Finding of No Significant Impact
Environmental Assessment for Segment B1 Levee and Floodwall Construction
Green Brook Flood Damage Reduction Project
Middlesex Borough, Middlesex County, NJ

The U.S. Army Corps of Engineers, New York District (District) and the New Jersey Department of Environmental Protection (NJDEP) are proposing to construct approximately 1,900 feet of floodwall and 1,000 feet of levee along the Green Brook, raise the Sebring's Mills Bridge, flood proof ten business structures, and buy-out one residential structure. The project is being referred to as Segment B1 and is part of the overall Green Brook Flood Damage Reduction Project (GBFDRP). The levee, floodwall and structure buyout is located in Middlesex Borough in Middlesex County. The floodproofing component is located in the Green Brook Township, Somerset County. The bridge straddles the two municipalities.

The evaluation of potential environmental impacts were previously addressed in the U.S. Army Corps of Engineers (Corps), New York District, *Final Environmental Impact Statement (FEIS) for the Proposed Plan for the Green Brook Flood Control in the Green Brook Sub-Basin, Somerset, Middlesex and Union Counties, New Jersey*, filed August, 1980 and the *Final Supplemental Environmental Impact Statement (FSEIS) for the Proposed Plan for the Green Brook Flood Control in the Green Brook Sub-Basin, Somerset, Middlesex and Union Counties, New Jersey*, filed in May 1997.

The Environmental Assessment associated with this Finding of No Significant Impact (FONSI) was prepared specifically to address the significance of potential impacts the construction of the levee and floodwall will have on Indiana bat (*Myotis* sodalis), a federal and state endangered species, and the potential impacts the construction of all elements of Segment B1 will have on General Conformity of the Clean Air Act. At the time the 1980 FEIS and 1997 FSEIS were filed, Indiana bat was not identified as an endangered species within the GBFDR project area. The U.S. Environmental Protection Agency revised the General Conformity rules of the Clean Air Act in April 2010, requiring an updated General Conformity analysis for the project.

No Indiana bats were captured during a mist net survey conducted in June 2010. The General Conformity analysis performed for the project demonstrated that construction emissions are below the thresholds of 100 tons/year for NOx, 50 tons/year for VOC, and below 100 tons/year for PM 2.5. Therefore, based on my review and evaluation of the environmental effects as presented in the Environmental Assessment, I have determined that the proposed project is not a major Federal action significantly affecting the quality of the human environment and does not warrant the preparation of a supplemental environmental impact statement.

18 Aug 2010
Date

John R. Boulé II
Colonel, U.S. Army
District Commander

ENVIRONMENTAL ASSESSMENT

Segment B1 Levee and Floodwall Construction
Green Brook Flood Damage Reduction Project
Middlesex Borough, Middlesex County, NJ

August 2010

Prepared By:

US Army Corps of Engineers
New York District

Environmental Assessment
Segment B1, Levee and Floodwall Construction, Green Brook Flood Damage Reduction Project
Middlesex Borough, Middlesex County, NJ

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LIST OF ACRONYMS

Acronym	Title
ARRA	American Reinvestment and Recovery Act
AMP	Adaptive Management Plan
APE	Area of Potential Effect
ASTM	American Standards of Testing and Materials
CEQ	Council of Environmental Quality
CFR	Code of Federal Regulation
CRRNJ	Central Railroad of New Jersey
Corps	United States Army Corps of Engineers
EA	Environmental Assessment
District	U.S. Army Corps of Engineers, New York District
EPA	United States Environmental Protection Agency
FEIS	Final Environmental Impact Statement
FHACAR	New Jersey Flood Hazard Area Control Act Rules
FSEIS	Final Supplemental Environmental Impact Statement
FONSI	Finding of No Significant Impact
GBFDRP	Green Brook Flood Damage Reduction Project
HTRW	Hazardous, Toxic and Radioactive Waste
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
N.J.A.C.	New Jersey Administrative Code
NJDEP	New Jersey Department of Environmental Protection
NJHPO	NJDEP, Division of Parks, and Forestry, Historic Preservation Office
NRHP	National Register of Historic Places
PCE	Perchloroethylene
PM	Particulate Matter
PPB	Parts per Billion
PPM	Part per Million
RCRA	Resources Conservation and Recovery Act
TCE	Trichloroethylene
U.S.C.	United States Code
UST	Underground Storage Tank
USFWS	United States Fish and Wildlife Service

1.0 Introduction

The U.S. Army Corps of Engineers, New York District (District) and the New Jersey Department of Environmental Protection (NJDEP) are proposing to construct approximately 1,900 feet of floodwall and 1,000 feet of levee along the Green Brook, raise the Sebring's Mills Bridge, flood proof ten business structures, and buy-out one residential structure. The project is being referred to as Segment B1 and is part of the overall Green Brook Flood Damage Reduction Project (GBFDRP). The levee, floodwall and structure buyout is located in Middlesex Borough in Middlesex County. The floodproofing component is located in the Green Brook Township, Somerset County. The bridge straddles the two municipalities.

The purpose of this environmental assessment is to supplement the evaluation of potential environmental impacts that were previously addressed in the U.S. Army Corps of Engineers (Corps), New York District, *Final Environmental Impact Statement* (*FEIS) for the Proposed Plan for the Green Brook Flood Control in the Green Brook Sub-Basin, Somerset, Middlesex and Union Counties, New Jersey*, filed August, 1980 and the *Final Supplemental Environmental Impact Statement* (*FSEIS*) *for the Proposed Plan for the Green Brook Flood Control in the Green Brook Sub-Basin, Somerset, Middlesex and Union Counties, New Jersey*, filed in May 1997.

Specifically, this Environmental Assessment is being prepared specifically to address the significance of potential impacts the construction of the levee and floodwall will have on Indiana bat (*Myotis* sodalis), a federal and state endangered species, and the potential impacts the construction of all elements of Segment B1 will have on General Conformity of the Clean Air Act. At the time the 1980 FEIS and 1997 FSEIS were filed, Indiana bat was not identified as an endangered species within the GBFDR project area. The U.S. Environmental Protection Agency revised the General Conformity rules of the Clean Air Act in April 2010, requiring an updated General Conformity analysis for the project. The evaluation of impacts will determine if the proposed changed conditions warrants the preparation of a supplemental environmental impact statement to the *FSEIS* and *FEIS*.

2.0 Green Brook Flood Control Project Background

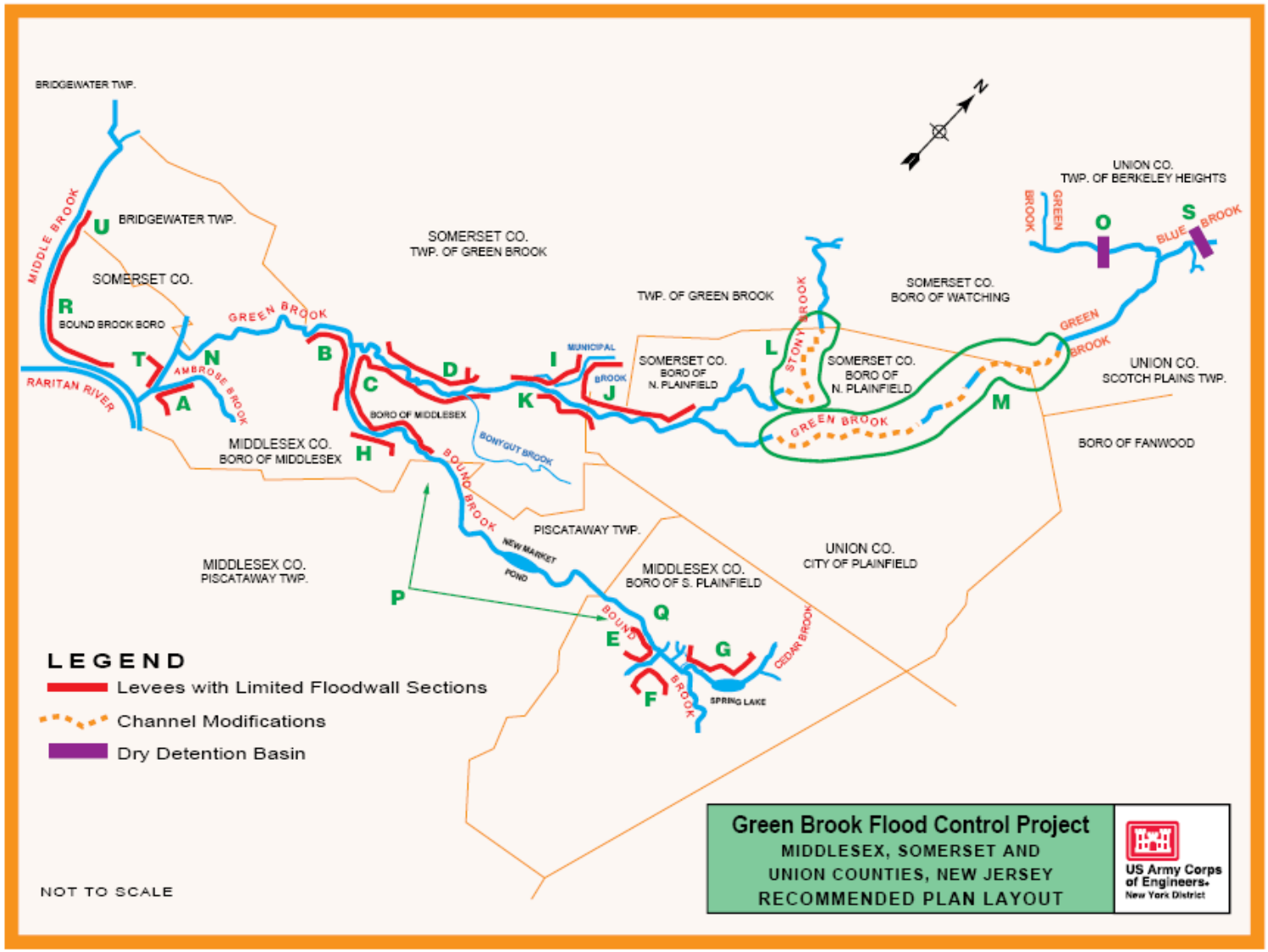
The overall Green Brook basin encompasses sixty-five square miles within the State of New Jersey in the counties of Somerset, Middlesex and Union, and incorporates the Green Brook sub-basin of the Raritan River Basin, a short reach of the Raritan River along the border of the Borough of Bound Brook and the Middle Brook tributary to the Raritan River (Figure 1).

