

**STAGE 1-B FIELD MONITORING
MONITORING WELL AND TEST BORING LOCATIONS**

**BROOKLYN NAVY YARD COGENERATION PROJECT
BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK**

SEQRA-K

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INTRODUCTION AND BACKGROUND

In 1993, a Stage I-A cultural resources survey, consisting of a documentary study and an assessment of potential impact to cultural resources (Geismar and Oberon 1993), was submitted to the New York City Landmarks Preservation Commission (LPC) and the New York State Office of Parks, Recreation and Historic Preservation (OPRHP). This study considered locations of planned construction in and immediately adjacent to the former Brooklyn Navy Yard associated with completion of the proposed Brooklyn Navy Yard cogeneration facility.

Because of its location on Wallabout Bay, where a Native American presence is possible and early Dutch settlement is known to have occurred, the former Navy Yard was considered to be archaeologically sensitive by the LPC. The Navy Yard, which so long played a key role in naval history and development, itself constitutes a significant cultural resource. Consequently, potential impacts were assessed where subsurface disturbance or above-ground construction will occur.

Another dimension is added to the potential for impact to buried cultural resources by the known interment of thousands of American Revolutionary War prisoners on the shores of Wallabout Bay after their deaths on British prison ships anchored nearby. Many of the skeletons were subsequently washed out of their shallow graves and haphazardly redeposited by the tides. Since much of Wallabout Bay was filled to expand the Navy Yard during the nineteenth century, the potential for the presence of as-yet-undiscovered human remains beneath this fill must be considered high.

Another focus of concern for potential project impact to cultural resources was identified in the "Monument Lot," where the remains of unknown numbers of Revolutionary War prisoners recovered from nearby beaches were interred in 1808. This site was located in the vicinity of the proposed underground construction along Hudson Avenue.

Though the low-lying, salty and marshy character of the Wallabout Bay shore would not have been very attractive for Native American settlement, the possibility was noted that indigenous groups ventured here to procure the plants and animals found in this environmental setting. The potential for the remains of small, briefly-occupied camps and shell heaps was therefore considered moderate for those portions of the project area that formed the shoreline of Wallabout Bay prior to establishment of the Navy Yard and subsequent filling.

Comprehensive documentary research indicated that no structures dating from the period of local Dutch or British settlement stood within the limits of project impact.

The area west of Fourth Street constitutes the oldest portion of the Navy Yard and is where the potential for construction impact to significant cultural resources was assessed to be the greatest. The Stage I-A study identified the sites of several former Navy Yard structures in this area, including Buildings 23, 13 and 15 (Geismar and Oberon 1993a:34-36). Because this portion of the former installation includes the eighteenth century shoreline of Wallabout Bay and adjacent salt marshes, the fill here appears to be shallower and consequently the potential is greatest for construction impact to the sites of interments and later redeposition of Revolutionary War human remains. It would also have been the site of any Native American occupation that might have occurred within the project impact area.

An additional locus of potential cultural resource impact was identified along the planned underground electric line construction route on Hudson Avenue, near the site of the aforementioned Monument Lot. The precise extent of the area in which these reinterments took place cannot readily be determined in relation to current property configurations. Therefore, although the remains were reportedly removed in 1873, the potential still exists for construction impact to human remains and/or other cultural resources associated with this monument that may yet exist beneath the ground surface.

MONITORING STRATEGY AND METHODS

Project plans call for installing a pipeline above ground between Building 41 and Dry Dock 2 to the northeast, construction of a fuel oil storage tank area just southeast of Dry Dock 2, and the installation of an above ground pipeline between Building 41 and the west end of Shipways Street to the northwest, and the installation of an underground electrical line between Building 41 and the Con Ed Hudson Avenue Interconnect Station. In order to determine the possible contamination of soils and groundwater around Building 41 and along the routes of proposed pipeline construction, ENSR Consulting and Engineering was engaged by Brooklyn Navy Yard Cogeneration Partners, L.P. to dig a series of test borings and install monitoring wells in these areas.

