ATTACHMENT M6

SHPO CONSULTATION

Connecticut State Historic Preservation Office
Consultations and Correspondence

On October 28, 2020, revised materials reflecting the current Project design and schedule (East Face berthing alignment) were provided to the CT SHPO[1]. These plans and select recent agency correspondence are included in Attachment M6.

Plans and text previously provided to this agency have been superseded by the current Project design. See Attachment P5 for the initial SHPO consultation documentation, including these older SPII design plans (South Face berthing alignment).

[1] Materials sent to SHPO on October 28, 2020 detail the current design, as documented in the enclosed JPA Revision (Rev. 2). Plans reflecting the East Berth arrangement were previously sent to CT DEEP NDDB on April 28, 2020 (JPA Revision 1); however, those April 2020 plans are superseded by content herein.

Van Naerssen, Kris

From:	Van Naerssen, Kris
Sent:	Wednesday, October 28, 2020 11:57 AM
To:	Labadia, Catherine
Cc:	Salvatore, Joseph R.; Grzywinski, Micheal; Lowry, Dennis; Garbolski, Michael; Ray, Diane M CIV USARMY CENAE (USA); Morin, Ed; Abbot, Martin (martin.abbot@aecom.com)
Subject:	State Pier Infrastructure Improvements - Project Dredging Updates
Attachments:	SHPO_Project_Updates-10282020.pdf

Good Morning Ms. Labadia –

Hope this note finds you well. As part of ongoing permitting and Section 106 processes, your office is reviewing materials related to the State Pier Infrastructure Improvements (SPII / Project) proposed by the Connecticut Port Authority (CPA) in New London.

In support of a pending Joint Permit Application resubmittal, we have prepared the attached letter to update you on the current Project design, which has changed somewhat since your last review. Changes include deeper dredging activities at the State Facility Pier and application clarifications to account for dredging sideslope. Additional detail on the Project revisions and associated plans are attached for your records. Please note that the dredging work would be completed within an area that AECOM previously determined be of low archaeological sensitivity._

Please let us know if you have any questions or comments regarding these changes, or if any additional coordination with your office would be required. Thank you for your ongoing assistance with the Project.

Regards,

Kris

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October 28, 2020

Catherine Labadia
Deputy State Historic Preservation Officer
State Historic Preservation Office (SHPO)
Connecticut Department of Economic and Community Development
450 Columbus Blvd, Ste. 5
Hartford, CT 06103

State Pier Infrastructure Improvements Project
Proposed State Pier Design Modifications - Revised JPA Resubmittal
200 State Pier Road in New London, Connecticut

Dear Ms. Labadia,

On behalf of the Connecticut Port Authority (CPA), AECOM is contacting the CT SHPO to provide an update to the State Pier Infrastructure Improvements (SPII or Project) work scope, which has been amended since your last review. The Project is proposed at the State Pier Facility, located in New London, CT. The changes described below are all located within the limits of the Area of Potential Effect (APE) boundaries included in prior SHPO submittals and are limited to reconfiguration of in-water works. These changes represent alterations to dredging and berthing area footprints which are located in areas previously deemed to be of low archaeological sensitivity.

CPA's consultants submitted a Joint Permit Application (JPA) to the CT DEEP and the United States Army Corps of Engineers (USACE) on May 6, 2019 for the proposed SPII. In response to feedback received from other harbor users, the Project design was amended in late 2019/early 2020. A Revised JPA was submitted to the agencies on May 8, 2020 to capture these design changes. We consulted with your office during the initial JPA submittal and subsequent resubmittal processes and will continue to do so.

The Project work scope has been slightly amended since the May 2020 Revised JPA was submitted, as the design has progressed and been further refined this year. Consequently, AECOM is preparing a second Revision to the JPA to capture related scope changes and associated application edits.

Project Changes

A summary of notable changes since the May 2020 Revised JPA materials follows. Select updated plan set sheets from the forthcoming Revised JPA (Rev. 2), as well as a revised JPA Executive Summary, are also included for your review. The JPA is being revised to the capture the following dredging and seabed preparation approach, including:

- Vessel Berth Dredging and Seabed Preparation:
  - A tiered berthing pocket design with deeper proposed dredge depths (eastern portions of the berth pockets dredged to -65' MLLW), rock pad areas and associated side-slope alterations.
  - Northeast (Delivery Vessel) Berth:
    - Dredging of ~70,000 SF and ~98,000 CY for berthing areas without rock pad placement.
    - Dredging of ~170,000 SF and ~124,000 CY in support of rock pad installation areas.
    - Installation of ~107,000 CY of crushed stone within the jack-up pad / rock pad area.

  - East (Installation Vessel) Berth:
    - Dredging of ~210,000 SF and ~122,000 CY of dredging in support of rock pad installation.
    - Installation of ~107,000 CY of crushed stone within the jack-up pad / rock pad area.
- Turning Basin Dredging:
  - Accounting for adjacent sideslope alterations, the turning basin dredging has decreased to approximately 55,000 CY of material from an approximately 241,000 SF subset of the turning basin.

Please see the accompanying plan sheets for additional detail. While the design elements noted above will be updated in the forthcoming JPA Revision, the majority of the other Project elements previously described remain unchanged. **Please note that the work described above remains within the Project's previously identified berth pocket and turning basin limits.**

We do not anticipate that these design changes will affect the SHPO findings, as these work areas are wholly located within the limits of the previously defined APE and represent a reconfiguration of work in areas previously found to be of low archaeological sensitivity.

If you have any questions or comments regarding the design revisions detailed herein, or if additional coordination is required, please do not hesitate to contact us. Thank you for your continued assistance with this Project.

Kind regards,

Kris van Naerssen, PWS
AECOM
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E: Kris.VanNaerssen@aecom.com

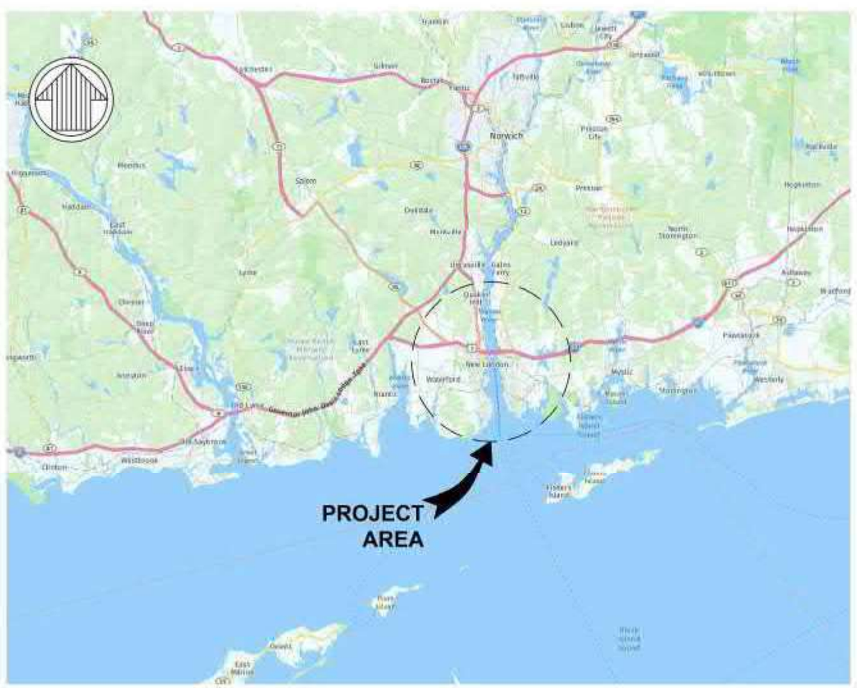
Enclosure: Revised Project Permitting Plans – Select Sheets
Revised Executive Summary

AECOM Imagine it. Delivered.

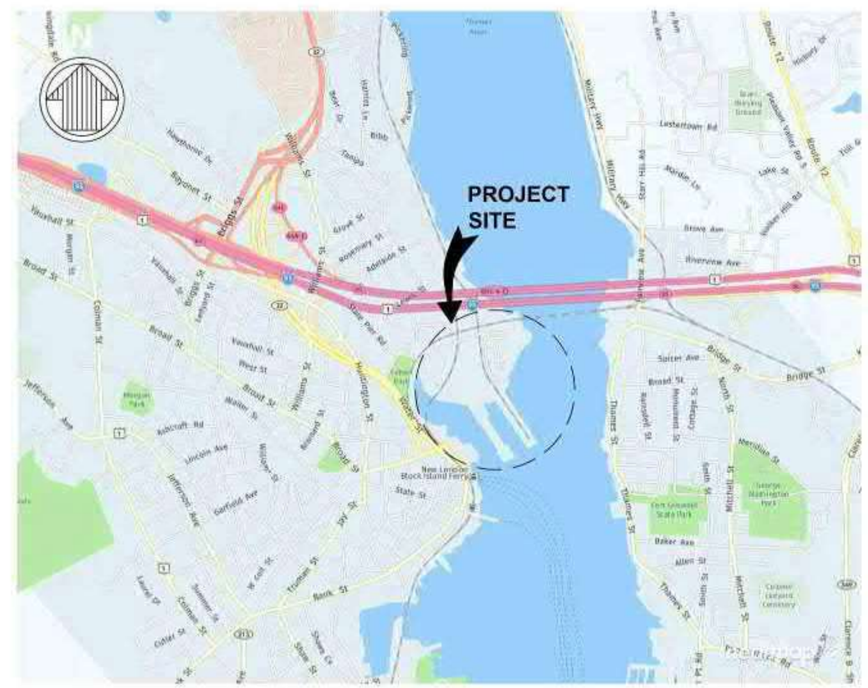
Revised Project Permitting Plans (Select Sheets)

STATE PIER INFRASTRUCTURE IMPROVEMENTS
STATE PIER FACILITY
NEW LONDON, CONNECTICUT

Select plan sheets identified below were forwarded to agency on 10/28/20. Omitted here to reduce document size. See Attachment I for corresponding plan sheets.



AREA MAP



LOCATION MAP

DRAWING INDEX

SHEET NUMBER	SHEET TITLE
1	COVER SHEET
2	NOTES - 1 OF 2
3	NOTES - 2 OF 2
4	EROSION AND SEDIMENT CONTROL NOTES - 1 OF 3
5	EROSION AND SEDIMENT CONTROL NOTES - 2 OF 3
6	EROSION AND SEDIMENT CONTROL NOTES - 3 OF 3
7	EROSION AND SEDIMENT CONTROL PLAN
8	EXISTING TOPOGRAPHIC AND HYDROGRAPHIC PLAN
9	EXISTING CONDITIONS PLAN
10	DEMOLITION AND REMOVAL PLAN
11	EXISTING STATE PIER PILE SUPPORTED PLATFORM
12	PROPOSED PLAN
13	PROPOSED DREDGING PLAN
14	GRADING AND DRAINAGE PLAN
15	PHASING PLAN
16	WORK COVERED UNDER CERTIFICATE OF PERMISSION AND CT GP PERMITS
17	OFFICE AND PARKING PLAN
18	FACILITY USE AND LOGISTICS PLAN
19	FEDERAL CHANNEL MAP PLAN
20	INSTALL VESSEL NAVIGATION PLAN (INBOUND)
21	INSTALL VESSEL NAVIGATION PLAN (OUTBOUND)
22	NORTHEAST BULKHEAD SECTIONS
23	PROPOSED EAST STATE PIER PILE SUPPORTED PLATFORM
24	KING PILE WALL CLOSURE BETWEEN CVRR AND STATE PIER
25	CVRR BULKHEAD SECTIONS
26	MOORING PLATFORM SECTION
27	BUOY ANCHORAGE AND MOORING DOLPHIN DETAILS
28	DRAINAGE STRUCTURE DETAILS - 1 OF 2
29	DRAINAGE STRUCTURE DETAILS - 2 OF 2
30	OUTFALL DETAILS
31	DUCTBANK DETAILS
32	PROPOSED DREDGE ALIGNMENT PLAN
33	NORTHEAST BERTH DREDGE SECTIONS
34	EAST BERTH DREDGE SECTIONS
35	DREDGE SECTIONS FOR INSTALL VESSEL JACK-UP LEGS

Connecticut PORT AUTHORITY

PERMITTING SET
ISSUED: 10/23/2020
NOT TO BE USED FOR CONSTRUCTION

moffatt & nichol

SEAL

Revised Executive Summary

Revised Executive Summary

On October 28, 2020, a copy of JPA *Attachment A – Executive Summary* was forwarded to the agency. To limit document size, this attachment is excluded here. See Attachment A for details.

AECOM
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Burlington, NJ 08016
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October 21, 2020

Catherine Labadia
Deputy State Historic Preservation Officer
450 Columbus Boulevard, Suite 5,
Hartford, CT 06103

RE: Geomorphological Investigation of the State Pier Infrastructure Improvements, New London, Connecticut: Supplemental Assessment - Addendum

Dear Ms. Labadia,

In support of the State Pier Infrastructure Improvements (SPII or Project) proposed in New London Connecticut (Figure 1) by the Connecticut Port Authority (CPA), AECOM conducted an onsite geomorphology survey to further investigate archaeologically sensitive areas previously identified during the Project's Phase IA desktop assessment (*Phase 1A Archaeological Sensitivity Report*: Campetti and Pelletier 2020). In May of 2020 AECOM conducted an initial geomorphological survey onsite but was unable to test a portion of the moderate-to-high sensitivity areas, due to the presence of a salt pile covering a portion of the investigation area (*Geomorphological Investigation of the State Pier Infrastructure Improvements, New London, CT*: LaVigne 2020). In August of 2020, this onsite salt pile was relocated and additional geoprobe testing was completed. The results of this additional testing are provided in this Addendum.

The goal of the SPII Geomorphological Investigation, including the August 2020 supplemental assessment, is to identify the presence or absence of buried surfaces/soils with the potential to preserve archaeological resources, in order to further refine recommendations regarding potential archaeological resources. The Geomorphological Investigation surveys were overseen by AECOM's Senior Geoarchaeologist who meets the Secretary of Interior's Professional Qualifications Standards (36 CFR 61) for archaeology.

In addition to presenting findings from the August 2020 supplemental geomorphological survey, the enclosed Addendum documents an assessment that was made for new impact areas (SP5 and SP6) recently included in the Area of Potential Effect (APE) (Figure 2). An enlarged APE associated with the Project's dredging footprint (SP6) and potential coastal restoration work area (SP5) was noted in email communication between Casey Campetti and your office on April 28, 2020. As documented below, the assessment of these additional work areas found there to be Low potential for impacts to either terrestrial or underwater archaeological resources.

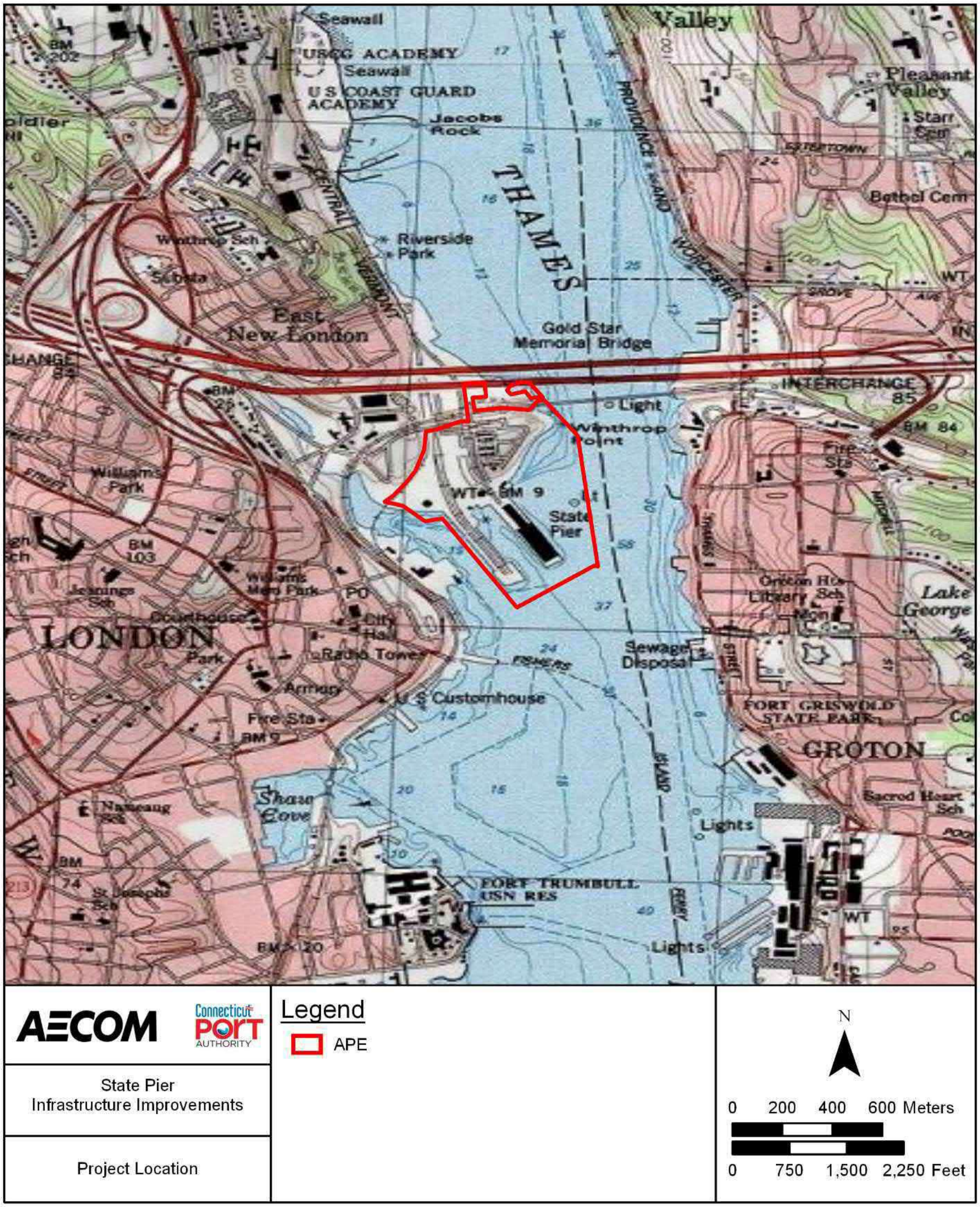

Figure 1: Project Location

Figure 2: APE Archaeological Sensitivity shown on modern aerial (ESRI Imagery 2020)

Shoreline Impact and Dredging Expansion APE Addition

As documented in prior email correspondence (AECOM, April 28, 2020), Project activities are now anticipated beyond the limits of the previously documented APE. AECOM has updated the corresponding SHPO/APE figures within this Addendum and has completed an assessment of the expanded work area, as documented below.

The Shoreline Impact expansion is located in the northeast area of the Project (SP5; Figure 2), in the vicinity of Winthrop Point. The expanded APE extends from north of the railroad bridge to the Gold Star Memorial Bridge, and it extends south of the railroad bridge along the shoreline of Winthrop Point, approximately 570 ft. The area of in-water dredging work in this vicinity has also been enlarged. Terrestrially, this added location has no archaeological sensitivity, as it can be determined from historic mapping that this area is all manmade land (Figure 3).

A review of historic nautical charts dating from 1848 through 1942 was conducted to determine if there were any shipwrecks or maritime structures that would fall into the expanded APE. No shipwrecks were charted in the area. It is apparent that the shoreline was changed by filling in the northern area to support the railroad bridge construction, as well as earlier bridge construction. Both the 1924 and 1942 charts noted the shoreline filling that was completed north of the modern railroad bridge. Below the railroad bridge, the shoreline from the early nineteenth century was altered by filling and wharf construction. No shipwrecks were plotted on the historic charts in the expanded APE.

Several shipwreck databases were consulted to determine if any shipwrecks or potential shipwrecks are recorded. The State of Connecticut's shipwreck database does not record any vessels or potential resources in the expanded APE. The National Oceanic and Atmospheric Administration Wrecks and Obstruction (NOAA's AWOIS) database does not record any shipwrecks in these areas but does record two obstructions that are associated with sunken pilings and a rip-rap dike that extends from the shoreline just south of the railroad bridge. Neither of these reported obstructions have potential to be associated with a significant submerged cultural resource.

The Dredging expansion (SP6) involved the extension of the former SP1 eastern boundary and additional 10-140 meters to the east of the original APE boundary. Based on the review of the underwater area conducted during the Phase IA for this project, any potential shipwrecks within this portion of the channel would not have survived dredging operations over the nineteenth and twentieth centuries.

Based on the historic documents reviewed for the expanded APE, there is no potential to affect terrestrial cultural resources withing the expanded APE and very low potential to affect significant submerged cultural resources within the expanded APE. As in the original Phase IA correspondence, underwater areas of low archaeological sensitivity are recommended to require no further archaeological testing.

Geomorphological Investigation: Supplemental Assessment - Methods and Results

A total of seven (7) Geoprobe borings were advanced and documented during the August 2020 additional geomorphological assessment field sampling event (Figure 4). These Geoprobes were placed to test the area previously covered by a large salt pile in the moderate-to-high sensitivity area (SP1). Six borings were initially proposed, but a seventh was added to ensure accurate and thorough testing. The Geoprobe log is available as Table 1. In multiple borings, some amount of material was not recovered within the sleeve of the Geoprobe. There are several reasons this may have occurred, such as: 1) the Geoprobe encountered a void; 2) something blocked the probe entrance, such as a rock, resulting in the blockage of sediment from entering the sleeve; or 3) the sediment was loose and was pushed out of the way rather than into the sleeve. This can happen in unconsolidated or water-logged sediments.