Flooding has been a longstanding problem in the Green Brook Sub-Basin. In September of 1999, Tropical Storm Floyd caused significant flood damages throughout the Sub-Basin, with the most extreme damages experienced in the Borough of Bound Brook. More recently, the April 2007 nor'easter caused significant flooding in Bound Brook and approximately $200,000 in damages to the Segment T pump station.

The Green Brook Flood Control Project was authorized for construction in Section 401a of the Water Resources Development Act of 1986 and involves the construction of seven different elements. Each element consists typically of multiple construction segments or contract reaches.

Two of the elements in the Upper Basin have been deferred for reanalysis, but the other elements will be constructed as federal and state partnered funding becomes available.

FIGURE 1: Proposed Green Brook Flood Damage Reduction Project



The recommended plan for the GBFDRP will provide flood protection to the lower portion of the basin and the Stony Brook portion of the basin through various structural and non-structural flood control elements including approximately 14 miles of levees and floodwalls along Green Brook with supporting pump stations and closure structures, bridge replacements and removals, approximately 1 mile of channel modification in the Stony Brook portion of the project, and various levels of flood proofing including buy-outs. Plans for the upper portion of the basin have been deferred for reevaluation at a later time.

Element No. 1 - Bound Brook

Element No. 1 is comprised of Segments A, N, R, T, and U. Segment R was subdivided into several construction contracts: Segment R-1 which includes the Talmadge Avenue Bridge Replacement, and Segment R-2. Construction of Element No. 1 started in 2001, and has continued with implementation of levees, floodwalls and associated pump stations and drainage features at Segments T, U, R-2, floodproofing of 500 Union Avenue residences and buy-outs at Prospect Place in Middlesex Borough. An additional component involving the removal of an abandoned Conrail Bridge over the Raritan River was included in Element 1 to reduce the potential of flooding during the completion of Segment R2. Segment R2, the last remaining segment to be completed, is currently under construction and is scheduled to be completed by the end of 2012.

Element No. 2- Green Brook and Middlesex

Element No. 2 is comprised of Segments B, C, H and D (Figure 2) and is located in Green Brook Township and the Borough of Middlesex. Proposed flood damage reduction measures for Element No. 2 include approximately 6,750 feet of floodwall, 24,100 feet of levee, a total of six buy-outs of residential structures, flood proofing of 26 commercial structures and the raising of the Sebrings Mills Road, South Lincoln Avenue, and Union Avenue bridges.

Segment B is further broken down into Segments B-1, B-2 and B-3 (Figure 3). Segment B1 is the first segment to be constructed and is being funded with American Recovery and Reinvestment Act (ARRA) funds. Construction is scheduled to begin in the fall of 2010. The remaining two segments are not anticipated to be constructed until 2012 or 2013.

Mitigation

The Finderne Farms Mitigation Site, located in Bridgewater Township, serves as off-site wetland and habitat mitigation acreage for the environmental impacts of the Bound Brook construction segments that could not be mitigated for on-site, including the construction of future structural project elements in Middlesex County.

The total property size is 179 acres, with the mitigation project focused on approximately 130 acres of the floodplain portion of the site. Habitats created, restored, enhanced or preserved as part of the mitigation effort include 35 acres of forested wetland, six acres of scrub-shrub wetland, five acres of emergent wetland enhancement, preservation of six acres of palustrine emergent wetland, six acres of upland forest, 27 acres of riparian forest, and 800 linear feet of stream restoration. In addition, 12 acres of active and passive recreation including two soccer fields and trails that will become part of the Raritan River Greenway have been created. Construction of the mitigation site and recreational fields began in Fall 2005, and was completed

in June 2006. Monitoring to evaluate the success of the mitigation site has been on-going since 2006 and an Adaptive Management Plan (AMP) was developed in 2009 in response to areas of the mitigation site which are not trending toward the permitted success. The AMP identified and described potential limiting conditions and suggested adaptive management strategies that may be employed to investigate and correct limiting conditions. Components of the AMP were initiated in 2009. The AMP will be updated with results of the field investigation and will include additional recommendations or plans of action.

Additional Project Background Information can be viewed online at the District project website: http://www.nan.usace.army.mil/business/prjlinks/flooding/greenbk/index.htm.

