
APPENDIX J
PAL ARCHAEOLOGY SENSITIVITY ASSESSMENT (PAL, 2016)



Technical Memorandum Nagog Pond Water Treatment Plant Improvement Project Acton, Massachusetts

Archaeological Sensitivity Assessment

Submitted to:

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The Town of Concord's existing water treatment plant is located near the eastern end of Nagog Pond in Acton, Massachusetts. The Town proposes to improve and upgrade the existing facility, including the installation of a photovoltaic (PV) solar array.

The parcel of land containing the existing treatment plant and proposed PV solar array is bounded on the east and south by developed land within the Acorn Park and Quail Ridge condominium developments. The project area is bounded on the north and west by undeveloped wooded land and wetlands bordering Nagog Pond (Figure 1). Environmental Partners Group, Inc. (EPG) is assisting the Town of Concord in the permitting and design process for this multi-phase project. PAL conducted the archaeological sensitivity assessment under contract with EPG on behalf of the Town of Concord.

Project Description

The proposed project will consist of the replacement of an existing 16-inch cast iron intake pipe into Nagog Pond, replacement of the existing Ozone Disinfection Facility with a new Water Treatment Plant, and the construction of a PV solar array field.

Most of these proposed improvements will be constructed within the footprint of the existing treatment facility. The proposed PV solar array field will be installed within two wooded portions of the project area east of the existing treatment facility and both north and south of the existing access road.

Project History and Authority

In 1994, an intensive (locational) archaeological survey was conducted by UMASS Archaeological Services within the location of the existing treatment facility and access road. A small pit feature associated with historic granite quarrying was identified in the wooded area south of the treatment facility, but no subsurface testing was conducted there. No other cultural resources were identified in the project area (Donta and Holmes 1994).

The Nagog Pond Water Treatment Plant (WTP) Improvement Project is being reviewed under Section 106 of the National Historic Preservation Act of 1966 (as amended) and MEPA (301 CMR 11). In December, 2015, the Massachusetts Historical Commission (MHC) reviewed a Project

Notification Form (PNF) and Environmental Notification Form (ENF) for the Nagog Pond Water Treatment Plant Improvement Project and requested that project information be provided to the Acton Historical Commission for their review and comment. In February, 2016 (2/11/2016), the MHC responded to comments on the project area from Quail Ridge Residents and the Acton Historical Commission.

MHC noted that the project area is in proximity to recorded pre-contact Native American sites and post-contact period granite quarries along Nagog Brook and undisturbed portions of the project impact area are archaeologically sensitive. MHC recommended that an intensive (locational) archaeological survey be conducted for the archaeologically sensitive portions of the new project impact area.

The goal of the archaeological sensitivity assessment was to assemble information about documented cultural resources within and near the Nagog Pond Water Treatment Plant Improvement project area, review the results of previous archaeological investigations, conduct a walkover survey of the project area and provide recommendations regarding any additional archaeological investigations that may be required or requested. This technical memorandum presents the results of the archaeological sensitivity assessment. PAL staff (D Ritchie) conducted fieldwork for the archaeological sensitivity assessment on February 4, 2016.

Methodology

The methodology for the archaeological sensitivity assessment consisted of two primary tasks. Background research on the project area included a review of project plans and boring logs from a geotechnical study provided by EPG and archival research. The second task was a systematic walkover survey and surface inspection of the project area.

For the archival research, PAL examined the Massachusetts Historical Commission's (MHC) Inventory of the Historic and Archaeological Assets of the Commonwealth (MHC Inventory) and the Massachusetts Cultural Resource Information System (MACRIS) maintained by the MHC to identify all recorded historic properties located within and near the project Area of Potential Effect (APE). This review included both archaeological resources and historic architectural properties that are listed in or evaluated as eligible for listing in the State or National Register of Historic Places, as well as those properties that have not been evaluated or have been determined ineligible for listing in the National Register of Historic Places. Cultural resource management (CRM) reports from archaeological investigations conducted within and adjacent to the project area were also examined for information about previously identified cultural resources. Town histories and historic maps were another source of information.

During the systematic walkover survey and surface inspection of the project area, PAL staff evaluated its current condition by identifying locations of previous alteration or modification to the original topography from past development such as construction of the existing treatment plant facility and its access road, and grading and filling around the facility. Sections of the project area with the potential to contain intact soil horizons such as wooded areas with no visible evidence of past alteration were also noted during the walkover survey.

