

6.0 PHASE I ARCHEOLOGICAL INVESTIGATION OF THE FRESH POND WETLAND MITIGATION AREA

6.1 INTRODUCTION

Over a period of weeks (July 16 through September 10, 2003, with auger testing undertaken on July 28 and July 30, 2003), and again between March 10 and 12, 2004 JMA conducted a Phase I archeological investigation at the proposed wetland mitigation area at Fresh Pond (Figure 30). The objective of the field survey was documentation of the presence or absence of archeological resources within the footprint of the proposed wetland mitigation area at Fresh Pond North, staging area, the length of the haul road, and in the vicinity of the existing borrow pits at Fresh Pond South in order to limit, if possible, the effects of the proposed undertaking on archeological resources. The total area of the Fresh Pond Wetland Mitigation Area investigation is approximately 23 acres (102,294 sq meters).

6.2 PROJECT LOCATION

The area investigations consisted of three distinct locations: 1) Fresh Pond North; 2) Fresh Pond South; and 3) the Haul Road connecting the two ponds (Figure 31). At Fresh Pond North the proposed wetland mitigation area consists of two discontinuous Option Areas situated along the west side of Fresh Pond, identified as Options 1 and 2, and a staging area. The staging area is located across the dredged canal and southeast of the wetland option areas. The Option Areas at Fresh Pond North are somewhat irregular, but each measures approximately 3.5 acres (14,400 square meters) in extent. Option 1 measures a maximum of 240 meters in length by a width of 60 meters, while Option 2 measures a maximum of 260 meters by 55 meters. Currently the option areas consist of fallow field and fringing marsh. At Fresh Pond South investigations focused on the margins of two borrow pit areas. The borrow pit areas are apparently associated with existing impoundments created prior to the present project. Borrow pit areas are currently anticipated to be filled in to create wetland fringes, and no soil removal or expansion of the pits will take place at these locations. The dirt trace connecting these two locations comprised the Haul Road area (Figure 30). The haul road runs along existing unimproved roads from the area of the wetland mitigation options and staging area to the borrow pit areas. The 1974 Sussex County Soil Survey identifies the entire project area a combination of upland soils consisting of Evesboro loamy sand and tidal marsh. Phase I testing conducted within each of these areas will be described below.

Previous archeological investigations in the vicinity of the proposed wetland mitigation study area at were conducted in the early 1970s and again in the late 1980s. The survey initially focused on the northern point of fast land (Evesboro loamy sand) and resulted in the identification of the archeological site 7S-K-13 (Figure 32). The site is actually composed of a series of loci, or areas containing prehistoric and historic archeological remains. The surface-collected artifact assemblage associated with this initial survey is curated as Provenience No. 72.14 at Delaware State Museums (DSM). The DSM assemblage contains prehistoric ceramics, including Coulbourn and Mockley (net and cord varieties), a rhyolite Fox Creek projectile point and a jasper side-notched projectile point of a form generally associated with the Delmarva Adena Complex, and quartz, chert, and jasper lithic debitage. At least one shell midden feature was observed at the site, suggesting an

occupation during the Woodland I period. Historic artifacts were also recovered, including early-nineteenth century ceramics and brick. Field notes and maps from the work conducted by Glenn Mellin at 7S-K-13 as part of the Atlantic Coast Survey were provided by DNREC personnel for the present Phase I survey. In the general vicinity of Fresh Pond South the site files of the State Historic Preservation Office (SHPO) indicate the presence of a possible prehistoric site (labeled 7S-K-4 or 7S-K-22). The site was apparently recorded in the 1950s by avocational archeologists. No further information regarding the site is included in the SHPO files, nor do the files or collections of Delaware State Museums have any additional information (Charles Fithian, personal communication, March 9, 2004).

6.3 METHODS

Phase I field methods used at the Fresh Pond Wetland Mitigation Area consisted of a pedestrian reconnaissance of that portion of the project area situated on fast land with sufficient ground visibility and along the entire length of the haul road, the excavation of shovel test units (STUs) at measured intervals on uplands associated with the wetland option areas, along the haul road, the staging area, and at the borrow pits, and auger test units (ATs) placed in four transects within the tidal marsh fringing the eastern edge of the Option 2 area (Figure 33). STUs measured approximately 50 centimeters on a side and were emplaced on a 15 meter interval. At STU locations where artifacts were recovered, STU's (termed radials) were placed at 7.5 m intervals at the four cardinal directions. The use of STUs is considered to be a standard, but not a creative, testing method. STUs provide information concerning presence or absence of archeological materials and, if such materials are present, some data regarding their horizontal and vertical extent. A series of STUs were also excavated to "link" the land area (consisting of an area measuring approximately 50 square meters) between Options 1 and 2, along the northern edge of the borrow pits, and within the footprint of the proposed staging area in order to determine the presence or absence of archeological materials within these areas. ATs were sampled using Eijelkamp gouge augers and/or piston samplers. The Eijelkamp gouge auger used for this survey was 100cm long and 6cm in diameter, and is capable of recovering an undisturbed sample of cohesive soil/sediment without compaction or mixing of stratigraphic layers. The piston sampler used for this survey was 75cm long and 4cm in diameter. The piston sampler also takes undisturbed samples of less cohesive soil/sediment (such as unconsolidated sand) without compaction or mixing of stratigraphic layers. The auger tests were placed judgmentally and were used to examine stratigraphic data beneath the current marsh.

