

LEGGETTE, BRASHEARS & GRAHAM, INC.

PROFESSIONAL GROUNDWATER AND ENVIRONMENTAL ENGINEERING SERVICES

4 RESEARCH DRIVE, SUITE 204
SHELTON, CT 06484
(203) 929-8555
FAX (203) 926-9140
www.lbgweb.com

June 26, 2017

Mr. James Carnell, Jr.
Town of Thompson Building Department
4052 Route 42
Monticello, NY 12701

RE: Pumping Test Plan
Thompson Education Center
(T) Thompson, New York

Dear Mr. Carnell, Jr.:

Leggette, Brashears & Graham, Inc. (LBG) has prepared the following Pumping Test Plan for a proposed 72-hour pumping test program to be conducted on bedrock test wells located on the Thompson Education Center property at Wild Turnpike Road (SEC-BLK-LOT: 26-1-6) in Thompson, New York (figure 1). Bedrock test Wells # 1, 2 and 3 were drilled by Northern Drilling, Inc. between December 6 and January 26, 2017 after receiving approval in the form of Well Drilling permits from the Town of Thompson Building Department issued on August 2, 2016 (Appendix I). Bedrock Well #5 is an existing well located on the property that was drilled by a prior property owner. The table below shows a summary of the well construction details for the test wells drilled to date.

Well ID	Date Drilled	Casing Diameter (inches)	Casing Length (feet)	Total Depth (feet)	Depth of Reported Water-Bearing Fractures (feet)	Preliminary Yield (gpm)
TW-1	12/30/16	12/8	26/62	540	70 – 75	30-70
TW-2	1/23/17	8	50	600	240; 315	115
TW-3	2/1/17	8	52	710	218	5
TW-5 (aka Existing Well)	9/30/07	12/8	21/56	685	460; 570	85

The New York State Department of Health (NYSDOH) requires that for new developments that contain residential components the well capacity developed must be capable of meeting twice the maximum daily water demand with the best well out of service. The projected water demands for Phase I is approximately 217,500 gpd (gallons per day) or approximately 150 gpm (gallons per minute). To meet the NYSDOH requirements, the project must demonstrate a combined pumping rate of 300 gpm. Currently the combined yield of the

four wells ranges from 235 gpm to 275 gpm. This yield reduces to 120 gpm to 160 gpm with the best well (TW-2) taken out of service. Therefore, additional wells are needed to meet the NYSDOH requirements. Any additional wells drilled on the property will be included in the 72-hour test.

This Pumping Test Plan for the 72-hour pumping test program to be conducted on the Thompson Education Center test wells (once drilling has been completed) has been prepared in accordance with the NYSDOH Sanitary Code Part 5, subpart 5-1 Appendix 5-D and the New York State Department of Environmental Conservation (NYSDEC) February 2015 “Pumping Test Procedures for Water Withdrawal Applications”.

72-HOUR PUMPING TEST PROGRAM

Pumping Wells

A 72-hour pumping test will be conducted on the test wells located on the Thompson Education Center property to demonstrate stabilized yield and water-level drawdown in the test wells and to assess the long-term yield capacity. To meet the NYSDOH requirement of demonstrating the maximum daily water demand with the best well out of service, LBG is proposing to conduct a simultaneous 72-hour pumping test on all of the proposed water-supply wells with the exception of the highest yielding well (i.e. the “best well”). An individual 72-hour pumping test will be conducted separately on the best well to demonstrate its stabilized yield and water-level drawdown.

Pressure transducers will be installed in the pumping wells and will be set to record water-level data at one-minute intervals. Manual water-level measurements will also be collected from the pumping wells. If a transducer cannot be installed in a pumping well, LBG will attempt to collect manual measurements in accordance with the measuring schedule identified in the February 2015 NYSDEC guidance document. The water-level monitoring equipment installation will be conducted a minimum of one week prior to the start of pumping to collect background water-level information. The monitoring equipment will remain in the wells for a minimum of three days after the end of pumping to collect water-level recovery data.

