Attachment F:
Pump Test Proposal
Report

PUMP TEST PROPOSAL REPORT

NEW SOURCE APPROVAL – SITE SOURCE / CONDITIONAL PUMPING TEST UNDER 70 GPM (BRP WS 13) (DEP TRANSMITTAL # X288272)

For

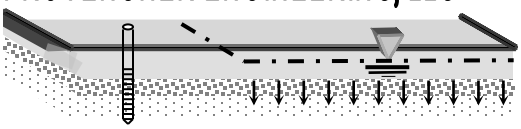
PROPOSED RESIDENTIAL HOUSING COMMUNITY
ATHENS STREET PROPERTY – OFF HUDSON ROAD
STOW, MASSACHUSETTS

Prepared for:

Athens Street, LLC & Goshen Lane, LLC
148 Park Street
North Reading, MA 01864

Prepared by:

PROVENCHER ENGINEERING, LLC



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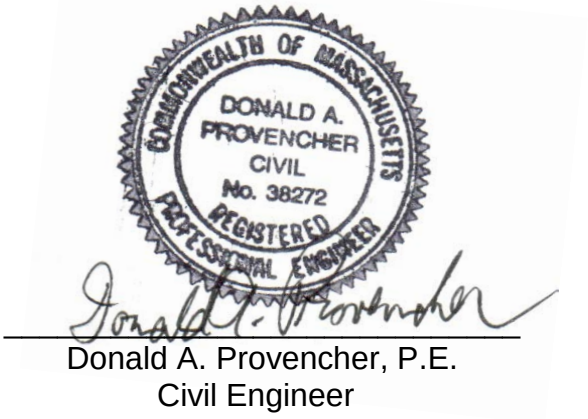


Donald A. Provencher, P.E.
Civil Engineer

Project No. PE381.01
September 2, 2021
(Revised 12/16/2022)

PAGE

APPENDIX

- **USGS Locus Map (8.5 x 11 inch)**
- **MA DEP – Bureau of Waste Site Cleanup (BWSC) – Site Scoring Map**
- **Waste Site & Reportable Release Results (8.5 x 11 inch)**
- **Conceptual Site Plan by Hawk Design, Inc. (11 x 17 inch)**

PLAN POCKET

- **Half-Mile Radius Plan**
- **Pump Test Exhibit Plan**

1.0 EXECUTIVE SUMMARY

On behalf of the applicant, Athens Street, LLC & Goshen Lane, LLC of North Reading, Massachusetts, we submit this Pump Test Proposal Report to the Department of Environmental Protection (DEP) for approval to drill and pump test three proposed bedrock water supply wells in support of a 32,022 gallons per day (GPD) proposed, privately owned Community Public Water Supply (PWS). The new water supply is planned to support a proposed 141-unit residential housing community, currently referred to as the Athens Street Property, located off of Hudson Road in Stow, Massachusetts.

This application is submitted for approval of a "Site Source / Conditional Pumping Test Less Than 70 GPM." DEP permit application BRPWS13, DEP Transmittal form (X288272), and a check for the $1,380 application fee has been submitted in conjunction with this report. We respectfully request that the DEP review and accept this submission on behalf of the applicant, schedule and attend a Site Exam site visit at your convenience, and approve the site for bedrock well drilling and pump testing as presented herein.

2.0 PROJECT DESCRIPTION

Athens Street Property consists of an assemblage of several parcels of properties totaling approximately 115±-acres, and is located in the western-central portion of the Town of Stow. Please refer to the USGS Locus Map (Figure-1) in the appendix, and to the Half-Mile Radius Map in the back pocket of this report. The site is abutted to the north-northeast by the Bose Corporation campus, to the northwest, west, and southeast by single-family dwellings, to the east by the Arbor Glen condominiums, and to the south by undeveloped land. Athens Street traverses the central-southern portion of the property east to west, and Goshen Lane abuts the property to the south, also running east to west. Both streets have limited accessibility for vehicular access.

The Athens Street Property is a proposed condominium style community including 141 two-bedroom residential dwelling units (282 bedrooms total). The proposed Title 5 design flow and proposed water demand of 32,022 GPD is based on 110 GPD per bedroom (31,020 GPD), plus a 1,002 GPD allowance for a proposed clubhouse, for a total design flow of 32,022 GPD.

A proposed site entrance roadway will be constructed to provide access off of Hudson Road. The development will include a wastewater treatment plant (WWTP) and treated effluent soil absorption system (SAS) to be permitted with a future Groundwater Discharge Permit with the Worcester Department of Environmental Protection (DEP). The on-site SAS is proposed to be located outside of the proposed PWS wells' Interim Wellhead Protection Area (IWPA) radii. Stormwater collection, treatment, and detention / infiltration systems are also proposed. Please refer to the Conceptual Site Plan by Hawk Design, Inc., dated 8-30-2021 in the appendix.

The three PWS wells and their Zone 1s are proposed to be entirely located within the Athens Street Property boundaries, and are each proposed to provide a 10,674 GPD approved withdrawal, a 254-foot Zone 1 wellhead protection area radius, and a 637-foot IWPA radius. Please refer to the Pump Test Exhibit Plan. The combined well withdrawal capacity will be 32,022 GPD (i.e. 3 x 10,674 GPD), which matches the site's 32,022 GPD proposed design flow. Because the Zones 1's will be entirely contained within the subject property, no Zone 1 easements or Conservation Restrictions will be required. Proposed land use within the Zone 1s includes uses related exclusively to the water system. No pavement, buildings, stormwater detention or infiltration systems, sewers or leach fields are proposed within the Zone 1s.

A proposed above-ground pump station and at least 64,000 gallons of atmospheric storage (two days capacity) will also be designed to accommodate any water treatment and storage needed. The finished water will be re-pumped through a proposed 4 and / or 6-inch PVC distribution system to be located within the site roadways to provide individual water service to each of the dwelling units.

Each well's proposed 10,674 GPD approved withdrawal is equivalent to an average 24-hour flow rate of 7.41 gallons per minute (GPM). Using the DEP's 33% safety factor, we propose to conduct a simultaneous 5-day pumping test on each of the three wells at minimum 9.88 GPM pumping rate. We will most likely pump each well at a rate of 10-12 GPM simultaneously. We propose to drill three wells until an individual target rate of 30 GPM is achieved. We propose to conduct individual step tests at 4, 8, 12, and 16 GPM at each well.

The proposed PWS wells are anticipated to be bedrock wells completed with a pitless adapter. An underground HDPE water supply line from each individual well will enter into a proposed pump station building. Once inside the pump station, it is anticipated that the raw water from each individual well will pass through a raw water sample tap, a totalizing flow meter, and other miscellaneous valves and fittings, before combining into a common well supply manifold. If required, sediment filtration, water treatment, and disinfection will be provided.

Atmospheric storage with booster pumps will be designed to draw treated water from the storage tanks and pressurize a distribution system to the residences. Activation of the wells will be controlled by the water level in the storage tanks. No direct fire protection or irrigation is anticipated to be provided by the public water supply wells or distribution system. Any irrigation demand will be provided by other sources, such as irrigation wells, which if proposed, will be located outside the PWS wells' IWPAs.

If applicable, backwash from any water treatment systems will be discharged into a proposed on-site underground leaching pit to be located outside of the Zone 1s. The leaching pit design will be based on a test pit conducted in the disposal location. An Underground Injection Control (UIC) permit registration application will be filed with the DEP, if on-site water treatment backwash water disposal is needed. Alternatively, the water treatment system backwash may be disposed of in the site's treated effluent SAS.