Shovel test units were excavated 10 centimeters (4 inches) into natural subsoil or to the limit of practical excavation, whichever was shallower. Auger test units were sampled into natural subsoil or to the limit of practical augering, whichever was achieved. The location of each unit was recorded on a map of the project area, and soil profiles of all units were recorded on standardized recording forms. Soils were passed through one-quarter inch mesh screen to ensure uniform recovery of cultural materials. Such materials were retained in bags marked with standard provenience information. Narrative field notes and black and white photographs were produced to document the results of the excavation. Recovered artifacts and supporting materials resulting from the testing will be appropriately packaged and submitted to the DSM for curation at an approved facility.

6.4 RESULTS OF FIELD INVESTIGATION

6.4.1 FRESH POND NORTH

Due to the irregular footprints of the proposed Option Areas at Fresh Pond North, in the summer of 2003, a baseline was placed along the western extent of the project area and approximately 15 meters west of the proposed footprints of the option areas (Figure 33). This baseline extended from the southwestern corner of Option 1 and continued to the northern edge of the upland landform, approximately 75 meters north of Option 2, a distance of approximately 615 meters. This baseline, although falling outside some of the proposed dredge areas, was established to impose a grid over both option areas, allow for continuously tested transects that extended the entire length of the project area, and test a larger portion of the upland soils known to contain a previously identified archeological site. From this baseline, transects of STUs were excavated east toward the canal and terminated at the eastern edge of the upland landform or where impenetrable thicket and/or wetland was encountered. Within the tidal marsh portions of Option 2, four transects of ATUs were sampled.

At Fresh Pond North, Option 1 primarily consisted of relatively open fallow field characterized by waist high field grass and small brush (Plate 19). Along the eastern extreme of the landform, the vegetation became noticeable denser with some coniferous and deciduous trees present. In the summer of 2003, 70 STUs were excavated within or immediately adjacent to this southern option area. Sixty-three of these STUs, or 90 percent of the excavated STUs in Option 1, were within upland soils quite similar to the representative Evesboro series described in the *Soil Survey of Sussex County, Delaware* (Ireland and Matthews 1974).

A typical Evesboro loamy sand profile is described as having an overlying Ap-horizon comprised of a dark grayish brown (10YR 4/2) loamy sand, atop a brown (10YR 5/3) to a yellowish brown (10YR 5/4, 5/6) loamy sand B-horizon. All of the upland STUs in Option 1 contained an Ap-horizon (plowzone) at the surface (Table 3). The plowzone horizon varied in depth within the option area, ranging in depth from 17 to 47 cmbgs. Plowzone hue and chroma ranged from a very dark grayish brown (10YR 3/2), dark gray (10YR 4/1), dark grayish brown (10YR 4/2), and a brown (10YR 4/3) loamy sand to sand. The underlying B-horizon (subsoil) consisted of a dark yellowish brown (10YR 4/6), a brown (10YR 5/3), yellowish brown (10YR 5/4, 5/6), pale brown (10YR 6/3) and a light yellowish brown (10YR 6/4) loamy sand to sand. The subsoil extended from the base of the plowzone to a depth of 60 cmbgs.

Seven of the 70 STUs, located at the extreme northeastern corner of Option 1 (STUs L-4, M-4, N-4, O-3, O-4, P-3, P-4), contained a different soil profile than the Evesboro series described above. Not only did the surface vegetation change to low marsh grass encircled by small brush, but the soil profiles also indicated that these northeastern STUs were located within intact tidal marsh. The profiles exhibited a darker A-horizon at the surface consisting of a 24 to 45 cm thick black (10YR 2/1), very dark gray (10YR 3/1), and a dark grayish brown (10YR 4/2) highly organic loamy sand (peat). The underlying horizon consisted of a 10 to 17 cm thick grayish brown (10YR 5/2), brown (10YR 5/3), yellowish brown (10YR 5/4), and a light brownish gray (10YR 6/2) sand. Of special interest was the soil stratigraphy exhibited by STU M-4, which indicated the presence of canal dredge spoil atop the original peat (Table 3). This bermed canal dredge was also visible along the extreme eastern edge of the landform on aerial photographs of the project area (Figure 33). The



Plate 19. View SE from STU R-1 showing the crew excavating STU Q-2N and STU Q-2W in the vicinity of the proposed Fresh Pond Mitigation Option 1.

only other noted disturbance was related to the recent culvert improvement at the southeastern corner of this area (Figure 33).