FIGURE 2: Element No. 2 of the Green Brook Flood Damage Reduction Project

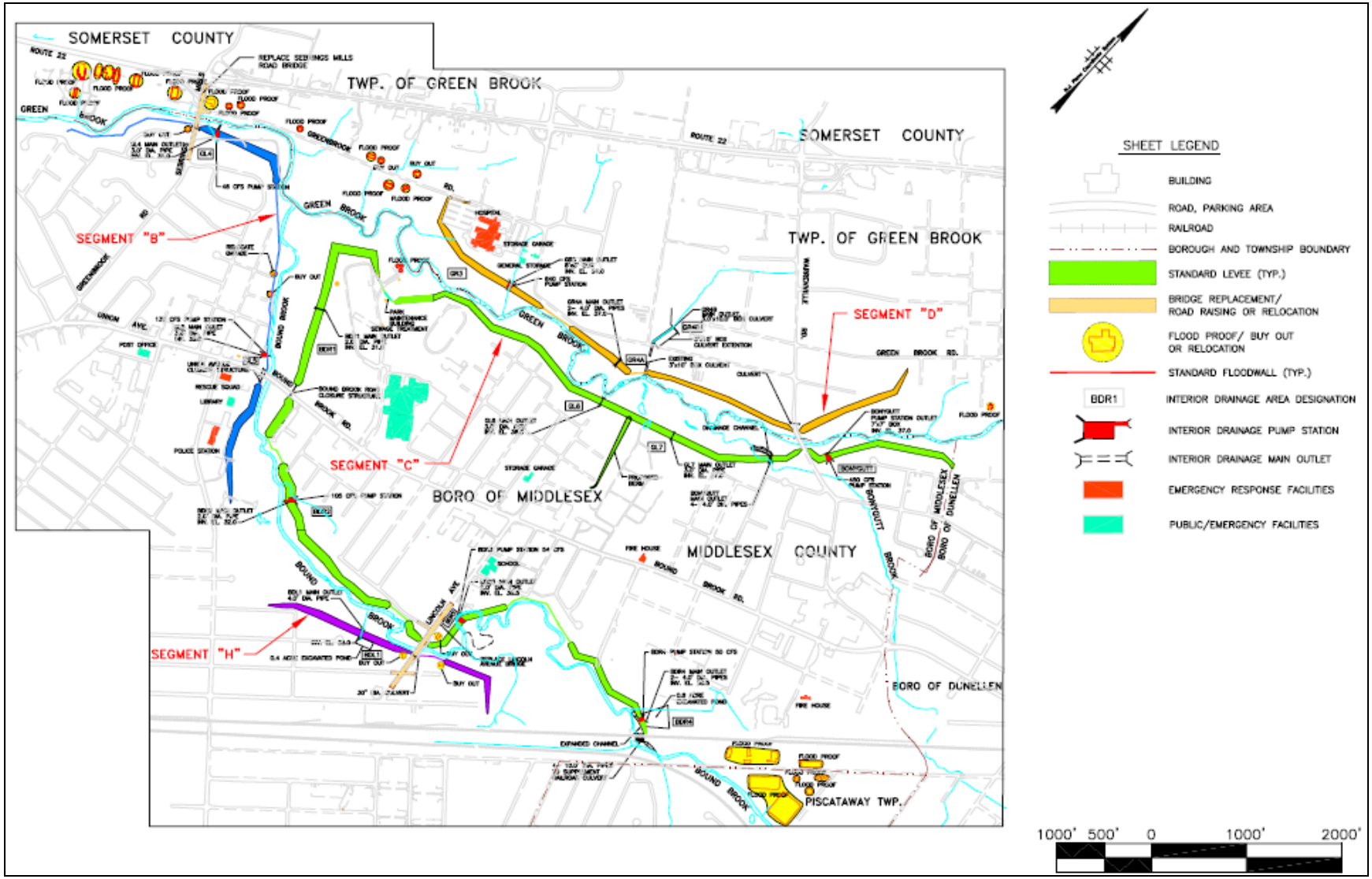
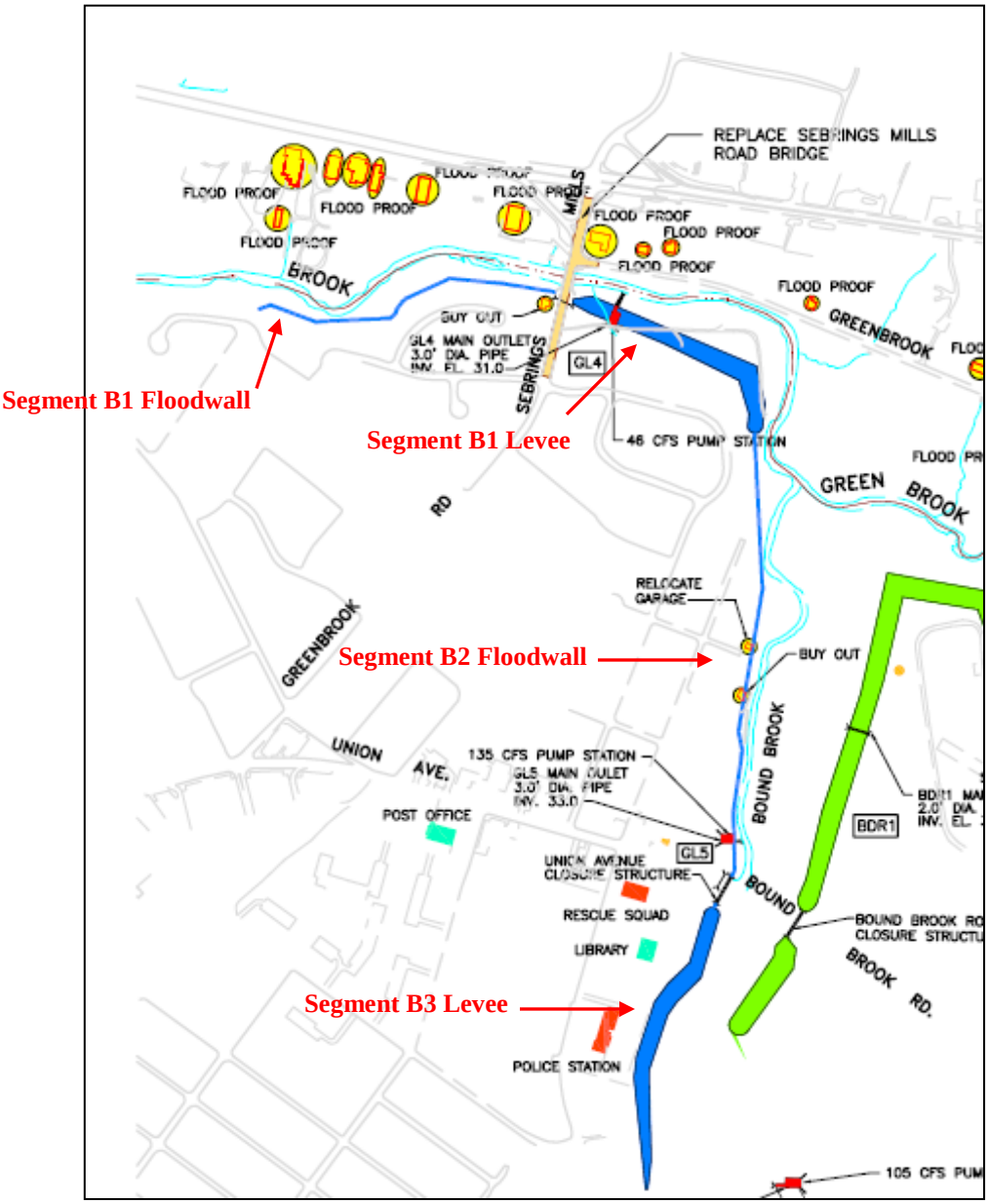


FIGURE 3: SEBRINGS MILLS BRIDGE AND SEGMENT B



3.0 Proposed Action

Segment B1 includes the construction of floodwall, levee and pump station, the raising of the Sebrings Mills Bridge and the buyout of one residential structure (see Figure 3). A more detailed description of the various components is provided below:

Levee and Floodwall Alignment with Pump Station

Approximately 1,000 linear feet of earthen levee will be constructed along the south bank of Green Brook east of Green Brook road (See Figure 3). The levee's average height will be 15 feet and an average footprint width of 110 linear feet. The levee will be paved on top for flood control public works vehicular access during flood events and for maintenance. A pump station, capable of pumping 100 cubic feet per second, is located adjacent to Green Brook road. A temporary tie-off will be constructed along the levee to provide a 10-year flood protection level until Segments B2 and B3 are constructed, which will increase the flood protection level to the 150 year flood event.

A floodwall approximately 1,900 linear feet in length will be constructed west of the Green Brook road within the residential area along the south bank of Green Brook. The height of the floodwall will range from 16 feet at the most easterly direction to 3 feet high near the terminus of the floodwall. A one foot high wall to tie off floodwall is proposed. The floodwall type will be cast-in place concrete T-Wall except where space constraints are extreme, in which case, concrete-capped sheet pile walls will be employed.

Five outfall structures to convey the discharge from pre-existing gravity storm drainage systems through the flood wall and levee system will be installed. These outfall structures will be equipped with check valves and manually operated sluice gate valves to prevent flood stage river water intrusion.

Reconstruction of the Sebrings Mill Road Bridge

The Sebrings Mill Road Bridge will be reconstructed in order to provide adequate freeboard and to provide an elevation closure to the proposed levee and flood walls. The re-construction of the bridge will utilize the existing abutments and wingwalls. Additional scour protection will be provided by rock placed below the river bottom adjacent to the abutment footings to protect the footings from being undermined.

Structure Buy-out and Flood-proofing

Parking lot flood walls and building flood-proofing is proposed to protect businesses on the north bank of Green Brook where there will be no continuous levee and floodwall system. The structure buy-out involves the acquisition and demolition of one single-family residential home located on Green Brook Road. The buy-out is being performed as a result of the Sebrings Mills Road Bridge raising.

4.0 Alternatives Analysis

A complete alternative analysis was performed in the 1989 FEIS and 1997 FSEIS. In general, the alignment of the levee and wall at Segment B1 was selected in order to accommodate a ponding area to the east of Sebring Mills Road on the interior of the levee, which would be inundated during flood events. This area is a logical location for the pump station for several reasons:

1) it is at the existing low point in the drainage area; 2) it is the only large tract of land available; 3) the area is flat and capable of storing storm water; and, 4) the area is an existing wetland where inundation with water will maintain the existing hydrologic and hydraulic regime.

There were no other feasible alternatives to the proposed levee and floodwall system. The existing residential area is fully developed and constrains the river bank corridor except at the location of the existing water company property to the east of Sebrings Mills Road Bridge. The existing drainage patterns are constrained by local topography. The interior drainage area is unusual due to the fact that the low point in the local topography and hence the hydraulic discharge to the river is located at the upstream end of this drainage area. This drainage area forms an enclosed basin once the levee and floodwall are installed. Virtually the entire interior drainage area ultimately drains to the pump station pond area.

5.0 Affected Environment

5.1 Soils

The dominant soil in the project area is Bowmansville silt loam. The Bowmansville series consists of very deep, poorly and somewhat poorly drained soils. The soils are found on floodplains with slopes of 0 to 3 percent and are formed in recent alluvial deposits derived from weathered red and brown shale and sandstone or dolerite or basalt (USDA,2008). Bowmansville soils are frequently flooded and are included on the list of hydric soils for New Jersey developed by the Natural Resources Conservation Service (USDA, NRCS 2010). Soils with this classification are those saturated through natural or artificial means sufficiently enough to support the growth and regeneration of hydrophytic vegetation (USDA, NRCS 2010).