Results of the Due Diligence Review

Archival Research

Archival research indicated that a number of previously recorded pre-contact Native American and post-contact archaeological sites are located in proximity to the Nagog Pond Water Treatment Plant Improvement project area. These sites were identified in cultural resource management (CRM) surveys completed for various developments and larger study areas (Assabet River drainage, Town of Acton). No previously recorded pre-contact sites are within the project area.

Pre-Contact Sites

PAL completed intensive archaeological surveys for two large developments bounding the Nagog Pond Water Treatment Plant project area on the east and south. Within the Acorn Park development, two pre-contact Native American sites (Crow Head, 19-MD-585; Nagog Brook, 19-MD-586) were identified near Nagog Brook north of the project area. The Crow Head Site is of unknown temporal/cultural affiliation; and the Nagog Brook Site may date to the Late Archaic Period (5000-3000 years before present [B.P.]) (Ritchie and Holstein 1986).

In the Quail Ridge Country Club development, another group of 4 small pre-contact sites was found south of Nagog Brook and a small feeder stream. The Quail Ridge Find Spot 1, (19-MD-865); Quail Ridge Find Spot 2, (19-MD-866); Quail Ridge Find Spot 3, (19-MD-867) and Quail Ridge Find Spot 4, (19-MD-868) sites were located within approximately 500 meters (m) of the Nagog Pond Water Treatment Plant Improvement project area (Waller and Mair 2002). Quail Ridge Find Spot 1, (19-MD-865) yielded an untyped projectile point that may be of Transitional Archaic Period (3200-2500 years B.P.) age; the temporal/cultural affiliation of the Quail Ridge Find Spot 2, Quail Ridge Find Spot 3 and Quail Ridge Find Spot 4 sites is unknown. Another known site (Acorn, 19-MD-953) of unknown temporal/cultural affiliation is located about 700 m north of the project area near the northeast side of Nagog Pond (Hoffman and Edwards 2002).

Post Contact Sites

Cultural resource management surveys (CRM) have also identified a number of post contact period archaeological sites in and around the project area. A CRM survey of the existing Nagog Pond treatment plant facility and access road identified one small pit associated with granite quarrying outside the impact area for that project (Donta and Holmes 1994). This site is not listed in the state inventory of cultural resources maintained by MHC. It is within the currently proposed Nagog Pond Water Treatment Plant Improvement project area.

An intensive archaeological survey within the Acorn Park development, located east of the project area near Route 2A identified several granite quarries and associated features such as grout/quarry waste piles and haul roads designated as the Acorn Park Quarries (ACT-HA-1). This quarry complex appeared to date from the late nineteenth century to early Modern Period (ca. 1870-1940), and was partially preserved within the Acorn Park condominium development (Ritchie and Holstein 1986).

An intensive archaeological survey of the Quail Ridge Country Club project area identified a complex of 14 granite quarries designated as Quail Ridge Quarry Locales 1-14 (ACT-HA-4), in addition to a

former farmstead site (Quail Ridge Farmstead, ACT-HA-3) and an associated feature (Quail Ridge Stone Platform, ACT-HA-2) (Waller and Mair 2002).

In 2011, PAL completed an archaeological assessment to document the condition of archaeological resources previously identified within the Quail Ridge Country Club. This assessment found that construction of the Quail Ridge Country Club preserved four previously identified quarry sites, **but altered three quarries, and removed or obscured seven other quarry sites. Construction of the Quail Ridge Golf Course also removed or buried the Quail Ridge Farmstead (ACT-HA-3) and altered a stone bridge abutment on Nagog Brook.** The Quail Ridge Stone Platform (ACT-HA-2) and a stone pen remained intact (Waller and Mair 2011).

A review of historic maps of Acton from the late eighteenth to late nineteenth century indicated that no structures were built in the project area before construction of the existing water treatment facility. The abandoned farmstead (Quail Ridge Farmstead, ACT-HA-3) found within the Quail Ridge Country Club project area does not appear on any of these maps.

Walkover Survey and Surface Inspection

A systematic walkover survey and surface inspection of the Nagog Pond Water Treatment Plant Improvement project area was conducted on February 4, 2016. During the walkover survey, existing conditions within the project area were noted including the location of an asphalt paved driveway or access road for the existing water treatment plant and a fenced compound with a paved surface surrounding this facility. Other sections of the project area around the perimeter of the fenced compound containing modified, machine graded or stone rip-rapped surfaces were also noted.