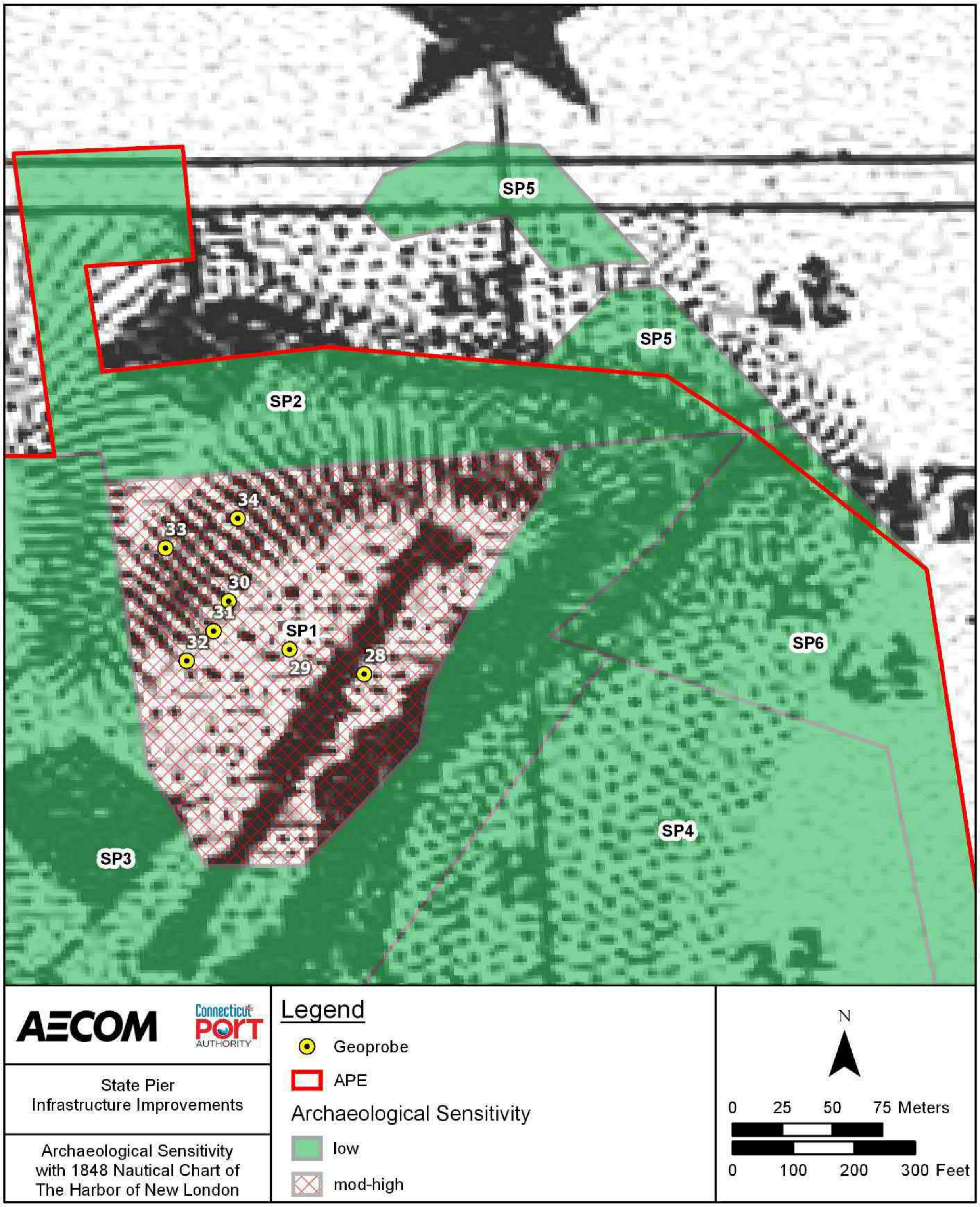

Figure 3:1848 nautical chart of the harbor of New London showing that the current SP5 shoreline area is manmade land.

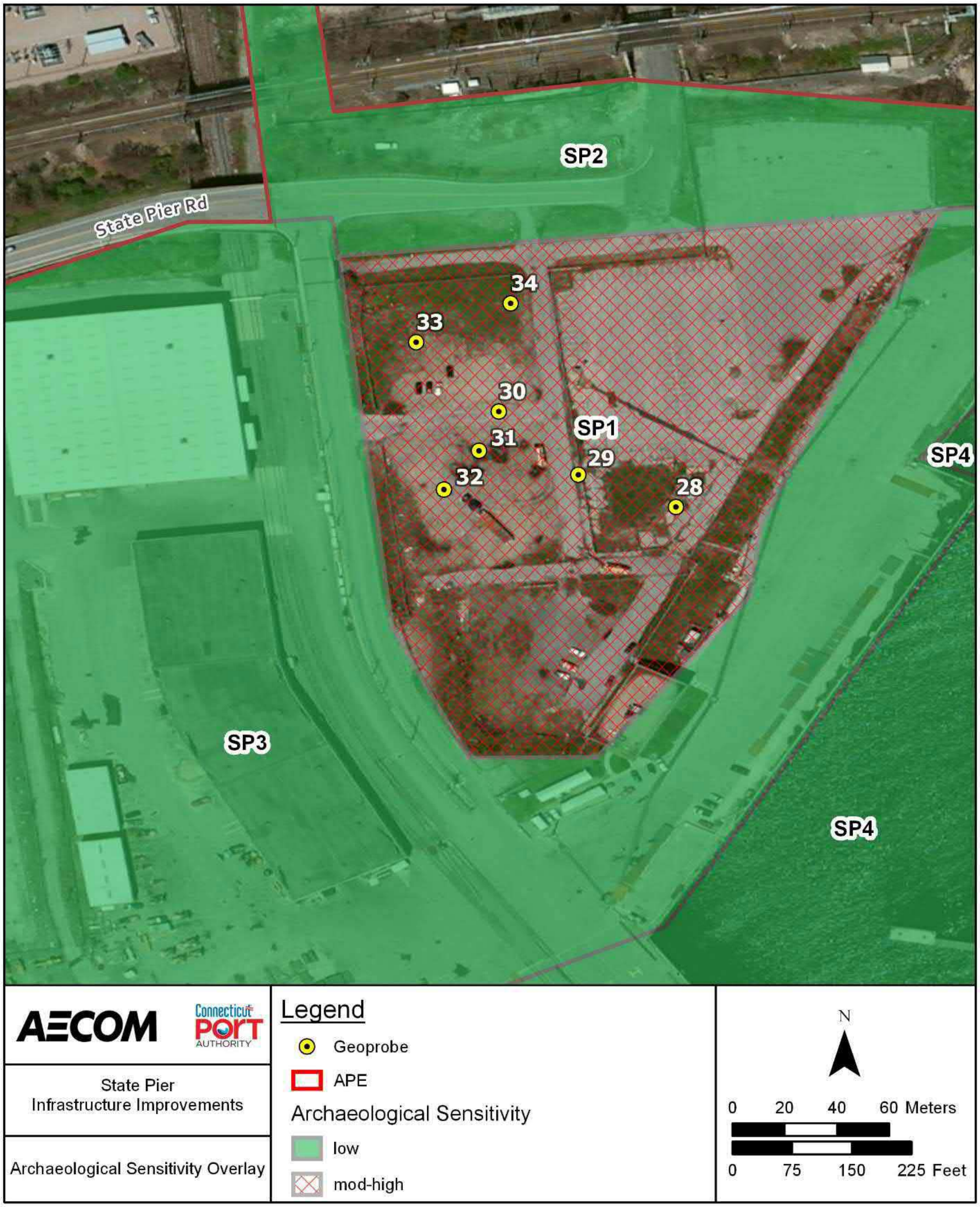

Figure 4: Geoprobe Locations

Geoprobe 28

Geoprobe 28 was positioned about 24 meters southwest of Geoprobe 5. A 14 cm-thick asphalt cap was underlain by fill to a depth of 222 cm below ground surface (bgs). All fill strata were screened but yielded no cultural material. From 222-268 cm bgs, two distinct depositional packages were encountered showing fining upwards sequences of medium to high energy glaciofluvial depositions underlain by a low energy silt lens deposit. This was underlain by glacial till to a depth of 282 cm bgs. Another glaciofluvial deposit was encountered from 282-285 cm bgs after which the boring was terminated. No soil horizons were encountered in this boring. The original landform has been truncated and then infilled, possibly during the construction of the pier complex.

Geoprobe 29

Geoprobe 29 was positioned about 31 meters northwest of Geoprobe 28. A 10 cm-thick asphalt cap was underlain by fill to a depth of 71 cm bgs. All fill strata were screened yielding one modern piece of plastic in the 25-30 cm bgs stratum. Six distinct glaciofluvial depositions with alternating natural stone were encountered to a depth of 358 cm bgs. A glacial till deposit was present documented from 358-371 cm bgs and underlain by another sequence of stone and glaciofluvial deposition to a depth of 379 cm bgs at which point the boring was terminated. No soil horizons were encountered in this boring. The original landform has been truncated and then infilled, possibly during the construction of the pier complex.

Geoprobe 30

Geoprobe 30 was positioned about 33 meters northwest of Geoprobe 29. A 53 cm-thick asphalt cap was underlain by 7 cm of fill. A truncated A horizon was then encountered from 60-63 cm bgs which was underlain by a transitional AB horizon (63-70 cm bgs) followed by two distinct B horizons to a depth of 110 cm bgs. This portion of the soil profile exhibited a diffuse boundary between the A and B horizons indicating the area was not plowed. All fill strata and horizons were screened but yielded no cultural material. Alternating glaciofluvial depositions and natural stones were present to a depth of 438 cm bgs after which the boring was terminated.

Geoprobe 31

Geoprobe 31 was positioned about 16 meters southwest of Geoprobe 30. A 6 cm-thick asphalt cap was underlain by alternating stone and fill to a depth of 162 cm bgs. All fill strata were screened but yielded no cultural material. Alternating glaciofluvial depositions and natural stones were present below the fill to a depth of 407 cm bgs at which point the boring was terminated. No soil horizons were encountered in this boring. The original landform has been truncated and then capped with a thin lens of fill, possibly during the construction of the pier complex.

Geoprobe 32

Geoprobe 32 was positioned about 18 meters southwest of Geoprobe 31. A 20 cm-thick cap of asphalt was underlain by stone and fill to a depth of 210 cm bgs. All fill strata were screened but yielded no cultural material. Glaciofluvial deposits were encountered to a depth of 252 cm bgs. No sediment recovery was made from 252-305 cm bgs. From 305-315 cm bgs a glaciofluvial deposition was encountered and underlain by two distinct packages of glacial till to a depth of 355 cm bgs. Three distinct glaciofluvial depositions were then encountered to a depth of 410 cm bgs at which point the boring was terminated. No soil horizons were encountered in this boring; however due to the loss of sediment from 70-152 cm bgs, the interface between fill and natural material could not be seen. Based on what is evident from the nearby Geoprobes, with fill extending to this depth it is most likely that the original landform has been truncated and then capped with fill, possibly during the construction of the roads or the pier complex.

Geoprobe 33

Geoprobe 33 was positioned about 57 meters north of Geoprobe 32. A 17 cm asphalt cap was underlain by 6 distinct fill packages to a depth of 66 cm bgs. From 66 to 80 cm bgs a truncated A horizon was encountered. The clear, irregular boundary with the underlying B horizon indicates that this location has been plowed. The B horizon was present to a depth of 87 cm bgs at which point natural stone was encountered to a depth of 162 cm bgs. All fill strata and horizons were screened yielding three colorless glass shards in the 27-39 cm bgs fill stratum and 2 colorless glass shards and an iron fragment in the 39-43 cm bgs fill stratum. Alternating layers of glaciofluvial deposits and natural stone were then encountered to a depth of 228 cm bgs. No sediment recovery was made from 228-305 cm bgs. Five distinct glaciofluvial depositions were encountered from 305- 427 cm bgs at which point the boring was terminated.

Geoprobe 34

Geoprobe 34 was positioned about 31 meters east of Geoprobe 33. A 15 cm-thick asphalt cap was underlain by fill to a depth of 45 cm bgs. A truncated A horizon was encountered from 45-50 cm bgs and underlain by a B horizon to a depth of 70 cm bgs. A clear, abrupt boundary between the two horizons indicates a plow zone. All fill strata and horizons were screened but yielded no cultural material. A glaciofluvial package was then encountered from 70-162 cm bgs, though no recovery was made from 100-152 cm bgs. This was underlain by glacial till to a depth of 232 cm bgs. Glaciofluvial deposition was encountered from 232-415 cm bgs at which point the boring was terminated.

Table 1: Geoprobe Log

Auger	Depth (cm)	Texture	Color	Gravel %	Gravel Type	Horizon	Interpretation	Artifacts
28	0-14			0%		^C1	Asphalt	NCM
28	14-28	sandy loam	10YR 2/1	30%	sub-rounded	^C2	Fill	NCM
28	28-42			0%		^C3	Stone	NCM
28	42-60			0%		^C4	Stone	NCM
28	60-72	sandy loam	10YR 3/6	20%	sub-rounded	^C5	Fill	NCM
28	72-152						No recovery	
28	152-172	sandy loam	10YR 3/3	30%	sub-rounded	^C6	Fill	NCM
28	172-222	sandy loam	10YR 5/2	20%	sub-angular	^C7	Fill	NCM
28	222-265	fine to medium to coarse sand	10YR 7/2 mixed with 10YR 6/3	50%	sub-rounded	2C1	Glaciofluvial deposition	NCM
28	265-268	silt	2.5Y 6/2	0%		2C2	Glaciofluvial deposition	NCM
28	268-282	fine to coarse sandy loam	10YR 7/2	50%	sub-rounded	3C	Glacial till	NCM
28	282-285	fine sand	2.5Y 7/2	0%		4C	Glaciofluvial deposition	NCM
28	285-305						No recovery	
28	305-331			0%		5C1	Stone	NCM
28	331-342	fine to coarse sandy loam	10YR 7/2	30%	sub-rounded	5C2	Glacial till	NCM
28	342-346	fine sandy loam	2.5Y 5/2	0%		6C1	Glaciofluvial deposition; some organics	NCM
28	346-353	coarse sand	10YR 6/3	5%	sub-rounded	6C2	Glaciofluvial deposition	NCM

28	353-391	fine to coarse sandy loam	10YR 7/2	10%	sub-rounded	7C	Glacial till	NCM
28	391-457						No recovery	
29	0-10			0%		^C1	Asphalt	NCM
29	10-25	medium sand	2.5Y 6/8	2%	sub-rounded	^C2	Fill	NCM
29	25-30	sandy clay loam	2.5Y 2/0	0%		^C3	Fill; contaminated	1 modern plastic
29	30-38	sandy clay loam	2.5Y 3/2	0%		^C4	Fill	NCM
29	38-43			0%		^C5	Stone	NCM
29	43-46	silty clay loam	7.5YR 4/8	10%	sub-angular	^C6	Fill	NCM
29	46-71			0%		^C7	Stone	NCM
29	71-80	coarse sand	10YR 7/2	20%	sub-rounded	2C1	Glaciofluvial deposition	NCM
29	80-90			0%		2C2	Stone	NCM
29	90-152						No recovery	
29	152-164	coarse sand	10YR 7/2	20%	sub-rounded	2C3	Glaciofluvial deposition	NCM
29	164-182			0%		2C4	Stone	NCM
29	182-257	coarse sand	10YR 7/2	20%	sub-rounded	2C5	Glaciofluvial deposition	NCM
29	257-305						No recovery	
29	305-328	coarse sand	10YR 7/2	20%	sub-rounded	2C5	Glaciofluvial deposition	NCM
29	328-335	coarse sand	10YR 7/4	10%	sub-rounded	2C6	Glaciofluvial deposition	NCM
29	335-347	very coarse sand	10YR 3/4	15%	sub-rounded	2C7	Glaciofluvial deposition	NCM
29	347-358			0%		2C8	Stone	NCM
29	358-371	very coarse sandy loam	7.5YR 4/4	50%	sub-rounded	3C	Glacial till	NCM
29	371-379	gravel	10YR 3/4	0%		4C	Glaciofluvial deposition	NCM
29	379-457						No recovery	
30	0-53			0%		^C1	Asphalt	NCM
30	53-60	fine sandy loam	10YR 4/1	0%		^C2	Fill	NCM
30	60-63	silty loam	10YR 4/4	0%		2Ab	A horizon; truncated	NCM
30	63-70	silty loam	10YR 4/6	0%		2ABb	AB horizon; transitional	NCM
30	70-88	silty loam	10YR 5/8	0%		2Bwb1	B (cambic) horizon	NCM
30	88-110	silty loam	2.5Y 5/6	0%		2Bwb2	B (cambic) horizon	NCM
30	110-140	fine sandy loam	10YR 5/3	10%	sub-rounded	3C1	Glaciofluvial deposition	NCM
30	140-152						No recovery	
30	152-162	fine sandy loam	10YR 5/3	10%	sub-rounded	3C1	Glaciofluvial deposition	NCM
30	162-177	silty loam	10YR 5/3	5%	sub-rounded	3C2	Glaciofluvial deposition	NCM

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30	177-202	coarse to very coarse sand	10YR 7/2	30%	sub-rounded	3C3	Glaciofluvial deposition	NCM
30	202-232			0%			Stone	NCM
30	232-253	coarse sand	10YR 7/2	10%		3C4	Glaciofluvial deposition	NCM
30	253-305						No recovery	
30	305-333	coarse sand	10YR 7/2	10%		3C4	Glaciofluvial deposition	NCM
30	333-368			0%			Stone	NCM
30	368-373	coarse sand	10YR 7/2	10%		3C4	Glaciofluvial deposition	NCM
30	373-438	medium to fine sand	10YR 6/2	0%		3C5	Glaciofluvial deposition	NCM
30	438-457						No recovery	
31	0-6			0%		^C1	Asphalt	NCM
31	6-15			0%		^C2	Stone	NCM
31	15-40	coarse sandy loam	10YR 3/2	10%	sub-rounded	^C3	Fill	NCM
31	40-53	sandy loam	2.5Y 4/2	30%	sub-rounded	^C4	Fill	NCM
31	53-56	coarse sandy loam	10YR 3/1	10%	sub-rounded	^C5	Fill	NCM
31	56-71			0%		^C6	Stone	NCM
31	71-76	silty loam	10YR 2/2	30%	sub-angular	^C7	Fill	NCM
31	76-82	sandy loam	10YR 3/2	10%	sub-rounded	^C8	Fill	NCM
31	82-86			0%		^C9	Stone	NCM
31	86-91	silty clay loam	10YR 3/6	0%		^C10	Fill	NCM
31	91-103	sily loam	10YR 4/6	0%		^C11	Fill	NCM
31	103-111			0%		^C12	Stone	NCM
31	111-152						No recovery	
31	152-162	medium sandy loam	10YR 7/3	0%		^C13	Fill	NCM
31	162-169	medium to coarse sand	10YR 5/8	5%	sub-rounded	2C1	Glaciofluvial deposition	NCM
31	169-247			0%		2C2	Stone	NCM
31	247-305						No recovery	
31	305-335			0%		2C3	Stone	NCM
31	335-396	fine sand	2.5Y 7/2	0%		2C4	Glaciofluvial deposition	NCM
31	396-407	silt	2.5Y 7/2	0%		2C5	Glaciofluvial deposition	NCM
31	407-457			0%			No recovery	
32	0-20			0%		^C1	Asphalt	NCM
32	20-40			0%		^C2	Stone	NCM
32	40-50	silty loam	10YR 2/2 mixed with 10YR 3/1	2%	sub-rounded	^C3	Fill; some organics	NCM
32	50-66	fine sandy loam	10YR 3/4 mixed with 10YR 6/8	5%	sub-angular	^C4	Fill; some organics	NCM