5.2 Water Resources

The project area is bounded by the Green Brook to the north and east which is classified as a FW-2 NT or freshwater river not supporting trout spawning or maintenance (N.J.A.C. 7:9B 2008). Green Brook, a tributary of the Raritan River, originates in the Watchung Mountains and has a drainage area of approximately 65.4 square miles. The Green Brook flows in a southwesterly direction for 17.3 miles before converging with the Raritan River near the Borough of Bound Brook.

The width of the brook in the project area ranges from 35 to 60 feet with an average depth of one foot. The substrate is comprised of silt, sand, mud. The stream banks are vegetated with mature trees along the north and south bank although severe erosion is occurring along the south bank in the westernmost portion of the project area. Tributaries to the Green Brook within the project area include Bound Brook which joins with Green Brook approximately 200 feet south of the Segment B1 project area.

5.3 Vegetation

Vegetation within the project area of the proposed floodwall varies from maintained lawn and ornamental shrubs and trees to mature deciduous forest located behind the residences and along the Green Brook. The proposed levee is located in mature deciduous forest.

The New Jersey Flood Hazard Area Control Act Rules, N.J.A.C. 13 (FHACAR) establishes and requires the preservation of riparian zones. The width of the established riparian zone is based on

the environmental resources being protected and can range from 50, 150 or 300 feet as measured from the side of surface waters. The Green Brook is designated FW2-NT and does not support habitat for any threatened or endangered species; therefore, the riparian zone is 50 feet as described in N.J.A.C. 7:13-4.1(c) 3.

A wetland delineation was conducted within the project area in March and April 2010. Freshwater wetlands were identified and delineated within the Project site using the method described in the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (Federal Interagency Committee on Wetland Delineation, January 1989). Four wetlands ranging from 0.53 acres to 8.35 acres were identified within the project area and further described in Section 5.3.1.

5.3.1 Wetlands

Federal (33 CFR 328.3(b); EO 11990) and State (N.J.A.C. 7:7A1.4) definitions of wetlands are similar, identifying wetlands as "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions." As defined above, wetlands generally include swamps, marshes, bogs, and similar areas.

Four separate palustrine forested wetlands were found within the project area and are further described below.

Wetland 1 (South of Green Brook, East of Sebrings Mills Road)

Wetland 1 is located within the levee footprint and is approximately 8.25 acres in size. The dominant vegetative species includes: pin oak (*Quercus* palustris), box elder (*Acer* negundo), silver maple (*Acer* saccharinum), American elm (Ulmus Americana), green ash (*Fraxinus* pennsylvanica), and red maple (*Acer* rubrum), along with species multiflora rose, (*Rose* multiflora), and greenbrier (*Smilax* rotundifolia).

Wetland 2 (North of Green Brook, East of Sebrings Road)

Wetland 2 is located on the opposite bank of Green Brook from Wetland 1 and is approximately 0.53 acres in size. Dominant hydrophytic vegetation species in the wetland includes: pin oak, box elder, silver maple, American elm, green ash, and red maple, along with species multiflora rose, and greenbrier.

Wetland 3 (South of Green Brook West of Sebrings Road)

Wetland 3 is located within the area of the proposed floodwall and is approximately 2.35 acres in size. Generally the floodplain is a flat topographic feature above Green Brook's primary bank where, it varies from very narrow with steep banks to wide flat or gentle slopes before a steeper slope and the high water mark. This wetland is similar to the other wetland areas, in that it contained a variety of vegetation including: scrub-shrub such as multiflora rose and honey suckle (Lonicera sp.), small trees species including box elder, pin oaks with a limited number of sycamore (Platanus occidentalis) and shagbark hickory (Carya ovata).

Wetland 4 (North of Green Brook, West of Sebrings Road)

Wetland 4 is located on a property containing a strip mall on the corner of Sebrings Road and Route 22 E and is approximately 0.60 acres in size. Species identified in the area include black locust (*Robina* pseudoacacia), red maple, silver maple were found along with red-osier dogwood (*Cornus* stolonifera), black cherry (*Prunus* serotina), multiflora rose; (*Rosa* multiflora), spring beauty (*Claytonia* virginica), wormwood (*Artemesia* biennis), wood sorrel and wild onion (Allium sp.) Closer to the stream several mature tree species such as pin oak (*Quercus* palustris), American elm, silver maple and red maple dominate the vegetation, and to a lesser extent some shrub and understory species such as multiflora rose, black locust (*Robina* pseudoacacia) tartarian honeysuckle (*Lonicera* tartarica), along with troutlily (*Erythronium* americanum) and other just emerging herbaceous vegetation.

In addition, as per State regulations, a 50- foot transition area was delineated from the boundary of the four wetlands. By definition, a transition area is "an area of upland adjacent to a freshwater wetland which minimizes adverse impacts on the wetland or serves as an integral component of the wetlands ecosystem."

5.4 Wildlife and Fisheries Resources

Green Brook supports fish species such as spottail shiner (*Notropis* hudsonius*)*, American eel (*Anguilla* rostrata*)*, tessellated darter (*Etheostoma* olmstedi), white sucker (*Catostomus* commersoni), longnose dace (*Rhinichthys* cataractae), redbreast sunfish (*Lepomis* auritus), fallfish (*Semotilus* corporalis), banded killifish (*Fundulus* diaphanus), creek chub (*Semotilus* atromaculatus), common shiner (*Notropis* cornutus), satinfin shiner (*Notropis analostanus*), golden shiner (*Notemigonus* crysoleucas), green sunfish (*Lepomis* cyanellus), blacknose dace (*Rhinichtys* atratulus), brown bullhead (*Ameiurus* nebulosus), yellow bullhead (*Ameiurus natalis*) (NJDEP 2006).

Mammals within the project area include squirrel (*Sciurus* carolinensis), eastern cottontail (*Sylvilagus* foridanus), white-tailed deer (*Odocoileus* virginianus) and other species. Bird species tolerant of urban-suburban areas, such as American robin (*Turdus* migratorius), European starling (*Sturnus* vulgaris), northern cardinal (*Baeolophus* bicolor), and gray catbird (*Dumetella* carolinensis), utilize the riparian habitat of the project area.

5.4.1 Federal and State Endangered, Threatened and Special Concern Species

Indiana bat (Federal and State Endangered)

Indiana bats spend the winter hibernating in caves and mines. The Hibernia Mine located in Hibernia, NJ, is a known Indiana bat hibernaculum. Female Indiana bats occupy summer maternity roosts under the loose bark of dead or dying trees within riparian, floodplain, and upland forests. Tree species commonly used as roost sites include American elm, slippery elm (*Ulmus* rubra), shagbark hickory, silver maple, and green ash. Adult males usually roost in trees near maternity roosts, but some remain near the hibernaculum.

Preferred foraging areas are streams, associated flood plain forests, and impounded bodies of water such as ponds and reservoirs. However, they have been observed in upland forests; pastures and clearings with early successional vegetation; cropland borders; and wooded fencerows (USFWS 2007).

Due to the proximity of the project area to Hibernia Mine and known maternity roosts, the U.S. Fish and Wildlife Service (USFWS) required the District to evaluate the project area to determine the presence of habitat supportive of Indiana bat. The District hired a bat specialist who conducted a site visit in April 2010 and found potential Indiana bat habitat primarily within the property where the proposed levee will be constructed.

Other than the Indiana bat and an occasional transient bald eagle (*Haliaeetus* leucocephalus) that may be observed in the project vicinity, no other Federal or state endangered, threatened or special concern species is known to utilize the project area.

Bald Eagle (State Threatened)
The designation of the bald eagle foraging habitat is part of New Jersey's "Landscape Project" developed by the NJ Division of Fish and Wildlife's Endangered and Nongame Species Program which delineates and identifies critical habitat for the states threatened and endangered species. The bald eagle foraging habitat is defined as the "amount of habitat required to support a nesting pair of eagles throughout the year."

5.5 Environmental Contamination

As required by ER 1165-2-132 (Hazardous, Toxic and Radioactive Waste Guidance for Civil Works, 26 June 1992), an assessment of hazardous, toxic, and radioactive waste (HTRW) was conducted in the project area. Hazardous, Toxic, and Radioactive Waste (HTRW) are defined as any "hazardous substance" regulated under Comprehensive, Environmental Response, Compensation, Liability Act (CERCLA), 42 U.S.C. 9601 et seq, including "hazardous wastes" under Section 3001 of the Resources Conservation and Recovery Act (RCRA), 42 U.S.C. 6921 et seq.