The area between the two option areas contained similar stratigraphy to that present in the northern end of Option 1. The western portion of this area consisted of fallow field covered by light to moderate understory. Vegetation increased toward the canal, becoming moderate to heavy, with intermittent trees present immediately west of the intact tidal marsh at the extreme eastern edge. The tidal marsh was again characterized by low marsh grass atop an uneven surface. A total of 21 STUs were excavated within this area. Of this total 18 STUs (86 percent) were within the upland Evesboro soil series while the remaining 3 STUs (14 percent) were excavated within the marsh area (STUs R-3, Q-4, S-4). Although not tested, a noticeable berm from canal dredging activities was present along the eastern edge of the landform. No other disturbances were noted.

Table 3. Representative Shovel Test Soil Profiles, Fresh Pond North

STU	Depth (cm)	Soil Description (Horizon)	Artifacts
M-4	0-39	10YR 3/1 very dark gray loamy sand (A1)	2 machine made bottle glass frags.
	39-56	10YR 2/1 black loamy sand (A2)	
	56-61	10YR 5/2 grayish brown sand (B1)	
	61-73	10YR 5/3 brown sand (B2)	
N-1	0-28	10YR 4/2 dark grayish brown loamy sand (Ap)	
	28-40	10YR 5/4 yellowish brown sand (B)	
N-2	0-18	10YR 3/2 very dark grayish brown loamy sand (Ap)	1 jasper flake, 1 clam shell
	18-31	10YR 6/4 light yellowish brown sand (B)	
N-3	0-39	10YR 3/2 very dark grayish brown loamy sand (Ap)	
	39-52	10YR 5/3 brown sand (B)	
N-4	0-29	10YR 2/1 black loamy sand (Ap)	
	29-41	10YR 6/2 light brownish gray sand (B)	
Q-1	0-25	10YR 4/3 brown sand (Ap)	
	25-47	10YR 6/4 light yellowish brown sand (B)	
Q-2	0-22	10YR 4/3 brown sand (Ap)	1 jasper flake
	22-32	10YR 5/4 yellowish brown sand (B)	
Q-3	0-38	10YR 3/2 very dark grayish brown sand (Ap)	
	38-48	10YR 5/4 yellowish brown sand (B)	
Q-4	0-10	10YR 3/1 very dark gray sand (Ap)	
	10-22	10YR 5/2 grayish brown sand (B1)	
	22-37	10YR 5/3 brown sand (B2)	
	@37	Standing water	
V-1	0-22	10YR 4/3 brown sand (Ap)	
	22-35	10YR 6/4 light yellowish brown sand (B)	
V-2	0-16	10YR 4/3 brown sand (Ap)	1 jasper flake
	16-30	10YR 6/4 light yellowish brown sand (B)	

Table 3 (continued)

STU	Depth (cm)	Soil Description (Horizon)	Artifacts
V-3	0-28	10YR 3/2 very dark grayish brown sand (Ap)	
	28-38	10YR 4/6 dark yellowish brown sand (B)	
V-4	N/A	Hydric soils, not excavated	
AG-2	0-26	10YR 4/3 brown sand (Ap1)	
	26-42	10YR 2/1 black loamy sand (Ap2)	
	42-62	10YR 3/2 very dark grayish brown moist sand (Ap3)	
	62-72	10YR 5/3 brown wet sand (B)	
	@72	Standing water	

Option 2 was largely covered by moderate to heavy understory with intermittent tree copses, with only some fallow field present along the southern portion of the option area. In addition, approximately half of this area was composed of extant tidal wetlands. This tidal marsh portion of Option 2 was tested by the placement of ATs in four west-east transects from the upland portions to the canal edge.

Fifty-nine of the 67 STUs (88 percent) excavated within or immediately adjacent this northern option were within the Evesboro series, and six of the remaining eight units were characteristic of tidal marsh soils (STUs U-3, U-4, Y-3, AB-2, AL-2, AM-2; representing 9 percent of the total). Eleven ATs were sampled with all exhibiting tidal marsh deposits overlying classic Evesboro series soils. STU profiles are quite similar those seen in Option 1 (Table 3). However, STU AG-2 and AE-2 were stratigraphically dissimilar to any of the previously described profiles. Both of these STUs were placed at the crest of a low ridge, approximately 20 meters west of the canal. Their profiles indicate up to three distinct Ap-horizons overlying the lower B-horizon soils. These units contained Ap-horizons ranging from black (10YR 2/1), very dark grayish brown (10YR 3/2), dark gray (10YR 4/1), and a brown (10YR 4/3) loamy sand to sand. The underlying B-horizon consisted of a brown (10YR 5/3) sand (Table 3).

The distance of this low ridge from the edge of the landform seems to preclude its origin from canal dredging. It is unclear what may have caused its creation, but one possible scenario is that the ridge represents accumulated slope wash originating from the plowed fields located west of the project area. In addition to this low ridge present in the north-central portion of Option 2, the pronounced canal dredge berm was again present over the entire eastern edge of this area. No other disturbances were noted within this northern option area.

A typical composite AT profile consisted of a tidal marsh organic mud with abundant root matter overlying a grey organic mud typical of Delaware lagoonal deposits (Figure 34). Below these tidal deposits and bounded by a sharp contact was an A-horizon of dark grayish brown (10YR 3/2) medium loamy sand. Below this loamy sand marked by a transitional boundary was a B1-horizon of light brownish gray (10YR 6/2) loamy sand that transitioned into a B2-horizon of brown (10YR 5/3) medium sand (Table 4). AT AI-3 exhibited a profile that demonstrated the deposition of canal dredge spoil upon the marsh deposits (Table 4).