The fuel oil storage tank area will be built in the immediate vicinity of Dry Dock 2, located just north of Market Street in the southeast portion of the former New York (Brooklyn) Navy Yard. The dry dock was built in 1890, at which time it was noteworthy as the largest wooden facility of its kind. Its exterior was covered with concrete in 1902 (Geismar and Oberon 1993a:43). The construction planned in the vicinity of Dry Dock 2 relates to the renovation of Building 41 as a power generating facility and will have limited subsurface impact.

It is therefore not expected to affect the dry dock itself or any surrounding structures. The installation of pipes to transport oil from the storage tanks to the Building 41 generating facility in conjunction with this project will cause limited subsurface impact to the existing pavement on Fifth Street and the Dry Dock 2 crane track. The crane track was built much later than the original dry dock structure, probably dating from the middle decades of the twentieth century, and is not considered of historical significance. Construction of the above-ground pipeline between Building 41 and the west end of Shipways Street will also cause limited impact to existing streets. No impact to existing buildings is anticipated.

In conjunction with the soil boring and monitoring well effort described above, and after consultation with the New York City Landmarks Commission, the authors were asked to monitor the drilling in order to assess whether this activity would impact cultural remains that might be present and, if so, to investigate such remains in a scientific manner prior to the continuation of ground-disturbing activities.

Plans for conducting test borings and installing monitoring wells will cause subsurface impact to various portions of the former Navy Yard: the interior of Building 41; the alley between that structure and Building 132; the portion of Fourth Street, Fifth Street and Morris Avenue adjacent to Building 41; the southeast side of Fifth Street between Building 41 and Dry Dock 2; the area southwest, south, and southeast of Dry Dock 2; the portions of Fourth Street and Dock Avenue adjacent to the southeast and northeast sides of Building 20 and the northeast side of Building 10; the south side of Shipways Street adjacent to the north side of the Craneway; and the southwest side of Building 41, along Perry Avenue, across the Craneway area, through the Red Hook Water Pollution Plant, along Plymouth Street to the Hudson Avenue Interconnect.

FIELD MONITORING RESULTS

A search of pertinent documents, an assessment of the environmental setting of this area prior to the construction of the Navy Yard, and a review of subsequent activity on the site indicated little potential for extant cultural remains to be present within the immediate study area. This included the area adjacent to Dry Dock 2 and the route along Fifth Street between Dry Dock 2 and Morris Avenue, along the route of the above-ground pipeline proceeding northwest from Building 41 northeast of Building 20 and Building 10, and then along Shipways Street (Geismar and Oberon 1993a). The same document noted that a potential exists for impact to human remains buried in what was the western portion of Wallabout Bay if sampling or other disturbance extends beneath the fill on

which the Navy Yard was built. For this reason, all thirty-one test boring and both monitor well locations were monitored. All samples retrieved were examined for traces of human bone.

The potential for impact to cultural resources of this subsurface disturbance ranged from high to low or nil, based on the model of cultural resource sensitivity in and around the former Navy Yard developed in our Stage I-A study. The depth of proposed testing within Building 41 and data from archaeological monitoring of previous boring and monitor well installation adjacent to that structure on the southeast (Fifth Street), southwest (adjacent to Building 132), and northwest (Fourth Street) carried out in 1993 (Geismar and Oberon 1993b), indicated that disturbance in these areas would be restricted to fill. It was therefore considered unlikely that construction here would penetrate potential culture-bearing soils.

There were three subareas within the zone of proposed impact that required monitoring. Fifth Street between Building 41 and Dry Dock 2 had not been previously monitored, and the area around Dry Dock 2 only superficially sampled, preserving the potential that drilling would penetrate beneath the fill associated with construction of the Navy Yard. Though no traces of human remains were encountered in the soil cores recovered in prior monitoring, a moderate potential existed for impact to this class of cultural remains resulting from the additional testing. Test borings northwest of Building 41 along Dock Avenue and Shipways Street would occur in the portion of the Navy Yard identified as most likely to contain human remains as well as other cultural resources and therefore had to be considered to have high potential for cultural resource impact.

