August 25, 2017

Mr. Anthony Lopes, P.E.
Project Manager
New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2915

Re: 229 Homer Street Site
Site No. C905044
Work Plan for Pilot Study: Air Sparging and Soil Vapor Extraction

Dear Mr. Lopes:

On behalf of our client, Benson Construction and Development, LLC, TurnKey Environmental Restoration, LLC (TurnKey) has prepared this work plan to assess design parameters for the Recommended Remedial Alternative for the 229 Homer Street Brownfield Cleanup Program (BCP) Site No. C905044 (Site; see Figures 1 & 2).

Based on the revised Remedial Investigation/Alternatives Analysis (RI/AA) report, which is currently in public comment, the planned remedy is a Track 4 commercial cleanup that includes soil vapor extraction (SVE) and air sparging (AS) as a main component of the remedy. Therefore, we are proposing to perform a pilot study to assist our engineering analysis with regard to planned well numbers and spacing, depths, and air withdrawal and air injection rates.

SVE & AS Layout

Based on our preliminary layout of the SVE and AS system provided in the revised RI/AA report, we have opted to perform the pilot study in the southwestern portion of the property as shown on Figure 3 (the SVE well and AS wells are at locations previously shown in that report). We intend to install one SVE extraction well, three AS wells, and two vadose zone piezometers. The SVE well and two vadose zone piezometers will be installed to a nominal depth of 9 feet below ground surface as shown on the details on Figure 4 (5 feet of screen, sand pack and a surface seal consisting of a layer of bentonite chips and a cement grout surface seal). The three AS wells will be installed to a nominal bottom depth of 21 feet below ground surface or about 5 feet below the zone of groundwater treatment (i.e., the upper 5 feet of the aquifer). The AS well will have a one foot screen and sand pack, followed by a one foot bentonite seal and backfilled to grade with cement bentonite grout.

IMPLEMENTATION OF PILOT STUDY

Prior to initiating the pilot study, groundwater levels and dissolved oxygen measurements (DO) will be measured in all wells (MW-1 to MW-5, and AS-1 to AS-3). The pilot study will commence with just SVE operations at an estimated vapor extraction rate of 100 to 200 cubic feet per minute. The blower will be connected via above ground piping to the SVE extraction well. The SVE system will be activated and monitored to assess the radius of influence of the vacuum induced field by monitoring the vacuum at three points (the two vadose zone piezometers, PZ-1 and PZ-2, and monitoring well MW-2) using a portable manometer. In addition to measuring the vacuum field in the vadose zone, we will also monitor the air quality of the discharged air. The air sample will be collected using a summa canister, and analyzed by USEPA Method TO-15 plus tentatively identified compounds (TICs); and gasoline range organics (GRO) and diesel range organics (DRO) by MADEP Air Phase Hydrocarbons (APH). At the time of Summa canister sample collection, a contemporaneous photoionization detector (PID) reading will be made and the results compared to the analytical data which will serve as a surrogate to assess the air quality with time and at various locations. The SVE-only portion of the pilot study will be run for several days until "quasi" steady state conditions are achieved (i.e., the PID readings are fairly consistent over a 24 hour period).

The air sparging portion of the pilot testing will commence after we have determined that "quasi" steady-state conditions are achieved. The groundwater levels and DO concentration of the groundwater will be measured in all wells (MW-1 to MW-5 and AS-1 to AS-3) prior to and during air sparging. The compressor will be connected to the three AS wells and ball valves will be installed between the compressor and the AS wells so that individual AS wells will be subject to injection; we anticipate injecting air at approximately 10 to 20 cubic feet per minute (CFM) into the wells at approximately 5 to 10 pounds per square inch (psi). Initially, well AS-1 will be deployed. The PID readings will be monitored at the SVE air discharge and at PZ-1 and PZ-2 to assess the radius-of-influence of the air injected to the AS well (e.g., the increase in the PID would imply the SVE well is in the radius-of-influence). The PID readings will be monitored for 24 hours. Then, the air sparging will be shut-off and SVE operations continued to reestablish "quasi" steady-state conditions. This procedure will be repeated at well AS-2 followed by well AS-3. Assuming we observe a significant increase in the PID readings during the air sparging, a second air sample will be collected from the SVE exhaust sometime during the air sparging and it will be tested for GRO, DRO and TO-15 VOCs and TICs. If air sparging does not show readily favorable results (e.g., low mass removal), tracer gas analysis (helium) may be added to the air sparge make-up air and monitored in the SVE