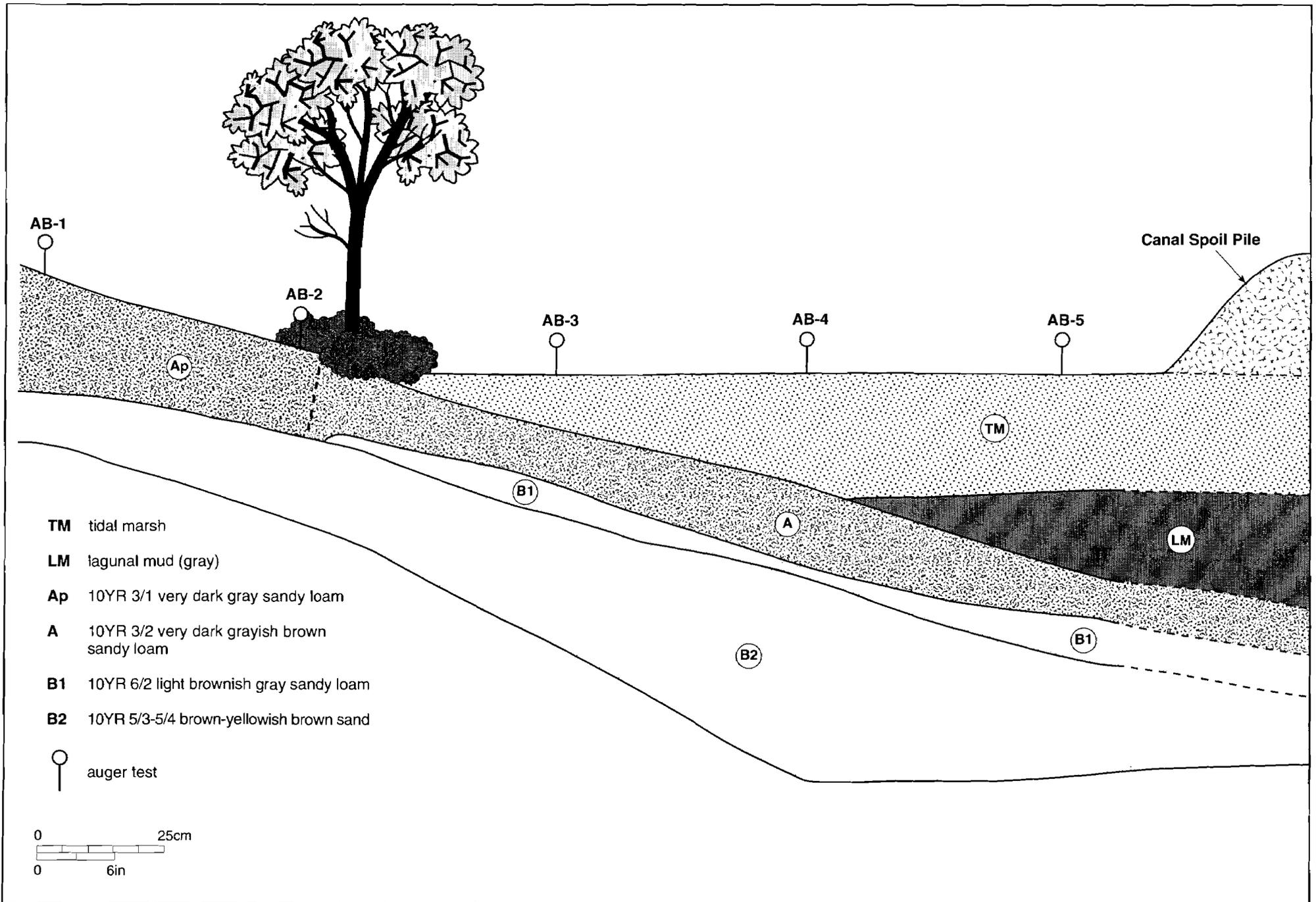


Figure 34. Fresh Pond North, west-east auger test cross-section of upland, across the intertidal marsh to edge of dredged channel.

Table 4. Representative Auger Soil Profiles, Fresh Pond Mitigation Area

AT	Depth (cm)	Soil Description (Horizon)	Artifacts
AB-3	0-13	organic tidal marsh deposit (TM)	
	13-20	10YR 3/2 very dark grayish brown loamy sand (A)	
	20-26	10YR 6/2 light brownish gray sand (B1)	
	26-50	10YR 5/3 brown medium sand (B2)	
AB-4	0-22	organic tidal marsh deposit (TM)	
	22-40	10YR 3/2 very dark grayish brown loamy sand (A)	
	40-77	10YR 5/3 brown medium sand (B)	
AB-5	0-24	organic tidal marsh deposit (TM)	
	24-36	gray organic lagoonal mud (LM)	
	36-46	10YR 3/2 very dark grayish brown loamy sand (A)	
	46-55	10YR 6/2 light brownish gray sand (B1)	
	55-77	10YR 5/3 brown medium sand (B2)	
AI-3	0-25	organic tidal marsh deposit (TM)	
	25-30	10YR 4/2 dark grayish brown lagoonal mud (LM)	
	30-32	10YR 3/1 very dark gray organic lagoonal mud (LM)	
	32-42	10YR 4/1 medium sand (fill)	
	42-66	10YR 3/1 very dark gray organic lagoonal mud (LM)	
	66-71	10YR 2/1 black loamy sand (A)	
	71-78	10YR 4/2 dark grayish brown loamy sand (B1)	
	78-110	10YR 5/3 brown medium sand (B2)	