Archaeological monitoring of planned test borings and monitoring well installation in and around Building 41 was not recommended. However, proposed subsurface impact to the remaining sites was monitored. Each soil core was carefully examined to ascertain whether it had penetrated below intrusive material into natural strata. Where this occurred, core contents were trowelled and subjected to close visual and manual examination. If appropriate, they were to have been flushed through 1/8-inch (3.12-millimeter) hardware cloth to permit the recovery of minute pieces of cultural material, but this was not considered necessary.

Had any human bone be recovered, all soil disturbance in that area would have ceased at once and appropriate LPC and OPRHP personnel notified. A log was kept that recorded the various depths of fill and the type of material encountered in the soil cores. After these two monitoring episodes were completed and the recovered material analyzed, the results were incorporated

into this brief report. The results of any subsequent monitoring necessitated by any additional subsurface impact to portions of the former Navy Yard that have been identified as likely to contain buried cultural resources will be appended to this document and it will be submitted in its entirety to both LPC and OPRHP for review.

These test borings were executed and the monitoring wells installed between 12 and 19 April 1994 at the locations shown on the accompanying map. Thirteen soil borings and both monitoring wells were located within and immediately around Building 41 (Area 1 and Area 2, respectively). Previous monitoring of sampling carried out in the area (Geismar and Oberon 1993b) indicated that sampling would not extend beneath the fill; these holes were therefore not monitored.

All other split-spoon samples, a total of 18, were examined as they were retrieved from the boring holes. All samples were trowelled and subjected to close visual and manual examination as they were retrieved.

Subsurface disturbance relating to placement of monitoring wells and test borings was found to pass exclusively through fill strata that date from construction of the Navy Yard during the nineteenth and twentieth centuries. The composition of this fill is detailed in the accompanying soil boring logs. Small quantities of brick, coal, wood, and glazed ceramic were recovered from the borings as indicated. This material constitutes deposition dating either to the filling of the Wallabout or to the construction of the dry dock, associated craneway, or other structures and streets along the sampling route. As such, it may be considered insignificant from a cultural resources perspective.

As stated above, any impact to natural soils of the Wallabout has the potential of encountering human remains associated with the interment and subsequent redeposition of unknown numbers of American Revolutionary War soldiers who perished aboard British prison ships anchored in that bay. This is particularly true of the western portion of the Navy Yard. For this reason, the monitoring well samples were carefully examined as described. This examination was focused even more rigorously wherever the presence of black, highly organic silty sand and shell fragments indicated the sampling might be approaching the natural soils that formerly constituted the floor of the bay. No trace of human bone or bone of any kind was noted in the recovered drilling core samples.