3.0 ZONING AND CURRENT LAND USES

Based on the Town of Stow Zoning – 2015 Map, "Industrial" zoning comprises the vast majority of the site, as well as the Bose Corporation property to the northeast, and an additional few parcels to the south of the site across Goshen Lane. "Residential" zoning abuts the site to the east and west, and surrounds the site to the east, west, and to the south beyond the limited industrial zoned land along Goshen Lane.

The Town boundary with Bolton is located approximately 3,000 feet to the west of the proposed PWS wells.

4.0 EXISTING AND POTENTIAL SOURCES OF CONTAMINATION

We conducted research of various sources and databases, including review of Mass DEP – Bureau of Waste Site Cleanup (BWSC) Site Scoring Map; review of DEP's Release Tracking Number (RTN) database provided by the Executive Office of Energy & Environmental Affairs (EEA) on-line data portal; review of the MassGIS Online Mapping Tool OLIVER; and review of existing and proposed conditions site plan information provided by the site civil engineer / land surveyor, Stamski & McNary, Inc. These sources were reviewed to identify and evaluate the potential for contamination of the proposed PWS wells from other sources. The following is a summary of all informational sources reviewed, potential contamination sources identified, and the potential for impacts to the proposed PWS well.

4.1 Bureau of Waste Site Cleanup (BWSC) Site Scoring Map & OLIVER

Review of the BWSC Map in the appendix indicates that there are three IWPAs, but no Zone IIs, dams, shore lands, medium or high-yield aquifers, EPA sole-source aquifers, reservoirs, landfills, solid waste facilities, or road salt storage facilities within one-half mile of the proposed PWS wells. The BWSC map indicates limited 100-year floodplains on the site associated with unnamed streams that traverse the site from west to east.

The MassGIS Online Mapping Tool OLIVER database was reviewed and indicated no existence of any underground fuel storage tanks, recycling operations, organics conversion operations; active, closed, or inactive landfills; transfer or compost facilities, construction or demolition processing facilities, historic incineration facilities, car washes, laundromats, large quantity generators of hazardous waste; RCRA, treatment, storage, disposal, air discharge facilities; or Activity Use Limitation sites within one-half mile of the proposed PWS wells.

OLIVER did indicate one registered groundwater discharge and one classified 21E site within one-half mile of the proposed PWS wells, both of which are associated with the Bose Corporation facility to the north of the site. The groundwater discharge at Bose is related to their on-site WWTP and SAS, and their classified 21E site is discussed in further detail in section 4.3.

4.2 Title 5 Septic Systems and Regional Wastewater Discharges

Single family homes with private septic systems are generally not high-risk sources of contamination provided that their net effluent loading rate does not exceed 440 GPD/acre. Larger commercial or community septic systems could be higher risk systems because of their larger wastewater discharge volumes.

In Stow, municipal water and sewer is not available within one half-mile of the proposed PWS wells, therefore, it is assumed that all developed properties in Stow within one-half mile of the proposed PWS wells include private septic systems. We estimated approximately 80 private septic systems served by their own private wells in Stow located within one-half mile of the proposed PWS wells. Please refer to the Half-Mile Radius Map in the plan pocket at the back of this report.

The regional groundwater flow in the vicinity of the proposed PWS wells is anticipated to be generally in a west-southwesterly direction toward wetlands associated with an unnamed Brook, adjacent to the westerly property boundary, which flows to the south. The site topography to the east of the proposed PWS wells slopes steeply downward to the west from an on-site local highpoint to the east of the proposed PWS wells, and then the topography slopes gently to the west from the propose PWS wells towards the wetlands and unnamed brook. Please refer to the Pump Test Exhibit Plan in the back pocket of this report.

There is an on-site wetland area located approximately between 56 and 76 feet to the west of the proposed PWS wells, which drains to the unnamed brook to the west. Off-site properties to the north appear to flow to the north toward Hiley Meadow Brook, on the north side of Great Road, which flows north and is tributary to Elizabeth Brook. Consequently, due to the unnamed stream to the west, and the local topographic high to the east, there is no appreciable area that would be considered upgradient of the site. Land to the south would be considered downgradient.

The proposed on-site septic system is depicted on the Pump test Exhibit Plan, and is located approximately 660 feet south of the closest of the proposed PWS wells, and the Bose SAS is located approximately 688 feet northeast of the closest of the proposed PWS wells. Both of those SAS are outside of the 637-foot IWPA radii from the proposed PWS wells.

Because there is no significant upgradient area to the proposed PWS wells, and because both the proposed on-site SAS and the Bose SAS are outside of the IWPA radii of the proposed PWS wells, impacts from Title 5 septic systems and treated wastewater SAS is not expected.

4.3 DEP Reportable Release Look-Up Database

Research of Hazardous Waste Sites was conducted by reviewing the Mass DEP –Waste Site / Reportable Release File Viewer, provided by the Executive Office of Energy & Environmental Affairs (EEA) on-line data portal. Two Release Tracking Number (RTN) locations were identified in Stow within the half-mile radius of the proposed PWS wells.

RTN 2-0019330 is located at a residential dwelling at 174 Hudson Road, approximately just under one-half mile southeast of the proposed PWS wells. A report entitled "Immediate Response Action Completion and Permanent Solution With No Conditions", prepared by EndPoint Engineers & Environmental Professionals of Londonderry, New Hampshire, dated February 2015 was downloaded off of the EEA website and reviewed. The report indicates that a release of home heating oil was discovered on October 6, 2014 during the removal of a 275-gallon underground storage tank (UST) previously used to store heating oil for the residential dwelling. One hundred cubic yards of petroleum-impacted soil was excavated and stockpiled, and dewatering of impacted groundwater was employed. Nine soil borings were advanced, and soil and groundwater samples were collected.

Results indicated that bedrock or groundwater was not impacted. Approximately 10 cubic yards of impacted soil was removed, to the extent feasible, following the removal of the former UST. It was concluded that any impacts remaining at the perimeter of the excavation will likely attenuate over time due to naturally occurring attenuation processes. Groundwater impacts were below Massachusetts Method 1 GW-1, GW-2 and GW-3 Standards. A Method 3 Risk Assessment was conducted to assess potential current and future risks, due to remaining impacts to soil. Based on the results of the Method 3 Risk Characterization, the report concluded that "No Significant Risk" exists with respect to human health, safety, public welfare, and the environment. A "Permanent Solution with No Conditions" has been achieved for this Site. Groundwater flow is anticipated to be towards the southeast, away from the proposed PWS wells, and therefore, no impacts to the proposed PWS Wells is anticipated.

RTN 2-0019626 is located at the Bose Corporation property abutting the Athens Street subject site to the northeast. Various reports by Capaccio Environmental Engineering, Inc. and other consultants were downloaded off of the EEA website and reviewed. Bose noted a gradual increase in perchlorate levels from routine sampling of their two public water overburden sand & gravel supply wells (PWS ID#2286016-01G & 02G) located approximately 2,000 feet north of the proposed PWS wells. Twelve monitoring wells were installed across the Bose property to provide a horizontal and vertical profile of perchlorate concentrations and groundwater flow direction at the property. Groundwater flow is reported to be towards the north - northwest, away from the proposed PWS wells. The source of the perchlorate was suspected to originate from the immediate vicinity of the Bose facility. An anion exchange (AIX) treatment system was installed on the Bose public water supply wells to mitigate the drinking water at Bose, however, the perchlorate contamination continues to exist at the Bose site.