The proposed staging area also exhibits extensive disturbance likely due, in part, to the recent road and culvert improvements. The western 2/3 of this area contained large push piles and was not tested. Only three STUs were excavated along the eastern extreme of this area (Figure 33). Two of these STUs contained intact stratigraphy while the third unit exhibited a graded and filled profile. Profiles of the intact units were quite similar to the previously discussed Evesboro series.

In the spring of 2004 further Phase I testing was undertaken at Fresh Pond North in an effort to further refine the boundaries of Locus A. Additional fieldwork, not included within the original Scope of Work but requested by RK&K by telephone on March 11, 2004, was conducted within the northern section of Fresh Pond to further define the limits of Site 7S-K-13 (Locus A) and to expand the excavated grid an additional 45m to the south, for a total increase in survey area of approximately 3,150 m² (0.78 acres) within this northern-most field.

Twelve additional shovel tests were excavated south of the previously established grid within Fresh Pond North. These test units extended an additional 45m south from Transect A, corresponding to newly excavated Transects BM through BO (Figure 33). This work was completed in order to clear a larger footprint at the conjunction of the haul road and the proposed wetland mitigation area. It appears that this section of field has recently been clear cut and covered with thick layer of wood chips (a maximum documented depth of 30 cm). The Ap-horizon within this area consisted of dark grayish brown (10YR 4/2) loamy sand. The B-horizon was comprised of pale brown (10YR 6/3) to yellowish brown (10YR 5/4) sand to loamy sand. Only one artifact, a metal button, was recovered from the plowzone of STU BM-0.

At the northern end of Fresh Pond North a total of 10 shovel test units (6 primary and 4 radial) were excavated 15m west of the AH-0 to AM-0 in order to help further delineate the eastern boundary of Site 7S-K-13 (Locus A). The plowzone, with a depth range between 22 to 31 cm, was comprised of dark yellowish brown (10YR 4/2) loamy sand. While the underlying B1-horizon consisted of pale brown (10YR 6/3), yellowish brown (10YR 5/4, 5/6), to light yellowish brown (10YR 6/4) sand. A secondary B2-horizon comprised of a brown (10YR 5/3) sand with increased gravel content was encountered in three units (STUs BQ-1, BQ-3, BQ-5) and the C-horizon, which consisted of strong brown (7.5YR 5/6) sandy clay loam, was encountered at 67 cmbgs within STU BQ-5. All three of these units were excavated to approximately 75 cmbgs in order to fully document the stratigraphic profile.

Two primary shovel tests yielded three prehistoric artifacts; one jasper flake from the Ap-horizon in STU BQ-4 and one jasper flake and one unidentified prehistoric ceramic from the B1-horizon in STU BQ-5. Two of the four radial shovel tests excavated around these grid units produced additional prehistoric material from the Ap-horizon; including 2 jasper flakes and three prehistoric ceramic sherds, one of which exhibits interior and exterior cordmarking. In total, eight prehistoric artifacts were recovered from four of the test units excavated during the Spring 2004 fieldwork.

At Fresh Pond North over 1300 artifacts were identified during the current fieldwork and a great majority were recovered from the plowzone of intact Evesboro soils (Appendix III). The remaining artifacts were recovered from units containing redeposited soils or from within the marsh peat along the eastern edge of the project area. The aggregate prehistoric artifact total is 24 for all of the phases of JMA survey at Fresh Pond North. This number includes six flakes (rhyolite, chert, and jasper) and 10 Mockley ceramic sherds that were previously recovered from STUs AM-0, AM-0N, AM-0S, and AM-0W. No archeological features have been documented in any of the excavated units (Figure 35). Shovel testing at Fresh Pond North recovered prehistoric artifacts, all of which are situated within the known limits of a recorded archeological site, 7S-K-13 (Figures 33 and 35). Prehistoric artifacts recovered consist of nine prehistoric flakes and twelve fragments of a ceramic termed Mockley Ware. Historic period remains included a scatter within the plowzone of nineteenth and twentieth century historic artifacts and a concentration of eighteenth-century historic artifacts and a shell midden (termed Locus S) representing a possible historic component of 7S-K-13 in the area of the wetland options. The prehistoric artifacts and the majority of the historic artifacts were recovered from intact Evesboro soils, not from dredge spoils or redeposited soils.