A database search on possible environmental concerns for the project area was completed. No significant findings were discovered during the database research. However, underground storage tanks (UST) containing heating oil were discovered to be located within 300 feet of the Site. The database research indicated that there were no leaking USTs within 300 feet of the Site.

The property on which the proposed levee is located is a former well field currently owned by the New Jersey American Water Company. The previous owner was Elizabethtown Water Company. Two HTRW reports completed in 1994 and 1996 as part of the GBFDRP Feasibility Study discussed a supply well identified as the Sebrings Mill Well No. 6 (Well #6) located on the property.

The 1996 HTRW Feasibility Study Report indicates Well #6 was contaminated with trichloroethylene (TCE) and perchloroethylene (PCE) at levels measuring at 6 ppb, which exceeds the EPA drinking water standards of 5 ppb and NJDEP drinking standards of 1 ppb. The 1996 report further discusses an air stripper was employed to decontaminate the water from Well #6. According to a NJDEP Well Abandonment Report prepared in 2005, Well #6 was abandoned for the reason of "No longer in use" (NJDEP Well Abandonment Report, 2005). As part of the abandonment, Well #6 was sealed with cement slurry.

5.6 Cultural Resources

A Programmatic Agreement for the Green Brook Flood Damage Reduction Project was signed in 1998. The agreement was based on the results of a cultural resources survey conducted by Hunter Research Inc. in 1988/89 and an evaluation of structures conducted by Panamerican Consultants in 1997 (with supplemental work conducted in 1999) (Hunter Research 1988, 1989) (Panamerican Consultants, 1997). Archaeological work associated with Segment B1; Sebrings Mill Road Bridge replacement and adjacent floodwall and levee construction, was documented in the Hunter Research study. Shovel testing along the alignment of the floodwall and levee yielded no significant artifacts and no sites were identified. No further work was recommended. The structures proposed for buy-out were surveyed and documented in the two Panamerican reports. Sebrings Mill Road Bridge, built in 1974, is not a historic resource. The New Jersey Historic Preservation Office (NJHPO) reviewed the previous reports and concurred with the recommendations.

The replacement of Sebrings Mills Road Bridge was of concern due to the fact that, as suggested by the name, a mill once stood near this crossing. Research indicated that the mill was likely in use by the mid-18th century. A 1923 map depicts a mill and its raceways on the northwest side of the bridge. Comparison with the modern landscape indicated that the road was widened and about one third of the mill building is under the present roadway. Three test trenches were excavated but were located considerably west of the bridge due to concern with undermining the bridge.

Based on archaeological evidence the Hunter report states "substantial and informative remains are unlikely to survive" due to extensive changes to the landscape except perhaps beneath the bridge embankments. Acknowledging that the mill complex was historically important the recommendation however was for no further work as any remains encountered would form just a part of the mill complex and therefore not be eligible for the National Register of Historic Places (NRHP). The bridge was designed with the knowledge that in time the flood control measures would be constructed so the existing bridge abutment could be raised to the needed height and reused. At present, it is assumed that the existing abutments will be reused. The District's opinion is that no further archaeological work will be undertaken at the Sebrings Mill Road Bridge. If the plans change as detailed engineering and design proceeds the Corps may revisit the need for further archaeological work. However, borings taken in March 2010 through each of the four corners of the bridge did not encounter any stone or timber or other indications of mill remains.

The architectural survey conducted by Panamerican Consultants surveyed 14 of the 17 structures proposed for flood proofing or buy-out. All were residential or commercial/industrial structures dating from 1950 to 1996. None of the structures were determined significant. Due to an apparent oversight three structures in this area were not surveyed. They were evaluated in 1999 and were determined not eligible. No further cultural resources studies will be conducted for the structures proposed to be flood proofed or bought out. The District evaluated the possibility of buying out two additional structures on Green Brook Road. These two dwellings are similar to the other houses in the neighborhood dating to *circa* 1960 and are not considered eligible for the NRHP.

The levee runs through the well field of American Water. This property that was not previously evaluated for historic significance although was subject to archaeological testing and no significant artifacts were recovered. The Watchung Water Company first operated a well field here in 1897. The area is presently a wooded floodplain. Several wells exist on the site, which were until recently in use. American Water demolished all standing structures on the property as evidenced by the debris piles in the locations of mapped structures observed in March 2010 by the project archaeologist. Given that there is little evidence remaining of the historic operation and little to be gained from the site on the technology of historic water supply the property is not considered eligible for the NRHP. No further work is recommended for this property.

5.7 Air Quality

In accordance with the Clean Air Act of 1977, as amended, the Environmental Protection Agency (EPA) developed National Ambient Air Quality Standards (NAAQS) to establish the maximum allowable atmospheric concentrations of pollutants that may occur while ensuring protection of public health and welfare with a reasonable margin of safety.

The USEPA measures community-wide air quality based on daily measured concentrations of six criteria air pollutants; carbon monoxide, sulfur dioxide, respirable particulate matter, lead, nitrogen dioxide, and ozone. Based on these measurements of air quality, the USEPA designates attainment areas and non-attainment areas nationwide. Non-attainment areas are designated in areas where air pollution levels persistently exceed the national ambient air quality standards.

Somerset and Middlesex Counties are located in the New York-New Jersey-Long Island Air Quality Control Region. Similar to most urban industrial areas, emissions from automobiles, manufacturing processes, utility plants, and refineries have impacted air quality in the Project area. Based on the National Ambient Air Quality Standards (NAAQS) six primary pollutants, Somerset County is designated as a non-attainment area for ozone and particulate matter (PM2.5) and an attainment area for sulfur dioxide, carbon dioxide, particulate matter (PM10), lead and nitrogen oxide.

5.8 Socioeconomics

Green Brook Township has a population of 5,654 with 1,234.66 persons/square mile. The population is comprised of 88% White, 4% Hispanic, and 1.7% African American. The median age is 39 and the median per capita income is $37,290. Approximately 1.7% of families and 2.4% of individuals live below the poverty line. 46% of the residents are occupied in the management and professional sector. 84% of the residential structures are detached, single family homes; 32% of which were built from 1940 to 1959 (2000 U.S. Census Bureau).

Middlesex Borough has a population of 13,717 with 3,921.15 persons/square mile. The population is comprised of 87% White, 9% Hispanic, and 3.4% African American. The median age is 38 and the median per capita income is $27,834 (U.S. Census Bureau 2000). Approximately 2.4% of families and 3.6% of individuals live below the poverty line. 39.4% of the residents are occupied in the management and professional sector. 73% of the residential structures are detached, single family homes; 37% of which were built from 1940 to 1959 (U.S. Census Bureau 2000).

6.0 Environmental Impacts

6.1 Soils

The in-situ soil does not meet the geotechnical specifications for levee construction, therefore soil that meets the specifications will be imported from off-site. Although the importation of soil will constitute a change in the existing soil type within the immediate vicinity of the levee, no changes to the soil beyond the levee footprint are proposed. Soil may also need to be imported to use as backfill when constructing the floodwall but as with the levee, the change in soil type will not extend beyond the immediate footprint of the floodwall. The floodwall will provide some long term protection against the soil erosion occurring along the western most portion of the project area.

6.2 Water Quality

The full range of impacts to water resources were evaluated in 1980 FEIS and 1997 SEIS. The proposed action may increase turbidity to surface waters during construction as a result of earth disturbance. The turbidity impacts are anticipated to be minor and will be controlled to the extent practicable through use of best management practices identified in the soil and sedimentation erosion control plan. The District will be applying for Soil and Sedimentation Erosion Control and Request for Authorization permits from the Freehold and Somerset Soil Conservation Districts prior to construction.

A review of the NJDEP GIS database indicated that there are two public community water supply wells within the levee project area. The District has coordinated with the property owner, New Jersey American Water Company, to verify that the wells are no longer in service and were sealed in 2006. Therefore, the proposed activity will not have any temporary or permanent impacts to public water supplies.

6.3 Vegetation

Approximately 4.5 acres of vegetation will be removed in order to construct the levee and floodwall; with the majority of the impacts occurring in wetlands. The limits of construction have been minimized to greatest extent possible to reduce loss of vegetation. Upon completion of the levee and the house demolition, shrubs and trees will be planted and the area will be reseeded with native grasses and wildflowers. The floodwall area will be reseeded with native grasses and wildflowers.

Approximately 1.24 acres of riparian zone will be permanently impacted through the construction of the levee and floodwall. The FHACAR allow for a maximum 3,000 square feet of riparian zone disturbance for flood damage reduction projects before requiring an application for a Hardship Exception and compensating the impact through mitigation at a 2:1 ratio. Given that the impact acreage exceeds the maximum limit, the District and NJDEP have included a Hardship Exception as part of the Flood Hazard Area Individual Permit application and have demonstrated in the application that public safety cannot be adequately ensured without exceeding this limit. A 2.52 acre mitigation credit will be applied at the Finderne Mitigation site to compensate for the impacts to the riparian zone.