An Immediate Response Action (IRA) completion report, Phase I Initial Site Investigation Report, and a Tier I Classification Report were submitted to the DEP in September 2016 addressing the groundwater perchlorate contamination. Since then, Notices of Delay have been submitted by Bose to DEP requesting a deadline extension to August 31, 2021 for submitting a Phase II report, which is intended to identify the source, nature, and extent of impacts of the perchlorate contamination.

In September 2018, August of 2019, and December 2020, Bose proactively sampled their two PWS wells for PFAS. Results indicate that PFAS was detected at both wells at concentrations below the MCL of 20 ug/L (ppt). Bose has subsequently incorporated PFAS investigation into their ongoing Phase II assessments under the Massachusetts Contingency Plan (MCP).

In 2019, greensand treatment vessels were installed to mitigate naturally-occurring manganese in Bose's PWS wells. As part of the design, chlorine is introduced ahead of the greensand vessels to oxidize the manganese, and then Granular Activated Carbon (GAC) vessels were installed after the greensand vessels and prior to the AIX vessels to remove the residual chlorine passing through the greensand vessels to avoid potential fouling of the AIX vessels. In December 2020, the finished (post-treated) drinking water at Bose was sampled and indicated non-detect for all PFAS compounds, indicating that the drinking water treatment installed for manganese and perchlorate treatment was effectively removing the PFAS.

In November 2020, DEP requested that Bose provide information on current and historic use of PFAS that may have been used or stored at the facility. In March 2021, Bose submitted the requested information to DEP, indicating that Bose has been the only occupant at the facility since December 2003, that the Bose facility was initially constructed in 1981 by Digital Equipment Corporation, and had changed ownership and occupancy until Bose occupied the facility in 2003. Bose indicated that no known PFAS compounds were used by Bose, nor was any aqueous film firefighting foam (AFFF) compounds used at the site to Bose's knowledge.

In a recent discussion with Bose, it was learned that ongoing sampling of their monitoring well network is underway by Cappacio to refine the extent of PFAS contamination. No further information is available. Capaccio concluded that perchlorate and PFAS sample results in monitoring wells are considered low level, and groundwater flow is in a direction to the north – northwest, away from the Athens Street property and proposed PWS wells. Should perchlorate and / or PFAS be detected above respective MCLs during the 5-day pump test on the proposed PWS wells, treatment will be incorporated into the design and will be submitted with the future New Source Approval permit process.

5.0 ENVIRONMENTALLY SENSITIVE AREAS

We conducted research of various sources and databases, including review of Mass DEP – Bureau of Waste Site Cleanup (BWSC) Site Scoring Map; review of the MassGIS Online Mapping Tool OLIVER; and review of existing and proposed conditions site plan information provided by the site civil engineer / land surveyor, Allen Engineering Associates, Inc. These sources were reviewed to identify and evaluate the potential for the proposed PWS wells to impact any sensitive resource areas.

5.1 Potential Impacts to Streams, Wetlands, and Resource Areas

The BWSC map indicates no Areas of Critical Environmental Concern (ACEC), and limited 100-year floodplains on the site associated with an unnamed stream to the west of the site that flows south, and then traverses the site flowing west to east. None of those floodplains are located in the vicinity of the proposed PWS wells. Bordering vegetated wetlands are indicated between 56 and 76 feet west of the proposed PWS wells, and are associated with the unnamed stream to the west, which is located approximately 690 feet southwest of the closest proposed PWS well.

The BWSC map also indicates protected open space approximately 500 feet to the northwest, across a wetland area west of the proposed PWS wells. The BWSC Map indicates no certified vernal pools within one-half mile of the proposed PWS wells, however, one potential vernal pool is indicated approximately 1,130 feet northwest of the proposed PWS wells within that protected open space.

The MassGIS Online Mapping Tool OLIVER was reviewed and confirmed the same 100-year flood plains, streams, surface water bodies, etc., as the BWSC map. OLIVER indicated no outstanding water resources, high or medium yield aquifers, or PWS reservoirs within one-half mile of the proposed PWS wells.

Given the proposed pumping from deep bedrock wells cased through the upper sand and gravel aquifer, as opposed to pumping from sand & gravel surficial aquifer wells, we do not expect any measurable draw down impacts to wetlands, streams, vernal pools, or surface water bodies. Consequently, we do not propose to monitor any draw down at any locations other than the proposed PWS wells during the proposed pumping test on the proposed PWS wells.

5.2 Potential Impacts to Private Wells & Regional Water Supplies

Review of the BWSC Map in the appendix indicates that there are no Zone IIs, dams, shore lands, medium or high-yield aquifers, EPA sole-source aquifers, or reservoirs, within one-half mile of the proposed PWS wells.

There are two public water supplies (PWS) and three IWPAs within one-half mile of the proposed PWS wells. One Non-Transient Non-Community (NTNC) PWS (ID# 2286016) is located at the Bose Corporation, approximately 2,000 feet north of the proposed PWS wells. One community PWS (ID# 2286026) is located at Arbor Glen Condominiums, approximately 2,140 feet east-southeast of the proposed PWS wells. A second community PWS (ID# 2286024) is located at the Villages at Stow, approximately 3,080 feet northeast, and beyond the half-mile radius of the proposed PWS wells.

In Stow, municipal water and sewer is not available within one half-mile of the proposed PWS wells, therefore, it is assumed that all developed properties in Stow within one-half mile of the proposed PWS wells include private wells and private septic systems. We estimated

approximately 80 private septic systems served by their own private wells in Stow located within one-half mile of the proposed PWS wells. Please refer to the Half-Mile Radius Map in the plan pocket.

The closest private wells are located approximately 980 feet northwest and southwest of the proposed PWS wells at 114 Maple Street, and at 60 & 68 Kettell Plain Road. These three closest wells are all located across either a stream and / or wetland hydraulic boundaries form the proposed PWS wells. Given the stream location and distance to these private wells, no drawdown impacts to those private wells from the proposed PWS wells, nor drawdown impacts to the proposed PWS wells from those private wells is anticipated.

6.0 PROPOSED WELL DRILLING & PUMPING TESTS

We propose to install three bedrock wells by drilling, placing and grouting 6-inch diameter steel casings within a drilled 12-inch diameter minimum overburden hole. Well casing material used will be steel meeting the requirements of the American Water Works Association (AWWA) standards (19-LB steel), and will be sealed with grout from a depth of not less than 6 feet below the ground surface to the bottom of the casing, which is proposed to be installed at least 20 feet into competent bedrock.

The grout shall be either neat cement or concrete with type II cement conforming to the requirements of ASTM standard C150, with not more than 6 gallons of water per 94 lbs. Grouting will be applied by pressure or tremie pipe from the bottom of the casing in an upward direction, and will be completed in one continuous motion. The grouted casing will be allowed to sufficiently cure before drilling of the bedrock well shaft commences. The top of well casings will be finished approximately 2-3 feet above the ground surface with a locking cap to prevent tampering or entrance of foreign materials into the well.

Drilling will continue until a target well yield of at least 30 GPM (or more) is achieved at each well. Drilling will stop once the target yield is achieved, provided a minimum well depth of 300 feet is achieved, unless this 300-foot depth is unachievable due to excessive water. We may reduce the target well yield to 15 GPM if the well depth exceeds 750 feet. A maximum well depth of 1,200 feet will be required if the reduced target yield is not first achieved.