Historic artifacts (Figure 36) were, with one exception, lightly scattered across the entire surveyed area. The majority were recovered from the plowzone soils of the Evesboro series. Recovered ceramics range in date from the eighteenth through the twentieth centuries, and include one buff-

bodied earthenware fragment (possibly staffordshire), eight redware sherds, three salt-glazed stoneware sherds; two unscaloped and impressed shell edged whiteware sherds, one edge decorated whiteware sherd, and five plain whiteware sherds. Additionally, nine pieces of coal/coal ash, 22 brick fragments, seven window glass fragments, eight bottle glass fragments, 15 nail fragments, one metal spike, one unidentified metal object, three tobacco pipe bowl fragments, and one pipe stem fragment were recovered.

The remainder of the artifact assemblage consists of faunal material including fish scales, bone, clam, and oyster shell fragments. These artifacts account for approximately 90 percent of the artifact assemblage, totaling 1058 in number, and were recovered within the plowzone of the upland Evesboro soils. The majority of these faunal remains were recovered from STUs S-0, S-1, and T-0. No prehistoric artifacts were found in association with this deposit.

One historic shell midden was encountered at the base of the plowzone in STU S-0 (Figure 37). Historic artifacts recovered in the STUs in the immediate vicinity of STU S-0 include the tobacco pipe fragments, the buff-bodied earthenware and salt-glazed stoneware fragments, much of the redware, charcoal, oyster and clam shell, brick fragments, and nails. The general concentration of these artifacts in STUs R-0, R-1, S-0, S-1, and T-0 is indicative of a previously unidentified eighteenth-century historical archeological site at this location.

6.4.2 FRESH POND SOUTH

In the late summer of 2003 a single transect 500 meters in length was placed along the northern edge of the borrow pits at Fresh Pond South (Figure 38). Field conditions consisted largely of light to moderate pine groves in conjunction with an extensive berm along the western 1/6 of the project area (Plate 20). Additional disturbances include underground utility and water lines that parallel a field road on the northern edge of the borrow pits. Numerous push piles containing road gravels and asphalt chunks were also scattered intermittently along the length of the tested area. The majority of these disturbances are undoubtedly due to the excavation of the borrow pits and it was deemed appropriate to change the testing interval from 15 to 30 meters. A total of 17 STUs were excavated and no intact profiles were encountered. The excavated STUs indicate that extensive grading and filling has occurred, again likely due to the creation of the borrow pits.

South of the borrow pits the archeologically examined areas in the Spring of 2004 encompassed three fallow fields and one section of woods immediately adjacent to the southern banks of two borrow pits located in Fresh Pond South (Figure 38). These areas may be affected during the construction activities related to the proposed mitigation work. The largest of the tested areas, encompassing an area of approximately 24,751 m² (6.12 acres), focused on the area south of the salt water and fresh water borrow pits (Borrow Pit West and East respectively). This portion of the project area was comprised of three fallow fields, numbering one to three from east to west, with a small wooded section west of Field 3 and north of the substation. Examination of the 1970 aerial indicates that the borrow pits were not present, while they are depicted on the 1984 USGS quadrangle map, thus providing a 14-year period when the pits were likely constructed. In addition, site files of the State Historic Preservation Office (SHPO) indicate the presence of a possible prehistoric site (labeled 7S-K-4 or 7S-K-22) in the general vicinity of Fresh Pond South. The site was apparently recorded in the 1950s by avocational archeologists. No further information regarding the site is included in the SHPO files, nor do the files or collections of Delaware State



Plate 20. View north showing the excavation of STU BP-29 adjacent to a linear push pile in vicinity of borrow pits.

Museums have any additional information (Charles Fithian, personal communication, March 9, 2004).

Existing field conditions within Fields 1 and 2 consisted of waist-high field grasses interspersed with pockets of briar. Immature pine growth delineates the field edges with a more mature pine copse located at the eastern extreme of Field 1 adjacent to the canal. Conditions within Field 3 were quite different. This field has largely been reclaimed by moderate to dense pine thickets, with discrete openings in the young pine growth still covered by grass and briar. The wooded section, at the western end of Borrow Pit West, contained a large wetland with extensive fill deposits toward the western 20 percent of the woods. Additional visible disturbances south of the borrow pits include two large back dirt piles within the north-central section of Field 2, obvious filling along the entire southern edge of Borrow Pit East, and visible surface disturbance in Field 1.

Although the entire breadth of the area south of the borrow pits was visually examined and subjected to pedestrian reconnaissance, subsurface testing was limited to the three fields. No testing was conducted within the woods north of the substation due to the presence of wetlands and filled areas throughout. A total of 38 STUs were excavated south of the borrow pits. Test units within the 30m buffer of the southern edge of the borrow pits (within Fields 1 and 3) were initially sampled on a 15m grid. After the presence of fill deposits was identified within the unit stratigraphy, the unit excavation interval was expanded to 30m. Evidence of grading and filling was apparent in Field 1 and extended east and south to the drainage. While 29 test units were excavated in Fields 1 and 3 (Transects BA, BB, BF, and BG), a judgmental excavation strategy was implemented within Field 2. Considerable portions of this field were clearly disturbed based on the presence of back dirt piles that were observed during a recent field view. The entire field was sampled with nine judgmentally placed test units (corresponding to Transects BC through BE).