The walkover survey was also used to confirm the location of a historic quarry pit identified in a prior intensive archaeological survey by UMASS Archaeological Services (Donta and Holmes 1994). The walkover survey and surface inspection identified two zones of archaeological sensitivity within the intact wooded section of the current project area. These zones are covered with a second growth forest of mixed hardwood (oak, black birch, red maple) and white pine trees. The largest zone of archaeological sensitivity is Area 1, within the section of the proposed solar photovoltaic (PV) array field south of the existing water treatment facility and access road (Figure 2). This zone of archaeological sensitivity contains the previously identified quarry pit. Designated as Quarry Pit #1, this site consists of a shallow depression about 1.5 m deep and 5m in diameter. This pit is filled with forest duff and leaf mold. Three fragments of quarried granite with hand drilled holes are visible on the surface within a few meters of the quarry pit (Figure 3). Given its limited size and depth, this pit feature is most likely an exploratory opening made to determine the depth of bedrock from the surface and the quality of the granite at this location (Table 1).

Table 1. Cultural Resources Within The Nagog Pond Wastewater Treatment Plant Project Area.

Site Name	Method of Identification	Site Type	Temporal/Cultural Affiliation	National Register status
Quarry Pit # 1	Walkover survey (Donta and Holmes 1994)	Granite quarry pit (small exploratory pit?)	Late nineteenth to twentieth century century (?)	Undetermined
Quarry Pit # 2	Walkover survey (PAL 2016)	Granite quarry with associated waste/grout pile and quarried slabs	Late nineteenth to early twentieth century (?)	Undetermined

A large glacial boulder in the eastern portion of this zone of archeological sensitivity could possibly be a boulder shelter that may have pre-contact Native American cultural material associated with it (Figure 4).

A second granite quarry pit with an associated grout/quarry waste pile and stockpiled granite slabs was identified during the walkover survey (see Table 1). Designated as Quarry Pit #2, it is located in Area 2, in the northeast/east portion of the project area where a smaller section of the proposed solar PV array field will be constructed. This quarry pit is in a wooded area east of the existing treatment plant and north of the access road, less than 10m from the chain link fence surrounding the plant. It is about 20m in length, 9m wide and approximately 4m deep. Granite bedrock with parallel joints or fracture planes is exposed in the west wall of the quarry pit (Figure 5).

A small quarry waste or grout pile with fragments of granite is located on the north end of the quarry pit. A few meters east of the pit is a pile of large granite slabs that may be stone stockpiled for use as construction material, but never transported from this quarry. One piece of granite in this pile is a large slab about 4m in length.

A large section in the eastern end of the proposed solar array, along the northern boundary of the Quail Ridge development and both sides of the existing access road had evidence of prior disturbance from grading and landscaping. This altered area was ranked as a zone of low archaeological sensitivity. The largest zone of low archaeological sensitivity was formed by the existing access road, treatment plant facility and a surrounding asphalt paved surface within a fenced compound. The fenced compound is bordered on the east and south by open areas with evidence of previous disturbance from soil stripping and grading and low archaeological sensitivity (see Figure 2).

Summary and Recommendations

The results of archival research for the archaeological sensitivity assessment found that 7 known pre-contact Native American sites and 4 known post-contact archaeological sites identified in cultural resource management surveys are within one half mile of the Nagog Pond Water Treatment Plant project area. The pre-contact sites consist of small temporary encampments associated with Native American settlement and resource use near Nagog Brook and wooded wetlands. The post-contact sites are mostly small granite quarries with associated quarry waste/grout piles and haul roads, and there is one abandoned farmstead site and a fieldstone platform. A cultural resource management survey of the existing treatment plant facility was conducted in 1994. The 26 test pits excavated

within the treatment plant site and access road did not identify any archaeological sites (Donta and Holmes 1994).

A town-wide archaeological reconnaissance survey of Acton conducted by PAL identified zones of high and moderate sensitivity for pre-contact archaeological resources on the upper end of Nagog Brook in an around the project area. A zone of high archaeological sensitivity for post-contact period archaeological resources includes the current Nagog Pond Water Treatment Plant Improvement project area (Ritchie 2009).

The two zones of high archeological sensitivity (Area 1, Area 2) in the Town of Concord project area have the potential to contain small, pre-contact Native American archaeological sites similar to those identified by previous CRM surveys. Expected Native American site types within the project area are low-density scatters of cultural materials (stone tools, chipping debris, burned rock, ceramic sherds,) marking temporary encampments or isolated chipped stone tools (bifacial tool blades, projectile points). A large glacial boulder found in the eastern end of the project area is a potential boulder shelter that may have pre-contact cultural material associated with it.

The two quarry pits in the archeologically sensitive portions of the project area may have metal tools (drills, chisels, wedge and feather sets) discarded or lost during active quarrying, associated with them. Small amounts of domestic refuse (ceramic sherds, bottle glass, animal bone) and structural materials or hardware (nails, bolts, window glass, etc.) could also be associated with these quarry pits.