An air-lift test will be conducted at the end of drilling for a period of 1/2 hour by damming an area around the well and measuring the flow through a pipe through the dam with a 5 gallon bucket and stop watch with accuracy to $1/10^{th}$ of a second. The estimated well yield will be computed in gallons per minute for successive measurements made over the 1/2-hour minimum period until a steady flow rate is achieved.

Each well's proposed 10,674 GPD approved withdrawal is equivalent to an average 7.41 gallons per minute (GPM) flow over a 24-hour period. Using the DEP's 33% safety factor, we

propose to conduct a simultaneous 5-day pumping test on each of the three wells at minimum 9.88 GPM pumping rate. We will most likely pump each well at a rate of 10-12 GPM simultaneously. We propose to conduct individual step tests at 4, 8, 12, and 16 GPM at each well. Submersible well pumps will be installed on threaded galvanized steel, PVC, or HDPE pipe. No glue will be used. A 1" HDPE or threaded PVC stilling tube will also be installed in order to facilitate water level readings with a water level indicator and / or pressure transducer.

The 5-Day pumping test water levels will be collected as follows:

- Every minute for the first ten minutes
- Every five minutes for the first two hours of the test
- Once per hour thereafter until shut down

Recovery readings will be recorded as follows:

- Every five minutes for the first two hours after pumping
- Every ten minutes for the next 100 minutes
- Twice per day for at least five days or until 95% recovery is achieved, whichever occurs first.

Approximately 550 feet of discharge line will be used as indicated on the attached Pump Test Exhibit Plan, in the back pocket of this report. The discharge line will be directed to the edge of and outside of the 100-foot wetland buffer zone to the southwest and downgradient from the subject wells. The pumped water will flow away from the wells. This configuration will minimize impact from recirculation of the pumped water. A 4'x4' plywood splash board will be placed on the ground at the outfall of the discharge line to dissipate the flow energy to prevent erosion.

During the 5-day pump test, the draw down data for all three wells will be plotted on semi-log graph paper. The data will be extrapolated out to 180 days, and the 10% initial water column draw down value will be compared. If during the test it appears that the 180-day stabilization criteria may not be achieved, the pumping rate will be reduced until extrapolation of the data indicates an achievable 180-day drawdown. We will contact the DEP prior to commencement. Upon 5-days of pumping, and once stabilization is achieved, we will terminate the pump test and record recovery water levels.

We are not proposing any field monitoring of any private wells, or piezometers or monitoring wells in any wetlands, streams, or proposed leaching areas. We intend to install a transducer in each of the subject wells to collect 10 days of pre-pumping baseline water levels, and to measure on-site barometric pressure with another absolute pressure transducer.

Following the pump tests, we will complete a Source Final Report summarizing the pump test results. We will prepare design plans and specifications of the wellhead construction and

water treatment, storage, and pumping facilities as needed. On a site plan we will show the proposed power and water supply conduits, any required storage tanks, treatment and distribution systems to the buildings. We will provide construction details and specifications as necessary and submit the Source Final Report with the plans and specifications along with Application BRP WS 15, Permit Application to Construct a Water Supply Less Than 70 GPM.

7.0 PROPOSED WATER QUALITY SAMPLING

We are planning to conduct a full round of water quality sampling at each well in accordance with the Guidelines. Field and laboratory samples will be collected in accordance with the Guidelines as follows:

Within 1 hour from start of test:
- Field: pH, odor, specific conductance, temperature, carbon dioxide
- Lab: secondary contaminants

At 2.5 days (test midpoint):
- Field: pH, odor, specific conductance, temperature, carbon dioxide
- Lab: secondary contaminants

Just Prior to Shut Down (5-Days):
- Field: pH, odor, specific conductance, temperature, carbon dioxide
- Lab: total coliform, inorganics, volatile organic compounds, synthetic organic compounds, radionuclides (including gross alpha, radium 226 & 228, radon, uranium), secondary contaminants, perchlorate, nitrate, nitrite, and PFAS (EPA Isotope Dilution method 537 modified).

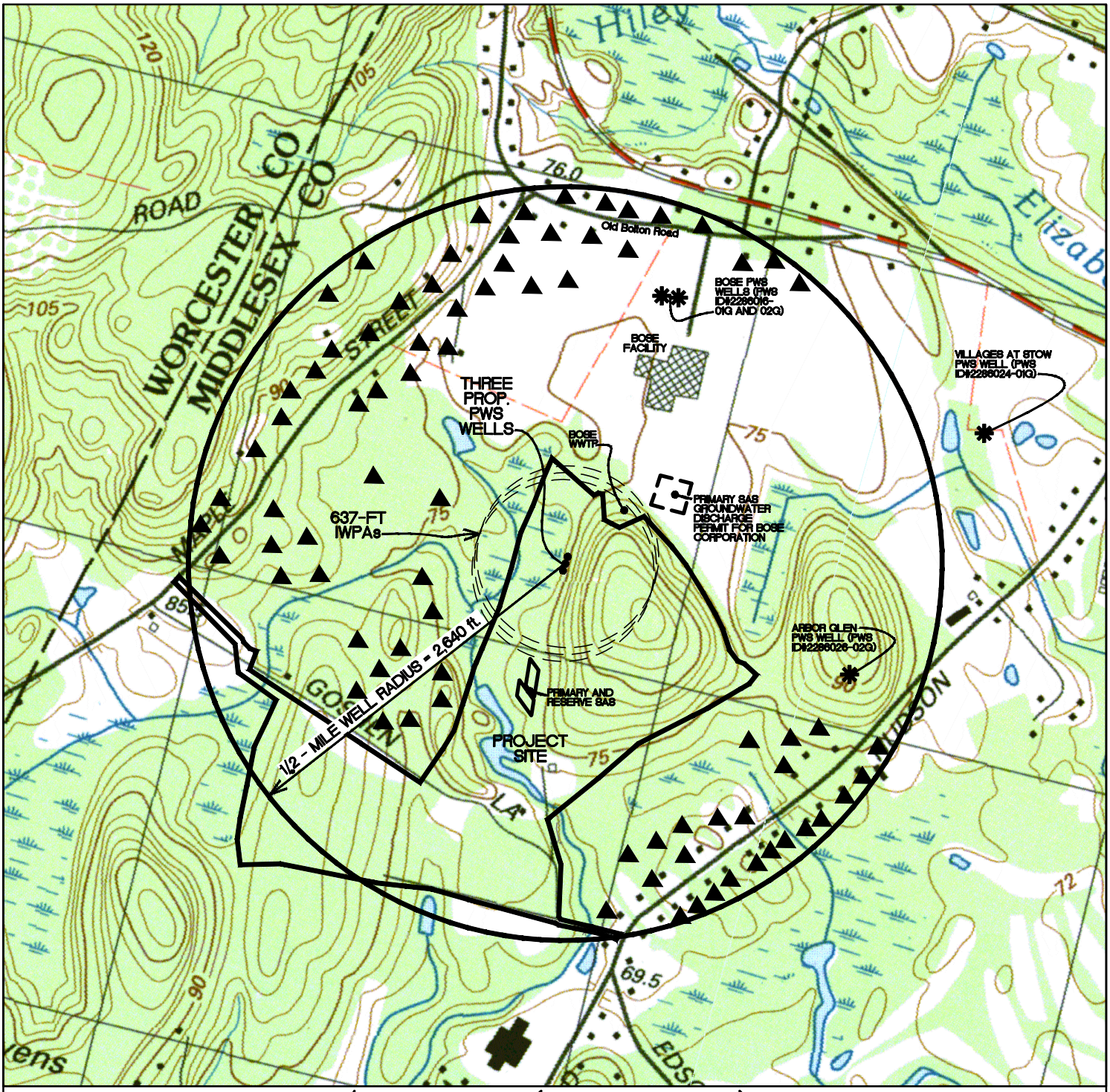
We are not proposing to collect a micro-particulate analysis (MPA) sample because the wells are not located within 150 feet of a permanent surface water. Samples will be collected from a sampling tap located at each well head and will be delivered to Nashoba Analytical Lab of Littleton, Massachusetts. The sample taps will be sterilized prior to sampling to prevent contamination from human or other contact with the sampling tap. Based on water quality results, we will include appropriate treatment design as necessary.