For the combined well test, the pumping wells will be started in staggered fashion with approximate one hour between the start of the pump in each well. The pumping test will run for a minimum of 72 hours following the start of the pump in the final well, and will be extended beyond 72 hours if needed until stabilized yield and water-level drawdown have been demonstrated in the pumping wells. If a pumping rate reduction is conducted in any of the

pumping wells during the test period, then the testing period will be extended for a minimum of 24 hours after the last pumping rate reduction was completed, i.e. no pumping rate reductions will be conducted in the final 24 hours of the pumping test period.

The determination of water-level stabilization will be based on the NYSDOH Sanitary Code Part 5 Appendix 5-D and the NYSDEC February 2015 “Pumping Test Procedures for Water Withdrawal Applications”. The documents describe stabilization as a water level that fluctuates less than plus or minus 0.5 foot per 100 feet of water in the well (static water level to bottom of well) over a six-hour period of pumping at a constant flow rate and plotted measurements have not shown a decreasing trend.

If a decreasing trend is observed in the water level in a pumping well at the end of the test, LBG will employ Section 3.b.ii of the NYSDEC pumping test procedures document and construct a semi-logarithmic plot showing a 180-day water-level drawdown projection on a time-drawdown curve. If the water level in the test well remains above the pump intake plus a margin of 5% (but no less than 5 feet of the pre-test water column) based on the graph; the well’s water level is fluctuating less than plus or minus 0.5 foot per 100 feet of water in the well over a six-hour period of pumping at a constant flow rate; and the well has been pumped for at least 72 hours, the test will be ended.

The water from the test wells will be pumped to waste during the test period. The discharge locations will be downgradient of the wells and of sufficient distance from the wells to prevent artificial recharge of the aquifer during the tests. The discharge rate of the pumping wells will be measured hourly with a totalizing meter installed on the discharge line near the wellheads and confirmed with a volume-calibrated bucket and stopwatch at the end of the discharge hoses.

Surface-Water Monitoring

Surface-water monitoring will be conducted as part of the 72-hour pumping test program. Piezometers will be installed near each of the pumping wells in the nearby surface-water feature. If surface water is present at the monitoring location at the time the test is conducted, a single piezometer will be installed to measure potential changes in surface-water height and shallow groundwater and to assess any potential changes in vertical head as a result of pumping. If no

surface water is present, a nested-pair of piezometers will be installed at the monitoring location to measure potential changes in shallow groundwater and vertical head.

The surface-water feature located on the site is a wetland and flow in the wetland is dispersed. LBG has not observed channelized stream flow within 500 feet of any of the pumping wells drilled to date. As a result, no stream gaging is proposed to be conducted as part of the pumping test program because no suitable locations for gaging are available.

Well Monitoring Locations

Water-level measurements will be collected from all accessible wells located on the Thompson Education Center property which currently includes Test Well-1, Test Well -2, Test Well-3 and Test Well-5 (Plate 1). In addition, LBG has also contacted property owners within an approximate 2,500-foot radius of the pumping wells with a request for authorization to measure the water levels in their wells during the pumping test period. To date, 19 homes in the vicinity of the property were solicited, with 7 property owners providing written permission to monitor their private water supply well. A map of the property owners who have agreed to participate in the monitoring program are also included on Plate 1. If their well is accessible, a pressure transducer will be installed in the well (if possible) and will be set to record water-level data at one-minute intervals. Manual water-level measurements will also be collected throughout the testing period. If a transducer cannot be installed in a well, LBG will collect manual measurements from the well in sufficient quantity to assess potential water-level impact and also to differentiate the well's pumping cycle from drawdown potential caused by the onsite pumping wells, if any. The water-level monitoring equipment installation will begin one week prior to the start of pumping to collect background water-level information. Following the end of pumping, the monitoring equipment will remain in the wells for a minimum of three days to collect water-level data during the test wells recovery period.