6.3.1 Wetlands

Approximately 4.38 acres of forested wetland and 0.88 acres of transition area will be permanently impacted as a result of project implementation. In addition, 0.38 acres of wetland and 0.033 acres of transition area will be temporarily impacted as a result of the construction equipment access. The temporary impacts from the levee construction will be mitigated on-site through landscape restoration plans that involve both seeding and planting of native shrubs and trees aside the levee alignment. Plant species to be utilized for on-site mitigation are included on the proposed planting plan located in Appendix C. The wetland floodplain areas will be seeded with a grass and wildflower mix of native and naturalized species. The levee itself will receive turf grass mix for maintenance requirements. Due to space constraints, the permanent impacts will be mitigated through credits generated by the Finderne Wetland Mitigation Site.

6.4 Wildlife and Fisheries Resources

The full range of impacts to fish and wildlife resources were evaluated in 1980 FEIS and 1997 SEIS. In general, the removal of mature trees to construct the floodwall and levee will result in a permanent reduction of cover, nesting and food sources for wildlife. Construction activities will temporarily displace animals that utilize the forest such as birds, squirrels, raccoons, etc., but they are anticipated to return to the area post-construction. To comply with the Migratory Bird Treaty Act (MBTA), trees and shrubs will be cleared outside of a 15 March through 31 July window to avoid adverse impacts to any potential nesting birds that are covered under this act. The Sebrings Mills Road bridge replacement is not expected to adversely impact fish and wildlife resources.

The floodwall and levee were set back to the greatest extent possible to retain as much mature vegetation along the banks. Erosion and sediment control best management practices will be implemented to reduce the introduction of sediment into open water surfaces.

6.4.1 Federal and State Endangered, Threatened and Special Concern Species

Indiana bat

A survey was performed over the course of two nights in June 2010 to verify the presence or absence of Indiana bat. A total of four nets were set in two locations; two nets along the Middle Brook and two nets along a gravel access road located on the property where the levee will be constructed. No Indiana bats were captured, thus satisfying the Endangered and Threatened species coordination with the U.S. Fish and Wildlife Service.

Bald Eagle

Based on coordination with staff from NJDEP Land Use Resource Program and Division of Fish and Wildlife's Endangered and Nongame Species Program, due to the urbanized nature of the project area and the relatively small width of Green Brook, the project area was determined to not provide suitable bald eagle foraging habitat. Therefore, no adverse impacts to the bald eagle or its supportive habitat are anticipated from the implementation of the project. See Appendix D for additional documentation from NJDEP regarding this matter.

6.5 Environmental Contamination

As mentioned in Section 5.5 of the EA, none of the USTs located within 300 feet of the project area were found to be leaking. Therefore, the presence of the USTs near the project area will not impact construction.

In regards to the TCE and PCE contamination of Well #6, both are volatile organic compounds (VOC's) typically used as industrial cleaners although they can also be found in common household products such as paint remover, and electronic equipment cleaners. Additionally, PCE is commonly used in dry cleaning. The primary exposure pathway for humans of TCE and PCE is through inhalation with ingestion as a secondary pathway. As VOC's such as TCE and PCE quickly evaporate upon contact with air, health risks associated with TCE and PCE is typically associated with inhalation in closed, confined areas or long term exposure (e.g. directly working with the chemicals). Neither significantly bioaccumulates in plants or animals.

The 2005 NJDEP Well Abandonment Report noted that Well #6 was installed to a depth of 412 feet below grade and a distance of 500 feet from Green Brook Road. Excavation for levee construction will extend to a maximum of 5 feet below grade. Due to the fact that the well has been capped and the location and depth of the well in relation to the location of the levee footprint and proposed excavation depth, it is unlikely that the contaminated water will be encountered during construction.

Exposure risk to residents is considered to be minimal given that the levee is setback from residences, and is located on private property. To reduce health risks, the construction contractor will be required to develop a Health and Safety Work Plan to be followed during all construction activities to minimize any release of contaminated materials, and also to protect workers' health. Additional information regarding the contamination of Well #6 is located in Appendix F of this document.

6.6 Cultural Resources

As such a long time has elapsed since the Hunter Research and Panamerican studies were conducted and reviewed by the NJHPO and as several new items were under consideration, a letter was sent by the District in March 2010 to update the NJHPO on the project and provide them with additional information on Segment B1. It is the District's opinion that no NRHP eligible resources are present within the Segment B1 Area of Potential Effect and no further cultural resources work will be undertaken. NJHPO concurred with this determination (Appendix E).

6.7 Air Quality and Noise

6.7.1 Air Quality

Construction emissions for the proposed project have been estimated to be below the Federal de minimis thresholds in accordance with the Clean Air Act. The emissions will be below the thresholds of 100 tons/year for NOx, 50 tons/year for VOC, and below 100 tons/year for PM 2.5. The emissions from the project are considered to have an insignificant impact on the regional air quality, and according to 40 CFR 93.153 (f) and (g), the proposed project is presumed to conform to the State Implementation Plan. A General Conformity, Record of

Non-Applicability (RONA) and associated air emissions calculations are included in Appendix C of this document.

6.7.2 Noise

The proximity of the project area to residences will increase noise levels due to operation of construction equipment. The impacts of noise will be mitigated to the extent possible through restriction of the work hours within normal operating hours and by coordinating with the local communities to comply with any locally enforced noise ordinances or work periods. Wildlife in the area may be temporarily displaced during active construction, but would be expected to return to the project area post-construction.

6.8 Socioeconomics

During construction of the floodwall, some of the residents within this project area will be unable to fully utilize their property and it will be required for them to move or disassemble structures such as sheds and above ground swimming pools to accommodate construction. In addition, setting the floodwall back from the Green Brook will fragment the properties and will result in the loss of direct access to the portion of property between the brook and floodwall. This loss will be offset through the acquisition of permanent easements for the operation and maintenance of the floodwall and compensating the property owner at its fair market value for the effect on the property.

The proposed levee is located on property owned by the NJ-American Water Company and is being acquired in its entirety. The temporary levee tie off that will provide a 10 year level of protection until the entire Segment B is constructed will require obtaining easements from two homeowners along Starlit Drive. As with the floodwall construction, the two property owners will not have full utilization of the rear of their property during construction.

The bridge replacement will require detours and/or traffic restrictions. This will be minimized to the greatest extent possible and will be coordinated with the municipalities and counties to determine road closures/traffic restriction schedules and durations.

Long term benefits achieved by the project include flood damage reduction benefits that include reduced damage to property, protection of business and residential structures, improved public health and safety, reduced traffic delays, and emergency access for the fire department, medical personnel and police protection. The proposed action is not expected to adversely impact the socioeconomic environment of the area.

6.8.1 Environmental Justice

Executive Order 12898, Federal Actions to address Environmental Justice in Minority and Low Income Populations mandates that each federal agency will identify and address potential disproportionately high and adverse human health or environmental effects of its activities on minority populations and low income populations.

No significant environmental impacts on the human population are anticipated as a result of the proposed action. The proposed project is not located in a low income area and is intended to protect the surrounding community from flood related damages. Therefore, a disproportionate

negative impact on minority or low-income groups in the community is not anticipated and a full evaluation of Environmental Justice issues is not required for this EA.

6.9 Cumulative Impacts

Cumulative impacts refer to one or more individual impacts, which when considered together, are considerable or which compound or increase the other's impacts. The cumulative impact from several projects is the change in the environment that results from the incremental impact of the selected plan when added to other closely related past, present or reasonably foreseeable future projects.

Past and current actions that need to be considered against the proposed action include construction of Element No. 1 of the GBFDRP. The proposed construction may overlap with the on-going Segment R2 construction in Bound Brook. However, the overlap of the construction activities is not anticipated to result in any unanticipated adverse environmental (e.g. air quality, wetlands) or socioeconomic impacts.

The total wetland impacts resulting from the construction of Element No. 1 of the GBFDRP and Segment B1 includes 11.98 acres of forested wetland, 0.13 acres of wetlands associated with drainage ditches or swales and 0.26 acres of scrub shrub wetlands. These impacts have been mitigated through the use of credits generated by the Finderne Farms mitigation site.

Future actions to be considered include the construction of the remaining Segment B and the implementation of C, H and D. Upon its completion, Segment B will provide a flood protection level for a 150 year event. Overall, the construction of future segments of the GBFDRP will provide comprehensive flood damage reduction within the Green Brook sub-basin.