well and piezometers to assess the distribution pattern of helium for the injected air in the subsurface and whether there are preferential pathways.

REPORTING/DESIGN

The results will be utilized for remedial design and a chapter of the remedial design report will detail the data and findings.

Please contact us if you require anything further on the enclosed.

Sincerely,
TurnKey Environmental Restoration, LLC

Michael Lesakowski
Principal/Sr. Project Manager

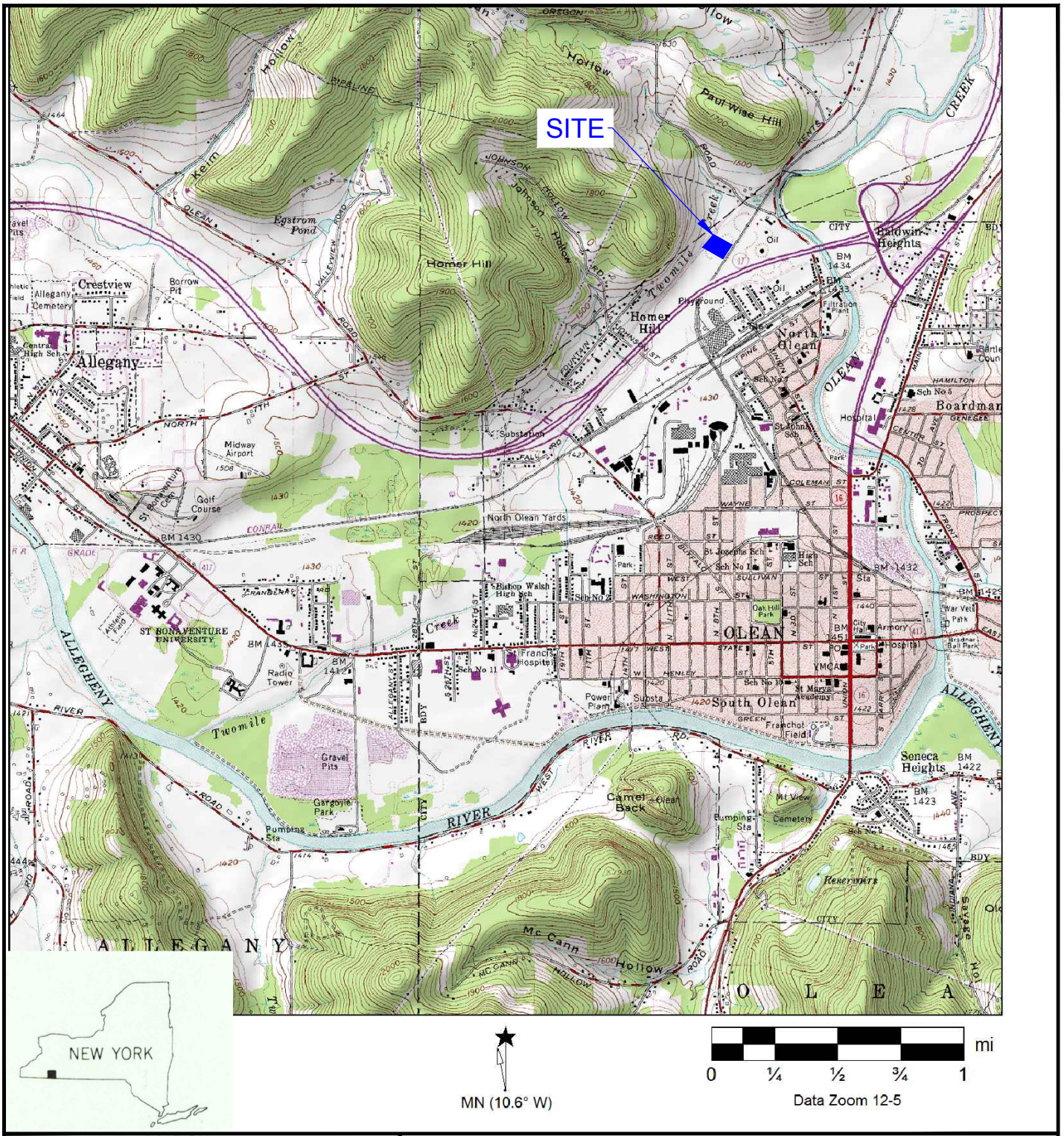
cc: Don Benson (Benson Construction and Development, LLC) (e-copy)
Craig Slater, Esq. (The Slater Law Firm, PLLC) (e-copy)
Chad Staniszewski (NYSDEC Region 9 Hazardous Waste Remediation Engineer) (e-copy)
Renata E. Ockerby (NYSDOH) (e-copy)