32	66-70			0%		^C5	Stone	NCM
32	70-152						No recovery	
32	152-210			0%		^C6	Stone	NCM
32	210-220	coarse sand	10YR 7/2	10%	sub-rounded	2C1	Glaciofluvial deposition	NCM
32	220-222	fine sand	2.5Y 6/4	0%		2C2	Glaciofluvial deposition	NCM
32	222-252			0%		3C	Stone	NCM
32	252-305						No recovery	
32	305-315	fine sand	10YR 8/1	0%		4C	Glaciofluvial deposition	NCM
32	315-325	sandy loam	10YR 6/3	0%		5C1	Glacial till	NCM
32	325-355	sandy loam	10YR 7/2	30%	sub-rounded	5C2	Glacial till	NCM
32	355-377	coarse sand	10YR 7/2	10%	sub-rounded	6C1	Glaciofluvial deposition	NCM
32	377-381	fine sand	2.5Y 7/2	0%		6C2	Glaciofluvial deposition	NCM
32	381-410	coarse sand	10YR 7/2	10%	sub-rounded	6C3	Glaciofluvial deposition	NCM
32	410-457						No recovery	
33	0-17					^C1	Asphalt	NCM
33	17-27	sandy loam	10YR 5/3	15%	sub-rounded	^C2	Fill	NCM
33	27-39	silty loam	10YR 3/2	5%	sub-rounded	^C3	Fill	3 colorless glass
33	39-43	sandy loam	10YR 3/6	5%	sub-rounded	^C4	Fill	2 colorless glass, 1 unidentified iron fragment
33	43-51	silty loam	10YR 3/2	5%	sub-rounded	^C5	Fill	NCM
33	51-58	loam	10YR 3/2 mixed with 10YR 6/8	0%		^C6	Fill	NCM
33	58-66	silty loam	10YR 6/8 mixed with 10YR 3/2	0%		^C7	Fill	NCM
33	66-80	fine sandy loam	10YR 3/4	5%	sub-rounded	2Apb	Ap horizon; iron concretions	NCM
33	80-87	silty loam	10YR 4/6	5%	sub-rounded	2Bwb	B (cambic) horizon	NCM
33	87-100			0%		3C	Stone	NCM
33	100-152						No recovery	
33	152-162			0%		3C	Stone	NCM
33	162-172	coarse sand	10YR 7/2	10%	sub-rounded	4C1	Glaciofluvial deposition	NCM
33	172-182			0%		4C2	Stone	NCM
33	182-196	fine sand	2.5Y 7/2	0%		4C3	Glaciofluvial deposition	NCM
33	196-228	fine to coarse sand	10YR 7/2	10%	sub-rounded	4C4	Glaciofluvial deposition	NCM
33	228-305						No recovery	

33	305-320	fine sand	10YR 8/1	0%		4C5	Glaciofluvial deposition	NCM
33	320-330	coarse sand	10YR 7/2	0%		4C6	Glaciofluvial deposition	NCM
33	330-341	fine sand	10YR 8/1	0%		4C7	Glaciofluvial deposition	NCM
33	341-387	fine sand to silt	10YR 7/2	0%		4C8	Glaciofluvial deposition	NCM
33	387-427	coarse sand	10YR 7/2	10%	sub-rounded	4C9	Glaciofluvial deposition	NCM
33	427-457						No recovery	
34	0-15					^C1	Asphalt	NCM
34	15-30	silty loam	10YR 5/6	5%	sub-rounded	^C2	Fill	NCM
34	30-45	fine sandy loam	10YR 3/3	5%	sub-rounded	^C3	Fill	NCM
34	45-50	fine sandy loam	10YR 3/2	10%	sub-rounded	2Apb	Ap horizon	NCM
34	50-70	loam	10YR 5/6	10%	sub-rounded	2Bwb	B (cambic) horizon	NCM
34	70-100	fine sand	10YR 8/1	0%		3C1	Glaciofluvial deposition	NCM
34	100-152						No recovery	
34	152-162	fine sand	10YR 8/1	0%		3C2	Glaciofluvial deposition	NCM
34	162-232	medium to coarse sand and cobbles	10YR 7/2	10%	sub-rounded	4C	Glacial till	NCM
34	232-242	medium to fine sand	10YR 6/3	5%	sub-rounded	5C1	Glaciofluvial deposition	NCM
34	242-305						No recovery	
34	305-375	medium to coarse sand	10YR 7/2	10%	sub-rounded	5C2	Glaciofluvial deposition	NCM
34	375-400	medium to coarse sand	10YR 6/3	10%	sub-rounded	5C3	Glaciofluvial deposition	NCM
34	400-405	fine sand	10YR 6/3	0%		5C4	Glaciofluvial deposition	NCM
34	405-415	medium to coarse sand	10YR 6/3	10%	sub-rounded	5C5	Glaciofluvial deposition	NCM
34	415-457						No recovery	

Conclusions

The review of the expanded APE was conducted for both terrestrial and underwater potential. Based on the historic documents reviewed for the expanded APE, there is no potential to affect terrestrial cultural resources withing the expanded APE and very low potential to affect significant submerged cultural resources within the expanded APE; therefore, no further archaeological testing is recommended in these added areas.

The supplemental geomorphological survey reviewed seven sediment profiles from the previously untested portion of the moderate-to-high sensitivity area (SP1) within the project APE. The area tested was previously determined to be moderate-high sensitivity. This included area is part of the high bluff overlooking the Thames River and slopes. The Geoprobes were placed to fully test the remainder of this area which could not originally be included in the original geomorphological study, due to a large salt pile. Three of the seven Geoprobes were positive for intact soils; the remainder are fully disturbed due to modern construction activities. The base geology of glaciofluvial and glacial till sediments was encountered within 15 feet bgs (3 Geoprobe sleeves) in all Geoprobes. The glacial sediments show a dynamic landscape following the retreat of the glacier. Many coarsening upwards sequences in the glaciofluvial sediments indicate meandering of the braided streams that drained the glacier.

Available evidence from both the Phase IA survey and the geomorphic assessment suggests that there is a moderate to high potential for archaeological preservation of both historic and/or pre-contact resources within portions of the SP1 area atop the bluff that overlooks the river. Geoprobes 30, 33, and 34 all contained preserved soils below fill (though Geoprobe 30 was truncated). No artifacts were recovered from any intact soils during the geomorphological survey.

No archaeological preservation potential was evidenced in any of the supplemental Geoprobes to the south of the previously mentioned positives. Disturbance related to rail and road construction as well as construction of the Pier complex in the early twentieth century has resulted in much of the area being graded and/or excavated prior to being infilled or capped with additional displaced glaciofluvial sediment. Variable thicknesses of fill lay atop glacial and fluvial sediments with no soil preserved at the interface.

Due to the moderate-high probability of encountering archaeological resources within portions of the SP1 area, AECOM recommends additional Phase IB testing be undertaken prior to any ground disturbing activities in specific areas around the Geoprobes positive for intact soils (Figure 5). Geoprobes 30, 33, and 34 were in paved areas and will require machinery to remove the pavement prior to testing. Figure 5 shows the final testing strategy recommendations for both phases of the geomorphological investigation. AECOM will put together a Phase IB Workplan for review and approval. Due to the expense of pavement removal and restoration, a potential alternative for these paved areas is to have an archaeological monitor onsite to conduct testing and documentation during construction in a Phase IB survey is not conducted prior to construction. AECOM also recommends an Unanticipated Discoveries Plan be developed prior to construction.

Figure 5: Proposed Phase IB Testing Strategy

Thank you for your review and please let me know if you have any questions.

Yours sincerely,

Elisabeth LaVigne, MA, RPA
Senior Geoarchaeologist
AECOM
E: liz.lavigne@aecom.com

AECOM
437 High Street
Burlington, NJ 08016
aecom.com

October 21, 2020

Catherine Labadia
Deputy State Historic Preservation
Officer
450 Columbus Boulevard, Suite 5,
Hartford, CT 06103

RE: Phase IB Workplan for the State Pier Infrastructure Improvements, New London, Connecticut

Dear Ms. Labadia,

In support of the State Pier Infrastructure Improvements (SPII or Project) proposed in New London Connecticut (Figure 1) by the Connecticut Port Authority (CPA), AECOM conducted an onsite geomorphology survey to further investigate archaeologically sensitive areas previously identified during the Project's Phase IA desktop assessment (*Phase 1A Archaeological Sensitivity Report*: Campetti and Pelletier 2020). AECOM conducted the geomorphological survey in two phases resulting in the identification of areas with cultural resource preservation potential (*Geomorphological Investigation of the State Pier Infrastructure Improvements, New London, CT*: LaVigne 2020; *Geomorphological Investigation of the State Pier Infrastructure Improvements, New London, Connecticut: Supplemental Assessment – Addendum*: LaVigne 2020). The final sensitivity locations that will be recommended for further testing are provided in (Figure 2).

Objectives of Phase IB Survey

The dual objectives of this Phase IB reconnaissance survey effort are both to ground truth areas identified as having archaeological potential within the project area of potential effects (APE) during the Geomorphological assessment, as well as to identify specific resources that may lie within the path of proposed project impacts. The geomorphological assessment sought to identify all areas with the potential for containing resources as identified as intact or truncated soils preserved below fill deposits, while the current effort will test these areas to document the presence or absence of buried cultural resources and provide a preliminary assessment of their integrity. These goals will be achieved through the completion of the following tasks:

- Shovel test pits (STPs) will be placed in areas identified as sensitive that are unpaved (marked as green on Figure 2) in order to test the preserved soils and subsoils for cultural artifacts or features.
- Mechanically assisted test trenches will be excavated in areas with archaeological potential in locations that are paved (marked as orange on Figure 2). These trenches will be mechanically excavated using a backhoe with a toothless bucket only to a depth of 35 cm deep which is 10 cm above the shallowest documented preserved soils. Hand-excavated STPs will then be excavated into the preserved soils and subsoils to test for cultural artifacts or features.

- Hand-excavated test units (TUs) may be placed in areas of shovel test pits and/or mechanically assisted trenches with positive results in order to further define the encountered resource.
- Consult with CTSHPO during field effort to determine if Phase II testing should be conducted prior to official Phase IB report submission
- Complete a Phase IB/II survey report containing the technical aspects of the excavation, documentation of findings, interpretation, and recommendations any need for additional investigation (Phase III survey).
- Consult with CTSHPO throughout the process to ensure a clear understanding and adherence to all state guidelines

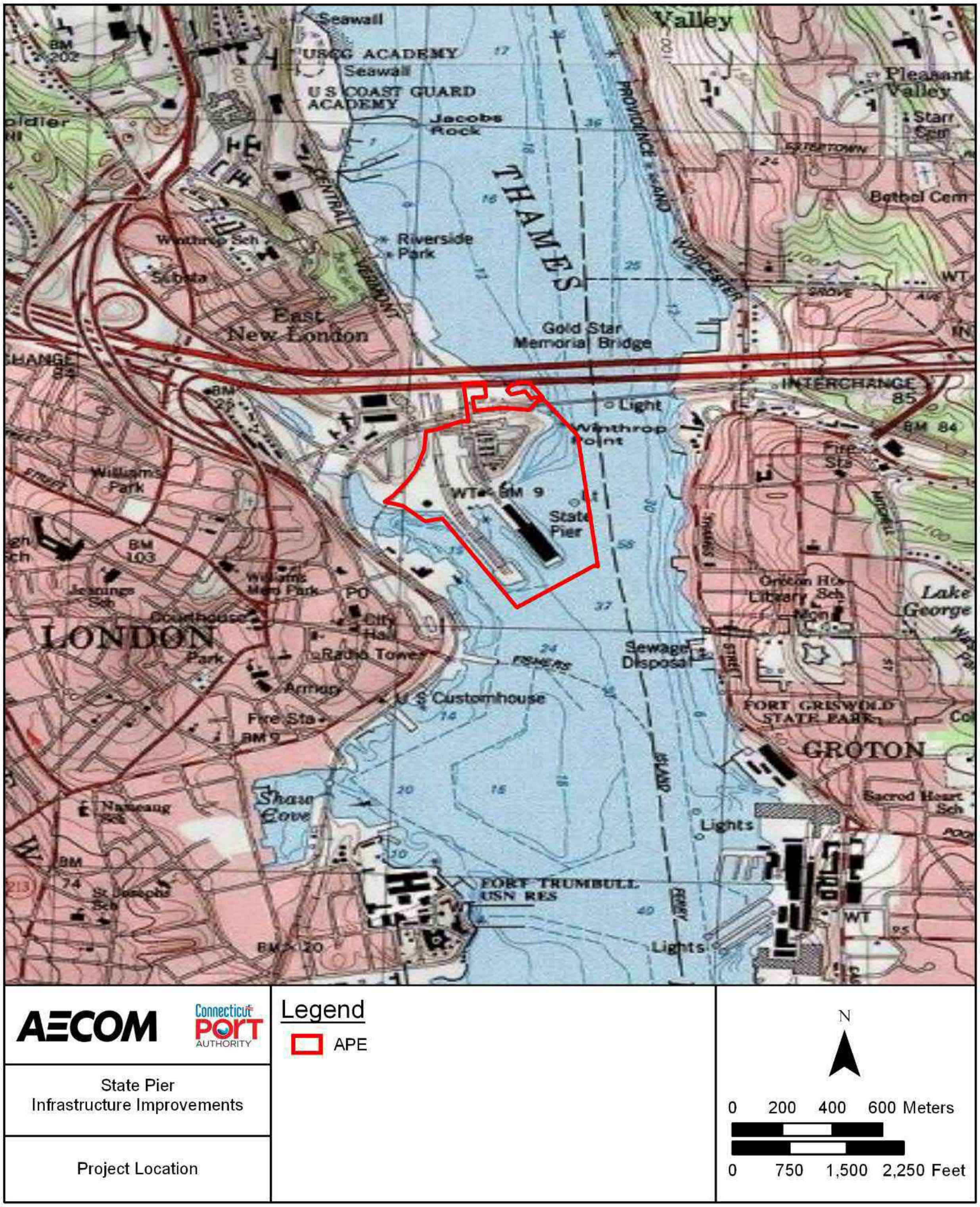

Figure 1: Project Location

Figure 2: Proposed Testing Strategy based on Geoprobes positive for intact soil.

Project Schedule and Organization

AECOM anticipates the Phase IB testing to be completed within one mobilization effort for both the STP excavations, mechanical trenching, and any subsequent TU excavation. The proposed distribution of testing is provided in Figure 3. AECOM anticipates the excavation and recordation of up to 13 STPs including preplots and 7 potential radial STPs. AECOM anticipates the pavement and fill overburden removal within 5 trench locations and the subsequent hand-excavation of up to 10 STPs at the base of the trenches. The five trenches are expected to total approximately 370 meters in length and measure approximately 1 meter wide. A maximum of 8 1x1 meter TUs will be excavated if cultural resources or features are identified during the STP and trench excavations. TUs are anticipated to be no more than 80 cm in depth. Artifact analysis and draft reporting will follow fieldwork completion. All work will be overseen by an archaeologist who is Secretary of Interior Qualified.

Field Methods

1.1 Health and Safety

AECOM will prepare a comprehensive health and safety plan based on OSHA safety standards that all field crew will be required to read and sign-off on prior to the commencement of work. Specific attention will be paid to COVID-19 health and safety policies and precautions. Safety tailgate meetings will be conducted each day before work begins. If necessary, test trenches and excavation units left open overnight will be secured and covered with plywood to prevent entry. All test trenches and excavation units will be backfilled as soon as all relevant information is collected and recorded.

1.2 Shovel Testing

Shovel test pits (STPs) will be employed in portions of the APE where archaeological potential has been identified in vegetated or gravel paved areas. Testing will consist of the excavation of STPs placed along linear transects or within a grid at an average interval of 15 meters, where feasible. Discretionary, non-systematic placement of STPs may also be employed in areas of limited surface exposure.

The STPs will be 50-cm by 50-cm and excavated to sterile soils when possible (it is possible that a number of shovel test pits will be terminated prematurely due to obstructions such as buried gravel, asphalt, or demolition debris within fill levels). All soils excavated from STPs will be screened through ¼-inch hardware mesh for systematic artifact recovery. Recovered artifacts will be bagged according to their unique provenience, given a specific field sample (FS) number, and transported to the laboratory for processing, conservation, and analysis. Non-feature-related structural debris, such as brick and cement, will be noted but not retained for processing.

Soil colors will be identified using the Munsell classification system for soil color, and the soil texture will be assessed for type, composition, and structure. When present, natural soils will be labeled with the appropriate soil horizon designations. All relevant information will be recorded on standardized AECOM field forms. Representative soil profiles will be hand drawn and the stratigraphy will be documented using high-resolution digital photography. A GPS capable of sub-meter accuracy will be used, along with traditional field mapping techniques, to document the location of all shovel tests. It is noted that as the STPs will be employed in an urban setting, modern artifacts are apt to be encountered. AECOM will therefore only delineate deposits that appear to be historic in origin. Such delineation will be achieved via radial shovel testing. In this way, areas of substantial artifact concentrations can be identified.

It is estimated that a maximum of 30 STPs, including radials around positive STPs, will be excavated in discrete locations across the APE, outside of the mechanical stripped areas.

Figure 3: Proposed STP and trench locations

1.3 Test Trenches

Test trenches will be mechanically excavated in paved locations previously identified, during the geomorphological survey, for containing preserved soils with the potential to contain cultural material. Mechanical excavation will be limited to pavement and fill overburden removal down to a maximum of 35 centimeters below ground surface (cm bgs); preserved soils were documented during the geomorphological survey as shallow as 45 cm bgs. Trenches will be mechanically excavated using a backhoe. After the removal of paving material, the machine operator will switch to a toothless backhoe bucket (or one with a steel plate welded across the bucket) in order to avoid any inadvertent disturbances to intact soils or resources during trenching activities. Using the toothless bucket, soil will be mechanically removed in a series of thin passes, enabling the archaeologists to monitor depth and examine the trench floor and identify any encountered features. Fill deposits will not be screened, but temporally or culturally diagnostic artifacts will be retained on a selective basis. Once a depth of 35 cm bgs is reached, mechanical excavation will stop in that location and a series of STPs will be hand excavated at a 15-meter interval. No preserved soils were documented below 1 meter, therefore no additional safety precautions for deep testing such as shoring will be necessary.

Archaeologists will record relevant stratigraphic data for each trench and STP. All soils excavated from STPs will be screened through ¼-inch hardware mesh for systematic artifact recovery. Recovered artifacts will be bagged according to their unique provenience, given a specific field sample (FS) number, and transported to the laboratory for processing, conservation, and analysis. Non-feature-related structural debris, such as brick and cement, will be noted but not retained for processing. For each encountered stratum, the characteristics of the soil; i.e., Munsell color and texture, the depth below ground that each stratum occurred, and the presence or absence of cultural material found in the stratum will be recorded on standardized AECOM field forms. Representative soil profiles will be hand drawn and the stratigraphy will be documented using high-resolution digital photography. A global positioning system (GPS) capable of sub-meter accuracy will be used to map each trench and STP location, along with traditional field mapping techniques.

It is estimated that up to 5 mechanically assisted trenches will be excavated during the Phase IB survey. Up to 370 meters of trench will be excavated and a maximum of 10 STPs will be placed at the base of the trenches to test intact soils.

1.4 Test Units

If cultural artifacts or features are identified during the shovel testing or trenching efforts, TUs will be placed to further investigate the potential for an archaeological site and National Register of Historic Places (NRHP) eligibility. AECOM anticipates in-field consultation with CTSHPO regarding the nature of recovered artifacts or features and proposed TU placement. This acceleration into what would be considered Phase II testing will ideally mitigate project schedule delays while collecting the required information to determine if a Phase III archaeological survey is necessary.

TUs will measure 1x1 meters and will be excavated until sterile subsoil is encountered. All soils excavated from excavation units will be screened through ¼-inch hardware mesh for systematic artifact recovery. Recovered artifacts will be bagged according to their unique provenience, given a specific field sample (FS) number, and transported to the laboratory for processing, conservation, and analysis. Non-feature-related structural debris, such as brick and cement, will be noted but not retained for processing.

Soil colors will be identified using the Munsell classification system for soil color, and the soil texture will be assessed for type, composition, and structure. When present, natural soils will be labeled with the appropriate soil horizon designations. All relevant information will be recorded on standardized AECOM field forms. Representative test unit soil profiles will be hand drawn and the stratigraphy will be documented using high-resolution digital photography. A GPS capable of sub-meter accuracy will be used, along with traditional field mapping techniques, to document the location of all excavation units.

It is estimated that a maximum of 8 excavation units will be utilized to investigate artifact concentrations or features, if present, during the Phase IB field survey.

1.5 Reporting

Following the completion of fieldwork, AECOM will produce a fully documented technical report that fits the standards outlined in the Environmental Review Primer for Connecticut's Archaeological Resources. CT SHPO archaeological site forms generated as a result of excavation efforts.

Van Naerssen, Kris

Subject: FW: Updated State Pier Improvements IA Archaeology Report
Attachments: CT-CPA-Phase-IA-Archaeology-revised.pdf

From: Campetti, Casey
Sent: Friday April 10, 2020 11:20 AM
To: Labadia, Catherine <Catherine.Labadia@ct.gov>
Subject: Updated State Pier Improvements IA Archaeology Report

Dear Cathy,

Please find attached the revised report for the State Pier Improvements project. These revisions have been made in response to your questions and comments, and address among other things the removal of references to NEPA, discussion of the 1889 bridge pier and actions to protect it, a clear discussion of sensitivity and recommendations, and recommendations for undertaking a Phase IB survey of push-probe/Geoprobes to identify intact soils. AECOM is recommending probes within the sensitive area as well as portions of the low sensitivity areas for comparative purposes. A new figure (Figure 9, p. 42) has been prepared to show recommended testing locations.

Additionally, some minor changes to the original permitting plans have been made, including shifting of an in-water installation vessel berth from south of the existing piers to east of the State Pier. These elements have been updated in the Project Description portion of the report, and updated plan sheets have been added to the beginning of Appendix A. For continuity, the original permitting set is also included within the appendix, as well as the four revised sheets reflecting the updated work. The APE has been updated in the figures to reflect this change as well. There is no change to conclusions or recommendations as a result of the shift in berth location. AECOM would like to perform the recommended Phase IB push-probe/Geoprobe survey at the end of April or early May, in order to facilitate the overall design and project schedule.