All of the units within this section of the project area contained extensive fill deposits. This level of disturbance was similar to that which had been documented on the north side of the borrow pits during previous fieldwork (Transect BP). In no instances in any of the fields were intact soil horizons identified, even when units were excavated to depths approaching 100 cmbgs. It appears that the areas surrounding the borrow pits, including the three currently tested fields, were extensively graded and filled. These disturbances were most likely caused by activities related to the initial borrow pit construction. No archeological evidence of 7S-K-4 (aka 7S-K-22) was discovered during the Phase I testing, and it is extremely likely that the site is no longer extant at this location. Based on the results of the background research, the pedestrian reconnaissance, and the subsurface testing, no archeological deposits were identified at Fresh Pond South.

Spoils Pile and Access Road

JMA examined historical maps and aerial images in order to evaluate historical land use and development of the ground occupied by the spoils pile (Figure 38). The USGS topographic map for 1918 depicts a 3000-foot long and 200-foot wide linear northwest/southeast trending topographic feature approximately ten feet high at this location. The current access road is not in place, and a wetland area occupies the land immediately southwest of the spoils pile location. The linear feature is still very apparent on the 1938 aerial image. Its northern limit seems to be at the approximate location where the present haul road turns north towards Fresh Pond North and its southern limit is approximately the area beneath the spoils pile and the recently created wetland to the east. Once again the present access road is not extant, and a fair degree of disturbance is depicted in the general

area where the present access road crosses the drainage. By the time of the 1960 aerial the linear feature appears to be an approximately 2300-foot long (200 feet wide) inundated borrow pit that extends southeast to the location of and beneath the spoils pile. The current access road is not depicted. Ten years later (1970) the aerial image clearly shows the feature as a man-made pond. In comparing the most recent aerial image with the 1970 image it is clear that the small northwest "spur" on the salt water pond is a remnant of this linear feature. The current access road is not depicted, but evidence of ground disturbance on both sides of the drainage is obvious.

Based on this review of information it is clear that portions of Field 3 and the ground beneath the spoils pile were previously disturbed by human action in the last century. The linear feature shown in 1918 appears to have initially been a sand ridge that over the course of the next several decades was mined and subsequently turned into a water-retention feature or pond. In addition, the creation of the spoils pile with heavy machinery in the recent past (circa 2003) also scarred the landscape beneath the pile. The recent creation of the spoils pile during the development of an adjacent wetland mitigation area is reported to have been reviewed by the SHPO in 1998 and apparently found to have no effect on cultural resources (Cherie Clark, DNREC, personal communication March 31, 2004). It is JMA's opinion that the ground beneath the spoils pile has been previously disturbed and no archeological investigation is recommended for this location. Given the level of disturbance documented for this section of the project area, it is JMA's opinion that no intact archeological resources are situated in or beneath the current access road, and no archeological investigation is recommended for the road.

6.4.3 THE HAUL ROAD

The haul road was initially examined during the summer 2003 fieldwork (Figure 31). Three STUs excavated along the northern end indicate that the road has been extensively modified and contains deeply stratified fill deposits. A pedestrian survey was conducted over the entire length of the haul road and no archeological resources were noted.

In the spring of 2004, project requirements necessitated a return to the Haul Road. Five sections along the proposed road were examined in order to clear potential location(s) for construction passing lanes or turn-outs that may be used during wetland mitigation work. Testing was conducted on the western side of the haul road in the vicinity of 7S-K-13 (Locus K) a mid-to-late nineteenth-century tenant farm site previously identified during a surface reconnaissance, which straddles the road surface. Testing in this area was done to determine what effect the construction related activities may have on the resource. Fieldwork focused on examining the west side of the road that, based on the available information, contained a smaller portion of this historical site.

In total, the five sections along the haul road (labeled Turn-Out 1 through 5, from south to north) ranging in length from 30m to 165m were examined through the excavation of 39 test units. These units were placed 9 m from the centerline of the extant road at a 15 m interval (Figure 39). Observed field conditions adjacent to the sampled sections consisted of fallow fields that were typically separated from the road by a tree line bordering a shallow but sometimes broad drainage ditch and its associated spoil.

Intact unit profiles were homogenous along the entire length of the tested section of road and are consistent to those previously observed within the intact upland sections of Fresh Pond. The *Sussex*

County Soil Survey (Ireland and Matthews 1974) describes this area as containing an Evesboro sandy loam. A representative profile is described as dark grayish brown (10YR 4/2) loamy sand A-horizon, atop a brown (10YR 5/3) to a yellowish brown (10YR 5/4, 5/6) loamy sand B-horizon.