Weather Monitoring

Temperature, barometric pressure and precipitation will be monitored using daily published data on the internet from a nearby weather station. In addition, a manual rain gage will be installed on the site during the test period for monitoring of precipitation.

Water-Quality Sampling

Water samples will be collected near the end of the test period from the pumping wells and submitted for analysis for parameters listed in the NYSDOH Sanitary Code Part 5, Subpart 5-1. For any pumping well that is located with 200 feet of surface water, microscopic particulate analysis (MPA), giardia and cryptosporidium samples will also be collected. The extra synthetic organic compound (SOC) analyses for dioxin, endothall, diquat and glyphosate will not be included in the analysis.

Thank you in advance for your time and consideration. Should you have any questions, please contact Karen Destefanis at (475) 882-1706.

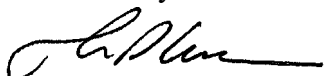
Very truly yours,

LEGGETTE, BRASHEARS & GRAHAM, INC.



Karen B. Destefanis, CPG
Associate/Hydrogeologist

Affirmed by:



Thomas P. Cusack, CPG
Senior Vice President

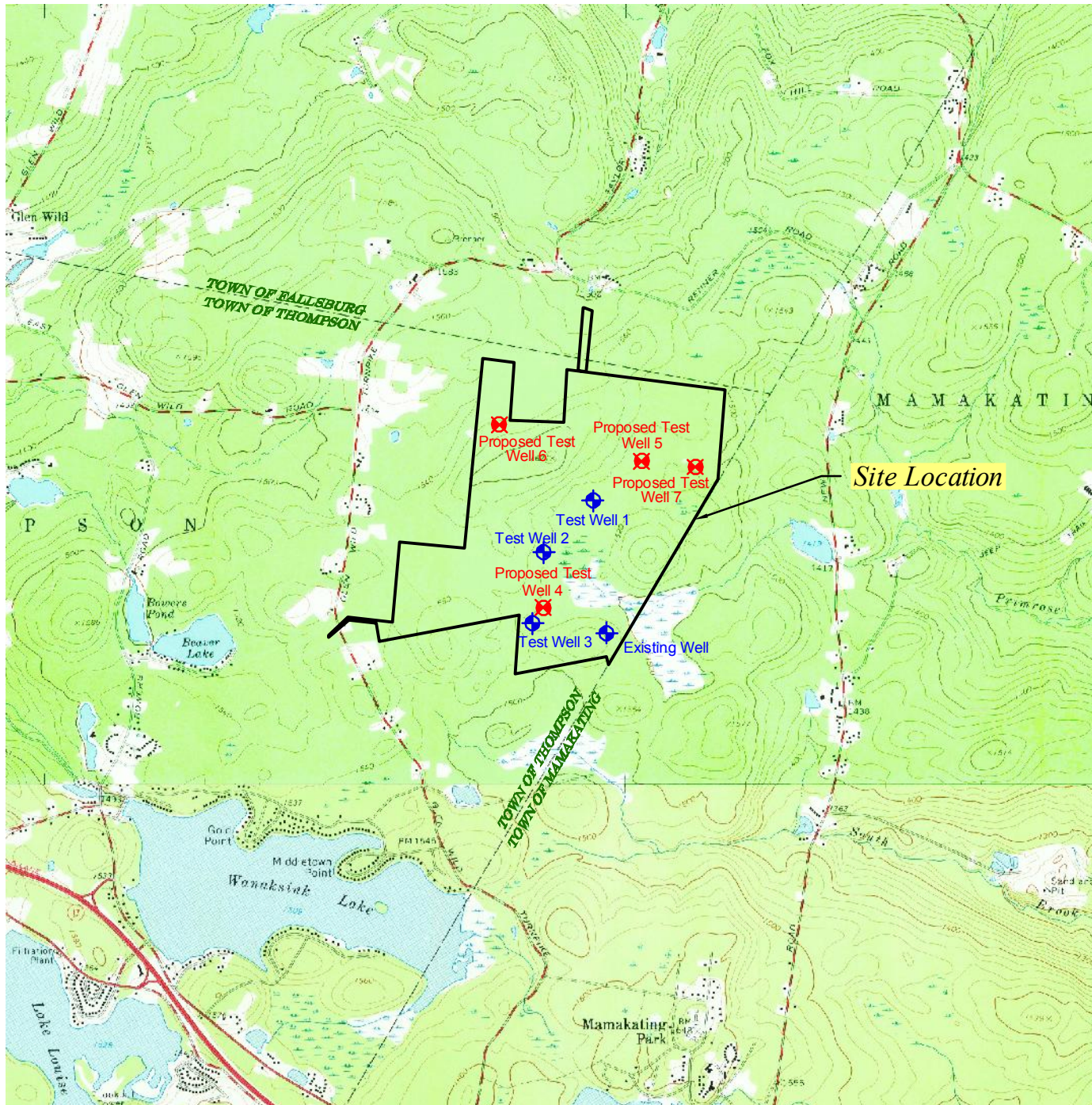
KBD:cmm

Enclosures

cc: Mary Beth Bianconi
Sherry Li
John Privitera
Vince Pietrzak
James Bates

H:\Thompson Edu Center\2017\Pumping Test Plan.doc

FIGURE



SOURCE: USGS TOPOGRAPHIC QUADRANGLES WOODRIDGE AND YANKEE LAKE 1966, NEW YORK.

LEGEND

PROPERTY BOUNDARY



EXISTING WELL LOCATION



PROPOSED TEST WELL LOCATION



QUADRANGLE LOCATION

0 3000
SCALE IN FEET