To assist in your review, report sections that have been updated include **Project Description (p. 1-2), Historic Background (p.19), Previously Recorded Archaeological Sites (p. 29), and the Conclusions and Recommendations chapter (p. 38-42).**

Please do not hesitate to reach out to me via phone or email to discuss, should you have further questions or comment, I appreciate your time and consideration in reviewing this report.

Best,

Casey

Casey Campetti MA, RPA

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AECOM

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Phase IA Archaeological Assessment State Pier Infrastructure Improvements New London, Connecticut

Report prepared for:
Connecticut Port Authority

Report prepared by:
Casey Campetti RPA
J.B. Pelletier RPA

AECOM

April 2020

Abstract

In support of the State Pier Infrastructure Improvements Project, AECOM has conducted a background data collection and archaeological sensitivity assessment of the proposed construction area of potential effects (APE) for the Connecticut Port Authority (CPA). This report presents the results of the sensitivity assessment of the project area where proposed construction would result in substantial ground disturbance. The archaeological sensitivity of the project area was assessed on both the local and project-specific levels. A broad-scoped sensitivity of the area was determined by reviewing the known archaeological resources that occur within a one-mile radius surrounding the proposed construction APE and review of historical maps and aerial photographs to determine whether historic resources were once present within the project APE. From this aggregate of techniques, recommendations were made concerning the necessity of further cultural resource survey within the APE.

The results of the background research indicate that portions of the project APE retain moderate to high terrestrial archaeological sensitivity. While evidence concerning the precontact archaeology of the area within the APE is low, the setting of the APE atop a natural bluff with viewsheds over the Thames River would have been an attractive spot throughout human history for occupation and use. Documented historical use of the bluff also indicates potential to encounter intact archaeological sites. Additionally, previous archaeological surveys have identified areas of sensitivity that have either not been tested or retain sensitivity due to the depth of the currently proposed work.

Areas where extensive disturbance is present due to construction of roads and bridges, the railyard, and the existing pier facilities, are all recommended as retaining low archaeological sensitivity due to significant grading and leveling associated with these activities. No further archaeological work is recommended for low sensitivity portions of the APE.

Due to the duration and volume of cut/fill and dredging activities associated with the deepening of the Thames River and Winthrop Cove through time, low sensitivity for underwater archaeological resources is recommended. No further archaeological investigation of underwater resources is recommended.

AECOM recommends that further examination of terrestrial portions of the APE designated as moderate to high sensitivity be subject to additional testing, including a push-probe (Geoprobe) survey overseen by a qualified (36 CFR 61) archaeologist to identify areas of intact soils and make additional recommendations for work.

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1 Introduction and Project Description

AECOM has been contracted to perform reconnaissance cultural resource assessment of the proposed Area of Potential Effects (APE) to satisfy requirements under Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended; the implementing regulations in 36 CFR Part 800; and the Connecticut Environmental Policy Act. The undertaking will require approvals from the Connecticut Department of Energy & Environmental Protection (CT DEEP). For the purposes of this assessment level survey, the project APE was confined to a buffer surrounding the proposed limit of disturbance (LOD) for the construction effort (Figure 1). The purpose of this assessment-level archaeological survey is to record the presence or absence of previously identified and unidentified cultural resources within the APE and determine whether the proposed construction impacts might adversely affect any potential resources. An assessment to investigate potential impact to architectural resources, such as the National Register of Historic Places (NRHP) listed Central Vermont Railroad (CVRR) pier, is being completed under separate cover. A one-mile archival study buffer was employed during the literature review portion of the survey to ascertain the cultural sensitivity of the APE. The result is a series of recommendations for further cultural testing within the project APE. The archaeological assessment has been prepared in accordance with the guidelines set forth by the NHPA and the Connecticut State Historic Preservation Office (CT SHPO) (Poirier 1987).

PROJECT DESCRIPTION

CPA is seeking to create a long-term regional wind turbine generation (WTG) port facility while at the same time continuing to support other existing long-term breakbulk operations for steel, coil steel, salt, lumber, copper billets, as well as other cargo. Upland facilities will include buildings, site infrastructure (lighting, security fencing), utilities and storage areas designed to support the regional WTG operations and continued support of the above-noted cargo operations. In-water improvements will result in easier navigation between the State Pier facility and the federal shipping channel in the Thames River for WTG-support vessels. In addition, a heavy-lift pad, increased pier size, increased water depths, and overall improvements will allow for a wider range of vessels to utilize the State Pier Facility.

The proposed State Pier Infrastructure Improvements (Project) activities include work on the onshore portion of the site, along with in-water activities in the Thames River. These activities include demolition, removal, improvement and installation of onshore and in-water facilities and are discussed below. For the purposes of this application, activities have been separated into demolition/removal activities and construction/installation/improvement activities. The Project will be completed in phases:

Onshore Demolition Activities

- Demolition of existing buildings in upland area.
- Demolition of existing administration building.

- Demolition of existing warehouse building.

In-Water and Over-Water Demolition Activities

- Demolition of southwest corner of state pier to facilitate king pile bulkhead installation.
- Demolition of existing berthing dolphins (currently not used).
- Demolition of timber pile supported concrete deck on east side of state pier along shoreline (±6,300 sf).

Onshore Improvements

- Cutting of the existing hill in northeast corner of the site (±190,000 CY).
- Overall grading and compaction of the site and installation of a gravel surface (±25 acres).
- Installation of new drainage and stormwater treatment system to meet stormwater quality parameters.

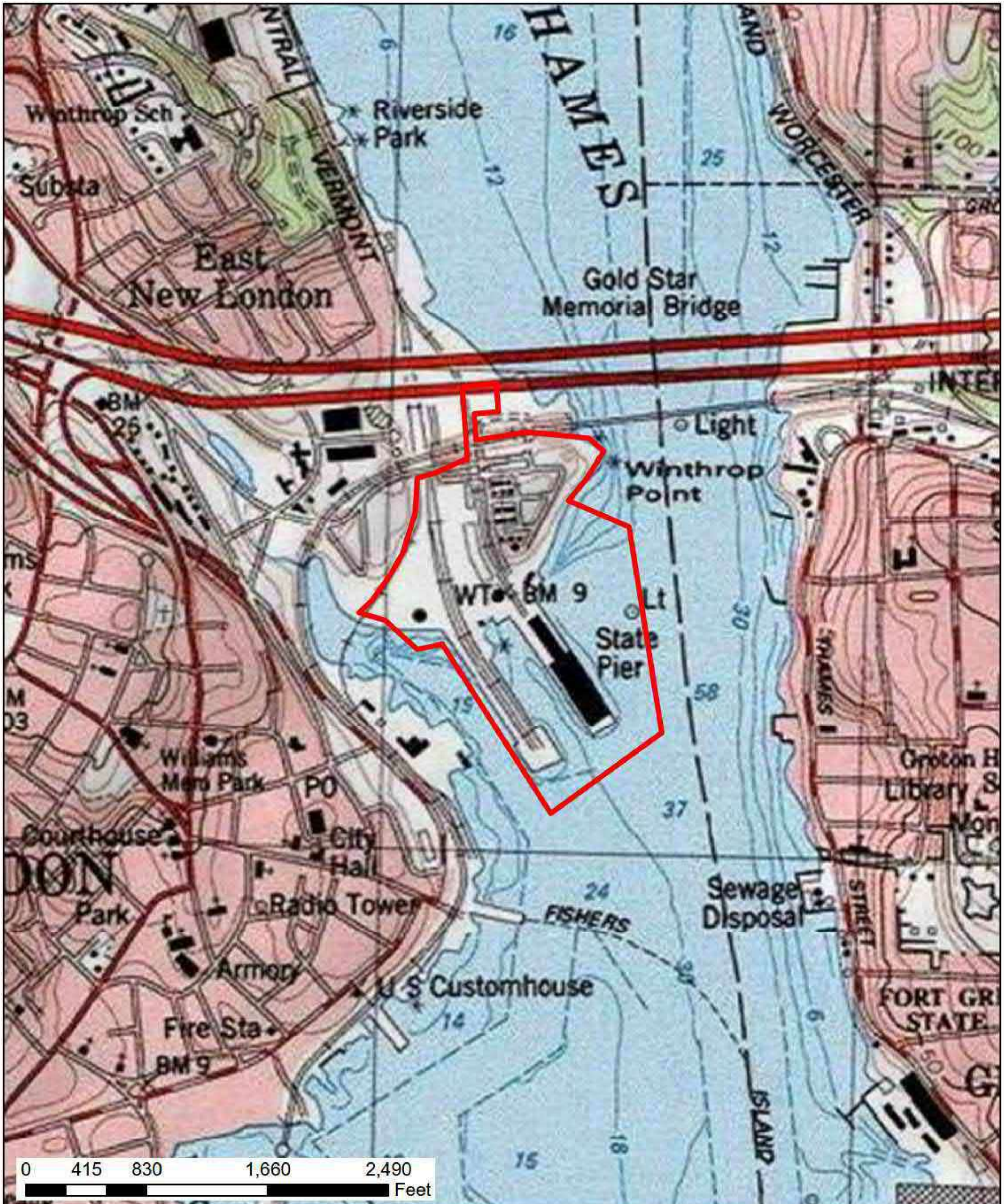
On-shore improvements and activities at the site after demolition of the buildings identified above, consists primarily of excavation, grading and installation of a stormwater management system and utilities. Major earthwork will be needed to level the site and accommodate future uses. The entire upland portion of the site will be leveled, graded, and graveled to create a solid suitable workspace for any cargo storage or onshore activities.

In-Water and Over-Water Improvements

- Installation of anchored heavy lift bulkhead to northeast of State Pier along shoreline (±700 linear feet (lf) impact on mudline).
- Installation of new installation berth area on the east side of State Pier (±127,200 sf)
- Maintenance dredging of vessel berthing area along proposed heavy lift bulkhead (±15,000
- CY).
- Placement of in-water fill (±30,000 sf) to convert existing pile-supported wharf over water on the State Pier into a bulkhead area capable of supporting 5,000 pounds per square foot for the heavy lift platform at east installation berth
- Maintenance dredging of vessel berthing area proposed heavy lift area (±82,000 CY).
- Raising of CVRR Pier elevation from +5' to +9'.
- Seabed preparation for installation of crushed gravel areas to allow for berthing of vessels with jack up legs or similar (±1,500 CY, 12,000 sf).
- Installation of king pile bulkhead between State Pier and CVRR Pier.
- Filling approximately 7 acres (~305,000 SF) between the CVRR Pier and State Pier to create a new upland area (±390,000 CY).

ESTABLISHING THE AREA OF POTENTIAL EFFECTS (APE)

As defined at 36 CFR 800.16(d), the area of potential effects means "the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking." The APE is determined by an understanding of the undertaking (Project) and the potential for temporary and long-term impacts, both physical and visual. The archaeological APE recommended within this report represents the footprint of impact, both terrestrial and marine, associated with the proposed project. It is expected that as project plans are developed and further refined, the APE will reduce in size (Figure 2).



CLIENT	Connecticut Port Authority
PROJ	State Pier Infrastructure Improvements
SCALE	1:10,937
SOURCE	*USGS Topographic Maps*

N

TITLE

Project Location Map

AECOM

12420 Milestone Center Dr.
Germantown, MD 20876

PROJ NO	60579714
FIGURE	1

CLIENT	**Connecticut Port Authority**
PROJ	**State Pier Infrastructure Improvements**
SCALE	**1:4,000**
SOURCE	*ESRI Aerial Images*

N

TITLE

Project Area of Potential Effect (APE)

AECOM

12420 Milestone Center Dr.
Germantown, MD 20876

PROJ NO 60579714

FIGURE 2

2 Environmental Background

PHYSIOGRAPHY, DRAINAGE, BEDROCK GEOLOGY, AND SOILS

The State Pier Facility is located on the western bank (right descendant) of the Thames River in the upper New London Harbor. The Thames River is a tidal river that originates at the confluence of the Yantic and Shetucket Rivers in Norwich, Connecticut, and extends south 15 miles to the mouth of Long Island Sound (ACOE 1857). The Thames basin drains 1474 square miles of land within portions of Connecticut, Massachusetts, and Rhode Island (USFWS 1984).

The city of New London is located atop a class of bedrock known as the Waterford Group. The Mamacoke Formation consists largely of intermediate and felsic metavolcanic rocks, with the upper part containing layered sequence of think white quartzite underlain by amphibolite and gneiss. The lower layers consist of layers gneiss with hornblende-bearing layers (Goldsmith 1976:271). Also present within the APE is intrusive Hope Valley Alaskite Gneiss.

Soil data for the Study Area was derived from the online Web Soil Survey (WSS 2019) and is summarized in Table 1. According to the WSS, there are three mapped soil types within the APE. As these designations are provided in areas where the initial soil characteristics prior to urban development are unknown, the characteristics of the historic ground surface are unknown. It is important to note that while soil maps indicate the current status of soils, they do not necessarily reflect original soils or soils that may still underlie soils impacted by recent human activity.

One area within the APE is mapped as Hinckley loamy sand, 3 to 15 percent slopes. This area corresponds to the approximate location of the stored salt on a hill located to the east of State Pier Access Road.

Table 1 Principal Soil Types within the Proposed APE

Mapping Unit Name	Depth	Depth and Drainage	Genesis and Location
Urban Land	n/a	No data	n/a
Udorthents-Urban land complex	n/a	Well Drained	n/a
Hinckley loamy sand, 3 to 15 percent slopes	65 in.	Excessively Drained	Sandy and gravelly glaciofluvial deposits derived from gneiss and/or granite and schist

PALEOENVIRONMENT

The Wisconsin glacial period in Connecticut lasted from 26,000 years ago to roughly 15,500 years ago. Until around 17,000 years ago, the glacier still covered the entire southern coast of Connecticut. Over the next 2500 years, the glacial ice retreated northward. By about 15,000 years ago, the glacier had receded north past the boundaries of modern-day Connecticut. As the glacial ice melted and retreated northward, a massive lake was formed. This glacial lake, called Lake Hitchcock, occupied the present location of the Connecticut River Valley and continued northward, well into Vermont (Davis and Jacobson 1985). By around 11,000 years, the earthen dam of glacial deposits of soil and rock that formed the southern end of Lake Hitchcock was breached, and the water began flowing south toward Long Island Sound (Davis and Jacobson 1985). This flow of water became the ancestor of the Connecticut River, which divides the state to this day. The formation of rivers like the Connecticut, also fed by large glacial lakes, began to reshape the landscape. During this interval, the ancestral paths of the Connecticut and Merrimack Rivers began eroding and reworking the glaciolacustrine sediments and constructing a series of lower stream terraces in New England. Aeolian deposition capped stream terraces and proglacial lake deposits in places (Koteff et al. 1984:391–392), a process that continued into the late Holocene, based on Dincauze's (1976:10–11) interpretation of soil parent material at the Neville Site. This process set the stage for the reintroduction of vegetation and ecosystems in this previously lifeless environment.

Low-growing tundra vegetation consisting of mosses, ferns, sedges, and grasses—along with dwarf birch and alder—colonized newly deglaciated landscapes. Pollen-based vegetation reconstructions for northern New England vary regarding the earliest trees to colonize tundra. Newby et al. (2005) suggest that spruce and pine were the first pollen-based trees to dominate the open woodlands in southeastern and central Connecticut. According to a 1969 palynology study done by Margaret B. Davis at Rogers Lake (11 miles west of New London), the environment in southern Connecticut from 14,300–12,150 years ago was dominated by sedge grass pollens that characterize the region as tundra. Her data indicates that in the period from 12,150–11,700, there was a marked increase in the presence of trees like birch, poplar, and spruce, indicative of a transitional environment. In the period that followed, beginning 11,700 years ago, the pollen counts shifted again, with a greater variety of tree pollens coming to dominate, most notably pine and oak—indicating a shift to a dense forested environment. The Newby et al. (2005) study on the paleoenvironment of New England indicates a similar shift toward dense forest during the period known as the Little Dryas, beginning 11,600 years ago. Newby et al. showed that by 11,000 years ago, however, the presence of transitional forest and tundra-associated pollens virtually disappeared, while the concentrations of pollen for pine and other dense forest trees steadily increased, indicating that forest had come to dominate much of New England during this period. Newby et al. linked a retraction of spruce/fir transitional forests and tundra in New England between 11,000 and 10,000 years ago to the Younger Dryas climate episode, which coincides with the arrival of Paleoindians in northern New England. The data for Connecticut at this time sees the complete retreat of tundra environment from Connecticut and the establishment of a dense pine-oak forest along the coastal plain (Newby et al. 2005; Davis 1969). Newby et al. further posit that the transition in point technology from large fluted points (well suited to hunting large herd animals in open tundra or sparse woodland) to a new, more environmentally dictated toolkit was made necessary by the changing environment and resultant change in fauna. The changes in environment at or around the Younger Dryas period led to the transition from tundra to woodland and, as a result, a shift from dependence on herd fauna, like caribou, to more solitary large game, like deer and bear. Adaptation to the new environment necessitated new hunting/subsistence practices, which created the need for a new and more diverse toolkit among early human occupants of the region (Newby et al. 2005).

As in the case of flora, faunal communities of this late glacial period have no modern analogues. These communities were characterized by the association of a number of Late Pleistocene species that are either extinct (e.g., mammoth, mastodon) or regionally extirpated (e.g., caribou), with other species (e.g., deer, moose, black bear) that have persisted in the area into the modern period (Lundelius et al. 1983). Although there is no archaeological evidence in New England for Paleoindian exploitation of mammoth or mastodon, radiocarbon dates for these and other extinct species indicate that they were available to at least the earliest Paleoindian groups. Small fragments of calcined caribou bone have been recovered from the Whipple and Bull Brook Paleoindian sites (Spiess et al. 1998:226).

Rapid warming after the Younger Dryas fostered the arrival of oak, white pine, and maple into northern New England between 10,000 and 9000 years ago. These species quickly replaced spruce and fir, resulting in a new composition of the closed forests of southeastern New Hampshire and southern Maine that came to be dominated by pine. Hemlock, beech, and birch followed between 9,000 and 8,000 years ago. The growing numbers and density of mast-producing species in early Holocene forests would have increased the carrying capacity of the environment, resulting in higher terrestrial game populations and diversified subsistence opportunities for Native American groups. Between 9,000 and 6,000 years ago, the center of pine abundance moved northwest, and forests composed of pine, birch, maple, beech, and hemlock became dominant. Other mast-bearing trees—hickory and chestnut—arrived in northern New England 5,000 and 2,000 years ago, respectively (Davis 1981; Gaudreau 1988).

Early historic period vegetation patterns in the Northeast include a conifer-hardwood forest region in the northern sections and deciduous forests in the southern portions. This modern ecotone extended from southern Maine, and west along the Massachusetts-New Hampshire border. Pollen records indicate that the ecotone between the two major zones was established in the early Holocene and became more pronounced between 8,000 and 6,000 years ago. While the ecotone was stable from the early Holocene, the species composition of the two forest zones continued to change throughout the late Holocene (Gaudreau 1988).

3 Cultural Background

PRE-CONTACT BACKGROUND

Paleoindian Period (11,500–9400 B.P.)

The earliest documented occupation of New England and the Maritimes dates to the Paleoindian period, from approximately 11,500 to 9600 years before present (B.P.). Paleoindian sites are most commonly identified by the presence of distinctive fluted and unfluted lanceolate projectile points. Other parts of the toolkit included formal flake tool types and large, bifacial cores. In the greater Northeast, Paleoindian toolkits are marked by a conspicuous use of high-quality cryptocrystalline lithic materials that often originate at considerable distances from their point of discard. The former characteristic is inferred to result from a need for durability over numerous episodes of intensive use at locations distant from sources (Goodyear 1989; Spiess et al. 1998:239–242), while the distances from sites to sources have been used to estimate maximum travel distances.

In a synthesis of Paleoindian data for New England and the Maritimes, Spiess et al. (1998: 235–239) proposed a series of five chronological phases for the period, based on stylistic changes in projectile forms. The earliest phases, Bull Brook and Vail-Debert, are roughly coeval. Bull Brook phase fluted points are relatively straight-sided with moderately deep basal concavities and flutes that exceed half the length of the point. Vail-Debert fluted points are generally larger and exhibit the same outline as Bull Brook points, but have deep basal concavities and shorter flutes. Dates for these phases range from circa 11,500 to 10,500 B.P. Fluted points of the following Michaud-Neponset phase are generally narrower and thinner than earlier fluted point styles, display flaring basal ears, and are often fluted to within 10 millimeters of the tip. Crowfield phase fluted points expand markedly from the base, reach maximum width near midpoint, and display long, often multiple flutes. Michaud-Neponset and Crowfield points both display shallow basal concavities compared to Bull Brook and Vail Debert points. Spiess et al. suggested that the Michaud-Neponset phase ranged from 10,310 to 10,070 B.P. The Nicholas phase is the final proposed Paleoindian phase. The Nicholas point is unfluted, small, thin, and expands at the base, similar to Crowfield points. Dates for this phase are few and range from circa 10,120 to 9400 B.P.