8.0 CONCLUSIONS

Based on the research conducted and information provided, we believe that the proposed PWS wells are acceptable from environmental, geological, and Zone 1 site accommodation perspectives. Environmentally, there are no abutting properties or land uses in the vicinity of the site, with known contamination or significant potential for degradation of water quality.

On site, the stormwater and wastewater recharge systems are sufficiently distant from the proposed PWS wells. The treated wastewater effluent disposal system proposed for the subject site, as well as the existing wastewater effluent disposal system for Bose Corporation are both located outside of the proposed PWS wells' IWPA radii. Adequate treatment of the stormwater is proposed, and the on-site wastewater disposal system will be designed in compliance with Groundwater Discharge regulations, which includes nitrogen reduction to less than 10 mg/L. Those regulations have been promulgated to provide protection to the environment. Adequate Zone 1 protection and land uses have been proposed, and there are no non-conforming uses proposed within the Zone 1s.

We are proposing a simultaneous 5-Day pump test on the subject wells, and water quality sampling in accordance with current DEP Guidelines and Policies for Public Water Systems. We request that the DEP review this application, and approve the site for well drilling, conduct of step and/or a 5-Day pumping test, and water quality sampling. Please call with any questions, comments, or to schedule a site exam at your convenience.



▲ ASSUMED PRIVATE WELL / SEPTIC SYSTEM (APPROX. LOCATION)

✱ PUBLIC WELL / SEPTIC SYSTEM OR GW DISCHARGE PERMIT SAS (APPROX. LOCATION)

1000 0 500 1000 2000

1 inch = 1000 ft.

NORTH

PREPARED BY:

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C/O:
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TITLE:

USGS SITE LOCUS MAP

PROPOSED COMMUNITY WATER SUPPLY
ATHENS STREET PROPERTY
OFF HUDSON ROAD, STOW, MASSACHUSETTS

APPLICANT:

ATHENS STREET, LLC & GOSHEN LANE, LLC
148 PARK STREET
NORTH READING, MA 01864

DATE:	9/2/2021	FILE NO.:	PE381001.DWG
JOB NO.:	PE381.01	ISSUE for:	PUMP TEST PROPOSAL REPORT (BRPWS13)
SCALE:	1" = 1,000'		
DWG NO.:	PE381001		

FIGURE 1

MassDEP - Bureau of Waste Site Cleanup

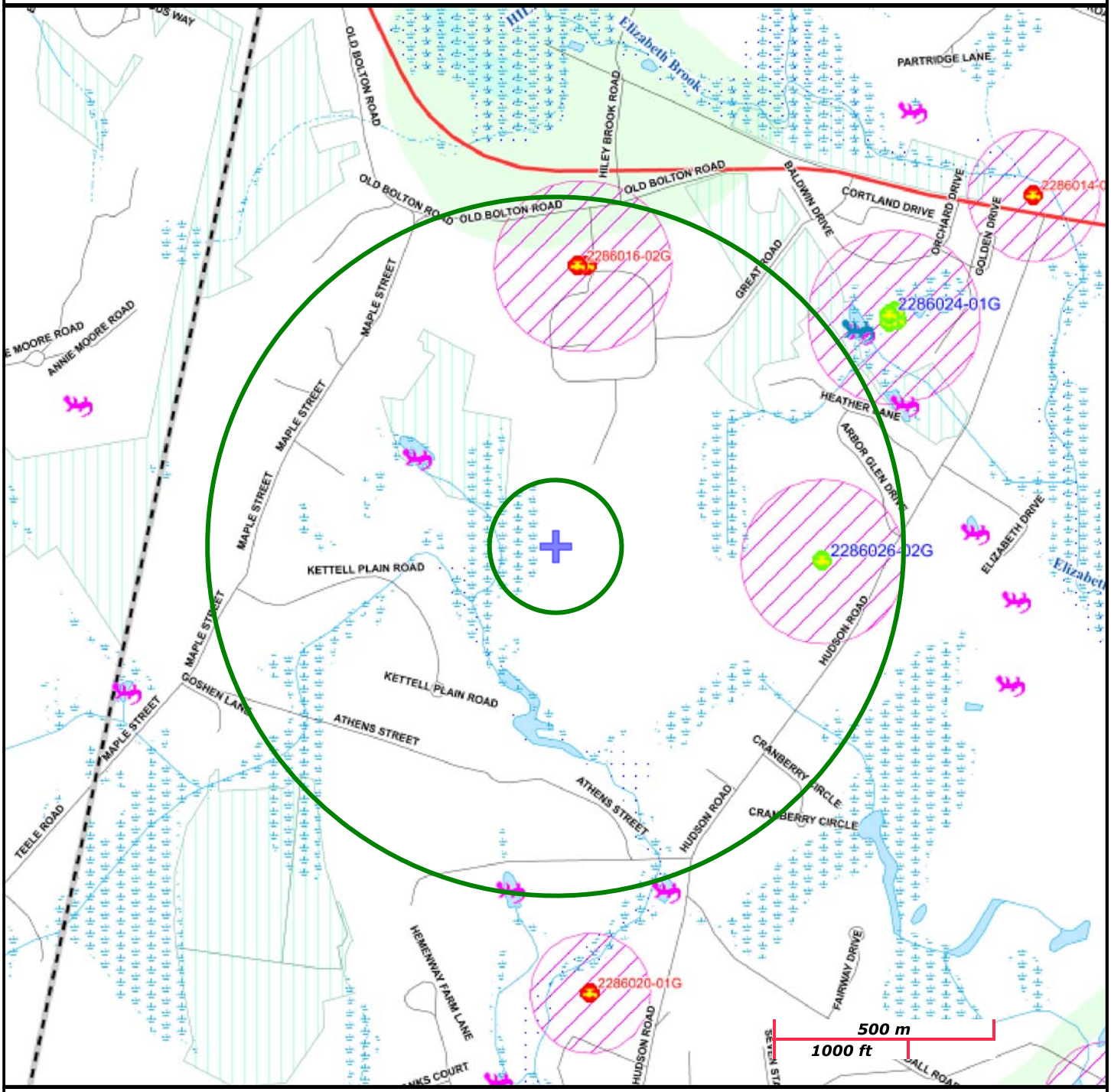
Phase 1 Site Assessment Map: 500 feet & 0.5 Mile Radii

Site Information:
ATHENS STREET
STOW, MA

NAD83 UTM Meters:
4700403mN , 290807mE (Zone: 19)
August 24, 2021

The information shown is the best available at the date of printing. However, it may be incomplete. The responsible party and LSP are ultimately responsible for ascertaining the true conditions surrounding the site. Metadata for data layers shown on this map can be found at: https://www.mass.gov/orgs/massgis-bureau-of-geographic-information.