File: 0225-015-002

FIGURES

F:\CAD\TurnKey\Benson\229 Homer Street\SVE AS Pilot Study\Figure 1; Site Location and Vicinity Map.dwg

FIGURE 1



TURNKEY ENVIRONMENTAL RESTORATION, LLC

2558 HAMBURG TURNPIKE
SUITE 300
BUFFALO, NY 14218
(716) 856-0635

SITE LOCATION AND VICINITY MAP

SVE/AS PILOT-STUDY WORK PLAN

229 HOMER STREET SITE

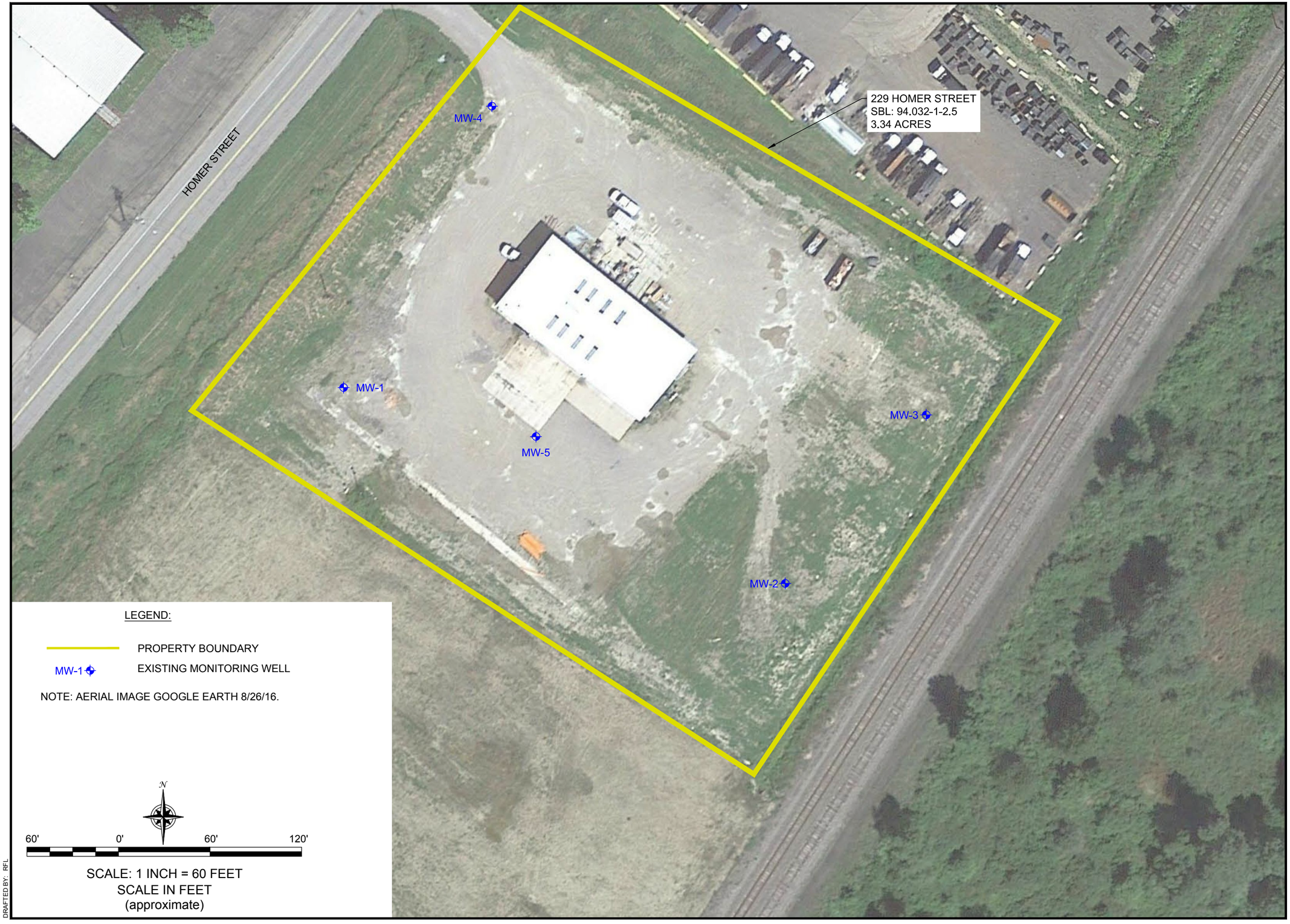
OLEAN, NEW YORK

PREPARED FOR

BENSON CONSTRUCTION AND DEVELOPMENT, LLC

PROJECT NO.:	0225-015-001
DATE:	AUGUST 2017
DRAFTED BY:	RFL

F:\CAD\TurnKey\Benson\229 Homer Street\Revised AA Report\Figure 2; Site Plan (aerial).dwg



LEGEND:

PROPERTY BOUNDARY

MW-1 EXISTING MONITORING WELL

NOTE: AERIAL IMAGE GOOGLE EARTH 8/26/16.

N

60' 0' 60' 120'

SCALE: 1 INCH = 60 FEET
SCALE IN FEET
(approximate)

