II. Background Research

The background research conducted for these projects focused on the history and development of the project areas in order to assess the potential for locating both prehistoric and historic archaeological sites and to provide a context for the identification of any identified archaeological resources. Information regarding the soils and geology of the project areas was examined, including the soil boring information recently compiled by Tetra Tech ***(Appendix C).***

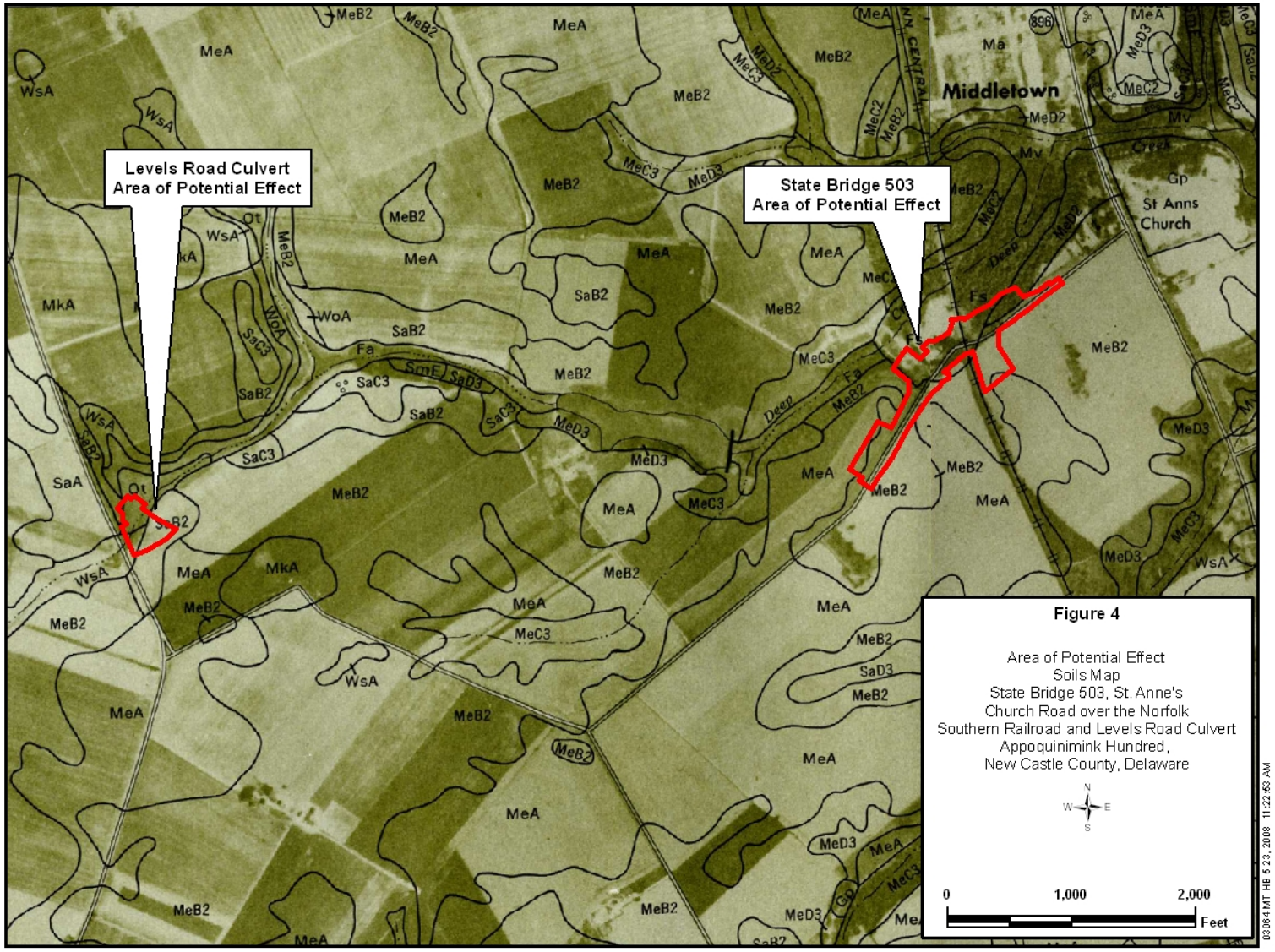
The Delaware Cultural Resource Survey (CRS) Inventory and National Register files in Dover were reviewed to determine the presence of known archaeological sites within the APE and to collect data on archaeological sites in the vicinity of the project area. Historic maps and other relevant documentation were obtained at the Delaware Public Archives in order to determine if non-extant buildings or other structures were located within the projects' APE.