MassDEP
Commonwealth of Massachusetts
Department of Environmental Protection



Roads: Limited Access, Divided, Other Hwy, Major Road, Minor Road, Track, Trail

Boundaries: Town, County, DEP Region; Train; Powerline; Pipeline; Aqueduct

Basins: Major, PWS; Streams: Perennial, Intermittent, Man Made Shore, Dam

Aquifers: Medium Yield, High Yield, EPA Sole Source

Non Potential Drinking Water Source Area: Medium, High (Yield)

PWS Protection Areas: Zone II, IWPA, Zone A

Hydrography: Open Water, PWS Reservoir, Tidal Flat

Wetlands: Freshwater, Saltwater, Cranberry Bog

FEMA 100yr Floodplain; Protected Open Space; ACEC

Est. Rare Wetland Wildlife Hab; Vernal Pool: Cert., Potential

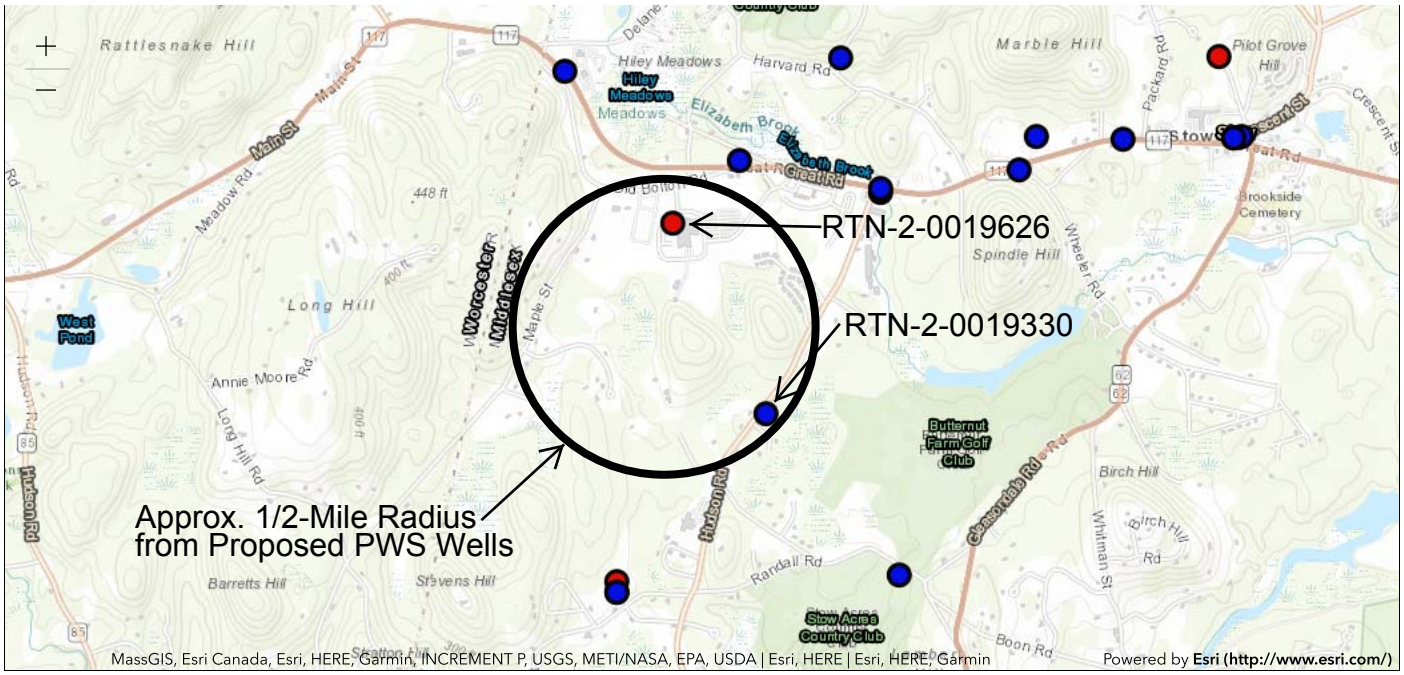
Solid Waste Landfill; PWS: Com.GW,SW, Emerg., Non-Com.