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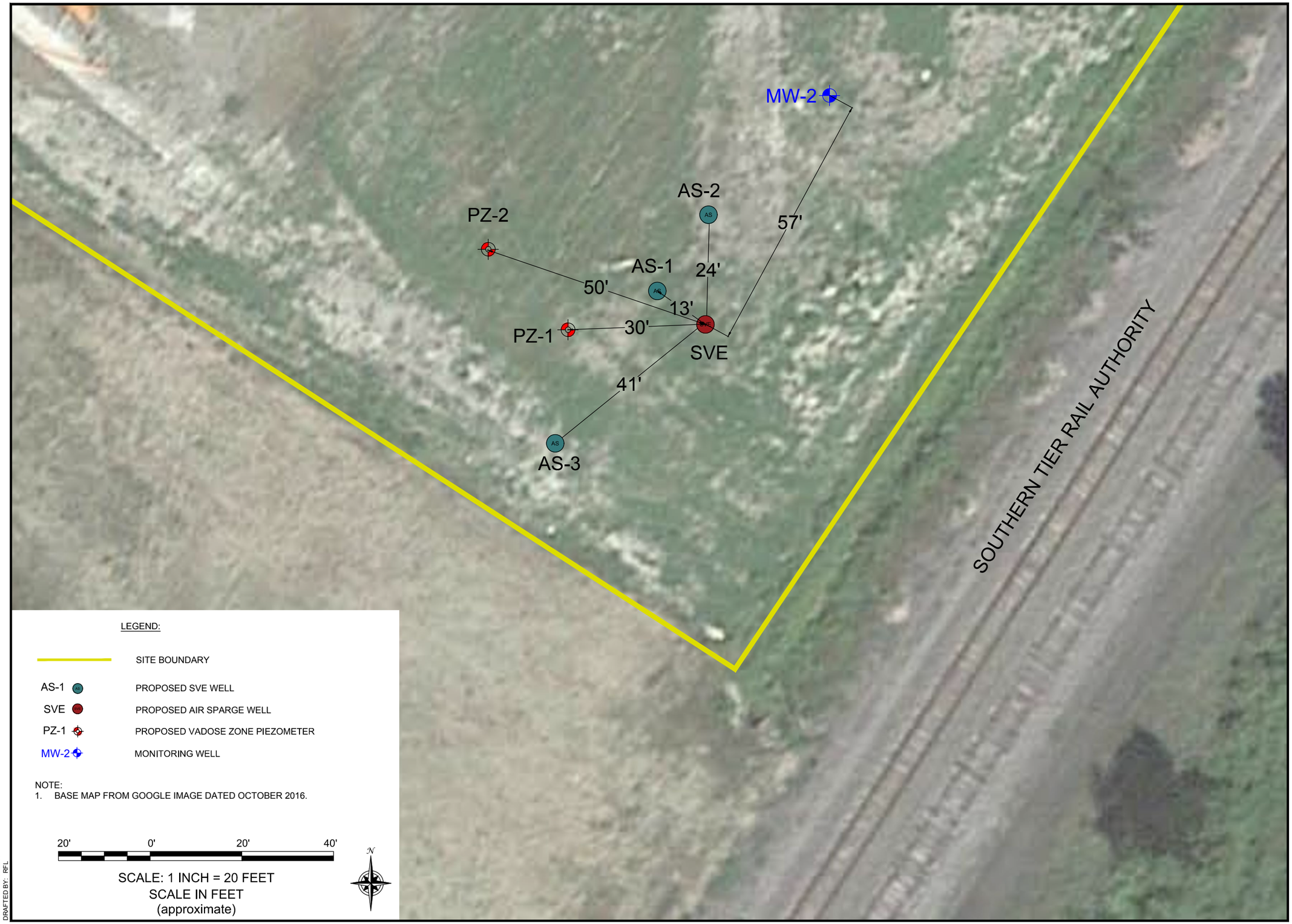
SITE PLAN (AERIAL)

SVE/AS PILOT-STUDY WORK PLAN
229 HOMER STREET SITE
OLEAN, NEW YORK
PREPARED FOR
BENSON CONSTRUCTION AND DEVELOPMENT, LLC

FIGURE 2



LEGEND:

- SITE BOUNDARY
- AS-1 — PROPOSED SVE WELL
- SVE — PROPOSED AIR SPARGE WELL
- PZ-1 — PROPOSED VADOSE ZONE PIEZOMETER
- MW-2 — MONITORING WELL

NOTE:
1. BASE MAP FROM GOOGLE IMAGE DATED OCTOBER 2016.

20' 0' 20' 40'

SCALE: 1 INCH = 20 FEET
SCALE IN FEET
(approximate)

N

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SVE AND AIR SPARGE PILOT TEST