A. Soils and Geology

Based on the *Soil Survey of New Castle County, Delaware* (Mathews and Lavoie: 1970) two soil types are mapped within the State Bridge 503 project APE ***(Figure 4)***. Matapeake silt loam, 2 to 5 percent slopes (MeB2) is mapped on the upland landforms in all four quadrants of the bridge. This is a well drained soil that occurs on uplands that has lost much of the original surface layer due to the effects of erosion (Mathews and Lavoie 1970: 29). The lower lying landforms in the northeast and northwest quadrants are mapped as Fallsington loam (Fs). A sliver of this soil type is also mapped adjacent to the existing road in the southeast and southwest quadrants of the APE. Fallsington loam is a poorly drained soil that is found on upland flats on the Coastal Plain. These soils developed on sandy deposits with moderate amounts of silt and clay. There is some susceptibility to erosion in this soil type and it is common for some material to accumulate in small local dips and depressions (Mathews and Lavoie 1970: 22). (During the geomorphological evaluation, Dr. Vento noted that soils located on the T1 terrace are more similar to the Mixed Alluvial Land (Mv) type; see ***Appendix B***).

Two soil types are mapped in the area of the proposed Levels Road culvert. Othello silt loam (Ot) represents the only soil type mapped in the northern portion of the project area. A sliver of this soil type occurs immediately adjacent to Deep Creek in the southern portion of the APE ***(Figure 4).*** Othella silt loam consists of poorly drained soils that are found on upland flats in the southern part of New Castle County. These soils are developed in highly silty material and are underlaid by sand (Mathews and Lavoie 1970: 33-34). Moving south of Deep Creek, Othello series soils yield to Sassafras sandy loam, 2 to 5 percent slopes, moderately eroded (SaB2). This well-drained soil is found on uplands in the Coastal Plain. It is developed in bands of sandy sediments that exhibit moderate amounts of sand and clay (Mathews and Lavoie 1970: 33-34).

Both projects are located in the Coastal Plain physiographic province. Within the project areas, the geologic surface layer deposits consist of approximately 20 meters (66 feet) of oxidized sands and gravels attributable to the Pleistocene age Columbia Formation. The Columbia Formation is commonly overlain with small depressions or basins that have no organized drainage network, therefore the basins are filled with water for much of the year. Beneath the Columbia Formation, a thick package of glauconitic sands associated with the Tertiary age


Levels Road Culvert
Area of Potential Effect
State Bridge 503
Area of Potential Effect
Middletown
St Anns
Church
Figure 4
Area of Potential Effect
Soils Map
State Bridge 503, St. Anne's
Church Road over the Norfolk
Southern Railroad and Levels Road Culvert
Appoquinimink Hundred,
New Castle County, Delaware
0
1,000
2,000
Feet

Hornerstown Formation is present (Ramsey 2005). ***Appendix B*** contains additional information regarding the project area geology.

B. Cultural Background Research and Archaeological Potential

Background research for this survey included examination of 1) archaeological site data at the Delaware SHPO, 2) published works and CRM reports relevant to archaeological site locations in and adjacent to Delaware's portion of the Atlantic Coastal Plain (i.e. Baublitz *et al*. 2006, Custer 1984, 1986, 1989, Custer *et al*. 1984), 3) historic maps obtained at the Delaware Public Archives, and 4) aerial photographs supplied by DelDOT.

The APEs for the State Bridge 503 realignment and the Levels Road Culvert replacement are located in the High Coastal Plain section of the Atlantic Coastal Plain Physiographic Province. These APE's fall within the area defined as the Mid-Peninsular Drainage Divide (Custer 1986). Examination of the Delaware SHPO's archaeological site maps indicated that no archaeological sites are recorded within or adjacent to the APE for the State Bridge 503 realignment or the Levels Road Culvert replacement. The nearest recorded archaeological sites in the vicinity of either APE are 7NC-F-32 and 7NC-F-33. These sites are located between 0.8 and 1.3 kilometers (0.5 and 0.8 miles) east of the State Bridge 503 APE on lower slope settings within 100 meters (328 Feet) of Deep Creek, a third-order tributary of the Appoquinimink River. Although both sites produced Native American artifacts, temporally diagnostic artifacts were not recovered.