Energy & Environmental Affairs
Data Portal

Waste Site & Reportable Releases Results

HIDE MAP

Locations



● Open Sites ● Closed Sites ● Closed Sites with Use Limitation

Search Criteria *City/Town:* STOW

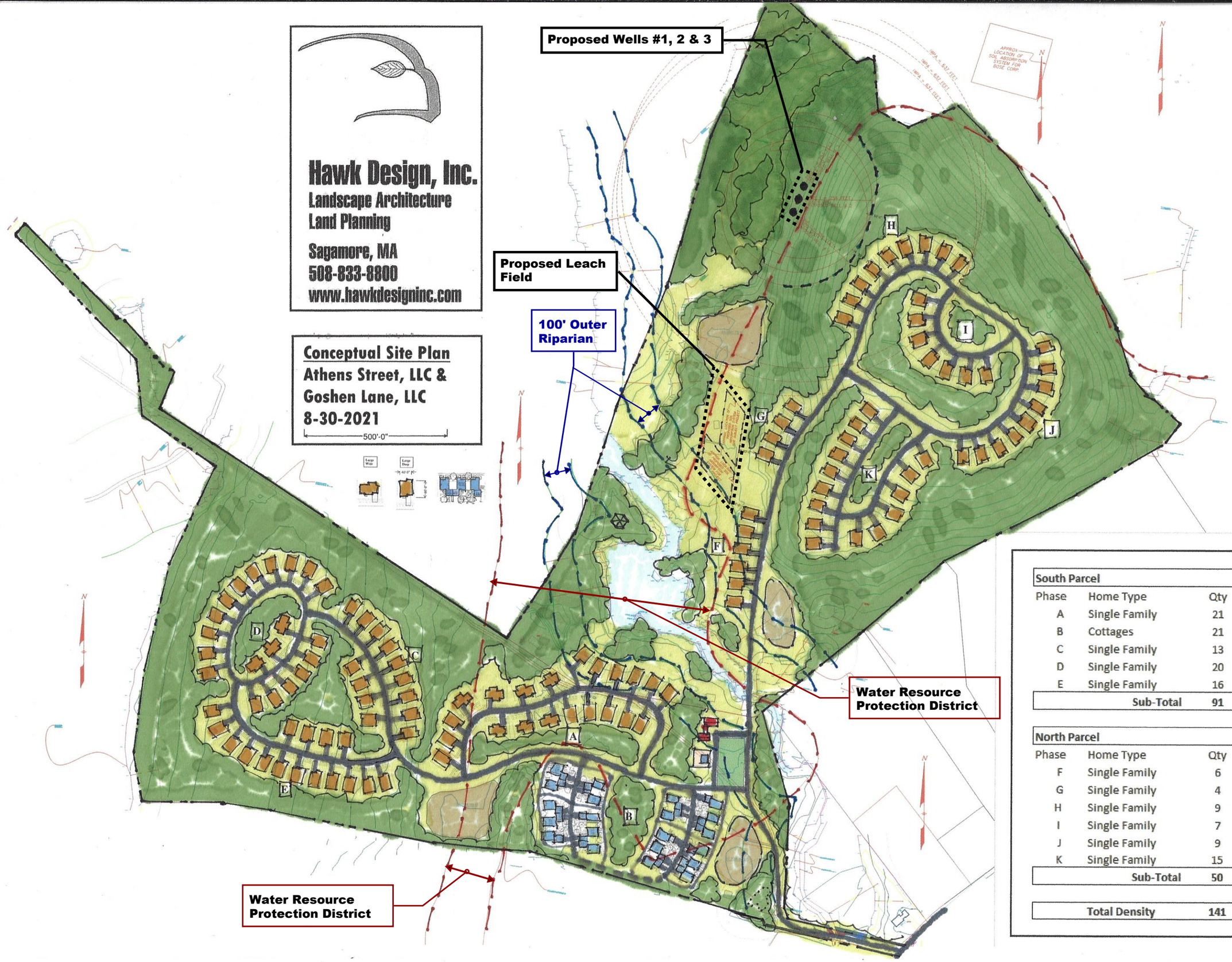
1 / 1

200 1 - 49 of 49 items

SELECT	RTN	CITY/TOWN	RELEASE ADDRES...	SITE NAME LOCATION AID	REPORTING CATEGO...	NOTIFICATION DAT...	COMPLIANCE
☐	2-0021541	STOW	688 GREAT RD	BOSE FACILITY	72 HR	04/16/2021	UNCLASSIFIED
☐	2-0021116	STOW	501 GLEASONDALE...	GLEASONDALE MILL	TWO HR	02/14/2020	TIERI
☐	2-0021075	STOW	16 CRESCENT ST	FMR FIRE STATION	TWO HR	10/01/2019	UNCLASSIFIED
☐	2-0021045	STOW	664 SUDBURY RD	MA DFS FIREFIGHTING AC...	72 HR	10/24/2019	TIERI
☐	2-0021039	STOW	380 GREAT RD	STOW TOWN OFFICES	TWO HR	10/04/2019	PSNC
☐	2-0020789	STOW	OCTOBER LN	HYDRAULIC OIL SPILL	TWO HR	01/26/2019	PSNC
☐	2-0020574	STOW	122 CRESCENT ST	TRUCK ACCIDENT	TWO HR	06/29/2018	PSNC
☐	2-0020337	STOW	220 AND 216 BART...	BARTON ROAD NEIGHBO...	TWO HR	10/13/2017	TIER1D
☐	2-0020255	STOW	242 BOXBOROUG...	FUEL OIL RELEASE	TWO HR	07/13/2017	PSNC
☐	2-0019944	STOW	56 PINE POINT RD	BOON POND	TWO HR	07/30/2016	PSNC
☐	2-0019886	STOW	45 WALCOTT ST	MONITORING WELL CONT...	72 HR	05/19/2016	RTN CLOSED
☐	2-0019626	STOW	688 GREAT ROAD	BOSE CORPORATION	72 HR	08/31/2015	TIERI

1 / 1

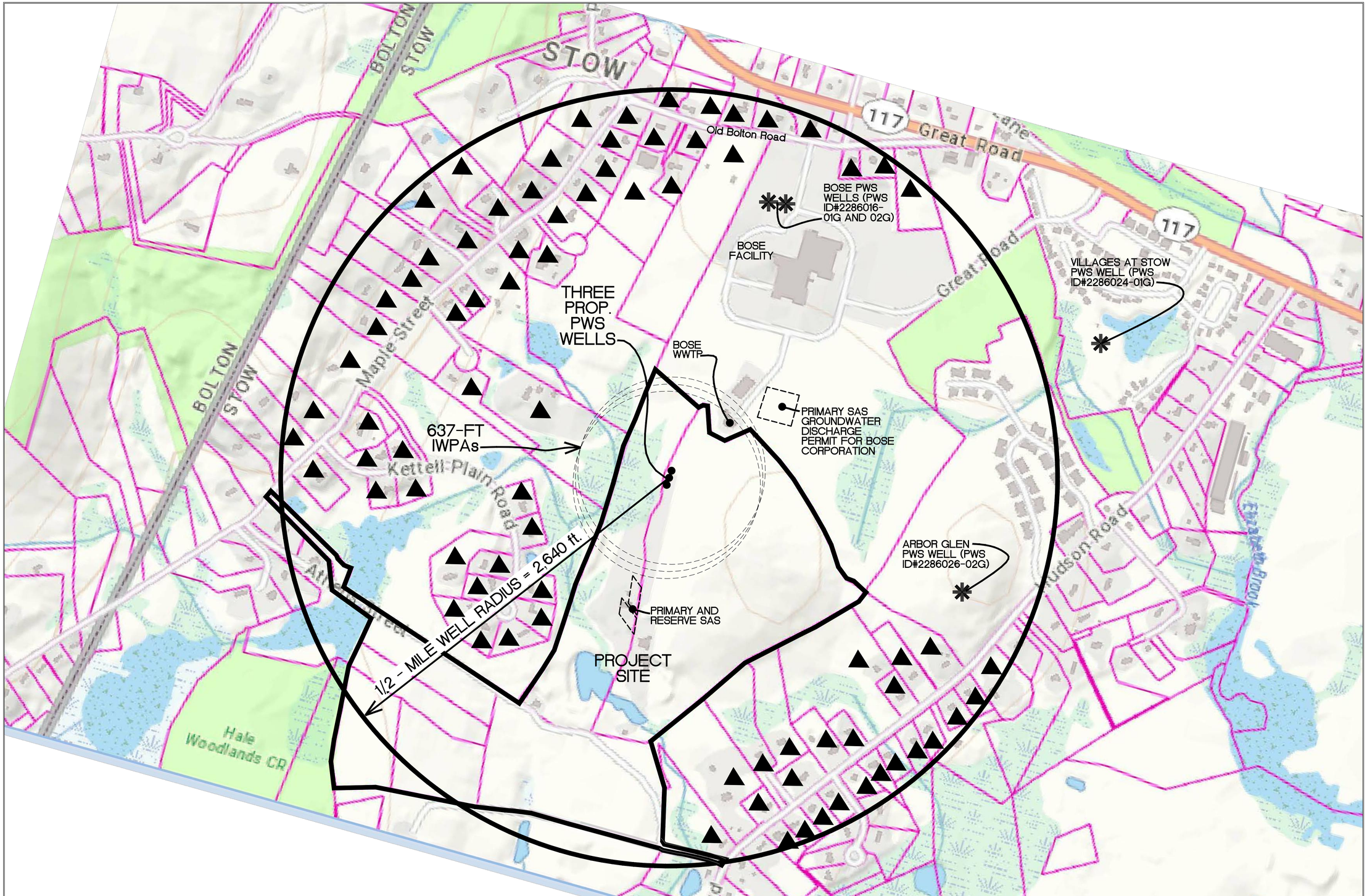
200 1 - 49 of 49 items



South Parcel		
Phase	Home Type	Qty
A	Single Family	21
B	Cottages	21
C	Single Family	13
D	Single Family	20
E	Single Family	16
	Sub-Total	91

North Parcel		
Phase	Home Type	Qty
F	Single Family	6
G	Single Family	4
H	Single Family	9
I	Single Family	7
J	Single Family	9
K	Single Family	15
	Sub-Total	50

Total Density	141



HALF-MILE RADIUS PLAN

1" = 300'