In Connecticut, there are several well-documented Paleoindian sites spread across the state (Lavin 2013). The Liebman Site located in Lebanon, Connecticut, conforms to the accepted pattern of Paleoindian settlement in state, in that it is situated on a sandy knoll overlooking a body of water (Lavin 2013). Like other Paleoindian sites in Connecticut, it contained a diagnostic fluted point among its lithic assemblage. The high incidence of chert within the assemblage led the excavator to presume a lithic source somewhere in the Hudson River Valley, a Jasper source in Pennsylvania, and another lithic source at the Conklin quarry in Rhode Island

(Pfeiffer 1994). Pfeiffer's assumption has led to speculation about trade networks and migration patterns, but this hypothesis was never tested nor was the lithic analysis to establish that the source material was indeed from these disparate sources. The 52-square-meter site, located adjacent to a stream ford, now covered by an artificial lake, was ephemeral and contained no features associated with the lithic production artifacts recovered. This seems to indicate a short-term occupation; i.e. as small camp (Lavin 2013:52; Moeller 1999:72; Spiess et al. 1998:212). Another small site, the Lovers Leap Site in New Milford, is situated on an overlook of the Housatonic River, near a fishing spot utilized by people for millennia (Lavin 2013:49). This site has been largely degraded by local development and looting, and the only real evidence of a Paleoindian presence came in the discovery of small fluted points discovered in the deepest soil strata, which also contain artifacts that date to the later Late Archaic period (Lavin 2013:49). While the presence of Paleoindian artifacts at this site identifies an area of Paleoindian habitation, it contains no associated features or deposits that help to illicit further information about that period of occupation. The Allen's Meadows Site, located in Wilton, was located on a terrace overlooking the old course of the Norwalk River and contained several fluted points that indicated a Paleoindian presence. However, this site occurs in a plowzone and lacks stratigraphic integrity, as artifacts from later Archaic period occupations were found in the same plowzone contexts. Another small Paleoindian site, the Baldwin Ridge Site, is situated atop a bluff overlooking the Thames River in Groton, near the current project APE. It yielded an ephemeral collection made up of a single fluted point base, end-scrapers, and a flake; the purpose of the site is difficult to determine due to the lack of artifacts and or associated features (Lavin 2013:52–53). Given what can be gleaned from these small Paleoindian sites, it is difficult to draw detailed conclusions about Paleoindian life in Connecticut. Thankfully, two other Connecticut Paleoindian sites—Hidden Creek and the Templeton Site—have stratigraphic integrity, features, and sufficient artifact density; when correlated with regional Paleoenvironmental data, these findings have revealed much about the Paleoindian occupation of Connecticut.

The discovery of the Hidden Creek Site has demonstrated the presence of Paleoindian occupation dating to the period between 10,000 and 9500 B.P. This site differs somewhat from the established pattern, wherein Paleoindian sites are characterized by the presence of predominately fluted points (Jones 1997). No such points were recovered, but collections of other lithic tools dating to that time period were found at the site, as well as the presence of other tools, such as lanceolate points. The predominately chert lithic assemblage recovered at the Hidden Creek Site was determined to have come from the distant Hudson River Valley, suggesting substantial mobility among the Paleoindian occupants of the region. While atypical in terms of its artifact assemblage, the spatial location of the site is typical of other known Paleoindian sites in New England. Sitting atop a sandy glacial terrace adjacent to a wetland, the stratigraphy of the Hidden Creek Site remains intact and has been well documented (Jones 1997; Spiess and Wilson 1989). Stratigraphic excavation encountered the densest concentrations of Paleoindian deposits at an average depth of only 50 centimeters, unlike some sites near riverine environments where such artifacts are discovered at depths several meters below ground, due to substantial alluvial deposition. This site is not limited to simply a Paleoindian occupation, but contains evidence of Terminal Archaic occupation, as well, which has been radiocarbon dated to the period spanning 352+/-50 to 3390+/-60 years B.P. Paleoenvironmental reconstruction of the region around the site suggests that the location of the Hidden Creek Site was inundated by a glacial lake during the period of 15,000–13,000 B.P. The surrounding terrain around this glacial lake was a sedge-based tundra environment based on the palynological reconstruction of the region (Jones, 1997; Thorson and Webb 1991:28). This information is largely congruent with observed trends elsewhere in New England. Around 12,700 B.P., the glacial lake drained, leaving a smaller pond environment that came to be dominated by spruce, fir, birch, and white pine. Over the next 700 years, the glacial pond evolved into a wetland environment (Jones 1997:48). The local environment became an inland wetland, ringed by dense coastal forests by the period of 10,000–9000 B.P., when the first evidence of Paleoindian occupation is documented at this location. These conditions would have attracted a variety of game and marine life, creating a rich hunting and gathering ground that, in turn, attracted early Paleoindian groups (Jones 1997:49).

The Templeton Site, discovered in Western Connecticut in 1977 by Roger W. Moeller, is a 43-square-meter site containing lithic artifacts and features dated to the Paleoindian period between 10,190 B.P. +/-300. Like the Hidden Creek Site, evidence at this location suggests a more mosaic woodland/wetland environment, not the tundra environment often associated with Paleoindian sites elsewhere along the East Coast (Moeller 1999). The Templeton Site has been reinvestigated in current years, and additional data is anticipated as reporting on the results is completed.

Archaic Period (9400–3000 B.P.)

The Archaic period exhibits an increase in the density and horizontal dispersal of archaeological remains. It is characterized by a reliance on both animals and wild plant resources, which became increasingly stabilized and broad-based over time. Group organization was presumed to still be fairly mobile, making use of seasonally available resources in different areas of the Southeast. Caldwell (1958) has termed the maximizing adaptation (scheduled hunter-forager) to the environment in the Eastern Woodlands during the Archaic period "primary forest efficiency." Group size gradually increased during this period, culminating in a fairly complex society in the Late Archaic.

The Early Archaic period (circa 9400–7000 B.P.) is marked by the end of the Pleistocene glacial advance and the extinction of megafauna. To date, evidence of Early Archaic occupations is much more common in southeastern North America than in the Northeast. In addition, the southeastern sequence suggests a transition from Paleoindian to Early Archaic assemblages, which has not yet been demonstrated for the Northeast. Prior to 1970, there was virtually no evidence of any northeastern sites dating to the Early or Middle Archaic periods. In the last four decades, considerable information has been obtained to fill in that gap, but the picture is still incomplete. The period is characterized by greater diversity in projectile point forms and increasing reliance on diverse species of Holocene fauna, including white-tailed deer, anadromous fish, water fowl, turtle, and turkey (Petersen et al. 1986:9; Lavin 2013:58).

Early Archaic sites in Connecticut demonstrate a rapid departure from the observed patterns of the Paleoindian period in the region. These changes are marked by evidence of new and changing lithic technology and evidence of changing migration patterns. These observed changes have been largely linked to adaptation of subsistence to a changing environment, and the different responses to that changing environment have led to the establishment of two "tradition" classifications for Early Archaic subsistence. The less common of these differing traditions has become known as the Atlantic Slope Tradition, characterized by highly transient foraging communities and typified by a lithic technology focused on the use of corner-notched bifaces of the Hardaway, Palmer, and Kirk types that are stylistically more similar to those of the Middle Atlantic Region and southern New England (Lavin 2013:82; Camps and Chauhan 2009:517). While sites associated with the Atlantic Slope Tradition have been found in Connecticut—namely at the Dill Farm Site, which demonstrated the extensive use of bifurcate projectile points during the period dating to about 8560+/- 270 years B.P.—site types of this tradition are far less common in Connecticut than in southern New England and the Middle Atlantic (Pfeiffer 1986).

The most common lithic tradition found in Connecticut during the Early Archaic is the Gulf of Maine Tradition. This tradition is typified by a more diverse and informal toolkit comprised of choppers, scrapers, and flake tools made of locally available lithics, as well as the limited use of bifurcate projectile points (Camps and Chauhan 2009:517; Forest 1999:81; Hornsby and Reid 2005:19). This departure from the heavy reliance on bifaces and bifurcate projectile points separates the Gulf of Maine Tradition from the Atlantic Slope Tradition, as well as earlier Paleoindian lithic traditions that were heavily dependent on bifacial lanceolate points. This stark departure in technology has sparked a question about the continuity of populations from the Paleoindian to the Early Archaic, or rather whether or not the change resulted from adaptation to a diversifying environment (Hornsby and Reid 2005:19). One of the finest examples of this Gulf of Maine Tradition can be found at the Sandy Hill Site, located in Mashantucket, Connecticut. This site illustrated a decided departure in lithic technology from the traditions of the Paleoindian period and showed evidence of extensive use of uniface tools (likely hafted to bone or wood) made of locally available quartz (Lavin 2013:61). This transition to more readily available lithic sources instead of reliance on exotics like chert and jasper stands in sharp contrast to the Paleoindian period, when large bifacial tools made out of exotic lithics were prevalent. The lack of bifurcate points at these sites has led to the hypothesis that tools of sharpened wood and bone supplanted this need for such piercing weapons during the Early Archaic, but owing to lack of organic preservation, examples of this technology do not survive (Hornsby and Reid, 2005:19). The Sandy Hill Site was well preserved and provided evidence of a dozen pit houses built into a south-facing sandy hill. Both macro- and micro-botanical remains recovered from these pit house features revealed the variety of wild plant materials being exploited by the peoples of this time. The Sandy Hill Site provided evidence for the utilization of foraged resources from terrestrial forest, supported by the presence of hazelnuts. The site also contained organic and palynological evidence of the exploitation of aquatic/wetland resources like cattail, water plantain, water-lily, etc. This data suggests that the Early Archaic peoples who occupied the Sandy Hill Site utilized a wide range of plant resources centered around mosaic forests/swamps and lake environments characteristic of Connecticut at this time (Lavin 2013:62; Camps and Chauhan 2009:517). Evidence of substantial dwellings and the exploitation of a wide array of both plant and animal resources seem to indicate transition away from the more nomadic lifestyle of the earlier Paleoindian culture to a semi-sedentary lifestyle of seasonal migration from one semi-permanent camp to another to exploit the best resources for each season. This conclusion is supported by the fact that the Sandy Hill Site appears to have been seasonally reoccupied for a nearly half a millennium.

Surveys of the areas around Cedar Swamp showed evidence of Early Archaic hunting in the region. A similar survey around Robbins Swamp revealed 35 small Early Archaic sites. These sites, most of which are classified as small hunting camps, provided evidence that the mosaic forest and wetland environment of the region was capable of supporting a substantial semi-sedentary human population during the Early Archaic (Lavin 2013:64). Lithic workshops discovered around Robbins Swamp also showed evidence of advance in lithic technology, such as heat-treating cobbles of lithics like jasper to improve their flaking qualities (Lavin 2013:64).

The Middle Archaic, circa 7000–5000 B.P., is associated with warmer and drier climatic conditions. By the start of the Middle Archaic period, modern floral communities, characterized by mast-producing hardwoods, were established. Rivers stabilized during this time and wetland and lake areas were reduced in size. Hunting remained important, and fish may have become a more predictable resource during this period. There is evidence for shellfish exploitation during this period. Excavations at the Neville Site in Manchester, New Hampshire, documented the Neville stemmed point type dating to between 7800 and 7000 B.P., and the Stark stemmed point type dating between about 7600 and 6400 B.P. (Dincauze 1976). The point types, often associated with the Middle Archaic, were found at a location adjacent to the Amoskeag Falls, the site of seasonal runs of anadromous fish like salmon that people exploited for millennia (Dincauze 1976). Other point types commonly associated with the Middle Archaic located at the Neville Site include the Merrimack point type, which has been identified as dating to the end of the Middle Archaic period, close to 6000 B.P. The Neville and Stark point types are similar in style and age to the Stanly and Morrow Mountain types that Coe (1964) defined earlier in the Southeast, but the Merrimack type appears to be more spatially restricted. The presence of all these diagnostic Middle Archaic lithics in proximity to well-documented fishing locations like the Amoskeag Falls suggests an increasing utilization of riverine resources during the Middle Archaic.

The accumulated data for the Middle Archaic period in the Northeast suggest that, during this period, the pre-contact inhabitants were forming themselves into distinct bands and settling into defined territories. These bands were establishing base camps and occupying a greater variety of special-purpose sites in a carefully planned seasonal round (Snow 1980:183). Evidence of repeated seasonal reuse of sites during the Middle Archaic can be found at well-established sites like the Dill Farm and sites in areas around the 16 Middle Archaic Site around the Great Cedar Swamp (Lavin 2013:81). Other substantial Middle Archaic sites include seasonal hunting camps like the Lewis-Walpole Site in Farmington, Connecticut, which contained evidence of hunting and butchering activities, as well as the harvesting of hickory nuts, hide and plant processing, and a plethora of cooking hearths (Lavin 2013:79). Evidence for the first use of coastal resources, such as shellfish beds, appeared during this period.

Development of alluvial terraces along Connecticut's major rivers and streams opened new environments for exploitation and riverine resources became more common. According to Lucianne Lavin "half of the known Middle Archaic sites in Connecticut are in riverine areas" (Lavin 2013:79). This would seem to support the conclusion that seasonal fishing became important during this period and that seasonal fishing camps similar to those observed in New Hampshire (like the Neville Site along the Amoskeag Falls) were by no means uncommon. However, evidence for such activities is scarce in Connecticut, a fact Lavin attributes to the relative acidity of the soil, which tends to destroy organic evidence of riverine activities like textile nets, bone fish hoods, and wooden fishing traps (Lavin 2013:79). Such fishing technology has appeared in similar assemblage found in nearby Massachusetts and New Hampshire that date to the Middle Archaic (Dincauze 1976; Snow 1980). Still, there is strong evidence to suggest that much of the subsistence strategy for the Middle Archaic peoples of Connecticut relied on the exploitation of upland wetland and lake resources, common for the Early Archaic (Lavin 2013:78).

The Late Archaic period is generally dated circa 5000–2500 B.P. Prior to the 1960s, Late Archaic sites were virtually the only Archaic period sites recognized in the Northeast. William Ritchie's work at sites like Lamoka Lake in New York had produced his seminal definition of an "Archaic" stage of culture in North American prehistory (Ritchie 1932, 1936), but no earlier complexes were known.

Throughout the Northeast, archaeologists now recognize the Late Archaic period as one in which the numbers and types of sites increased dramatically—what Snow (1980:187) described as the Late Archaic "florescence." Unlike earlier time periods, anyone interpreting Late Archaic assemblages must contend with a sometimes confusing and complex array of data. Based on his work in New York, Ritchie (1994) recognized two major Late Archaic trajectories, the Lamoka (aka Narrow Point or Small Stem) and the Laurentian, which overlap in both time and space. Both trajectories are also represented in Connecticut and throughout New England. In Connecticut, the two complexes coexisted. Lamoka (Narrow Stem) associated sites are found in Connecticut, as in the Late Archaic component of the Dill Farm Site and the Hateway-Bugbee Site in West Hartford, dating to slightly earlier than their Laurentian counterparts and thought to show a more direct continuation of the Middle Archaic tradition that the Laurentian complex.

During the Late Archaic, site density increased relative to the preceding Middle Archaic. Subsistence relied upon a seasonal migration and exploitation of available resources among both the Laurentian and Lamoka groups. Staple game like white-tailed deer were supplemented by a broad range of vegetal foods, particularly nuts, and a broad range of finfish and shellfish resources. Evidence of technological innovations, such as weirs and nets, first appeared in the Late Archaic—the Laurentian utilization of the net sinker having been quite substantial. During this period, extensive salt marshes developed along the coast and at river mouths, providing a stable environment for increased exploitation of shellfish. Population of coastal areas appears to have increased dramatically at this time, particularly near the end of the Late Archaic period. Both the Laurentian and Lamoka (Narrow Stem) groups exploited these new environmental niches. The differentiation between the two can be observed through their differing toolkits. The Laurentian toolkit came to rely more heavily on imported high-quality lithics and an increasing dependence on groundstone tools, whereas the Lamoka tradition continued to rely heavily on chipped stone tools made from locally sourced lithics (Lavin 2013). The development and interactions of these two divergent cultural traditions in Connecticut remains a topic in need of further study.

The end of the Archaic has also been commonly called the "Transitional," in reference to its presumed transitional status between the Archaic and Woodland periods. Since research continues to indicate that there is actually a great deal of cultural and biological continuity between the Archaic and the Woodland periods, Snow (1980:235) has suggested that the label "Terminal Archaic" is more appropriate.

As Snow defined it, the hallmark of the early part of the Terminal Archaic is the Susquehanna tradition of broad-stemmed projectile points and their associated assemblages. These points include several regional varieties, including the Genesee, Perkiomen, Snook Kill, and Susquehanna Broad types in New York. This Susquehanna tradition of broad-stemmed projectile points is analogous to Coe's (1964) Savannah River type from the southeastern United States. Characteristics of the Susquehanna tradition include a marked preference for a riverine adaptation and a predilection for the fine-grained lithic resources of the Piedmont province, including rhyolite, felsite, argillite, and slate (Dincauze 1975:27; Turnbaugh 1975:54). Recently, the question has been raised concerning whether this Susquehanna tradition of broad-stemmed projectile point is a representation of migration or whether it marks an in situ revolution and change of the established Laurentian culture in the region. A hybrid theory suggests that groups migrating north from New Jersey and Pennsylvania met and merged with the established Laurentian culture in new England, forming the Susquehanna Broadspear culture and remaining distinct from the Lamoka (Narrow Stem) culture. This hypostasis is borne out by the idea that immigrants moving north along waterways and rivers were more apt to encounter and interact with the Laurentian cultures, who favored riverine environments, than the Lamoka groups, who largely occupied upland wetland environments. This would explain the continuity between the Laurentian culture and new Susquehanna broad-stemmed culture that came to prominence in Connecticut during the Terminal Archaic, and would explain why that culture remained culturally distinct from the Lamoka culture (Lavin 2013:141–144). This period of transition raises many questions. The latter portion of the Terminal Archaic period is marked by the appearance of narrow, tapered Orient Fishtail projectile points. Named for the type locations at Orient Point on eastern Long Island, Orient Fishtail points tend to be found on Long Island, in the Hudson Valley, and in southern New England (Ritchie 1971). In the Terminal Archaic period, groups favoring narrow points came into contact with the broad point cultures of the Susquehanna tradition. This contact may have occurred as a result of rising sea levels forcing populations from coastal regions in the Middle Atlantic to migrate north as their environment became inundated. The Minor and Griffin Site in southern Connecticut contained burials where both artifact traditions were found together, suggesting that these groups coexisted (Lavin 2013:139).

A marked increase in ritualistic behavior is also a feature of the Terminal Archaic cultures. The Late Archaic period had seen the introduction of cremation burial ritual among the Laurentian culture in Connecticut, but Terminal Archaic Laurentian cremation burials involved the development of the ritual "killing" of objects associated with the deceased and the intentional burial of those objects with the deceased. Decayed bodies were placed on pyres with burial goods and offerings, burned, and then sprinkled with ochre (Lavin 2013:138).

Another hallmark of the Terminal Archaic is the appearance of steatite (soapstone) cooking vessels toward the end of the Susquehanna tradition (which continued throughout the Orient tradition). The presence of these large steatite vessels suggests that "the people who made, traded, and used [them] had reached a point in the evolution of their settlement and subsistence systems where the use of heavy cooking vessels was advantageous" (Snow 1980:240). This implies that these people lived in more sedentary settlements, utilizing foodstuffs that required long processing with heat.

Woodland Period (3000–300 B.P.)

The Early Woodland period in much of the Northeast is represented by distinctive, thin, side-notched projectile points and the first widespread appearance of ceramic vessels. This pottery, which has been given the type name Vinette I, appears on some Terminal Archaic sites, but did not become common until the Early to Middle Woodland (Lavin 1985:23). The presence of pottery has long been one of the key defining attributes to separate sites of the Woodland period from those of the Archaic, in the absence of radiocarbon dates or chronologically distinctive stone artifacts. In addition to Meadowood projectile points, Adena, Rossville, and Lagoon points are also associated with this time period. Rossville and Lagoon points are particularly common on Early Woodland sites in the coastal areas of southern New England and Long Island Sound.

Other material culture indicative of the Early Woodland includes the ungrooved axe or celt, which came to dominate artifact assemblages from this time. Additionally, the bow and arrow came to replace the atlatl during this period, so atlatl banner stones—a common staple from the

Late and Terminal Archaic—cease to appear in Woodland collections. The technological innovation of the bow and arrow enabled more accurate hunting with increased range and power, rendering spear-throwing tools like the atlatl largely defunct (Lavin 1985:23).

The Early Woodland period saw an apparent broadening of trade networks with groups in Connecticut, indicating interaction with groups as far north as Canada and well into the Midwest. Fulton Turkey Tail Points and boat stones typical of the Adena mound-building culture, prevalent in what is now Ohio, have been found in Connecticut sites like East Windsor Hill (Lavin 1985:26). Adena/Middlesex-related burial sites have been found as far east as New England and the Maritime provinces, where they appear to be most common in the St. Lawrence and Connecticut River drainages. Elsewhere in New England, similar burial complexes have been found at sites near Lake Champlain and in New Brunswick that have yielded a wide variety of objects associated with this the Adena/Middlesex culture, such as blocked-end smoking pipes, copper and shell ornaments, and stone tools from distant sources, such as Indiana, Ohio, Ontario, and Quebec.