In order to assess the likelihood that a Native American site would be located within either APE, data on 21 archaeological sites mapped in the Appoquinimink drainage on the Middletown U.S.G.S. quadrangle was examined. This sample includes 17 Native American sites which were all identified through surface collection. The temporal affiliation of most of these sites is unknown (N=11). For the remaining six sites, Woodland I occupations are known for two, unspecified Woodland period occupations are known for three, and Archaic occupations are known for one. In terms of site setting with respect to permanent streams, 10 of the 17 sites are located within 100 to 300 meters (328 to 984 feet) of first-order Appoquinimink River tributaries. Landscape settings for these 10 sites include lower and middle slopes (N=6) and interfluvial flats overlooking these tributary streams. The APE for the Levels Road Culvert replacement includes lower slopes within 100 meters (328 feet) of a first order tributary to Deep Creek. The APE for the State Bridge 503 realignment includes the edge of an interfluvial flat approximately 175 meters (574 feet) from the first order section of Deep Creek. Therefore, based on distance to permanent water and landscape setting, both APE's conform to the profile of a number of the Native American archaeological sites in the Appoquinimink headwaters. A portion of the State Bridge 503 APE is located on the floodplain of a first order segment of Deep Creek. Although none of the 17 archaeological sites examined appear to be located on floodplains, regional models of site location suggest these landforms were favored Native American settlement areas if they were well drained.

In terms of previous predictive models for Native American site locations, both APEs are mapped in an area of high site probability in Custer *et al*. (1984). Based on LANDSAT imaging, this predictive model assigned higher probability values to areas of well drained soils adjacent to 1) poorly drained soils (i.e. wetlands, bay/basin features), and 2) permanent water sources. A

more recent GIS-based predictive model (Baublitz *et al*. 2006) utilized many of the same criteria. Highest probability weighting was assigned to areas with 150 meters (492 feet) of a permanent stream, areas within 100 meters (328 feet) of a springhead, areas within 100 meters (328 feet) of a confluence, and areas within 100 meters (328 feet) of a wetland. Although the current APEs would not receive the highest probability ratings within Baublitz et al's model, it should be noted that this model have not been thoroughly evaluated through field testing.

The background research regarding the potential for locating historic archaeological resources focused on the history and development of the project areas. Review of the 1849 Ray and Price map of Appoquinimink Hundred ***(Figure 5),*** the 1868 Beers maps of Appoquinimink Hundred ***(Figure 6),*** and the 1931 Smyrna, Delaware USGS Quadrangle ***(Figure 7)*** indicate that no historic buildings lie within either the State Bridge 503 or Levels Road Culvert APEs. Based on the 1868 map, the closest building to the State Road 503 APE was the Parsonage associated with St. Anne's Episcopal Church. This building was located approximately 1000 feet to the east of the archaeological APE and is no longer extant. The landform between the existing St. Anne's Church and the project APE currently contains a cemetery that is located within the original 10 acre tract of land that was granted to the church in 1704 (Scharf 1888: 1020). According to the original deed in possession of St. Anne's Church, the vacant parcel of land which lies between the existing cemetery and the project APE was acquired by the church from the Delaware Railroad Company in 1919. For this reason it is unlikely that unmarked graves lie within the archaeological APE, although the sensitivity of locating historic archaeological resources in the northeast quadrant is heightened due to the presence of the cemetery and the long standing presence of the church. On both the 1849 and 1868 maps, a domestic residence labeled "J.P. Cochran" is present on the opposite side of St. Anne's Church Road from the church. Due to the distance from the APE, the potential for locating historic archaeological resources associated with this property are considered to be low. In the western portion of the State Road 503 APE, the probability for locating historic period archaeological sites is also judged to be low, again based on the lack of historical properties in the near vicinity of the APE. The historic maps do indicate the presence of a property attributable to "R.A. Cochran" to the north of St. Anne's Church Road. It appears that a possible tenant house is associated with this property, although its location is far removed from the archaeological APE. Also to the west of the State Bridge 503 APE, two structures associated with "R.T. Lockwood" are located to the south of St. Anne's Church Road. Again, it is likely that one of the structures represents a tenant house, although the distance from the project decreases the potential for locating associated historic sites within the archaeological APE.