PROPOSED THOMPSON EDUCATION CENTER WILD TURNPIKE ROAD THOMPSON, NEW YORK

PROPOSED BEDROCK TEST WELL LOCATIONS

DATE	REVISED	PREPARED BY:
		LEGGETTE, BRASHEARS & GRAHAM, INC.
		Professional Groundwater and Environmental Engineering Services
		4 Research Drive
		Suite 204
		Shelton, Connecticut 06484
		(203) 929-8555
DRAWN:	RAC	CHECKED: KD
		DATE: 07/26/17
		FIGURE: 1



APPENDIX I

TOWN OF THOMPSON

Building Department
4052 Route 42
Monticello, New York 12701-3221

Phone: (845) 794-2500 Ext. 321
Fax: (845) 794-8600
www.townofthompson.com

BUILDING PERMIT

PERMIT NO: 16-0258
ISSUED: 08/02/2016
SEC-BLK-LOT: 26.-1-6

TOTAL FEES: \$50.00
EXPIRING: 02/02/2017
LOCATION: Wild Tpke

ZONE: RR-1

A permit is hereby given by the Building Department,
TOWN OF THOMPSON, COUNTY OF SULLIVAN, NY, for the structure described herein:

Contact type	Full name	Phone number
Contractor	D&D Contracting	845-798-9260
Engineer	Leggette, Brashears & Graham, Inc.	203-929-8555
Well Driller	Northern Drilling Inc	845-774-3311
Owner	Thompson Education Ctr LLC	212-240-0707

Unit No:
Construction Type:
Dimensions of Building:
Use of Permit:
Number of Stories:
Dimensions of Lot: 568.00 Acres

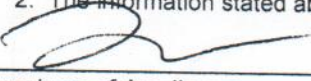
Number of Bedrooms:
Number of Bathrooms:
Number of Families:
Number of Toilets:
Approximate Cost: \$12,000.00
Heating Plant:

Remarks:

This permit is three test well drilling. Revisions are based on a workshop meeting held 7/18/16. A restoration bond has been submitted. Well to be drilled as per "Thompson Education Center Well Development Phase" submitted July 2016.