FEET: 0 150 300 600 1200

LEGEND

- PRIVATE WATER SUPPLY WELL WITH TITLE 5 SEPTIC SYSTEM (APPROXIMATE LOCATION ONLY)
- PUBLIC WATER SUPPLY WELL WITH TITLE 5 SEPTIC SYSTEM OR GROUNDWATER DISCHARGE TREATED EFFLUENT (APPROXIMATE LOCATION ONLY)

PREPARED FOR APPLICANT:

ATHENS STREET, LLC & GOSHEN LANE, LLC

148 PARK STREET
NORTH READING, MA 01864

TEL.: (978) 664-6900

PROJECT SITE INFORMATION:

PROPOSED COMMUNITY PUBLIC WATER SUPPLY

FOR

ATHENS STREET PROPERTY
OFF HUDSON ROAD
STOW, MASSACHUSETTS

DEP APPLICATION BRPWS13
DEP TRANS. # X288272

PREPARED BY:

PROVENCHER ENGINEERING, LLC

6 Wasserman Heights
Merrimack, NH 03054
Phone/Fax: (603) 883-4444
Don@Provencher.com
ProvencherEngineering.com

REVISION BLOCK:

COMMONWEALTH OF MASSACHUSETTS
DONALD A. PROVENCHER
CIVIL
No. 38272
REGISTERED PROFESSIONAL ENGINEER

SEPTEMBER 2, 2021

NO.	REVISION DATE	REVISION DESCRIPTION
7		
6		
5		
4		
3		
2		
1		
0	9/2/2021	BRPWS13 SITE EXAM APP'L

PROJECT:

PROPOSED COMMUNITY PUBLIC WATER SUPPLY

ATHENS STREET PROPERTY
OFF HUDSON ROAD
STOW, MASSACHUSETTS

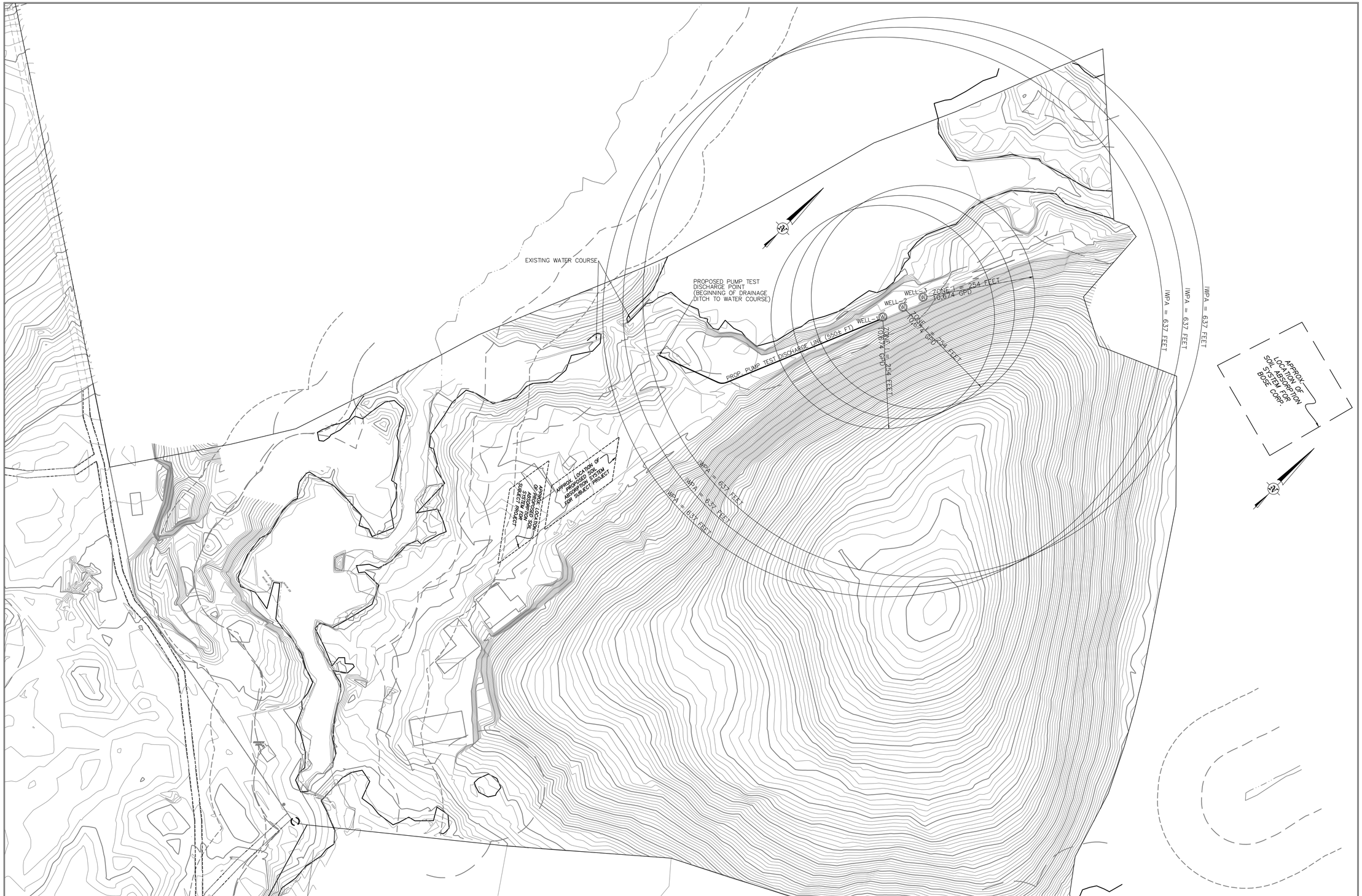
INITIAL ISSUE DATE: SEPTEMBER 2, 2021

PLAN SCALE: 1" = 300'

PLAN TITLE:

HALF-MILE RADIUS PLAN

PROJECT NO. PE381.01	1
CAD FILE NO. PE381001.DWG	
DRAWING NO. PE381002	
SHEET NO: 1 OF 2	



PUMP TEST EXHIBIT PLAN

1" = 100'

FEET: 0 50 100 200 400

PREPARED FOR APPLICANT:

ATHENS STREET, LLC & GOSHEN LANE, LLC

148 PARK STREET
NORTH READING, MA 01864

TEL.: (978) 664-6900

PROJECT SITE INFORMATION:

PROPOSED COMMUNITY PUBLIC WATER SUPPLY

FOR

ATHENS STREET PROPERTY
OFF HUDSON ROAD
STOW, MASSACHUSETTS

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COMMONWEALTH OF MASSACHUSETTS
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CIVIL
No. 38272
REGISTERED PROFESSIONAL ENGINEER

REV. 1 – 10/19/2021

NO.	REVISION DATE	REVISION DESCRIPTION
7		
6		
5		
4		
3		
2		
1	10/19/2021	PUMP TEST DISCHARGE
0	9/2/2021	BRPWS13 SITE EXAM APP'L

PROJECT:

PROPOSED COMMUNITY PUBLIC WATER SUPPLY

ATHENS STREET PROPERTY
OFF HUDSON ROAD
STOW, MASSACHUSETTS

INITIAL ISSUE DATE: SEPTEMBER 2, 2021

PLAN SCALE: 1" = 300'

PLAN TITLE:

PUMP TEST EXHIBIT PLAN

PROJECT NO. PE381.01	2
CAD FILE NO. PE381001.DWG	
DRAWING NO. PE381003	
SHEET NO: 2 OF 2	