SVE/AS PILOT-STUDY WORK PLAN

229 HOMER STREET SITE

OLEAN, NEW YORK

PREPARED FOR

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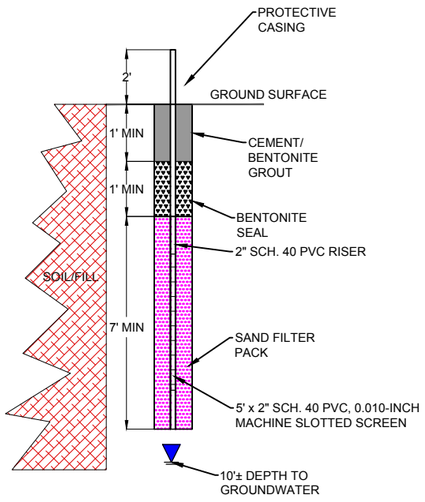
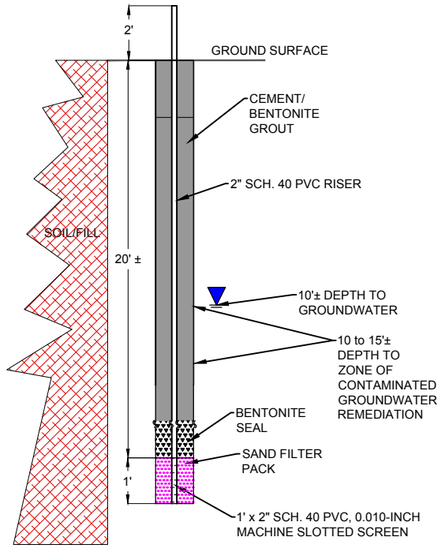
FIGURE 3

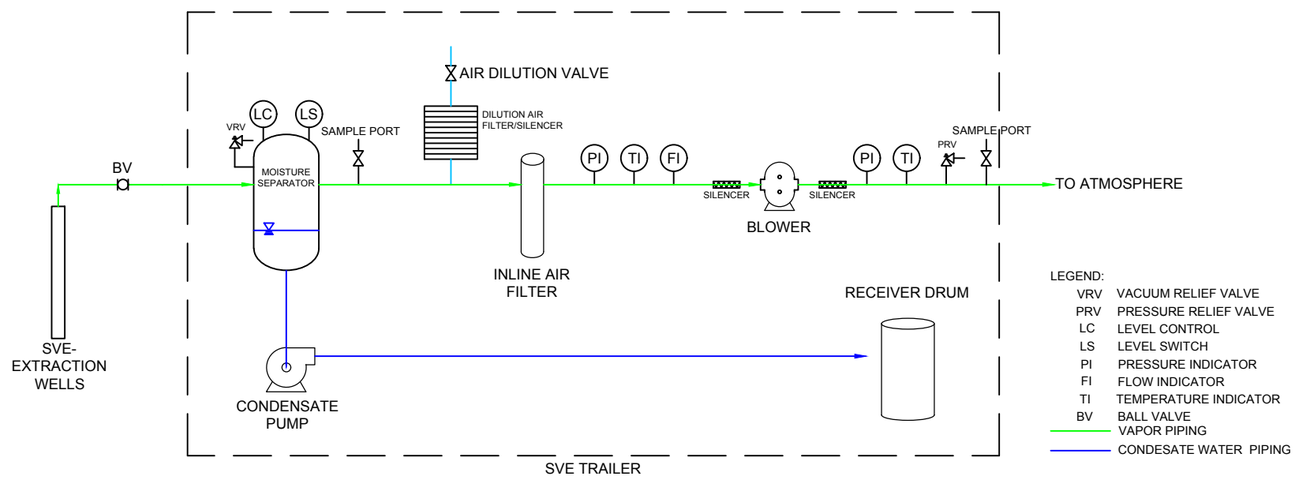
TYPICAL SVE WELL &
VADOSE ZONE PIEZOMETER



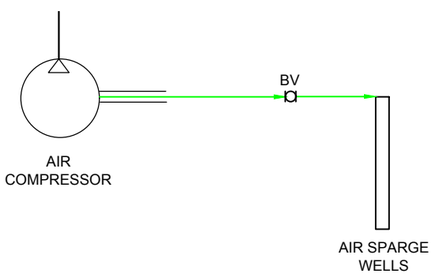
TYPICAL AIR SPARGE
WELL



SVE SYSTEM



AIR SPARGE
SYSTEM



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SVE AND AIR SPARGE DETAILS

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FIGURE 4