Conditions:

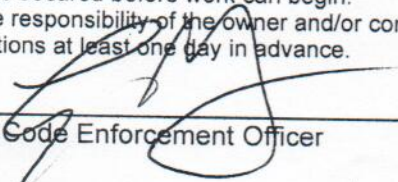
1. I am familiar with the Zoning and Building Ordinance of the TOWN OF THOMPSON, and do hereby agree to abide by them.
2. The information stated above is correct and accurate.


Signature of Applicant

8/2/16
Date of Signature

IMPORTANT

1. A permit under which no work has commenced within six (6) months after issuance, shall expire by limitation, and a new permit must be secured before work can begin.
2. It is the responsibility of the owner and/or contractor to comply with all applicable town ordinances and to call for the required inspections at least one day in advance.


Signature of Code Enforcement Officer

8/2/16
Date of Signature

BUILDING DEPARTMENT
Town of Thompson
MONTICELLO, NEW YORK

**This Card Must Be Kept Posted
In A Conspicuous Place On The
Premises For Which It Is Issued**

.....

Permit No. 16-0258

Issued to Thompson Education Center

Address Wild Turnpike

SBL# 26-1-6

**NO CONSTRUCTION in this Building Shall be Concealed Until
Inspected by the Building Department.**

TEST well #1

**NOTICE Must be Given to the Building Department when Work
is Ready for Inspection.**

8/2/16

Logan Morey
Code Enforcement Officer

BUILDING DEPARTMENT
Town of Thompson
MONTICELLO, NEW YORK

**This Card Must Be Kept Posted
In A Conspicuous Place On The
Premises For Which It Is Issued**

.....

Permit No. 16-0259

Issued to Thompson Education Center

Address Wild Turnpike

SBL# 26.-1-6

**NO CONSTRUCTION in this Building Shall be Concealed Until
Inspected by the Building Department.**

TEST well #2

**NOTICE Must be Given to the Building Department when Work
is Ready for Inspection.**

8/2/16

Logan Morey
Code Enforcement Officer

TOWN OF THOMPSON

Building Department
4052 Route 42
Monticello, New York 12701-3221

Phone: (845) 794-2500 Ext. 321
Fax: (845) 794-8600
www.townofthompson.com

BUILDING PERMIT

PERMIT NO: 16-0259
ISSUED: 08/02/2016
SEC-BLK-LOT: 26.-1-6

TOTAL FEES: \$50.00
EXPIRING: 02/02/2017
LOCATION: Wild Tpke

ZONE: RR-1

A permit is hereby given by the Building Department,
TOWN OF THOMPSON, COUNTY OF SULLIVAN, NY, for the structure described herein:

Contact type	Full name	Phone number
Contractor	D&D Contracting	845-798-9260
Engineer	Leggette, Brashears & Graham, Inc.	203-929-8555
Well Driller	Northern Drilling Inc	845-774-3311
Owner	Thompson Education Ctr LLC	212-240-0707

Unit No:
Construction Type:
Dimensions of Building:
Use of Permit:
Number of Stories:
Dimensions of Lot: 568.00 Acres

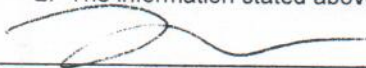
Number of Bedrooms:
Number of Bathrooms:
Number of Families:
Number of Toilets:
Approximate Cost: \$12,000.00
Heating Plant:

Remarks:

This permit is three test well drilling. Revisions are based on a workshop meeting held 7/18/16. A restoration bond has been submitted. Well to be drilled as per "Thompson Education Center Well Development Phase" submitted July 2016.

Conditions:

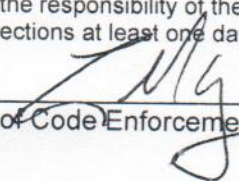
1. I am familiar with the Zoning and Building Ordinance of the TOWN OF THOMPSON, and do hereby agree to abide by them.
2. The information stated above is correct and accurate.