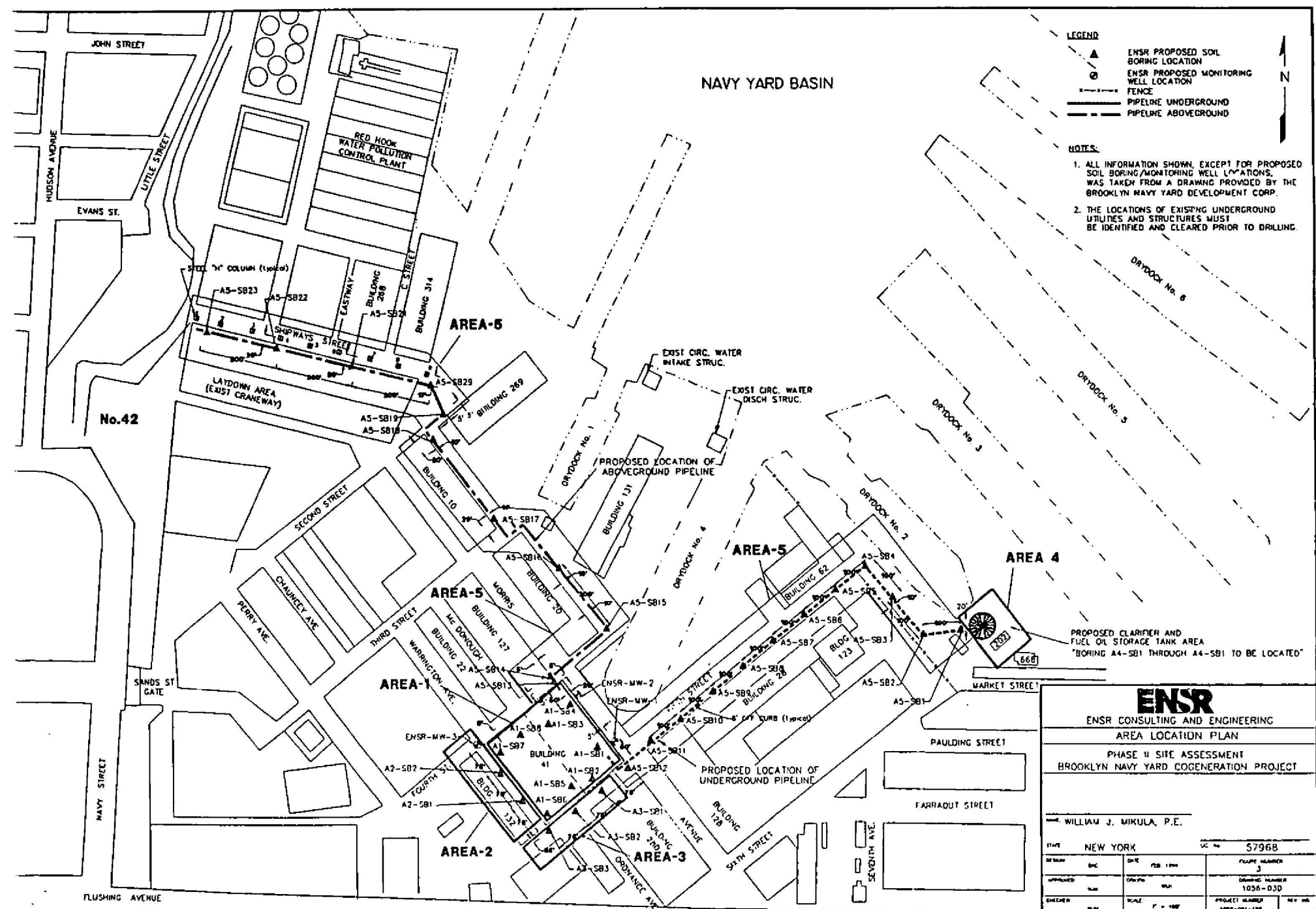
CONCLUSION

Observation of soil cores recovered from test borings drilled around Dry Dock 2, along the southeast side of Fifth Street, along the northeast sides of Building 20 and Building 10, and along the north side of Shipways Street of the former Brooklyn Navy Yard indicated that the subsurface impact was limited to soils introduced to their present location during the filling of this part of the Wallabout in the nineteenth century or whenever the present of former structures or roadways were built. All soils penetrated by this sampling were devoid of any traces of human remains. We therefore conclude these soil and water table sampling activities constituted no impact to extant cultural resources pertaining to any period of human occupation or use of the area.

The underground electrical line to the Con Ed Interconnect Station has yet to undergo sampling for potential soil and water contamination. This sampling will be monitored for potential impact to cultural resources. In addition, any construction excavation that extends below the level of fill in any portion of the Navy Yard will be archaeologically monitored, with further field investigation performed where necessary. A final report documenting results of all monitoring will be prepared upon completion of construction activities for submittal to LPC and OPRHP.

REFERENCES CITED

- Geismar, J.H. and S.J. Oberon
1993a Stage I-A Cultural Resources Survey, Documentary
Study and Assessment of Potential Impact, Proposed
Navy Yard Cogeneration Facility, Borough of Brooklyn,
Kings County, New York. Prepared For Blasland and
Bouck Engineers, P.C., Middletown, New York.
- 1993b Stage I-B Field Monitoring of Dry Dock 2 Area
Monitoring Wells, B-41 Cogeneration Project,
Borough of Brooklyn, Kings County, New York.
Prepared for Blasland and Bouck Engineers, P.C.,
Middletown, New York.