The stratigraphy along the haul road was quite similar to the *Soil Survey* description and remarkably uniform along the entire breadth of the haul road. The majority of the units contained an A-horizon, or plowzone, based on the presence of an abrupt lower boundary at the base of this surface horizon. This transition typically occurred at a depth of 20 to 35 cm. Description of this surface horizon consisted of very dark grayish brown (10YR 3/2), dark grayish brown (10YR 4/2), dark brown (10YR 3/3), and dark yellowish brown (10YR 4/2) loamy sand. The underlying B-horizon was comprised of brown (10YR 5/3) to yellowish brown (10YR 5/4) sand to loamy sand. The stratigraphic profile deviated in only three instances. In Turn-Out 3 two unit profiles contained a double plowzone (STUs BJ-6, BJ-10) while a third unit, STU BJ-1, contained fill deposits at the top of its profile. These anomalous profiles are most likely the result of drainage ditch excavation adjacent to the haul road and the subsequent deposits of excavated spoil on top of agricultural soils.

A total of 115 artifacts were identified from the plowzone of the 39 excavated test units, including faunal items such as oyster and clam shell fragments; jar and bottle glass; historic ceramic types including redware, cream ware, ironstone, and ubiquitous whiteware; architectural elements such as nail fragments, a metal spike, a metal doorbell fragment, numerous brick fragments, lighting and window glass; and miscellaneous items such as unidentified metal, coal, and coal ash. In no instances were prehistoric artifacts or features identified in any of the 39 shovel tests excavated along the haul road.

In general the density and distribution of artifacts recovered along the Haul Road is indicative of historic field scatter, and no historic features were encountered. The relatively low density of artifacts and the broad range of time indicated by their dates support this conclusion. At Locus K the density of historic artifacts was very low, suggesting that the previously identified locus does not extend across to the west side of the haul road. At Turn-Out 2, however, a relatively high density of historic artifacts was discovered. In fact, 63 of the 115 artifacts found during the Haul Road testing (approximately 55 percent) were recovered in three of the STUs in this location (STUs BK-3, BK-4, and BK-5). Recovered artifacts included brick, nails, bottle glass, oyster and clam shell, window glass, and ceramics. An examination of the Baltimore Hundred map of Beers' *Atlas of the State of Delaware* (1868) indicates that a dwelling labeled "Wm. Hudson" was situated in this general location (Figure 4). JMA has identified this area as Locus T of 7S-K-13, and will update the site form accordingly. No further definition of site boundaries was undertaken at this time due to limits and intentions of the survey.

6.5 SUMMARY

The Phase I field investigations of select portions of the Fresh Pond Wetland Mitigation Area consisted of four tasks, as follows: the testing in three areas 1) Fresh Pond South; 2) Haul Road; and 3) Fresh Pond North; and 4) review of the land use and development of the spoils pile and access road. Field investigations consisted of background research, pedestrian reconnaissance, and subsurface testing. Overall a total of 302 shovel test units (STUs) were excavated. At Fresh Pond South no archeological deposits were identified and no further archeological investigation is recommended, including the location of the spoils pile and access road. At Fresh Pond North,

testing at the south end of the area encountered no archeological deposits that would warrant further work, while testing at the north end served to reconfirm the location of 7S-K-13 (Locus A). Locus A is recommended to be avoided, and avoidance is what is illustrated on current design plans.

The results of the fieldwork at Fresh Pond North suggest that a possible eighteenth century historic component of 7S-K-13 may be present in the vicinity of STUs R-0, R-1, S-0, S-1 and T-0. This area is located between the proposed Option Areas and corresponds to the highest ground within the surveyed area. In addition, a large (20 meter) roughly circular area, with substantially decreased ground vegetation was present at this location. This area was the only area that allowed for pedestrian survey, and only oyster/clam shell fragments were visible on the face, although a clay tobacco pipe stem fragment was observed within this area on an earlier field view. It is in this area that STU S-0 and S-1 yielded 794 oyster/clam shell fragments. Historic artifacts recovered in this area include three tobacco pipe bowl fragments, one buff-bodied earthenware sherd (possibly staffordshire), three salt-glazed stoneware sherds, 22 brick fragments, seven pieces of flat glass, and numerous shell fragments. For recordation purposes, this area is termed Locus S.

Two of the previously identified archeological loci within 7S-K-13 contained historic period artifacts (Loci K and R) (Figure 40). Both are south of the potential eighteenth-century locus (Locus S) identified by the present survey. According to the field notes compiled by Glenn Mellin and provided by DNREC, the locus identified as "Mrs. Burton's" (Locus R) contained both eighteenth and nineteenth-century artifacts, while the second locus contained only nineteenth-century artifacts (Locus K).

Prior to the archeological field survey, questions were raised regarding the possible occurrence of "made land" within the area of the Fresh Pond wetland options. Such an occurrence would clearly obviate the need for any archeological testing. Hand augering in the project area confirmed that intact soil, not dredge spoils or fill, comprise the deposits beneath the tidal marsh. The canal berm that fringes the intertidal marsh, identified on historic photographs from DNREC and during the archeological testing appears to be dredging spoils, and does not constitute made land due to the fact that it was not placed in that location for the purposes of reclaiming the tidal marsh for agriculture or other uses. Based on the auger tests in the intertidal marsh beneath the overlying intertidal marsh deposits, soil profiles are consistent with typical Evesboro loamy sand. The existence of the Evesboro loamy sand lying intact beneath the intertidal marsh confirms that this landscape was exposed above sea level and available for occupation and or use in the past.