Adverse cumulative impacts to wetlands will be assessed as project design for each segment are developed and if necessary, additional mitigation sites will be identified and created to compensate for such impacts. Emissions analyses will be conducted for each segment to ensure compliance with General Conformity and if needed, construction operations will be scheduled in a manner to stay below the yearly de minimis levels for the applicable NAAQS. Continued coordination will occur with the USFWS to identify the need for field surveys to ensure Indiana bat will not be adversely impacted. Coordination with the SHPO will be on-going to ensure significant cultural resources will not be adversely impacted or identify mitigation requirements for any cultural resource impacts.

7.0 Public and Agency Coordination

The Draft Environmental Assessment is being coordinated with the public and involved agencies through targeted mailings, placement of the report in public repositories such as the local library and by advertisement of the documents availability on the New York District's website.

Coordination with the public includes meetings with affected property owners in February and June of this year to discuss the project features. The affected residents were also notified of the Flood Hazard and Freshwater Regulations Individual permit applications. Additionally, the proposed action has been coordinated with the State and local partners of the Green Brook Flood

Damage Reduction Project, including NJDEP, Somerset and Middlesex Counties as well as with the Green Brook Flood Control Commission.

The proposed project has been coordinated with the NJDEP Land Use Regulation Program Office via a pre-application meeting held in April 2010 and submission of the Flood Hazard Area and Freshwater Wetlands Individual Permit applications. Correspondence documenting coordination between the District and the State Historic Preservation Office Correspondence pertaining to cultural resources is located in Appendix E. The Corps is in continuing coordination with the U.S. Fish and Wildlife Service, who has prepared a Fish and Wildlife Coordination Act Report (FWCAR). The FWCAR and the District response is included in Appendix B of this document.

The circulation of this Environmental Assessment for public comment fulfills public coordination requirements in accordance with the National Environmental Policy Act of 1970. The District will prepare a final NEPA document to address all received comments.

8.0 Conclusion

In summary, the implementation of Segment B1 is not anticipated to have significant adverse impacts on the environment, cultural resources or socioeconomics and is therefore proposed to be documented with a Finding of No Significant Impact (FONSI). The proposed action is necessary to ultimately provide flood damage reduction for the Borough of Middlesex that will benefit the economics, health and safety of the residents. Temporary disturbance to floodplain and wetland habitat will be mitigated on-site through site landscaping and permanent floodplain and wetland impacts will be mitigated offsite at the Finderne Farms mitigation site. Therefore, a supplemental EIS is not required. Applicable laws and regulations related to federal actions are summarized in Table 1.

Table 1. Summary of Primary Federal and State Laws and Regulations Applicable to the Proposed Action

Federal		
Legislative Title U.S. Code/Other		Compliance
Clean Air Act	42 U.S.C. §§ 7401-7671g	An air quality analysis was completed for the project. Based upon the completed analysis, the emissions from the project are considered to have an insignificant impact on the regional air quality, and according to 40 CFR 93.153 (f) and (g) the proposed project is presumed to conform to the SIP. A Record of Non-Applicability is located in Appendix C.
Clean Water Act	33 U.S.C. §§ 1251 et seq.	The Corps has submitted a Freshwater Wetlands Individual Permit application to NJDEP to fulfill the requirements of Section 404 of this act. A 404(b) Review is also included in this report in Appendix A.
Endangered Species Act of 1973	16 U.S.C. §§ 1531 et seq.	Information provided by the U.S. Fish and Wildlife Service indicates that the proposed project will not have adverse impacts to any endangered or threatened species.
Fish and Wildlife Coordination Act	16 U.S.C. § 661 et seq.	The Corps is in continued coordination with the U.S. Fish and Wildlife Service. The Draft FWCAR and District response is located in Appendix B.
National Environmental Policy Act of 1969	42 U.S.C. §§ 4321-4347	The circulation of the Finding of No Significant Impact fulfills requirements of this act.
National Historic Preservation Act of 1966	16 U.S.C. §§ 470 et seq.	The Corps has continued to coordinate with the State Historic Preservation Office to fulfill requirements of this act. Correspondence indicating SHPO's non objection to the project is located in Appendix E.
Executive Order 11990, Protection of Wetlands	May 24, 1977	Circulation of this report for public and agency review fulfills the requirements of this order.
Executive Order 13045, Protection of Children from Environmental Health Risks and Safety Risks	April 21, 1997	Implementation of this project will reduce environmental health risks. Circulation of this report for public and agency review fulfills the requirements of this order.
State		
Legislative Title and code/date		Compliance
NJDEP Rules and Regulations – Flood Hazard Area	N.J.A.C. 7:13 (N.J.S.A 58:16A)	Permit has been received. Refer to Appendix E.
NJDEP Rules and Regulations – Freshwater Wetlands Permit	N.J.A.C. 7:7A (N.J.S.A. 13:9B)	Permit has been received. Refer to Appendix E.

9.0 References

Hunter Research, Inc. 1990. A Cultural Resource Survey for the Green Brook Flood Control Project in the City of Plainfield, the Boroughs of Bound Brook, Middlesex, Dunellen, North Plainfield and South Plainfield and the Townships of Green Brook and Bridgewater, Middlesex, Somerset and Union Counties, New Jersey.

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10.0 List of Preparers

Kimberly Rightler, Project Biologist, U.S. Army Corps of Engineers, NY District
Lynn Rakos, Project Archaeologist, U.S. Army Corps of Engineers, NY District
Angela Sabet, Physical Scientist, U.S. Army Corps of Engineers, NY District

Appendix A

Section 404 (b)(1) Evaluation

Segment B1 Levee and Floodwall Construction, Green Brook Flood Damage Reduction Project
Borough of Middlesex, Middlesex County, NJ
Section 404 (b)(1) Evaluation

I. PROJECT DESCRIPTION

a. Location: Borough of Middlesex, Middlesex County, New Jersey.

b. General Description: Installation of 1,000 feet of levee and 1,900 feet of floodwall along the southern bank of the Green Brook.

c. Authority and Purpose:
The study has been authorized under Section 401a of the Flood Control Act of 1986 as amended, to study and construct flood damage reduction measures for public works and non-profit public services. The purpose of the project is to provide flood damage reduction measures to the community of the Borough of Middlesex.

d. General Description of Fill Material
1.) Characteristics of Material: Material used to construct the levee will be clean fill that meets Corps specifications for levee construction. Other materials used in association of levee construction includes rip rap around discharge outlets to reduce discharge velocities and prevent scouring and soil erosion. The floodwall will be constructed of concrete.
2.) Quantity of Material: Levee: 33,960 cy soil and 300 cy of stone; Floodwall 24,349 cy of soil and 4,378 cy of concrete.
3.) Source of Material: The rock will be obtained from a local quarry. Soil fill will be clean material and will be acquired at an adequate site.

e. Description of the Proposed Discharge Sites
1.) Location: The discharge site is located on along the southern bank of the Green Brook in the Borough of Middlesex Brook, New Jersey.
2.) Size: Approximately 1,900 ft of floodwall and 1,000 levee will be constructed.
3.) Type of Site: The project is located in a residential area.
4.) Types of Habitat: The floodwall is located in a combination of forested wetland, some of which has been disturbed through the conversion to lawns. The levee is located in forested wetland. The aquatic habitat consists nontidal freshwater classified as FW2-NT (general fresh surface water, non-trout) by NJDEP.
5.) Time and Duration of Disposal: Construction of levee and floodwall system will take approximately eighteen months.

f. Description of Disposal Method: Land based construction equipment will be used to excavate and construct the flood damage reduction measures.

II. FACTUAL DETERMINATION

a. Physical Substrate Determinations

1) Substrate Evaluation and Slope: The project area is generally flat with the dominant soil in the project area being the Bowmansville Series.

2) Sediment Type: The sediment is primarily alluvial soils.

3) Dredged/Fill Material Movement: As the levees and floodwalls are set bank from the Green Brook, no fill will be directly placed in open water. Fill activities will occur in freshwater wetlands. Placement and grading of fill, riprap and concrete will result in the temporary disturbance of 0.38 acres of forested wetlands and the permanent loss of 4.38 acres of forested wetlands. Temporary wetland impacts will be mitigated through on-site restoration following completion of construction activities. Permanent wetland impacts will be mitigated by utilizing credits generated from the construction of the Finderne Farms mitigation site located in Bridgewater Township, approximately six miles from the Segment B1 project area.

4) Physical Effects on Stream Bottom: The project is not expected to change the existing substrate or characteristics of Green Brook given that the levee and floodwalls are setback from the streambank.

5) Other Effects: No unique or other effects are anticipated from this project.

6) Actions Taken to Minimize Impacts: Best management practices, include but not limited to silt fencing and straw bales, will be utilized during const ruction. Additionally, work will be limited to that which can be completed and stabilized in one day.

b. Water Circulation, Fluctuation and Salinity Determinations

1) Water, Consider Effects on:

a. Salinity- No effect

b. Water Chemistry- No effect

c. Clarity- Water clarity may be slightly impacted during construction activities; No long-term effect is anticipated.

d. Color- No effect

e. Odor- No effect

f. Taste – No effect

g. Dissolved Gas Levels- No effect

h. Nutrients- No effects

i. Eutrophication- No effect

j. Others as Appropriate- No other adverse impacts are anticipated from the project.