Because no known historic properties lie in the near vicinity of the APE, the potential for locating historic archaeological resources associated with the Level's Road Culvert APE is also considered to be low. Based on the 1868 map, a structure attributable to H.P. Reading was the closest structure to the project area, located approximately 900 feet to the southeast. This structure is not present on the 1849 map. Aerial photographs dating to 1937, 1954, 1961, and 1968, depict this structure, but by 1992 it is no longer present. Other than a field scatter of historic artifacts, the probability of locating historic sites associated with this feature is low.

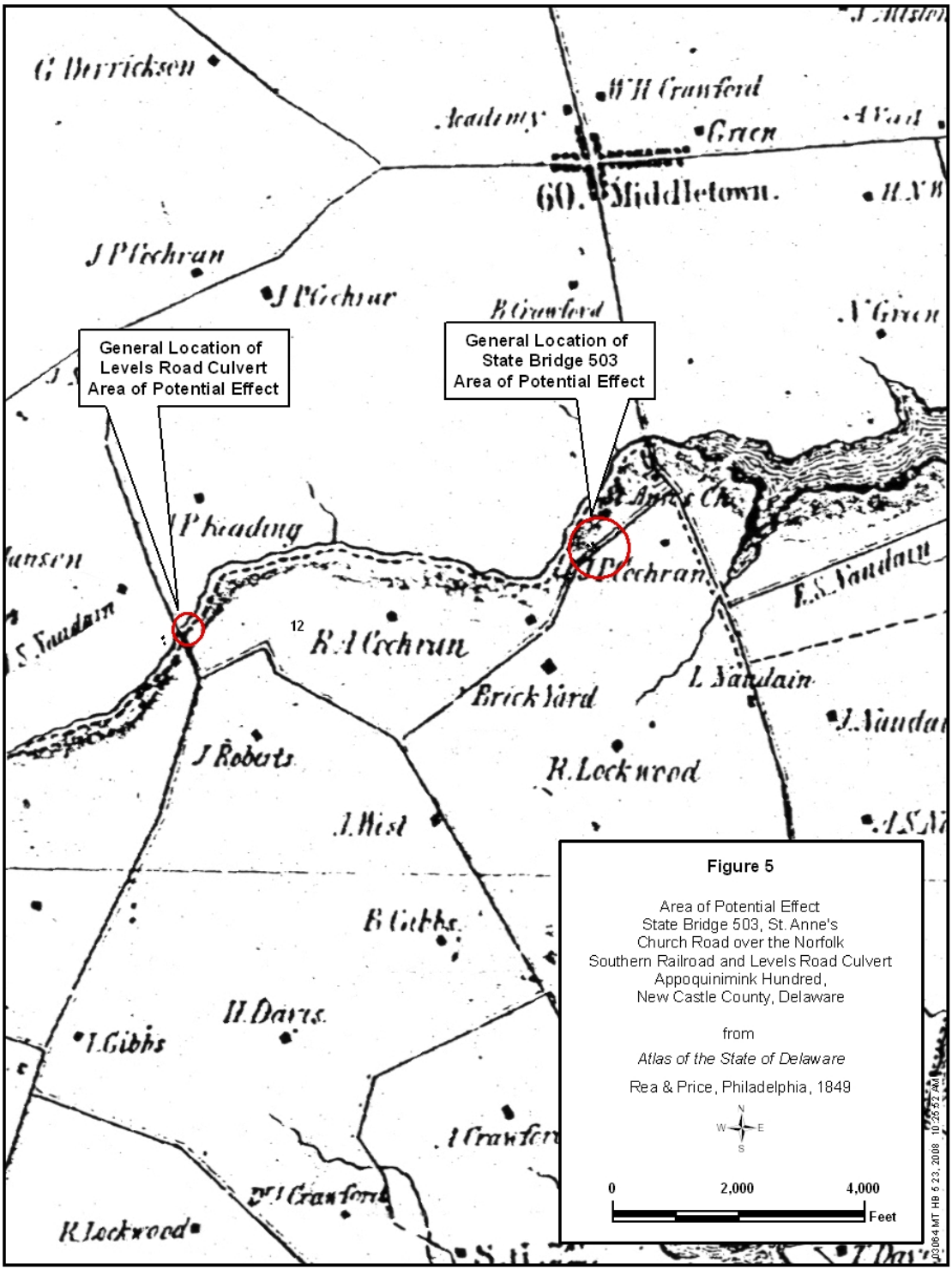


Figure 5

Area of Potential Effect
State Bridge 503, St. Anne's
Church Road over the Norfolk
Southern Railroad and Levels Road Culvert
Appoquinimink Hundred,
New Castle County, Delaware