The MHC has requested that an intensive (locational) archaeological survey be conducted for the archaeologically sensitive portions of the project area. It is recommended that an intensive archaeological survey be conducted within the two archaeologically sensitive, wooded portions of the project area that are proposed as locations for the photovoltaic solar array field.

An intensive archaeological survey within these two areas would consist of subsurface sampling with hand dug 50-x-50cm test pits along linear transects or sampling blocks and in judgmentally selected locations. Additional documentation for the two identified quarry pits would include scaled drawings and digital photographs. A scope and cost proposal for the intensive survey will be provided upon request.

References

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2011 *Technical Memorandum, The Residences at Quail Ridge, Acton Massachusetts.* PAL Report No. 2674. Submitted to Pulte Homes of New England, LLC, Westborough, MA.

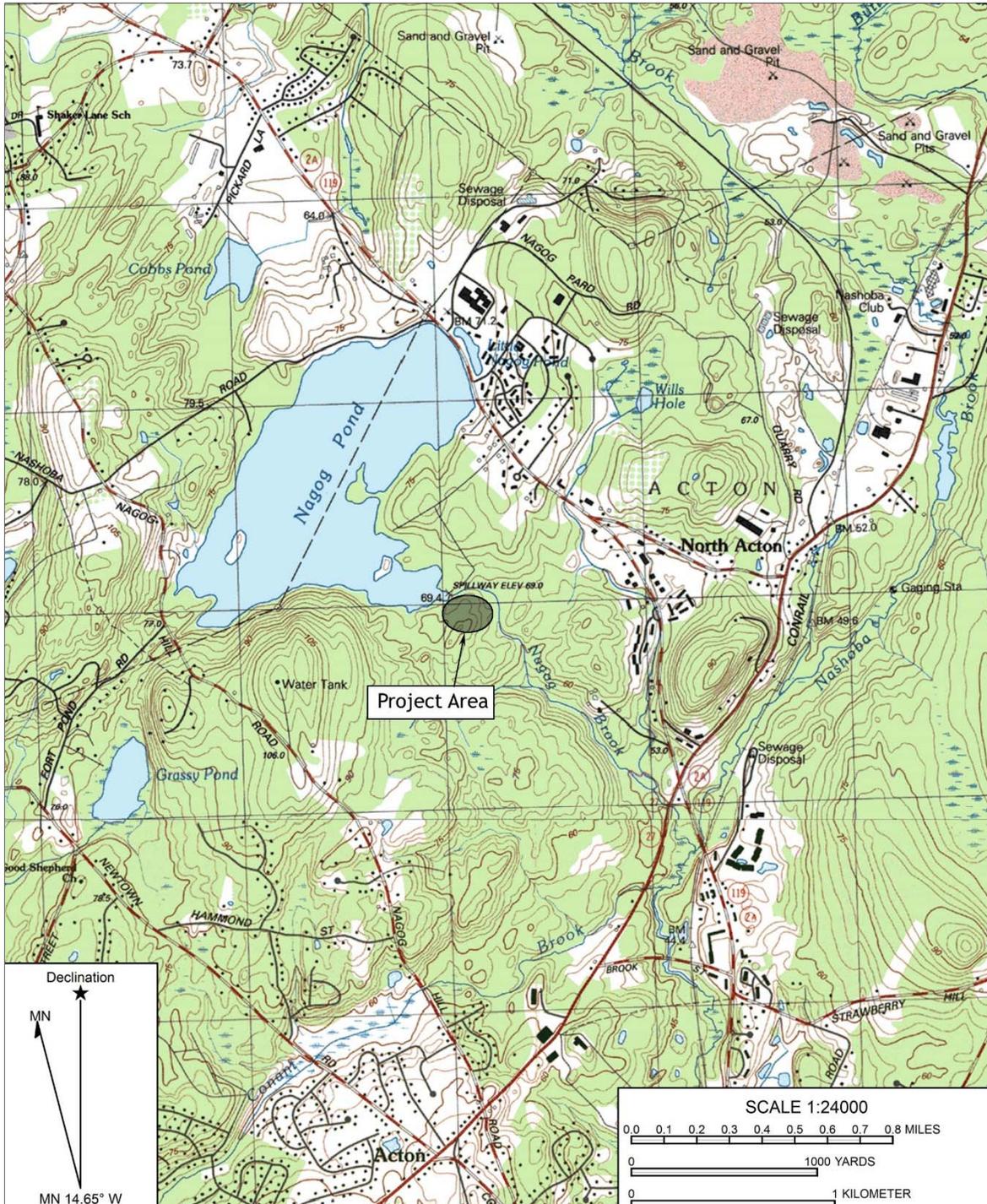


Figure 1. Location of the Nagog Pond Water Treatment Plant project area on the Billerica, MA USGS topographic quadrangle map.