Throughout the Northeast, Early Woodland habitation sites are generally less common than the cemetery site, which has skewed the picture of the pre-contact lifestyles for this period. Many Northeastern Early Woodland burial sites actually predate classic Adena in Ohio, and it is likely that the Early Woodland manifestations in this region represent a complex interplay of traditions. Early ceramic vessels tend to be thin and grit tempered. Settlement and subsistence patterns, at least in the earliest portion of the Woodland period, exhibit little variation from preceding Archaic period patterns (Kenyon and McDowell 1983:21; Lavin 1985:25). The continued use of narrow-stemmed points made of local quartz cobble continued to persist in Connecticut during the Woodland period, demonstrating a continuity between the Late/Terminal Archaic and Woodland populations of Connecticut despite expanding contact with other cultures from the west (Lavin 1985:25).

The Middle Woodland period, 2000–1000 B.P., saw little change in subsistence patterns. The practice of seasonal rounds to follow resources at separate camps based on seasonal availability remained—a practice largely consistent since the Terminal Archaic (Lavin 1985:27). However, the ceramic and point technologies employed by the peoples of Connecticut at this time clearly separate this period from the preceding Early Archaic. Lithic assemblages from this period contain Fox Creek points (concave base), Jack's Reef points (thin, medium bladed points with corner notching), and Green Points (lanceolate points that taper and thin toward the base)—all of which made their Connecticut debut during the Middle Woodland. The type and variety of ceramic decoration during this period also expanded. Decorative motifs like cord wrapping, shell imprinting, incising, brushing, and stamping became commonplace, leading to finds of such diagnostic ceramic traditions as the Clearview Stamped, Hollister Stamped, Windsor Brushed, Windsor Fabric-Marked, and Shantock Cove Incised (Lavin 1985:27). Also during this period, the tubular, cigar-shaped smoking pipe first appeared, although only few examples of this artifact have been found in Connecticut (Lavin 1985:28). While groups to the south and west of

Connecticut seem to have actively participated in the large Hopewell Interaction Sphere, a massive trading network linking eastern groups to the Midwest cultures, the Connecticut groups seemed to have avoided such interactions in favor of more localized and/or regional trade networks (Lavin 1985:28).

During the Late Woodland period, 1000–500 B.P., seasonal rounds for subsistence continued the pattern from the Terminal Archaic (Lavin 1985:30). Again, the transition to this period is marked more by technological change than drastic environmental or subsistence pattern alteration (Lavin 1985:30). Lithic assemblages from this period contain a new type of triangular lithic point known as the Levanna Point. New ceramic decorative motifs emerged during this period, including the East River Cordmarked and the Windsor Cordmarked traditions. Both types are denoted by cordmarking on the outside of clay vessels, but Windsor motif pottery has a smooth interior, while the East River Cordmarked tradition features a brushed interior (Lavin 1985:30). The Late Woodland period also saw a tradition in burial practice among the peoples of Connecticut. While previous burial rituals included cremation, the discovery of mortuary interments at the Old Lyme Site revealed no evidence of this practice, only the positioning of the body of the deceased into a fetal position (Lavin 1985:30). The earlier habit of including grave goods with the deceased remained intact, but those goods were not ritually cremated or destroyed, as uncovered for earlier periods.

An important cultural and subsistence revolution occurred in Connecticut near the end of the Middle Woodland and the beginning of the Late Woodland period. This big change was the introduction of limited horticulture to the region and, eventually, the incorporation of new foodstuffs like maize into the diet. While this change did cause some shifts in the subsistence plan of Connecticut populations, and they stayed put for longer periods of time, archaeological evidence suggests that they continued to follow seasonal rounds. In this case, horticulture was largely utilized to supplement a diet of gathered food, whereas in other parts of the continent, such developments caused the total abandonment of transient lifeways and seasonal migration. Connecticut does not seem to conform to the larger emerging agricultural subsistence shift that characterized much of New England at this time.

Contact Period (A.D. 1500–1633)

The contact period in Connecticut began around A.D. 1500 with the influx of European traders and trappers. These early interactions caused major subsistence, settlement, and technological shifts that forever changed the Native American way of life. European trade goods like copper and wampum made of colored trade beads quickly disrupted existing native lithic trade routes and supplanted many native craft goods. Ready availability of copper for the construction of points meant that fewer and fewer tools needed to be made of lithic material. The European demand for furs changed hunting practices from focusing on subsistence hunting to hunting for creatures whose pelts could be traded for foreign goods (Lavin 1985:31). As less and less time was spent on subsistence hunting and gathering activities, native populations became less selfsufficient and more dependent on trade for food. Subsistence began to focus more and more on horticulture and the seasonal procurement rounds that had sustained Connecticut's population for millennia began to fall to the wayside. During this period, the populations of Connecticut's coast increased, as such coastal settlements were more likely to encounter Europeans and their highly prized trade goods. While new material culture entered Connecticut via European contact, more traditional methods of tool production using quartz cobbles remained linked to the native toolkit. The widespread use of quartz Narrow and Levanna point types persisted throughout this period (Lavin 1985:31). Many new ceramic decoration motifs emerged during this period, including several stamped wares, like Van Cortlandt stamped, Niantic, Niantic Stamp and Drag, as well as other motifs like Niantic Linear Dentate and Niantic punctuate.

The permanent or semi-permanent villages the inhabitants of Connecticut established during this time included the familiar forms of the oval longhouse and the wigwam, both featuring a central hearth and clad in bark, rush matting, or animal skins. Early settlers often described such structures in detail in their letters and journals (Lavin 1985:33). By A.D. 1663, the first European settlements were being established in Connecticut, signaling the beginning of struggle to maintain traditional Native American lifeways in Connecticut.

HISTORIC BACKGROUND

The first foray to the Connecticut coast was undertaken by Adriaen Block, who surveyed the lands claimed by the Dutch as "New Netherland." The Block Map was the first documentation by Europeans of the coast in detail and included information on settlements of the Pequot and Mohegan inhabitants of the area around New London. Lands were purchased from tribal groups around the Connecticut River and settlements established before colonists moved eastward. The English also attempted to settle southeastern Connecticut, and in the process aggressively pursued the accumulation of lands within the Connecticut Valley. Due to the increased tension, The Pequot Wars broke out between 1635 and 1637. English colonists banded together with Mohegan groups against the Pequots and began a campaign of extermination against the indigenous peoples of the area. Sites in the New London area associated with conflicts during this time, including a suspected encampment of Israel Stoughton. Captain Stoughton led a party to murder Pequots in the area around the Thames River, and likely established the camp near Fort Trumbull (Caulkins 1895).

The end of the Pequot War created opportunities for English to establish a community at Pequot, the original name of the settlement at New London. Though the settlement became established through the 1640s, it was not until 1650 that John Winthrop was granted rights to site a mill and stability was fully realized. "The high-ground of Winthrop's Neck served as a protection from the winds and swell of the waves. It was comparatively easy, even in rugged weather, to round the point and run into the smooth water of the cove" (Caulkins 1895:659). This was the description of Winthrop's Neck, and indeed the area would see continued development due to its advantageous position and natural features.

One of the most well-known events in New London during the Revolution was the attack on the harbor by Benedict Arnold on September 6, 1781. Arnold's swift attack on Fort Trumbull drove back forces to Fort Griswold, which was captured and burned. Arnold then went on to burn much of New London, as well as many properties that had developed along Winthrop Neck. Earlier in the war, a fortification was established on the high bluff at Winthrop's Neck by Colonel Saltonstall. The redoubt appears on several maps from the period, including a map drawn by Arnold's forces in 1781 (Figure 3). The redoubt only lasted a few years, and there is little in the documentary record that provides definitive information on its location. It was certainly on the bluff within or near the APE, through the distance from shore is not clear.

The close of the Revolutionary War gave New London the opportunity to rebuild both its infrastructure and the relationships disrupted by years of conflict. Though the West Indian trade networks were rekindled, continued unrest culminated in the embargo of the War of 1812, and trade was no longer as reliable as it had been in the past. At the same time, whaling was becoming a primary industry along the southern New England coast, and New London was caught up in the whaling boom. The whaling boom in New London reflects the experience of other ports, dropping off in the nineteenth century with the advent of petroleum products and lessening demand for whale oil and other products. Fortunately, as one industry winded down, another grew; shipbuilding. New London had the largest number of shipyards of any town on the Connecticut coast, including shipyards sited along Winthrop's Cove (Herzan 1997:56).

Transportation routes along the coastline and inland connections were also integral to New London's development. By 1852 trains operated daily between New Haven and New London (Herzan 1997). The New London Willimantic & Palmer Railroad was the first rail stock company in the region and sited the railyard that is still present west of the APE today. The coming of the railroad split what had been a thriving neighborhood in East New London, though the two halves remained until later development resulted in the relocation or destruction of many residences (Decker 1976). The CVRR Pier was built in 1876. The CVRR connected New London with shipping routes to Montreal, becoming a connection between Canadian grain, sugar, and hides (Clouette 1993). From the late 1880s onwards, the New York, New Haven and Hartford Railroad began to upgrade in order to handle the ever-increasing rail traffic. The double-track rail drawbridge was opened in 1889 and spanned the Thames from Winthrop's Neck to Groton, and at the time was the longest bridge of its type at a length of over 1400 feet (Ruddy 1998, cited in Saunters and Schneiderman-Fox 2000). The Groton Bascule Bridge was built in 1918 parallel to the north of the 1889 bridge and intended to serve as a replacement structure to accommodate a four-track span across the river. The 1889 bridge was converted for vehicle traffic and was demolished in 1944, with the final span demolished in the early 1980s (Roth 1981, cited in Saunters and Schneiderman-Fox 2000). One of the foundations for the brownstone bridge piers is located within the northeastern portion of the APE, east of the building at the terminus of State Pier Road (SR 437).

CLIENT	**Connecticut Port Authority**
PROJ	**State Pier Infrastructure Improvements**
SCALE	**1:14,736**
SOURCE	*Lyman - A Sketch of New London and Groton... 1781.*

TITLE

1781 Sketch of New London and Groton

AECOM

12420 Milestone Center Dr.
Germantown, MD 20876

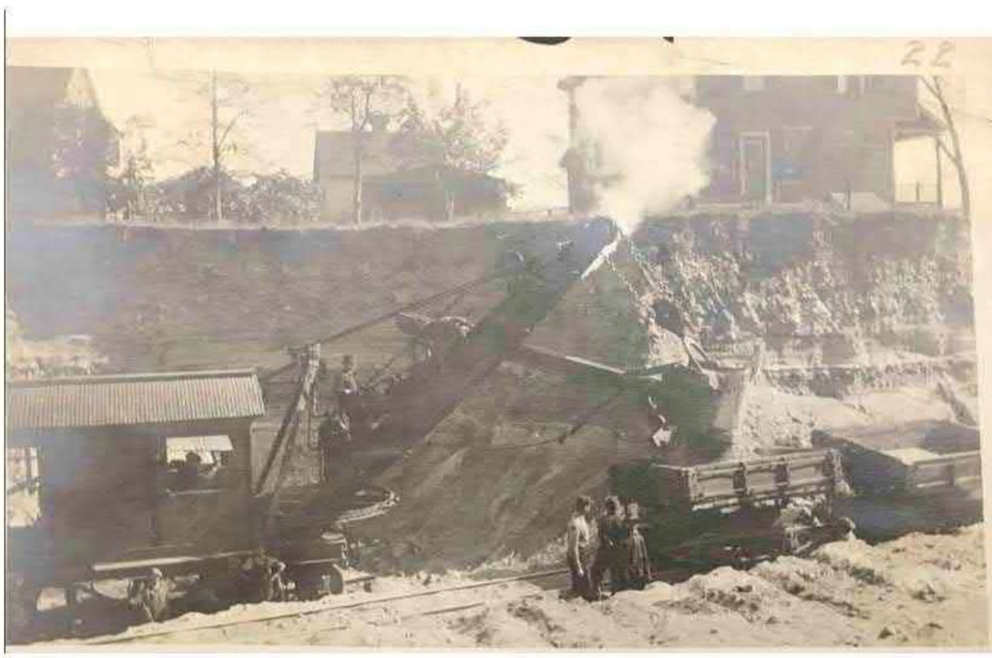
PROJ NO 60579714

FIGURE 3

The design history of the State Pier is given considerable attention in Clouette's Historic American Engineering Record (HAER) report of the structure, CT-141. The genesis of the State Pier began with a state commission tasked with studying the viability of a state-funded harbor. New London was determined to be a suitable candidate, and in 1911 the commission became permanent and construction started within two years (Clouette 1993). The Pier was finished in 1914, with construction of ancillary structures taking another three years. The Connecticut State Pier received considerable attention in engineering journals of the period (Clouette 1993). Other plans for the State Pier had included warehouses and grain elevators extending to the north and east of the bluff area, though these plans were never completed (Clouette 1993:14). Photographs 1-3 show some of the area during development of the Pier.

Photograph 1: View south along the rail spur to the State Pier c.1914. Note dramatic cut into bluff to the east.
Courtesy of the New London County Historical Society Archives

Photograph 2: Photograph facing north along the railroad tracks along the bluff.
Courtesy of the New London County Historical Society Archives



Photograph 3: View of bluff cut to accommodate the rail spur. Note stratigraphy, indicting multiple depositional events at depth (yellow arrows). Facing east. *Courtesy of the New London County Historical Society Archives.*

During World War I the Navy took possession of the State Pier as part of the war effort. At the conclusion of the conflict, the Pier began a slight downturn in cargo volume. In particular, the large amount of Canadian goods previously shipped through New London had dwindled (Clouette 1993). In the mid-twentieth century, two blocks were razed, and a parking pad was added by the US Navy (Saunters and Schneiderman-Fox 2000). The Navy constructed a small, one story facility east of Fraser Street and south of 10th Street before transferring the property to the State of Connecticut Department of Transportation.

MARITIME HISTORY

Fishing, shipbuilding, and the West Indies coastwise trade dominated Connecticut's maritime economy until the American Revolution. The war slowed these established trade industries between New England and the British West Indies. Subsequently, privateering and non-British West Indies trade grew (Albion 1972:54). New London's merchants and shipbuilders turned to refitting merchant vessels into ships of marque or privateers to attack English mercantile trade while establishing trade with the non-English colonies for munitions, salt, and other required goods (Middlebrook 1925:6). From the close of the Revolutionary War until the War of 1812, New London's trade with non-English colonies in the West Indies grew – supplying them fish, agricultural products, textiles, barrel staves, rum, and spices. Fishing, whaling, oil, and general mercantile trades grew at a slower rate until the outbreak of hostilities between England, France, and Spain. The European conflict created an opportunity for New London's merchants to supply trade goods to the European continent (Albion 1972:61). Trade continued to expand and contract on the Thames River in the nineteenth century. Global events and the development of the railroads reshaped the waterborne commerce. Bulk goods such as whaling, fishing, and agricultural trade diminished and was instead dominated by the export of wood products, coal, iron, textiles and general merchandise. Imports were primarily raw materials such as guano, logwood, sugar, molasses, and Bay Rum. The beginning of the twentieth century saw a more diverse mix of import/export goods: coal, lumber, oil and naphtha (for internal combustion engines), fish, pulp wood, paper, building materials, iron and steel, iron pipe and general merchandise. The bulk of these goods were shipped on a combination of sail, steamers, and barges. Sailing vessels (schooners) were still carrying cargo into the 1930s before larger oil-screw and steam-powered vessels displaced them.

The upper Thames River and New London Harbor underwent a series of major dredging campaigns beginning in 1836 to revitalize and increase waterborne transport and reduce the per-ton cost of shipping. Under the various River and Harbor Acts spanning the 19th to 20th centuries, the United States Army Corps of Engineers (COE) extensively dredged to deepen the natural channel that followed the west bank of the Thames River to Winthrop Point (Figure 4). Above Winthrop Point dredging continued to cut a channel initially measuring 11-foot (3.3-meters) depth and increased to 14-foot (4.3-meter) depth at mean low water (MLW). In addition, the Corps constructed a series of wing dikes and training walls to channelize the waterflow and prevent the dredged channel from filling with sediment.

Important to New London's development was the 1836 dredging of an entrance channel 60 feet wide and 930-foot-long (18.3 meters by 283 meters) across a shoal known as Haycock's Shoal, above Long Rock, in the mouth of the river (COE 1866:26). Later improvements in New London

Harbor led to the dredging of a channel 16 feet deep by 100 feet wide (4.9 meters by 30.5 meters) that ran the length of the waterfront up to Winthrop Point (COE 1880:92), and the dredging of Shaw's Cove to 15 feet (4.6 meters; COE 1857:2561).

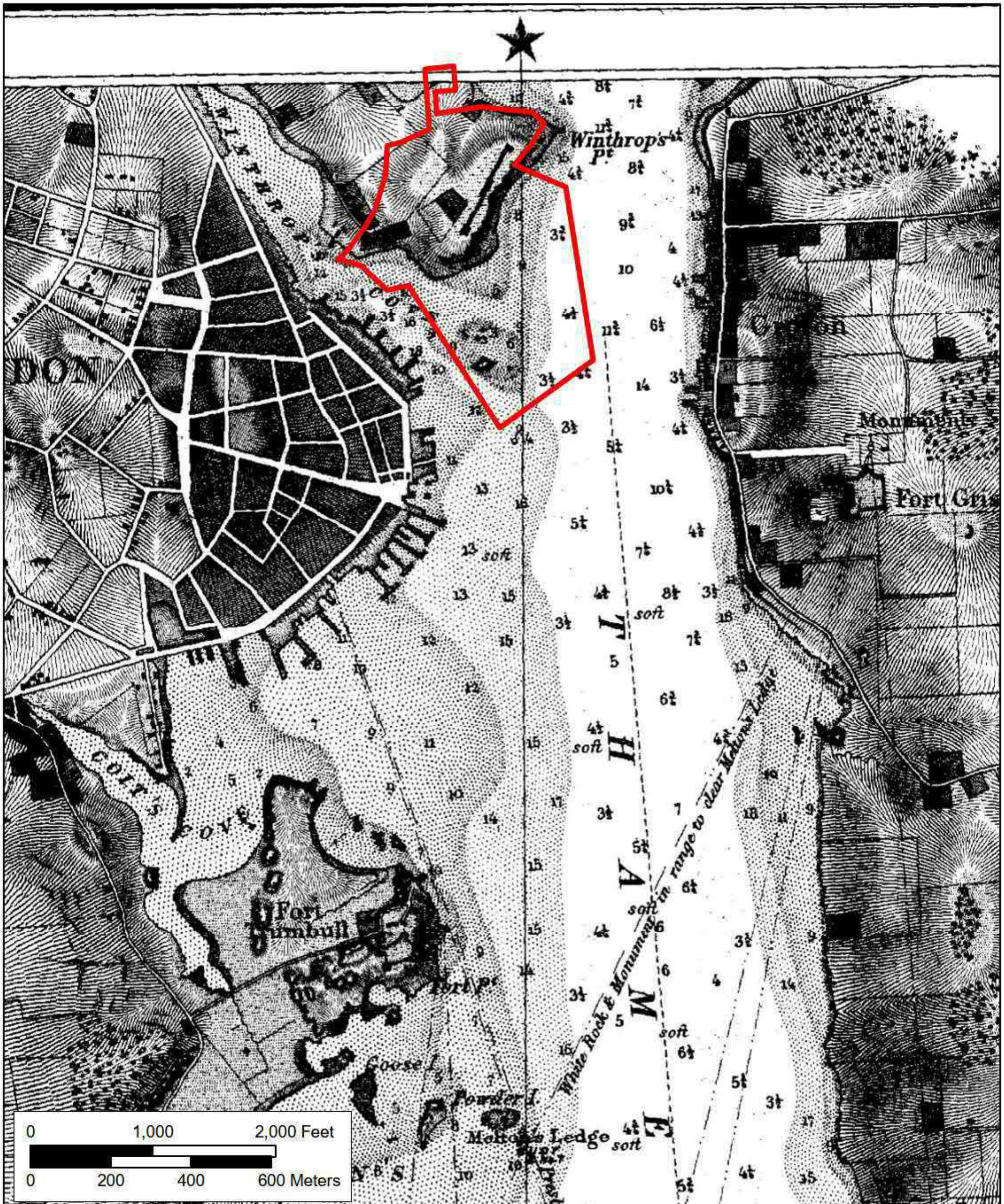
By the start of the twentieth century, the area that would become the Connecticut State Pier had been dredged for a channel that ran the length of the New London waterfront in addition to dredging shoals between New London Harbor and the east bank of Thames River (Table 2). The State Pier area was extensively disturbed by dredging a channel 6,000 feet long, 400 feet wide, and 30 feet deep (1,828 meters long by 122 meters wide by 9 meters deep) from just north of Fort Trumbull to Winthrop Point (COE 1907:1352). The Connecticut State Pier construction was completed in 1914 and measures 1,020 feet long by 200 feet wide (305 meters long by 61 meters wide) extending into the Thames River. This included extensive dredging between the piers to a depth of 33 to 35 feet (10 to 10.7 meters) (Figure 5). With the completion of the State Pier, a navigation channel was dredged to 33 feet depth (10 meters; MLW), for 1.5 miles (2.4 kilometers) from the State Pier south into the main navigation channel that was begun in 1902 (COE 1907:96).