BORING LOG FORM

DATE: 4/14/94

BORING/WELL NO.: A3-SB-2
PROJECT NO./NAME: 1056-001-221
GEOLOGIST/OFFICE: Straub/Somerset

LOCATION: AREA 3
DRILLING CONTRACTOR: SJB Services, Inc.
DRILLER: Brian Wagner

DRILLING EQUIPMENT/METHOD: Rotary Drill
SAMPLE METHOD: Split Spoon
WELL INSTALLED? YES NO X
SCREEN: N/A LENGTH: TO FEET
GROUND WATER DEPTH:

SIZE/TYPE OF BIT: 4 1/4"
START/FINISH DATE: 4/14/94
CASING MAT./DIA.: N/A
SLOT SIZE: N/A

REMARKS: _____

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		6"	6-5	4" ASPHALT, 1' CONCRETE, 6" Black M-SAND, some Gravel.	
2'-4'		18"	7-8-7-4	1' Brown F-SAND, trace Silt, 6" Black M-SAND. little Cobbles.	
4'-6'		6"	4-7-6-6	Brown moist F-M SAND, trace Clay.	
NOTES N/A - Not applicable.					

BORING LOG FORM

DATE: 4/14/94
 BORING/WELL NO.: A3-SB-3 LOCATION: AREA 3
 PROJECT NO./NAME: 1056-001-221 DRILLING CONTRACTOR: SJB Services, Inc.
 GEOLOGIST/OFFICE: Straub/Somerset DRILLER: Brian Wagner

DRILLING EQUIPMENT/METHOD: Rotary Drill SIZE/TYPE OF BIT: 4 1/4
 SAMPLE METHOD: Split Spoon START/FINISH DATE: 4/14/94
 WELL INSTALLED? YES ☐ NO ☒ CASING MAT./DIA.: N/A
 SCREEN: N/A LENGTH: TO FEET SLOT SIZE: N/A
 GROUND WATER DEPTH: Directly Beneath Concrete Floor

REMARKS: Samples collected at 12"-18"

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		18"	8-7	1.25 CONCRETE, .25 Black F-M SAND, some Gravel.	0
2'-4'		18"	7-4-4-3	Brown F-M SAND, some Cobble, trace Brick.	5
4'-6'		12"	3-4-4-5	Black/Brown SILT and F-Sand, some Gravel.	0
NOTES: N/A - Not applicable					

BORING LOG FORM

DATE: 4/15/94BORING/WELL NO.: A4-SB-1LOCATION: AREA 4PROJECT NO./NAME: 1056-001-221DRILLING CONTRACTOR: SJB Services, Inc.GEOLOGIST/OFFICE: Straub/SomersetDRILLER: Brian WagnerDRILLING EQUIPMENT/METHOD: Rotary DrillSIZE/TYPE OF BIT: 4SAMPLE METHOD: Split SpoonSTART/FINISH DATE: 4/15/94WELL INSTALLED? YES ☐ NO ☒CASING MAT./DIA.: N/ASCREEN: N/A LENGTH: TO FEETSLOT SIZE: N/AGROUND WATER DEPTH: REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		12"	4-4-3	1' CONCRETE, 6" Black C-SAND, some Cobbles, 6" Black Silty SAND, little Clay.	0
2'-4'		24"	4-3-3-4	Black clayey F-SAND, some Gravel.	0
4'-6'		24"	4-2-2-1	Black clayey F-SAND, some Gravel.	0
NOTES: N/A - Not applicable.					

BORING LOG FORM

DATE: 4/15/94

BORING/WELL NO.: A4-SB-2
PROJECT NO./NAME: 1056-001-221
GEOLOGIST/OFFICE: Straub/Somerset

LOCATION: AREA 4
DRILLING CONTRACTOR: SJB Services, Inc.
DRILLER: Brian Wagner

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 4 1/4"

SAMPLE METHOD: Split Spoon

START/FINISH DATE: 4/15/94

WELL INSTALLED? YES ☐ NO ☒

CASING MAT./DIA: N/A

SCREEN: N/A LENGTH: TO FEET SLOT SIZE: N/A

GROUND WATER DEPTH: _____

REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		12"	2-8-8	8" CONCRETE, 1' Black C-SAND, some Gravel, trace Silt.	0
2'-4'		18"	3-4-2-2	6" Black wet Gray M-C SAND, some Gravel. 1' Black wet F- SAND, some Silt.	0
4'-6'		18"	3-3-2-1	6" Black/Grey M-C SAND, some Gravel, 1' F-SAND, trace Silt, trace Shell Fragments.	0

