (attached) to the best of your ability and return it to _____in the enclosed stamped, self-addressed envelope at your earliest convenience.

Very truly yours,

Cc:

Attachments:

Water Well Questionnaire

WELL MONITORING FORM

- YES - _____ *I would like to have my well monitored.*

- NO - _____ *I do not wish to have my well monitored.*

Name: _____ Date: _____

Address: _____ Tel. (W) _____, (H) _____

Email:_____

Best time to reach me is: _____

There are a few items we will need to know to coordinate monitoring, as this new test will also run for a continuous [length of test] hours. Please answer question 2 to the best of your knowledge:

1. The location of your well should be clearly marked. The cap must be clean and accessible, as the well will have to be opened (cover removed) to monitor water levels during the test.

2. Year well was installed: _____. Depth of Well _____.

3. Number of persons in household _____.

4. You should plan to keep a time log of when water is being used in the home during the testing, as this affects the water level in your own home well.

5. Monitoring of the level of water in your well will be done using an automatic measuring device placed in your well. We will only need to enter your property at the beginning and end of monitoring

6. _____ will need access to your property during the monitoring events, but just to measure water levels in the well and to collect water samples at the beginning and end of the monitoring. Access to your home will not be needed except for sample collection, if you have no outside spigot.

Signature: _____ Date: _____