Signature of Applicant

8/2/16
Date of Signature

IMPORTANT

1. A permit under which no work has commenced within six (6) months after issuance, shall expire by limitation, and a new permit must be secured before work can begin.
2. It is the responsibility of the owner and/or contractor to comply with all applicable town ordinances and to call for the required inspections at least one day in advance.


Signature of Code Enforcement Officer

8/2/16
Date of Signature

BUILDING DEPARTMENT
Town of Thompson
MONTICELLO, NEW YORK

**This Card Must Be Kept Posted
In A Conspicuous Place On The
Premises For Which It Is Issued**

.....

Permit No. 16-0260

Issued to Thompson Education Center

Address Wild Turnpike

SBL# 26-1-6

**NO CONSTRUCTION in this Building Shall be Concealed Until
Inspected by the Building Department.**

Test well #3

**NOTICE Must be Given to the Building Department when Work
is Ready for Inspection.**

8/2/14

Logan Morey
Code Enforcement Officer

TOWN OF THOMPSON

Building Department
4052 Route 42
Monticello, New York 12701-3221

Phone: (845) 794-2500 Ext. 321
Fax: (845) 794-8600
www.townofthompson.com

BUILDING PERMIT

PERMIT NO: 16-0260
ISSUED: 08/02/2016
SEC-BLK-LOT: 26.-1-6

TOTAL FEES: \$50.00
EXPIRING: 02/02/2017
LOCATION: Wild Tpke

ZONE: RR-1

A permit is hereby given by the Building Department,
TOWN OF THOMPSON, COUNTY OF SULLIVAN, NY, for the structure described herein:

Contact type	Full name	Phone number
Contractor	D&D Contracting	845-798-9260
Engineer	Leggette, Brashears & Graham, Inc.	203-929-8555
Well Driller	Northern Drilling Inc	845-774-3311
Owner	Thompson Education Ctr LLC	212-240-0707

Unit No:
Construction Type:
Dimensions of Building:
Use of Permit:
Number of Stories:
Dimensions of Lot: 568.00 Acres

Number of Bedrooms:
Number of Bathrooms:
Number of Families:
Number of Toilets:
Approximate Cost: \$12,000.00
Heating Plant:

Remarks:

This permit is three test well drilling. Revisions are based on a workshop meeting held 7/18/16. A restoration bond has been submitted.
Well to be drilled as per "Thompson Education Center Well Development Phase" submitted July 2016.

Conditions:

1. I am familiar with the Zoning and Building Ordinance of the TOWN OF THOMPSON, and do hereby agree to abide by them.
2. The information stated above is correct and accurate.