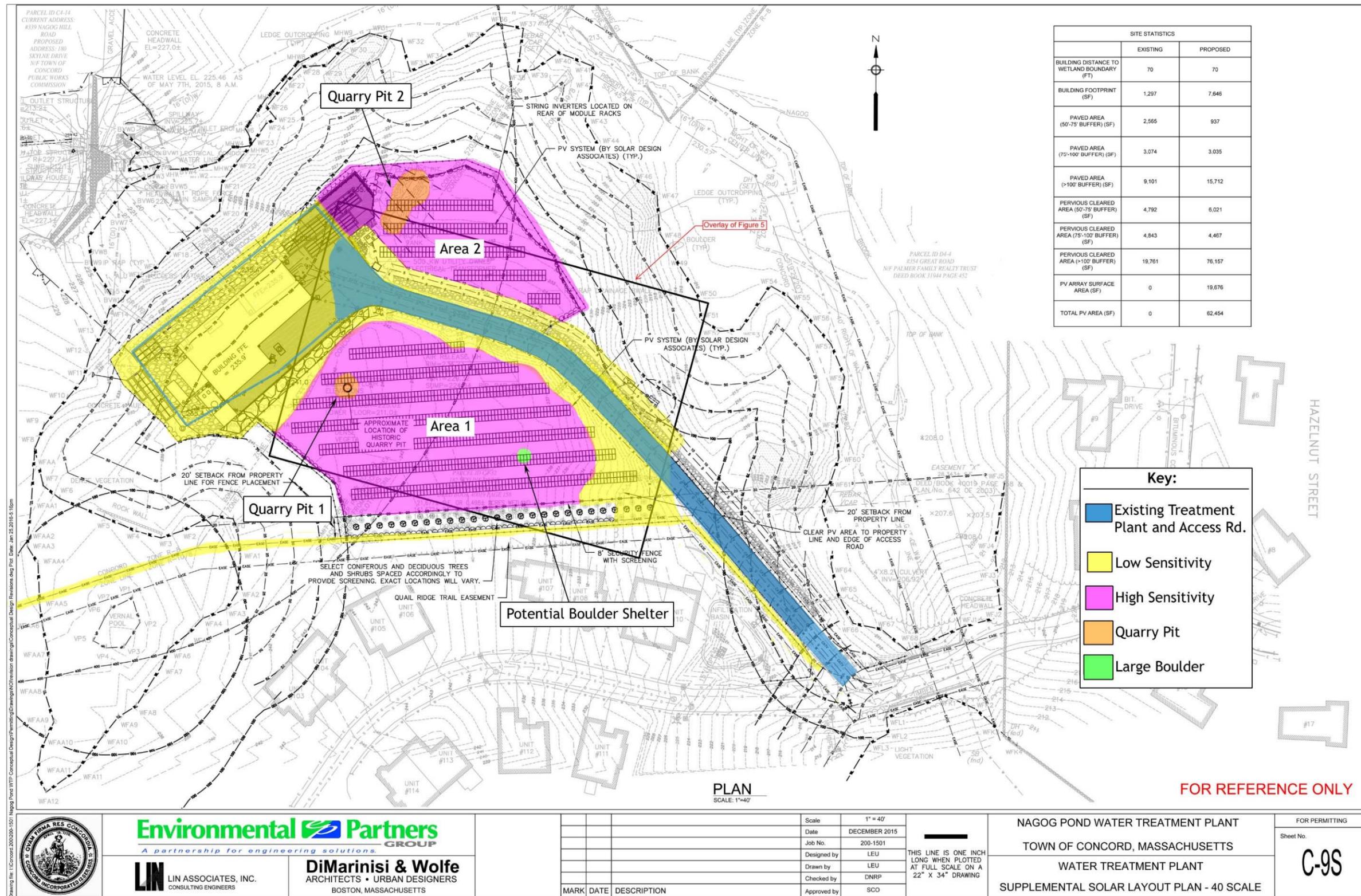


Figure 2. Nagog Pond Water Treatment Plant project area with zones of archaeological sensitivity.



Figure 3. Quarry Pit 1 in Area 1, southern portion of Nagog Pond Water Treatment Plant project area.



Figure 4. Large boulder representing possible boulder shelter in Area 1.



Figure 5. Quarry Pit 2 in Area 2, northern portion of Nagog Pond Water Treatment Plant project area.