Starting in 1919, the Thames River was dredged from the mouth of the river in Long Island Sound, north 3.5 miles (5.6 kilometers) to New London's upper harbor. The channel measured 600 feet wide (183 meters) with a depth of 33 feet (10 meters; COE 1919:206). The channel improvement was completed in 1942 and maintains this general configuration and layout to the present (COE 1944:77). Deepening of the channel has occurred since the completion of the main navigation channel at the request of the U.S. Navy to accommodate new classes of submarines.

Table 2: Dredging reports for the Thames River

Year	Depth (ft. MLW)	Notes
1821	NA	Removal of obstructions in river from War of 1812 (No location given)
1826	UnK	Survey of Thames for dredging
1836	UnK	Ft. Trumbull Lighthouse, entrance of river
1838	9.5	Dredging of 950 ft. by 60 ft. wide channel across the Haycock in entrance of river.
1857	15	Shaw's Cove dredged and channel creating winter anchorage.
1866	Unk	Survey of south 3.5 miles of Norwich to dredge 14 ft. deep, 100 ft. wide channel estimates 75,918 cubic yd. Reports velocity piers in need of repair between New London and Norwich. Dredging at Thames entrance and to Fort Trumbull Light (no depths reported)
1867	11	Dredging, training walls and surveys, Norwich south to New London
1871	11	Dredging, training walls and surveys, Norwich south to New London
1872	11	Dredging, training walls and surveys, Norwich south to New London
1873	11	Dredged Channel to Norwich 11 ft. deep (MLW), 100 ft. wide.
1883	14	Channel dredged opposite Trading Cove and between Bushnell's Reef and Perch Rock (60 to 100 ft.). Below Fort Point, training wall completed (2,988 ft.).
1884	16	Shoal area east of New London Northern Railroad Wharf dredged to 16 ft., (started 1880, completed 1884).
1887	16	Repairs of training walls, extension of dike at Rolling Mills (350 ft.), to total 1,580 ft. Additional dredging on shoal east of New London Railroad Wharf to 16 ft.
1900	16	200 ft., channel from Norwich to New London, Shaw's Cove Channel 100 ft. wide, 12 ft.deep, anchorage 7.5 acres at 12 ft., depth.

1900	23	Proposed channel from opposite Fort Trumbull along the New London Water front and returns to channel Central Vermont RR Dock. Completed 1904.
1904	21	New London sewer pipe outfall in channel at 21ft. water depth.
1907	26	New London railroad bridge south to mouth of Thames River navigation channel 1/4-mile-wide by 26 ft. or deeper by 6,000 ft long. Completed 1907.
1907	14	200 ft., channel from Norwich to New London, Shaw's Cove Channel 100 ft. wide, 12 ft. deep, and anchorage 7.5 acres at 14 ft., depth.
1916		State of Connecticut completed essential portions of 1,000 ft. long by 200 ft. wide State Pier including navigation channel dredged to 33 ft. (MLW) for a length of 1.5 miles.
1919	33	Navigation channel 600 ft. wide, 33 ft. deep starting at the entrance to 3.5 miles north to New London Upper Harbor, south of State Piers. Authorized 1916.
1919	15	Deeping of Shaw's Cove from 12 to 15 ft. Authorized 1910.
1920	33, 21, 14	Navigation channel 600 ft. wide, 33 ft. deep starting at the entrance to 3.5 miles north to New London Upper Harbor, New London Harbor access channel, and Shaw's Cove deepening.
1923	33, 21, 14	Dredging of navigation channel 600 ft. wide, 33 ft. deep starting at the entrance to 3.5 miles north to New London Upper Harbor, New London Harbor access channel, and Shaw's Cove deepening.
1929	33, 23, 15, 18, 20	Dredging of navigation channel 600 ft. wide, 33 ft. deep starting at the entrance to 3.5 miles north to New London Upper Harbor, New London Harbor Access Channel 400 ft. wide channel 23 ft. deep 6000 ft. long fronting New London waterfront and Connecticut State Pier, and deepening Shaw's Cove to 15 ft. Upper Thames wing dams and rock training walls including channel dredging
1931	33, 23, 15, 18, 20	Dredging of navigation channel 600 ft. wide, 33 ft. deep starting at the entrance to 3.5 miles north to New London Upper Harbor, New London Harbor Access Channel 400 ft. wide channel 23 ft. deep 6000 ft. long fronting New London waterfront and Connecticut State Pier, and deepening Shaw's Cove to 15 ft. Upper Thames wing dams and rock training walls including channel dredging
1938	33, 23, 15, 18, 20	Dredging of navigation channel 600 ft. wide, 33 ft. deep starting at the entrance to 3.5 miles north to New London Upper Harbor: Ongoing. New London Harbor Access Channel 400 ft. wide channel 23 ft. deep 6000 ft. long fronting New London waterfront and Connecticut State Pier: Continuing, and deepening Shaw's Cove to 15 ft.: Ongoing. Upper Thames wing dams and rock training walls including channel dredging: Ongoing
1941	22, 15	Winthrop Cove dredging: Complete. Shaw's Cove: Complete
1943	33, 18, 20	Dredging of navigation channel 600 ft. wide, 33 ft. deep starting at the entrance to 3.5 miles north to New London Upper Harbor: Completed. Upper Thames wing dams and rock Training walls including channel-maintained dredging: Ongoing



CLIENT	**Connecticut Port Authority**
PROJ	**State Pier Infrastructure Improvements**
SCALE	**1:13,000**
SOURCE	*NOAA 2019*

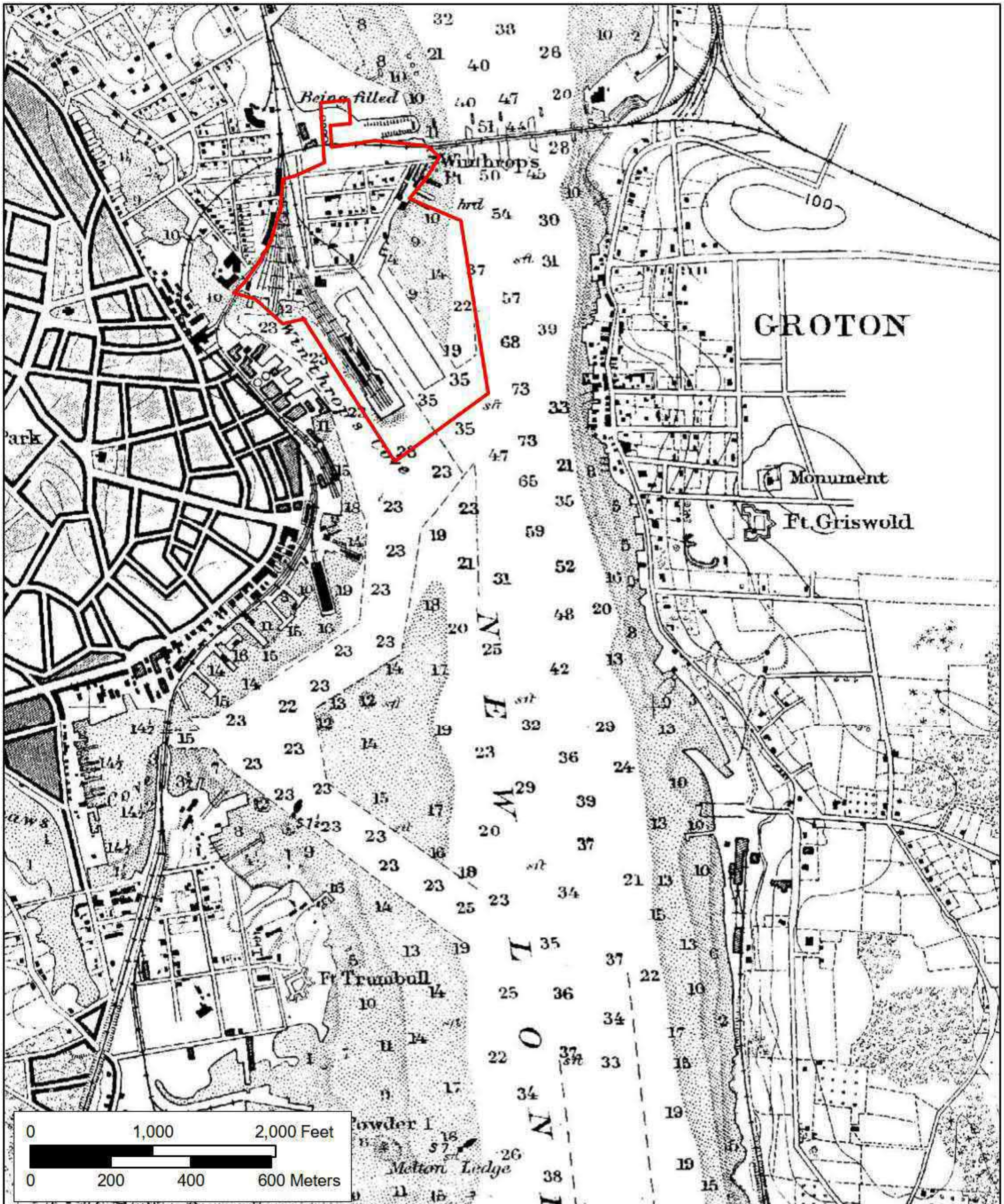
N

TITLE
1848 Nautical Chart of The Harbor of New London Showing the Natural Channels and Shoals in the Vicinity of the State Pier

AECOM
12420 Milestone Center Dr.
Germantown, MD 20876

PROJ NO 60579714

FIGURE 4



CLIENT	**Connecticut Port Authority**
PROJ	**State Pier Infrastructure Improvements**
SCALE	**1:13,000**
SOURCE	NOAA 2019

TITLE

1918 Navigation Chart 359, Harbor of New London and Approaches, Showing the Dredged Channels and Scouring in the Vicinity of the State Pier

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Germantown, MD 20876

PROJ NO 60579714

FIGURE 5

4 Literature Review

In addition to online repositories, AECOM conducted research at the New London Historical Society, New London Landmarks, the New London Library. The assistance and generosity of these organizations and their time, passion, and expertise with New London history has been greatly helpful in the preparation of this report. Additional research at CTSHPO was conducted to review previous reports and site forms on-file.

PREVIOUSLY RECORDED ARCHAEOLOGICAL SITES

The initial Study Area for the Project is a one-mile archival study buffer surrounding the Project APE. This study area includes the majority of downtown New London, Groton, and the Thames River to the mouth. An assessment of the known archaeological resources within this study area revealed archaeological sites have been found within the one-mile study buffer. None of the three known sites occur within the actual bounds of the project APE.

Previous archaeological studies completed within the APE provide additional insights. A 2000 survey prepared for the State Pier Action Area A was completed by Historical Perspectives, Inc. and provides a starting point for assessing the archaeological potential of the Project APE. The 2000 report was a Phase IA Assessment designed to assess the archaeological potential of a previous project involving demolition of structures around 12th Street. The report provides a block-by-block assessment of sensitivity by examining photographs and maps of residences in the area. The report recommended that precontact, colonial, and nineteenth century deposits may be present within the block of houses slated for demolition, and that subsurface testing be completed (Saunters and Schneiderman-Fox 2000). This testing occurred after demolition of the structures and did not include all areas identified as sensitive in the previous Phase IA Report. The results of the IB indicate that one area previously recommended as sensitive was not tested during the IB survey (Block 241) and that coverage within sensitive areas may not have been suitable to confirm that no archaeological sites were present. The IB report details the excavation of both hand-dug and machine-assisted test pits and trenches, with most reaching less than one meter in depth, and the deepest test extending to 118 centimeters (Saunters and Kearns 2001). It is also unclear from descriptions in the IB Survey what the nature of soils comprising the bluff are, and whether there is potential for deposits to be buried more deeply than testing identified. It is important to note that the proposed project in 2000 had a shallower depth of disturbance and smaller footprint than the current project APE, and that the extent of testing in the IB Survey likely reflects an appropriate strategy for testing the extent of proposed impact at that time (Figure 6). Additionally, the survey recommended two areas did not retain any archaeological potential. These areas were reported as the tax block lots designated as 108 and 245. Block 108 was not recommended for additional archaeological testing due to the extensive ground disturbance and alteration associated with the construction effort for the 1889 drawbridge, including installation of the massive masonry bridge piers, which likely destroyed any remaining precontact or preceding historic period archaeological remains that may have once been present (Saunters and Schneiderman-Fox 2000:26).

CLIENT	**Connecticut PortAuthority**
PROJ	**State Pier Infrastructure Improvements**
SCALE	**1:1,500**
SOURCE	*ESRI Aerial Images*

TITLE

Previous Archaeological Testing

AECOM 12420 Milestone Center Dr. Germantown, MD 20876

PROJ NO 60579714

FIGURE 6

Precontact Archaeological Sites

While numerous historic period sites have been documented in the region, fewer precontact sites are documented. The closest precontact sites are documented approximately 1.2 miles north of the APE, with five sites on the campus of the Connecticut College Arboretum. Though represented as a single site number in the SHPO files, there are six sites documented, with five representing precontact occupations. These sites are located along the heavily developed shore zone along the Thames. These sites are represented by two site numbers; 95-4 (Soccer Field Site) and 95-6. The following descriptions come from the site forms consulted at the offices of CTSHPO.

Harrison's Landing is a shell midden site at the head of the cove at Mamacoke Island. Shell remains were dominated by eastern oyster (*Crassostrea virginica*) with other species of clam, scallop, and mussel present within the assemblage. Also recovered were Wading River projectile points, relatively dating the site to the Late Archaic period.

Mamacoke Cove is on a hillslope at the southern end of the island. The site yielded large amounts of well-preserved shell and bone, stone tools, and precontact ceramics. The presence of ceramics dates the site to the Middle-Late Woodland Period, including the Sebonac stage within the Late Woodland. The presence of a shell midden indicates possible repeated use of the site over time.

Grave's Rock Shelter is a rock overhang where human remains and artifacts have been recovered. Radiocarbon dates have suggested a Late Archaic association for the burials.

College Soccer Field also contained a human burial and was discovered during construction work and grading for the installation of a soccer field. Additional shell middens were found throughout the site, which is level and located near the confluence of a small stream and the Thames River. The burial contained a sandstone blade and was recovered in a flexed position. Radiocarbon dates of bone indicate this individual died between 1550 and 1690.

Arboretum Field is a represented by a series of collected projectile points from a field on campus. The typology for the points spans the time from the Late Archaic Period through the Late Woodland, indicating occupation from approximately 5000 B.P. to the time of contact with Europeans. The assemblage contains Wading River, a Brewerton Earned Triangle point, Levanna point, and Squibnocket Triangle point. It has been remarked that "virtually any instance where a stream of almost any size enters the river [Thames], a prehistoric site can be found in the vicinity" (Juli and Dreyer 1992:16).

Historic Archaeological Sites

The City of New London has several documented sites with deposits dating to the eighteenth century, including sites that have been documented and examined by professional archaeologists. It is often assumed that hundreds of years of construction and grading eliminate or deeply bury the remains of a city's early history and precontact past, but sites do survive.

There were 16 previously identified archaeological sites found within the study buffer (Table 3).

Table 3: Archaeological Resources within the one-mile Study Buffer

CT SHPO ID#	Site Name	City	Site Classification	Time Period
95-4	Soccer Field Site	New London	Precontact, Open Air, Burial	Late Archaic – Late Woodland
95-6	Connecticut College Arboretum Sites	New London	Precontact, Open Air, Rockshelter, Burial	Late Archaic – Late Woodland
95-7	Allanach Carriage House	New London	Residential, Urban	1890-1940
95-8	Prentis-Palmer House	New London	Residential, Urban	1845-1940
95-9	Headstone at Columbus Circle	New London	Cemetery, Urban	19th century
95-11	n/a	New London	Urban, Residential/Commercial (?)	18th – 19th centuries
95-12	n/a	New London	Urban, Residential/Commercial (?)	19th century
95-14	U.S. Custom House	New London	Government, Urban	19th century
95-15	N. Niles House	New London	Residential, Urban	19th – 20th centuries
95-16	Parade Plank Wharf	New London	Commercial, Urban	19th – 20th centuries
95-19	Frink's Lower Wharf	New London	Commercial, Urban	18th – 20th centuries
59-20	Fort Griswold Site	Groton	Military	18th-19th centuries
59-39	Within Fort Griswold	Groton	Unknown	Unknown

The Allanach Carriage House (95-7) is documented as a fine example of a Queen Anne style structure associated with a residence on Cottage Street. It was unusual for an outbuilding to survive in a densely developed area, and so the structure was documented prior to its relocation as part of the New London Courthouse project in the 1940s. Though the structure was moved, the associated archaeological deposits were likely destroyed during construction activities.

The Prentis-Palmer House (95-8) was another nineteenth century structure moved during construction of the State Courthouse. The archaeological inventory form notes that fill and pavement on the site has preserved associated archaeological resources. It is assumed that associated archaeological deposits were likely destroyed during construction activities.

Site 95-9 documents the recovery of a single headstone dating to 1871. The form notes that there is no indication from the surrounding context that the stone represented a nineteenth century cemetery. A profile drawing of the stone does not depict soils indicative of excavation of a graveshaft.

Site 95-11 was uncovered during archaeological monitoring of the reconstruction of South Water Street in 1992. Ceramics dating to the eighteenth and nineteenth centuries were recovered from depths of approximately five feet underground. Also documented during monitoring were timbers that could have been associated with a wharf, dock, or mooring.

Site 95-12 was documented during the same archaeological monitoring project, noting the presence of nineteenth century materials form within the trench.

U.S. Custom House (95-14) was also recorded during the archaeological monitoring of the South Water Street project. Trench fill at the rear of the building yielded bottle glass, kaolin, ceramics, slag, mortar, and an iron nail. The context was fill deposited over an earlier wall, believed to be a wall formerly interior to the building.

The N. Niles House Site (95-15) is represented by nineteenth and twentieth century surface scatter comprised of coal, whiteware, bottle glass, brick, stoneware, field tile, window glass, iron nails, and a single quartz thinning flake (precontact). The site was documented within a narrow sewer easement and was believed to be associated with intact archaeological deposits.

Parade Plank Wharf (95-16) is represented by 15 deteriorated, load-bearing wooden piles believed to be associated with New London's waterfront development into a manufacturing and shipping center with the advent of the railroads. The site contained shell, a silver spoon, and a twentieth century dairy shipping crate.

Frink's Lower Wharf (95-19) is another set of dilapidated wharf remains along New London's waterfront. The stone wall base is noted as having semi-dressed dry laid stones, and nineteenth century fill soils containing artifacts. The Frink family was one of the wealthiest whaling dynasties before the coming of coal fuel and the railroads diminished the commercial viability of whaling.

Fort Griswold (59-20) is located within a State Park in Groton on the east side of the Thames River. The site form notes the presence of stone foundation remains related to the Revolutionary War-era fortifications, as well as bricks from the 1812 reconstruction of the fort in 1812. Additional deposits within the site date to later in the nineteenth century. A second site (59-35) is recorded on the CTSHPO's maps but there does not appear to be a site form in the records. No further information on the site type, time period, or artifacts recovered was available for this site.

Shipwrecks Near the State Pier

Vessels of all sizes and classes have been navigating the Thames River since the peopling of the region. The earliest watercraft were dugout canoes and skin boats utilized by the Native Americans of the region for travel, fishing, and hunting. With European contact and colonization, came larger wooden planked ships, and slowly progressed to larger vessels powered by sail, steam and internal combustion. Regardless of the design or rigging, vessels regularly sunk because of storms, fires, boiler explosions, hull strikes, and shoreline abandonments.