from

Atlas of the State of Delaware

Rea & Price, Philadelphia, 1849

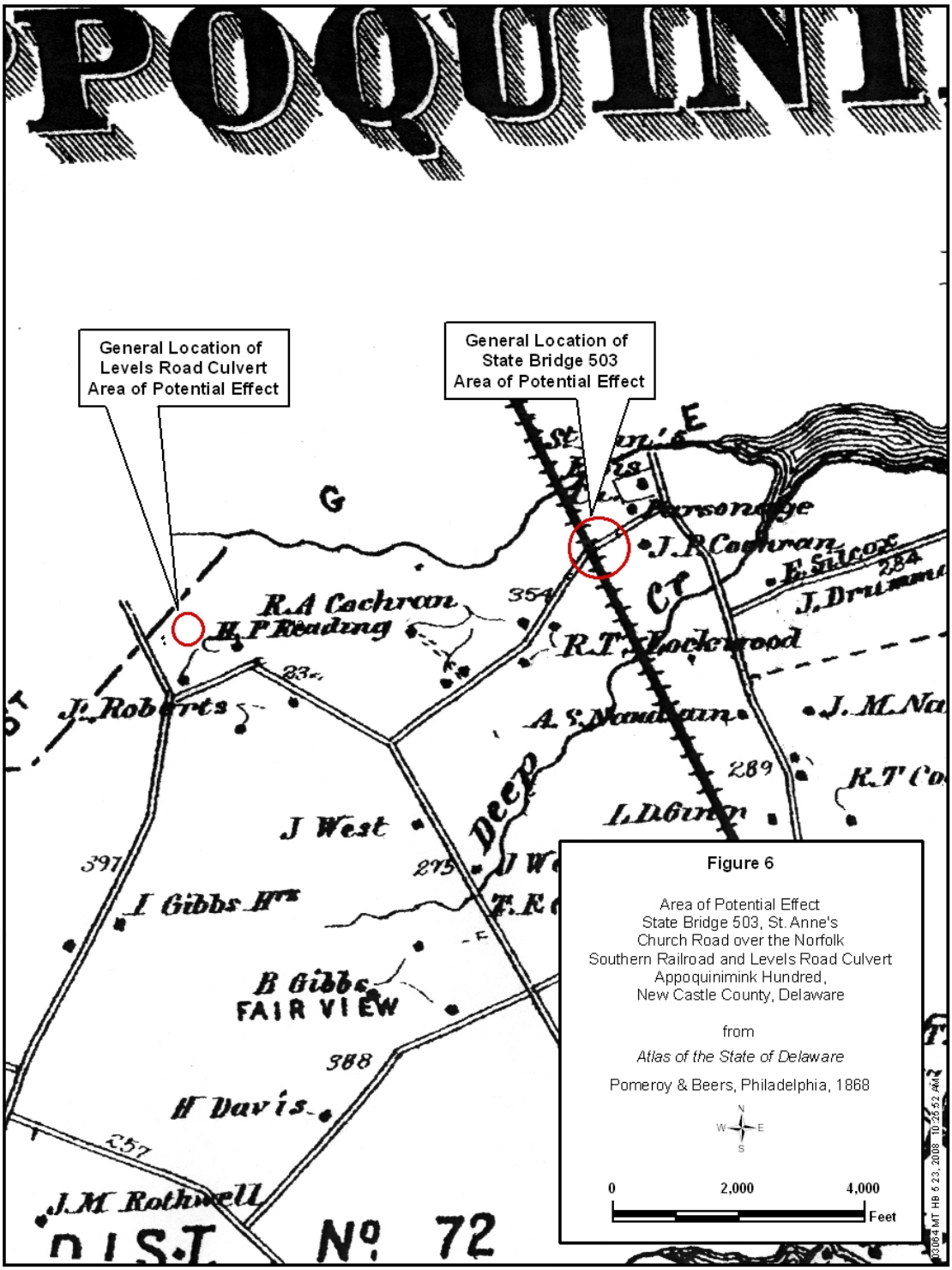


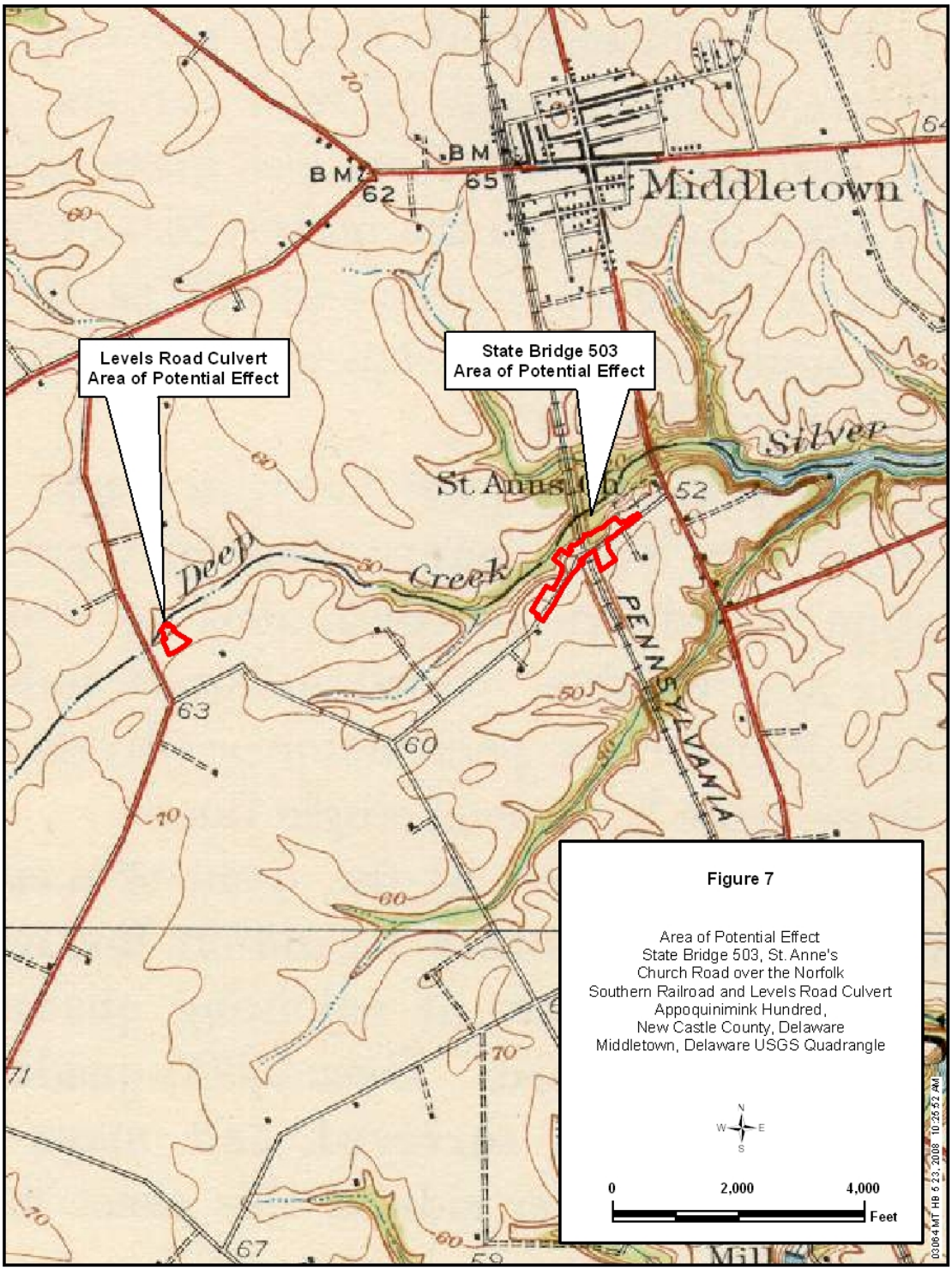
Figure 6

Area of Potential Effect
State Bridge 503, St. Anne's
Church Road over the Norfolk
Southern Railroad and Levels Road Culvert
Appoquinimink Hundred,
New Castle County, Delaware

from

Atlas of the State of Delaware

Pomeroy & Beers, Philadelphia, 1868


Levels Road Culvert
Area of Potential Effect
State Bridge 503
Area of Potential Effect
Middletown
Silver
St. Anns Ch
Deep
Creek
PENNSYLVANIA
BM
62
65
63
60
52
67
Figure 7
Area of Potential Effect
State Bridge 503, St. Anne's
Church Road over the Norfolk
Southern Railroad and Levels Road Culvert
Appoquinimink Hundred,
New Castle County, Delaware
Middletown, Delaware USGS Quadrangle
N
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