Signature of Applicant

8/2/16
Date of Signature

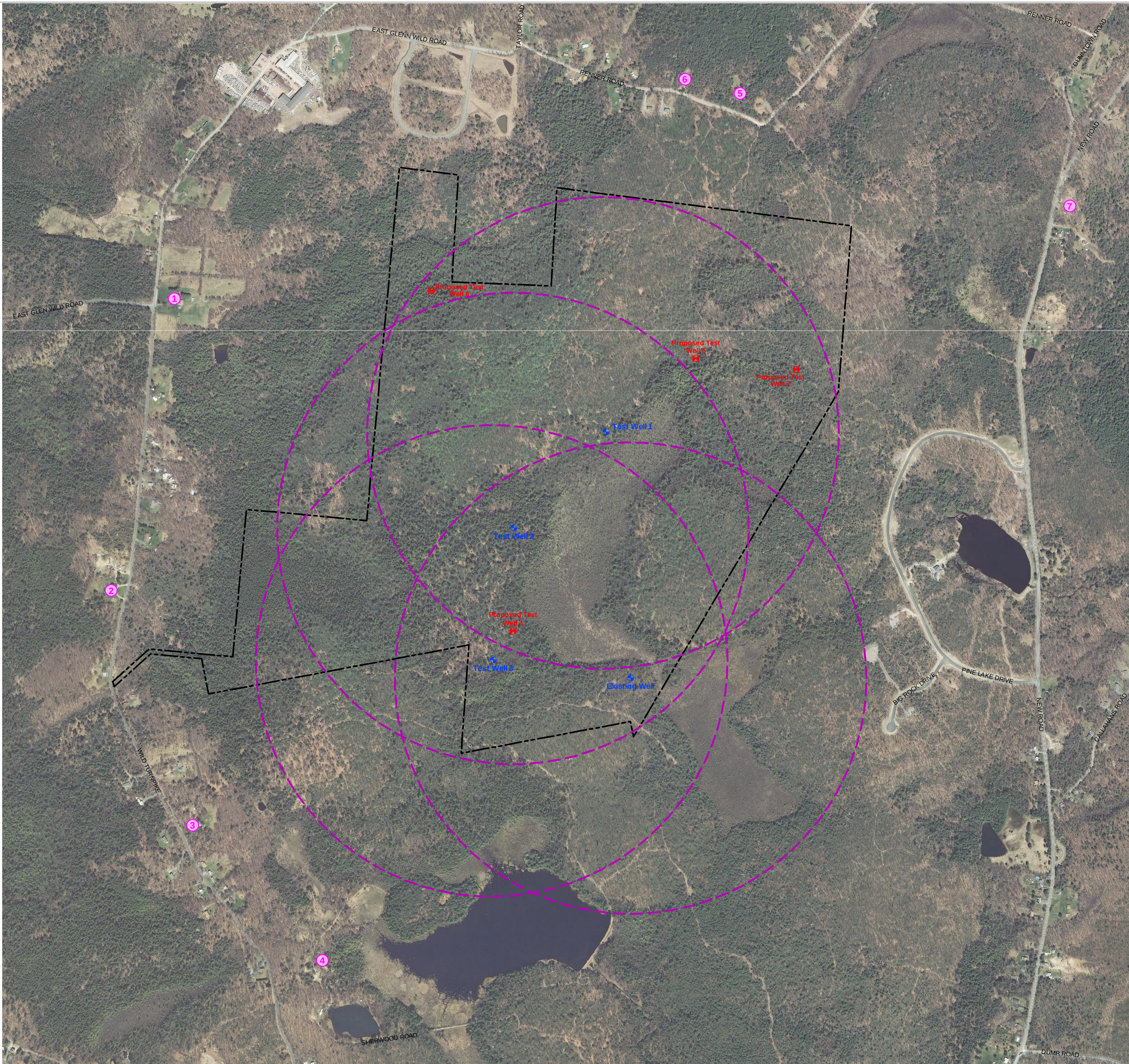
IMPORTANT

1. A permit under which no work has commenced within six (6) months after issuance, shall expire by limitation, and a new permit must be secured before work can begin.
2. It is the responsibility of the owner and/or contractor to comply with all applicable town ordinances and to call for the required inspections at least one day in advance.

Signature of Code Enforcement Officer

8/2/16
Date of Signature

PLATE



Map Key	Address
1	412 Wild Tumpike Road
2	283 Wild Tumpike Road
3	176 Wild Tumpike Road
4	98 Wild Tumpike Road
5	91 Renner Road
6	67 Renner Road
7	558 County Road Rt 56

PROPOSED THOMPSON EDUCATION CENTER
WILD TURNPIKE ROAD
THOMPSON, NEW YORK

DATE	REVISED	PREPARED BY:	LEGGETTE, BRASHEARS & GRAHAM, INC.				
			Professional Groundwater and Environmental Engineering Services				
			4 Research Drive				
			Suite 204				
			Shelton, Connecticut 06484				
			(203) 929-8555				
DRAWN:	RAC	CHECKED:	KD	DATE:	07/26/17	PLATE:	1