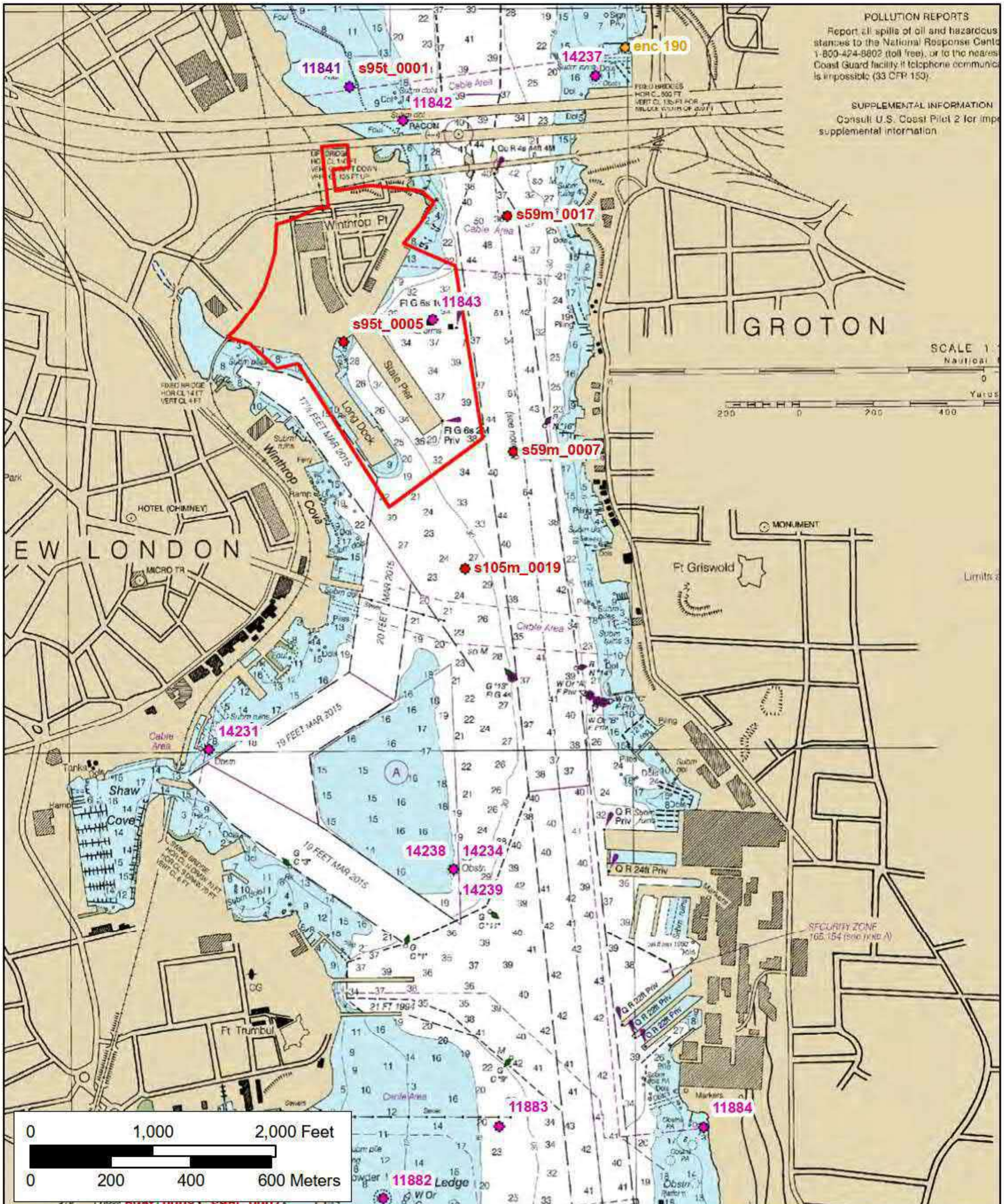
There are 28 reported shipwrecks in the New London region dating from the eighteenth to twentieth centuries (Table 4; Figure 7). One of the earlier documented wrecks resulted during the American Revolutionary attack on New London by Benedict Arnold and British troops. On September 7th, 1781, *Hannah* (s95t_0005), is reported to have drifted burning from Shaw's Wharf to Winthrop's Neck (Caulkins 1895). Several other ships and smaller watercraft were reported burned while moored or docked along the wharves fronting Bank Street during the attack, but no further locations are given (Caulkins 1885:579 – 580). In addition to *Hannah*, the *Charles Colgate* was abandoned in Winthrop's Cove in 1887, in approximately 10-12 feet of water. The *Charles* Colgate was later buried when the northern portion of the Cove was filled in. Some 624 feet (190 meters) southeast of the State Pier is the reported site of the *Isaac Merritt*. The Merritt was a two-masted schooner with a single deck that sunk in 1874. One other unidentified vessel identified only by its State Historic Preservation Office number s105m_0019, is reported approximately 1,160 feet (354 meters) south from the State Pier. The recorded date of loss is January 1, 1781. The remaining 25 vessels are reported lost in the New London region without specific locations, and do not plot on navigation charts for the Thames River.

Table 4: Shipwrecks near the APE

Name	Ton	Rig	Built	Lost	Notes
San Joseph (Spanish)	200	Frigate/Snow		1752	Wrecked on rocks off New London (Berman & Lonsdale, Kaplan). Reported as St. Joseph & St. Helena, 200-ton, Snow rigged, Mexico to Cadiz. Vessel was not sunk, abandoned in harbor (Caulkins).
Unknown				1770	10-19, Two Merchantmen wrecked during hurricane, New London (Fish & Marx)
Hannah	NA	NA	NA	1781	09-07, Prize ship reported burned to the waterline lost near the end of Winthrop's Neck during the burning of New London (Caulkins)
Osprey				1812	February, Reported off New London (Fish & Marx)
Anion (Spanish)		Sloop		1816	October, New London (Fish & Marx)
George		Merchantme n		1817	10-16, Off New London (Fish & Marx)

Commonwealth	1732	Steam Sidewheel	1855	1865	12-29, Groton (Fish, Lytle & Holdcamper)
Mary Elizabeth		Schooner		1872	11-06, New London (Fish)
Nevada	136	Steam	1861	1872	09-01 New London Burned. Originally named Whitehead, sold to USN 1865 renamed Nevada 10-07-1865 (Fish, Lytle & Holdcamper).
Richard Bullwinkle		Schooner		1872	01-17 New London (Fish)
Isaac Merritt	133	Schooner	1835	1874	Lost New London Harbor, coasting trade, 2 mast one deck, 78ft., x 24.4, draft 8 ft. (https://research.mysticseaport.org/databases/ct-ships/)
George A. Tuck		Schooner		1889	New London (Berman)
Ella Powell		Schooner		1906	10-11, Off New London (Fish)
City of Lawrence	1678	Steam Sidewheel	1867	1907	Stranded Eastern Pt. New London/Groton, iron vessel (Berman) and (http://wreckhunter.net/startpage-wreckhunter.htm)
Frances Belle		Gas		1913	01-13, New London (Fish)
Massachusetts	270	Barge	1873	1913	Foundered near New London (Berman & Fish & Lonsdale, Kaplan)
Ruth	89	Schooner	1881	1913	Stranded New London Light (Berman & Fish)
Evelyn W. Hinkly	698	Schooner	1905	1917	Foundered, New London (Berman)
Red Feather	471	Barge	1917	1922	Collided with steamship Cape Cod New London (Berman)
Virginia Dare	1569	Schooner	1919	1930	01-17, Stranded New London Light (Berman & Fish)
American Boy	79	Gas. Yacht	1917	1936	Burned, Two Tree Shoals Near New London (Berman)
Malcolm	449	Barge	1909	1938	Foundered, New London (Berman)
Locust	250	Dredge		1940	Burned Thames River (Berman)
American Soldier	422	Barge	1918	1941	Collided, vicinity of New London barge canal (Berman)
Annapolis*	1371	Barge	1918	1945	Collided with submarine off Block Isl. (Berman)
Elizabeth Ann	77	Ferry, Diesel Screw	1917	1951	02-01, Burned, New London (Bermen & Fish)
Lazy Days		Gas Cruiser		1984	Fiberglass pleasure craft reported mouth of New London harbor. AWOIS 1984 (Bachand, Vol II)
Charles Colgate	244	Schooner	1850	1887	Abandoned Winthrop Cove, filled in post 1887, based on water depth and access.

A review of navigation charts for the Thames river shows that in 1842 the approach into New London and Groton followed the natural channel along the western side of the river up to Winthrop Point with a shallower channel running along the eastern bank from Winthrop Point south to approximately Powder Island where it joins the deep channel on the west side of the river. The three previously discussed wrecks near the location of the State Pier would have been in water ranging as shallow as 2 feet (60 centimeters; Hannah), 5 – 6 feet (1.5 – 1.8 meters; s105m_0019), to 12 – 14 feet (3.6 – 4.3 meters; Isaac Merritt). These wrecks' last reported positions plot on navigation charts in 23 feet (7 meters; Hannah), 22 feet (6.7 meters; s105m_0019), and 60 feet (18.3 meters; Isaac Merritt). The positions and depths indicate that none of these known shipwrecks survived dredging operations over the nineteenth and twentieth centuries. An historical document review of shoreline infrastructures also records filling and removal of waterways such as Winthrop's Cove, Shaw's Cove, and the complete removal of the shoals between New London Harbor and Groton waterfront.



CLIENT	**Connecticut Port Authority**
PROJ	**State Pier Infrastructure Improvements**
SCALE	**1:13,000**
SOURCE	*NOAA 2019*

N

TITLE
NOAA Navigation Chart 13213, Showing the Connecticut State Pier and New London Harbor with Known Shipwreck Locations

AECOM
12420 Milestone Center Dr.
Germantown, MD 20876

PROJ NO	60579714
FIGURE	7

5 Conclusions and Recommendations

In support of the State Pier Infrastructure Improvements Project, AECOM has conducted a background data collection and archaeological sensitivity assessment of the proposed construction APE for CPA. CPA is seeking to create a long-term regional wind turbine generation (WTG) port facility while at the same time continuing to support other existing long-term breakbulk operations for steel, coil steel, salt, lumber, copper billets, as well as other cargo.

CONCLUSIONS

The presence of several well-preserved archaeological sites within developed contexts in New London demonstrates that the history of development has not destroyed the archaeological integrity of the city's urban areas. Surface grading is no guarantee that the subsurface has also been disturbed and graded. Grading and fill activities have the potential to place protective caps of fill over sensitive archaeological deposits, protecting them from disturbance and erosion. It is also notable that many of the documented historic period sites in New London are in areas with soil types of Udorthents or Urban Land, which indicates that the presence of these soil designations does not preclude the potential of intact archaeological deposits.

The results of the background research indicate that portions of the project APE retain moderate to high terrestrial archaeological sensitivity. While evidence concerning the precontact archaeology of the area within the APE is low, the setting of the APE atop a natural bluff with viewsheds over the Thames River would have been an attractive spot throughout human history for occupation and use (Figure 8). Previous Phase IA-IB has been conducted within portions of the APE, including subsurface testing within the APE (Saunters and Kearns 2001). However, depths associated with those efforts reached a maximum of 118 centimeters below ground surface, and though suitable for the scope of work at the time, may not have reached depths sufficient to characterize buried historical or precontact deposits that may be disturbed by the current proposed project. Additionally, an area designated as archaeologically sensitive during Phase IA efforts (Block 241) was ultimately not subjected to archaeological testing during the Phase IB and may still retain archaeological sensitivity. Given the density of historic development, there is potential for intact features or deposits associated with residential life or commerce. There is a lower potential to encounter eighteenth century evidence associated with military fortifications on the bluff. Block 241 and portions of previously tested areas that may not have reached sterile depths are included in a recommended area of moderate to high sensitivity, area SP1.

Areas of low archaeological sensitivity have also been identified. These areas may once have contained archaeological sites, but due to construction and land manipulation that has occurred since the mid- to late-nineteenth century, any archaeological potential has been lost. Saunters and Schneiderman-Fox (2000) recommended that Block 108, contains no archaeological potential due to prior disturbance associated with massive construction efforts for the 1889 drawbridge and bridge pier foundations. Block 108 corresponds with the current northern portion of the APE north of 8th Street at the end of State Pier Road (SR 437) and is within an area recommended as having low potential to contain archaeological remains, with the exception of the intact bridge pier. Other portions of the APE between State Pier Road and the current railroad bridge are also recommended as low sensitivity due to construction associated with both bridges (SP2).

The warehouse area and railyard west of State Pier access road, as well as the parking areas east along the Thames River and immediately north of the CVRR Pier and State Pier has been significantly altered and leveled to accommodate construction, expansion, and maintenance of facilities, as seen in historical maps as well as photographs showing the extent and depth of cutting in this area. Due to the extensive land modification associated with the railyard and level areas adjacent to the river, this area is recommended to retain low archaeological sensitivity for both precontact and historic period archaeological sites (SP3).

With regards to in-water resources, the Thames River shoreline and river bottom have undergone extensive changes through history. This has resulted from cut and fill episodes and periodic channel dredging within the river as well as Winthrop Cove. Further, natural scouring has been accelerated within the riverbed, caused by the channelization of the upper Thames River and the hydrodynamic effects of the State Pier. The combination of these factors indicates that there is low sensitivity for any significant submerged cultural resources (shipwrecks, submerged precontact sites) within the vicinity of the project APE. In-water portions of the APE are recommended as retaining low archaeological sensitivity for both precontact and historic period archaeological sites (SP4).

RECOMMENDATIONS

Based on the results of background research and conclusions regarding archaeological sensitivity of the APE, AECOM makes the following recommendations:

- The 1889 bridge pier foundation within SP2 be left undisturbed and intact. A protective buffer should be maintained during construction, with a fence and signage identifying that the pier should not be damaged or disturbed.

- Additional subsurface testing should be conducted for area SP1, which retains moderate to high sensitivity to contain precontact and historic period archaeological resources. AECOM recommends a program of direct-push probes be conducted, with direct oversight by a qualified archaeologist (36 CFR 61) with suitable knowledge in geoarchaeology. The push-probe survey should also include areas of low sensitivity to confirm disturbance and serve as a comparison with intact site soils. The goal of the push-probe survey should be to identify areas of intact soils, so that more refined recommendations regarding additional archaeological testing and/or archaeological monitoring during construction can be made, as well as an unanticipated discoveries plan. Probes should extend to depths of at least 20 feet below ground surface and be sufficient in number to characterize the soils. A map with recommended number (25) and placement of push-probes is included (Figure 9).

- Terrestrial areas of low archaeological sensitivity (SP2, SP3) are recommended to require no further archaeological testing

- Underwater areas of low archaeological sensitivity (SP4) are recommended to require no further archaeological testing

These recommendations have been made based upon the proposed project plans as described in this report; changes to the project footprint or elements of construction may require updated recommendations. If the 1889 bridge pier foundation cannot be avoided, additional consultation with CTSHPO will be required to determine of mitigation measures may be needed.

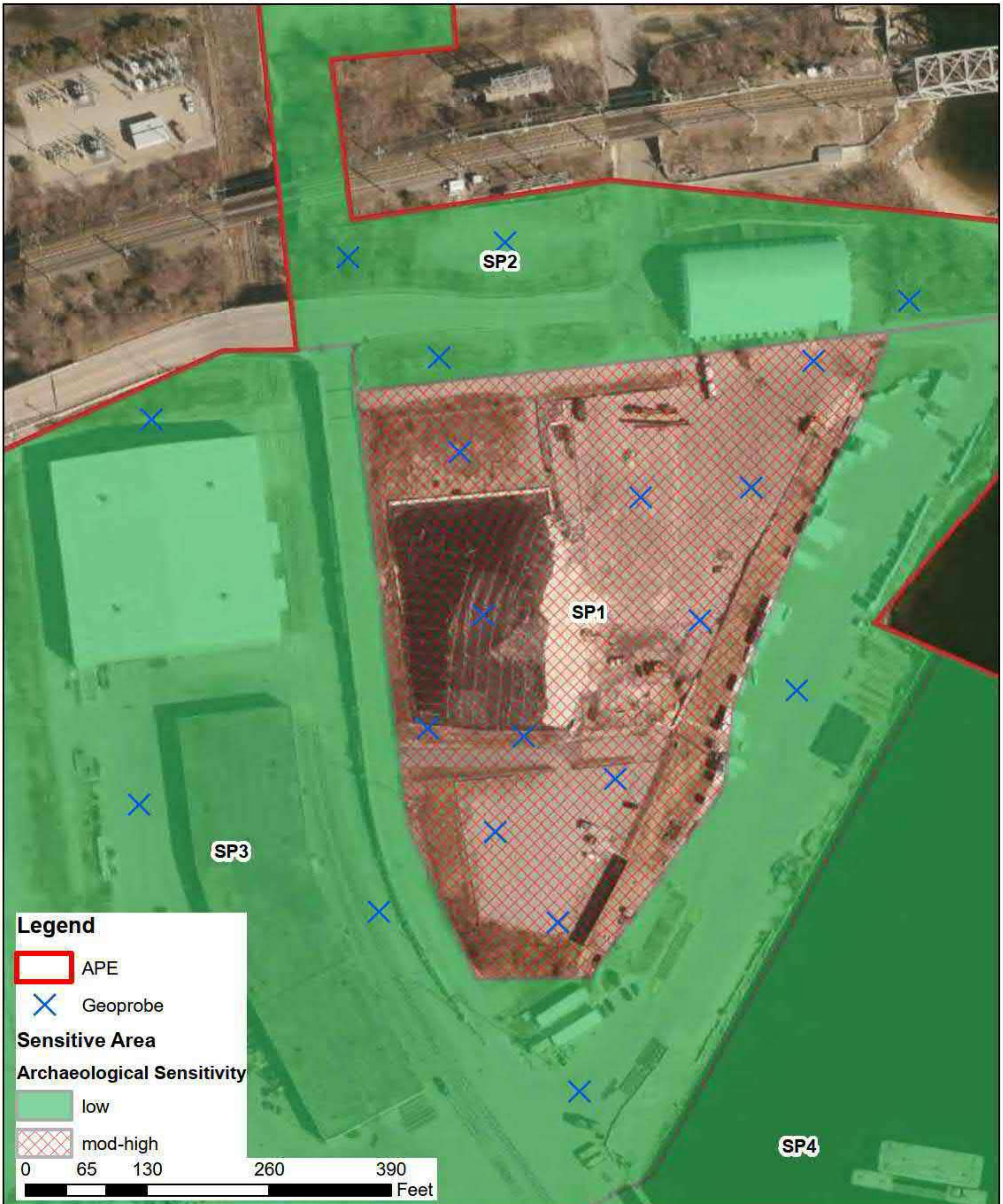
CLIENT	Connecticut Port Authority
PROJ	State Pier Infrastructure Improvements
SCALE	1:4,000
SOURCE	*ESRI Aerial Images*

N

TITLE
Archaeological Sensitivity

AECOM
12420 Milestone Center Dr.
Germantown, MD 20876

PROJ NO 60579714
FIGURE 8



CLIENT	Connecticut Port Authority
PROJ	State Pier Infrastructure Improvements
SCALE	1:1,700
SOURCE	*ESRI Aerial Images*

N

TITLE

Proposed Geoprobe Locations

AECOM

12420 Milestone Center Dr.
Germantown, MD 20876

PROJ NO 60579714

FIGURE 9

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Appendix A. *ENGINEERING PLANS*

Plan Submission Updated April, 202. See Above

September 13, 2019

Mr. Martin Abbot
AECOM
625 West Ridge Pike, Suite E-100
Conshohocken, PA 19428

Subject: State Pier Infrastructure Improvement Project
200 State Pier Road
New London, Connecticut

Dear Mr. Abbot:

This letter is intended to summarize consultation with the Connecticut State Historic Preservation Office regarding the referenced project. The Connecticut Port Authority (CPA) initiated consultation with the State Historic Preservation Office (SHPO) at the beginning of this year pursuant to Section 106 of the National Historic Preservation Act (36 CFR 800). Section 106 requires federal agencies to consider the effect of their actions on historic properties. These actions include projects carried out by the federal government, as well as activities approved, permitted or funded by a federal agency. The cornerstone of the Section 106 process is consultation to either avoid, minimize, or mitigate historic loss. It encourages, but does not mandate, preservation.

At our first meeting, SHPO reviewed a plan that would have included near total loss of the Central Vermont Railroad (CVRR) pier, a property listed on the National Register of Historic Places (NRHP). The pier is considered significant for its association with broad trends in history related to transportation and its distinctive engineering. During our initial meeting, it was brought to SHPO's attention that a portion of the eastern edge of the pier collapsed approximately 15 years ago and emergency repairs were made to stabilize the central section of the pier. The emergency repairs were made with driven sheet piling that resulted in the loss of approximately 540 ft along the eastern pier face and stripped back 65 ft to its center. Before evaluating project impacts or engaging in additional consultation, SHPO requested the Connecticut State Review Board (SRB) to evaluate the pier's historic integrity and its continued eligibility for listing on the NRHP. During the March meeting of the SRB, it was confirmed that the CVRR pier retained sufficient integrity for continued listing on the NRHP.

Following the SRB meeting, AECOM, working on behalf of CPA, submitted a project review package to SHPO. SHPO engaged in additional consultation with CPA and AECOM requesting the consideration of construction alternatives that would minimize impacts to CVRR pier. These discussions were conducted in good faith and provided our office with the necessary information to conduct a comprehensive assessment. During June, SHPO attended a meeting with CPA and

AECOM that also included Moffat & Nichol, project engineers, to discuss the project constraints and potential opportunities for preservation. SHPO understands that the prior collapse severely compromised the pier's structural integrity for the proposed use as a wind turbine port facility. The currently proposed design largely avoids impacts to the western and public facing wall. SHPO recognizes that two drainage outfalls will be required along the western wall, but best practices for the rehabilitation for historic masonry structures will be employed, which includes careful dismantling and rebuilding to match the existing structure. In addition, current plans indicate that portions of the substructure will remain in its current configuration and footprint. While the plans have improved, no suitable solutions could be identified to meet the project needs that could avoid an adverse effect on this historic property. To resolve the adverse effect, SHPO has requested the preparation of an agreement document that will contain stipulations to compensate for the historic loss. One of these stipulations will be additional project plan review opportunities for SHPO prior to implementation to ensure that all opportunities are explored to minimize impacts and retain historic fabric to the greatest extent possible.

This office looks forward to additional consultation as the project moves forward to minimize and mitigate the historic loss. SHPO notes that additional consideration will be given to archaeological and underwater resources that may be impacted by the project. For additional information, please contact me at (860) 500-2329 or catherine.labadia@ct.gov.

Sincerely,

Catherine Labadia
Deputy State Historic Preservation Officer

cc (via email): Garbolski, AECOM
Lowry, AECOM
Salvatore, CPA