NOTES:

N/A - Not applicable

BORING LOG FORM

DATE: 4/15/94BORING/WELL NO.: A4-SB-3LOCATION: AREA 4PROJECT NO./NAME: 1056-001-221DRILLING CONTRACTOR: SJB Services, Inc.GEOLOGIST/OFFICE: Straub/SomersetDRILLER: Brian WagnerDRILLING EQUIPMENT/METHOD: Rotary DrillSIZE/TYPER OF BIT: 4 1/4SAMPLE METHOD: Split SpoonSTART/FINISH DATE: 4/15/94WELL INSTALLED? YES ☐ NO ☒CASING MAT./DIA.: N/ASCREEN: N/A LENGTH: TO FEETSLOT SIZE: N/AGROUND WATER DEPTH: Directly Beneath Concrete FloorREMARKS: Samples collected at 12"-18"

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		12"	8-7-8	10" CONCRETE, 1' Black M-C SAND, some Cobbles.	0
2'-4'		12"	12-4-2-1	Black Wet C-SAND, some Cobbles.	0
4'-6'		24"	4-1-3-2	Black Wet C-SAND, some Cobbles.	0

NOTES:

N/A - Not applicable.

BORING LOG FORM

DATE: 4/18/94

BORING/WELL NO.: A5-SB-2

LOCATION: AREA 5

PROJECT NO./NAME: 1056-001-221

DRILLING CONTRACTOR: Parrot/Wolfe

GEOLOGIST/OFFICE: Straub/Somerset

DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 4 1/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/18/94

WELL INSTALLED? YES ☐ NO ☒

CASING MAT./DIA.: N/A

SCREEN: N/A LENGTH: TO FEE

SLOT SIZE: N/A

GROUND WATER DEPTH: _____

REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		12"		Black F-C SAND with Gravel.	0
2'-4'		12"		Black Clayey SAND, some Gravel, little Wood Fragments.	4
4'-6'		4"		Brown F-SAND, some Silt, trace Gravel.	0

NOTES

N/A - Not applicable.

BORING LOG FORM

DATE: 4/18/94

BORING/WELL NO.: A5-SB-4
PROJECT NO./NAME: 1056-001-221
GEOLOGIST/OFFICE: Straub/Somerset

LOCATION: AREA 5
DRILLING CONTRACTOR: Parrot/Wolfe
DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 3 3/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/18/94

WELL INSTALLED? YES ☐ NO ☒

CASING MAT./DIA: N/A

SCREEN: N/A LENGTH: TO FEET

SLOT SIZE: N/A

GROUND WATER DEPTH:

REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		18"		6" CONCRETE, 1' Black M-C SAND, some Gravel, 6" Brown F- SAND, some Silt, trace Gravel.	0
2'-4'		12"		6" CONCRETE, 1' Black M-C SAND, some Gravel, 6" Brown F- SAND, some Silt, trace Gravel.	0
4'-6'		18"		1' Brown F-C SAND, some Silt, trace Gravel, Rest Black Clayey SAND, some Gravel.	0
NOTES: N/A - Not applicable.					

BORING LOG FORM

DATE: 4/19/94

BORING/WELL NO.: A5-SB-6

LOCATION: AREA 5

PROJECT NO./NAME: 1056-001-221

DRILLING CONTRACTOR: Parrot/Wolfe

GEOLOGIST/OFFICE: Straub/Somerset

DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 3 3/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/19/94

WELL INSTALLED? YES NO X

CASING MAT./DIA.: N/A

SCREEN: N/A LENGTH: TO FEE

SLOT SIZE: N/A

GROUND WATER DEPTH: _____

REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/8"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'				5" ASPHALT, 14" CONCRETE.	NA
2'-4'		15"		4" Wood, 8" M-C SAND, some Cobbles, 4" Black M-K SAND, some Gravel.	0
4'-6'		12"		8" M-K SAND, some Gravel, 4" Black M-C SAND, some Silt. trace Cobble.	0
NOTES: N/A - Not applicable.					

BORING LOG FORM

DATE: 4/19/94

BORING/WELL NO.: A5-GB-7
PROJECT NO./NAME: 1056-001-221
GEOLOGIST/OFFICE: Straub/Somerset

LOCATION: AREA 5
DRILLING CONTRACTOR: Parrot/Wolfe
DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 4 1/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/19/94

WELL INSTALLED? YES NO X

CASING MAT./DIA.: N/A

SCREEN: N/A LENGTH: TO FEE

SLOT SIZE: N/A

GROUND WATER DEPTH: _____

REMARKS: _____

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'				2' CONCRETE.	
2'-4'				1' Black M-C SAND, some Gravel, trace Wood, 1' Black/Brown F- SAND, some Silt, little Glass, Gravel.	0
4'-6'				Black wet F-SAND and Silt, some Gravel, some Glass, little Wood Fragments, trace Brick.	8
NOTES: N/A - Not applicable					

BORING LOG FORM

DATE: 4/19/94

BORING/WELL NO.: A5-SB-9

LOCATION: AREA 5

PROJECT NO./NAME: 1056-001-221

DRILLING CONTRACTOR: Parrot/Wolfe

GEOLOGIST/OFFICE: Straub/Somerset

DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 3 3/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/19/94

WELL INSTALLED? YES ☐ NO ☒

CASING MAT./DIA: N/A

SCREEN: N/A LENGTH: TO FEE

SLOT SIZE: N/A

GROUND WATER DEPTH: _____

REMARKS: _____

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'				1.5' CONCRETE.	NA
2'-4'		8"		Black F-C SAND, some Gravel.	5
4'-6'		15"		1' Black F-C SAND, some Gravel, 4" Brown F-SAND, some Silt. little Glass, trace Gravel.	0

NOTES

N/A - Not applicable.

BORING LOG FORM

DATE: 4/18/94

BORING/WELL NO.: A5-SB-15
PROJECT NO./NAME: 1056-001-221
GEOLOGIST/OFFICE: Straub/Somerset

LOCATION: AREA 5
 DRILLING CONTRACTOR: Parrot/Wolfe
 DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPER OF BIT: 4 1/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/18/94

WELL INSTALLED? YES ☐ NO ☒

CASING MAT./DIA: N/A

SCREEN: N/A LENGTH: ____ TO ____ FEE

SLOT SIZE: N/A

GROUND WATER DEPTH: _____

REMARKS: _____

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'				6" ASPHALT, 1.6 CONCRETE.	NA
2'-4'		6"	9-7-6-5	Black F-M SAND, lhtde Gravel, trace Silt.	0
4'-6'		4"	11-7-6-7	Black F-M SAND, little Gravel, trace Silt.	0

NOTES

N/A - Not applicable.

BORING LOG FORM

DATE: 4/18/94

BORING/WELL NO.: A5-SB 17
PROJECT NO./NAME: 1056-001-221
GEOLOGIST/OFFICE: Straub/Somerset

LOCATION: AREA 5
DRILLING CONTRACTOR: Parrot/Wolfe
DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 4 1/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/18/94

WELL INSTALLED? YES ☐ NO ☒

CASING MAT./DIA.: N/A

SCREEN: N/A LENGTH: _____ TO _____ FEE

SLOT SIZE: N/A

GROUND WATER DEPTH: _____

REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		12"	4-9	8" CONCRETE, 1' Black/Brown F-C SAND, some Gravel, trace Glass Fragment.	3
2'-4'		18"	4-4-5-10	Moist, Brown F-M SAND, some Gravel, trace Silt.	0
4'-6'		24"	2-2-1-10	Moist, Brown F-M SAND, some Gravel, trace Silt.	0

NOTES:
N/A - Not applicable.

BORING LOG FORM

DATE: 4/18/94

BORING/WELL NO.: A5-SB-18
PROJECT NO./NAME: 1056-001-221
GEOLOGIST/OFFICE: Straub/Somerset

LOCATION: AREA 5
DRILLING CONTRACTOR: Parrot/Wolfe
DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 4 1/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/18/94

WELL INSTALLED? YES NO ☒

CASING MAT./DIA.: N/A

SCREEN: N/A LENGTH: TO FEET

SLOT SIZE: N/A

GROUND WATER DEPTH:

REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		6"		1' COBBLESTONE, 4" CONCRETE, 6" Brown M-S SAND, some Gravel, trace Silt	0
2'-4'		12"		1' M-S SAND, some Gravel, trace Silt	0
4'-6'		12"		6" M-S SAND, some Gravel, trace Silt, 8" Brown F-M SAND, trace Silt.	0
NOTES: N/A - Not applicable					

BORING LOG FORM

DATE: 4/18/94

BORING/WELL NO.: A5-SB-20

LOCATION: AREA 5

PROJECT NO./NAME: 1056-001-221

DRILLING CONTRACTOR: Parrot/Wolfe

GEOLOGIST/OFFICE: Straub/Somerset

DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 3 3/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/18/94

WELL INSTALLED? YES NO ☒

CASING MAT./DIA.: N/A

SCREEN: N/A LENGTH: TO FEET

SLOT SIZE: N/A

GROUND WATER DEPTH: 5'

REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'				1.5 CONCRETE.	NA
2'-4'		24"		6" Black M-C SAND, some Gravel, Rest Brown F-M SAND, some Gravel.	0
4'-6'		24"		6" F-M SAND, some Gravel, Rest F-M SAND, trace Silt, Bottom 6" Wet.	0
NOTES: N/A - Not applicable.					

BORING LOG FORM

DATE: 4/18/94

BORING/WELL NO.: A5-SB-21
PROJECT NO./NAME: 1056-001-221
GEOLOGIST/OFFICE: Straub/Somerset

LOCATION: AREA 5
DRILLING CONTRACTOR: Parrot/Wolfe
DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 3 3/4

SAMPLE METHOD: Split-Spoon

START/FINISH DATE: 4/18/94

WELL INSTALLED? YES NO X

CASING MAT./DIA: N/A

SCREEN: N/A LENGTH: _____ TO _____ FEE _____

SLOT SIZE: N/A

GROUND WATER DEPTH: _____

REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'				CONCRETE	NA
2'-4'		18"		1' Brown F-SAND, some Silt, little Gravel, 6" Brown Moist F-SAND, some Gravel, trace Silt.	0
4'-6'		18"		6" Brown Moist F-SAND, 1' Brown F-C SAND, some Gravel, wet.	0

NOTES:
N/A - Not applicable.

BORING LOG FORM

DATE: 4/18/94

BORING/WELL NO.: A5-SB-22
PROJECT NO./NAME: 1058-001-221
GEOLOGIST/OFFICE: Straub/Somerset

LOCATION: AREA 5
DRILLING CONTRACTOR: Parrot/Wolfe
DRILLER: Arnold Chapel

DRILLING EQUIPMENT/METHOD: Rotary Drill

SIZE/TYPE OF BIT: 3 3/4

SAMPLE METHOD: Spilt-Spoon

START/FINISH DATE: 4/18/94

WELL INSTALLED? YES NO X

CASING MAT./DIA.: N/A

SCREEN: N/A LENGTH: TO FEE

SLOT SIZE: N/A

GROUND WATER DEPTH: _____

REMARKS:

DEPTH (FT)	SAMPLE NO. AND TYPE	RECOVERY (INCHES)	PENETRATION RESISTANCE BLOWS/6"	SAMPLE DESCRIPTION	PID READING (ppm)
0-2'		18"		6" CONCRETE, Rest Black/Brown F-C SAND, some Gravel. little Brick.	
2'-4'		18"		1' Black/Brown F-C SAND, some Gravel, little Brick, 6" Brown wet F-M SAND, some Gravel, little Wood Fragments.	
4'-6'		18"		6" Brown wet F-M SAND, some Gravel, little Wood Fragments.	
NOTES: N/A - Not applicable.					