2) Current Patterns and Circulation:

a. Current Patterns and Flow- The project will not impact normal flows.

b. Velocity- The project will not impact velocities of the Green Brook.

c. Stratification- No effect.

d. Hydrologic Regime- No effect.

3) Normal Water Level Fluctuations: The project will not cause any change in normal water levels.

4) Salinity Gradients: Not applicable.

5) Actions Taken to Minimize Impacts: Erosion and sediment control practices will be utilized during construction.

c. Suspended Particulate/Turbidity Determinations.

1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Sites: Effects of the proposed project on turbidity and suspended sediment concentrations will be minimal.

2) Effects on Chemical/Physical Properties of the Water Column:

a. Light Penetration- No effect.
b. Dissolved Oxygen- No effect.
c. Toxic Metals and Organics- No effect.
d. Pathogens- The project will not cause any change in pathogen levels as no sewage or animal waste use or treatment is involved.
e. Aesthetics- The aesthetics of the project area will be somewhat compromised as the majority of the project area behind the residences is forested. Restoration of grass and shrub and tree species will be implemented to restore the vegetation.
f. Others as Appropriate- Not applicable

3) Effects on Biota:

a. Primary Production, Photosynthesis- Not applicable
b. Suspension/ Filter Feeders- No impact is expected. Erosion and sediment control best management practices will be implemented during construction to reduce sedimentation to Green Brook.
c. Sight Feeders- No impact is expected.

4) Actions Taken to Minimize Impacts: Erosion and sediment controls will be implemented during construction.

d. Contaminant Determinations: All fill material will be clean and will not pose a risk.

e. Aquatic Ecosystem and Organism Determinations.

1) Effects on Plankton: No effect.
2) Effects on Benthos: No effect.
3) Effects on Nekton: No effect.
4) Effects on Aquatic Food Web: No effect. Setting the floodwall and levee back from the stream bank will preserve the vegetation immediately along the bank.
5) Effects on Special Aquatic Sites:
a. Sanctuaries and Refuges- Non applicable

b. Wetlands- 4.38 acres of forested wetland will be permanently impacted by construction of the levee and floodwall with 0.38 acres of forested wetland being temporarily impacted during construction.
c. Mudflats- Non applicable.
d. Vegetated Shallows- Not applicable.
e. Coral Reefs- Not applicable.
f. Riffle and Pool Complexes- No effect.

6) Threatened and Endangered Species: The U.S. Fish and Wildlife Service deemed the site as potentially having Indiana bat habitat and required a survey to determine the presence or absence of Indiana bat. The survey was performed in June 2010 resulting in no Indiana bat captures therefore concluding the Endangered and Threatened species consultation. With the exception of transient bald eagle, no other state or Federally Threatened, Endangered species are known to inhabit the project area and will therefore not be adversely impacted from project implementation.

7) Other Wildlife: The project is not expected to have significant long-term impacts on the waterfowl, upland birds or mammals in the project area.

8) Actions to Minimize Impacts: Best management practices including but not limited to silt fence, cofferdams and turbidity curtains will be utilized during construction.

f. Proposed Disposal Site Determinations

1) Mixing Zone: Not applicable

2) Determination of Compliance with Applicable Water Quality Standards: Fill will be clean construction material and will meet water quality standards.

3) Potential Effects on Human Use Characteristic:
a. Municipal and Private Water Supply - The Green Brook is not used as a water supply so no direct or indirect adverse impacts to the municipal water supply form project implementation are expected.
b. Recreational and Commercial Fisheries - The project is not expected to have any adverse impacts to recreational or commercial fisheries.
c. Water Related Recreation- The Green Brook is not used for recreational purposes within the project area; therefore no permanent or temporary adverse impacts are expected as a result of project implementation.
d. Aesthetics - Removal of mature trees to construct the levee will reduce the aesthetics of the project area. However, the need for flood protection to homes within Middlesex Borough outweighs the loss. The floodwall will receive a decorative façade to minimize the impact. The levee is set back from residential homes will minimize the direct impacts the levee will have on views.
e. Parks, National and Historical Monuments, National Seashores, Wilderness Areas, Research Sites, and Similar Preserves - Not Applicable
f. Determination of Cumulative Effects on the Aquatic Ecosystem.

The Segment B1 project is a component of the larger Green Brook Flood Damage Reduction Project. Other components comprising of levees, buyouts and floodwalls have been implemented throughout 3 miles west of the project area in the Borough of Bound Brook. The majority of the cumulative impacts have been through the temporary disturbance and permanent loss of freshwater wetlands. The Finderne Farms mitigation area is serving as mitigation for the impacts to wetlands.

g. Determination of Secondary Effects on the Aquatic Ecosystem.

No secondary effects on the aquatic ecosystem are expected from this project.

III. FINDINGS OF COMPLIANCE OR NON-COMPLIANCE WITH THE RESTRICTIONS ON DISCHARGE.

a. No significant adaptation of the Section 404(b)(1) guidelines was made relative to this evaluation.
b. The objective of protecting Middlesex Borough from catastrophic flood damages necessitates the implementation of the floodwalls and levees.
c. The proposed activity will not violate the Toxic Effluent Standards of Section 307 of the Clean Water Act.
d. The proposed disposal operations will not harm any Federal or state endangered species or its critical habitat under the Endangered Species Act of 1973.
e. The proposed discharge of fill material will not result in significant adverse effects on human health and welfare, including municipal and private water supplies, fish, wildlife, and special aquatic sites. The life stages of aquatic life and other wildlife will not be significantly affected. Significant adverse effects on aquatic ecosystem diversity, productivity and stability, and recreational, aesthetic and economic values are not expected to occur.
f. Appropriate steps to minimize potential adverse impacts of the discharge of fill material include the implementation of an erosion and sediment control plan and judicious engineering practices.

Appendix B

U.S. Fish and Wildlife Service Correspondence

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
Ecological Services
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609/646 9310
Fax: 609/646 0352
http://www.fws.gov/northeast/njfieldoffice

In Reply Refer to:

2010-CPA-0201

JUL 21 2010

Leonard Houston, Chief
Environmental Analysis Branch
U.S. Army Corps of Engineers, New York District
26 Federal Plaza
New York, New York 10278-0090

Dear Mr. Houston:

The U.S. Fish and Wildlife Service (Service) has reviewed project information for the U.S. Army Corps of Engineers, New York District's (Corps) *Green Brook Flood Damage Reduction Project: Segment B1 of the Green Brook Element (Project), Borough of Middlesex, Middlesex County and Township of Green Brook, Somerset County, New Jersey*. The Service provides this draft Fish and Wildlife Coordination Act (FWCA) (48 Stat. 401, as amended; 16 U.S.C. 661 *et seq.*) Section 2(b) report in accordance with our Fiscal Year-2010 Scope-of-Work agreement. Our report is based on plans and information provided by the Corps. This report has been coordinated with the New Jersey Division of Fish and Wildlife (NJDFW); a copy has been forwarded to the NJDFW for review and comments.

AUTHORITY

The following comments are provided pursuant to Section 2(b) of the FWCA. Comments are also provided under the authority of the Endangered Species Act of 1973 (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) and the Migratory Bird Treaty Act of 1918 (MBTA) (40 Stat. 775, as amended; 16 U.S.C. 703-712), and are consistent with the intent of the Service's Mitigation Policy (Federal Register, Vol. 46, No. 15, Jan. 23, 1981).

PROJECT DESCRIPTION

The Corps is engaged in a flood damage reduction project for the Green Brook sub-basin, which is located within the Raritan River Basin in north-central New Jersey in the counties of Middlesex, Somerset, and Union. The Green Brook Flood Damage Reduction Project includes approximately 14 miles of levees and floodwalls along Green Brook and its tributaries, and flood

proofing in the lower portion of the project area. Due to its size, the project is broken into Construction Elements, which are further divided into segments. Funds were received as part of the American Recovery and Reinvestment Act (Pub. L. 111-5) to initiate design and construction of a portion of Segment B of the Green Brook Element. The 11-acre Segment B1 (hereafter referred to as "the Project") involves raising the Sebrings Mills Road Bridge crossing the Green Brook, installing approximately 950 linear feet of earthen levee and approximately 1,950 linear feet of floodwall, including tie-off and a pump station. Following installation of the levee, floodwall, tie-off, pump station, and raised bridge, the banks of the river would be restored to provide habitats for wildlife and to aid in flood-water storage.

The Project is located in northwestern Middlesex County, immediately adjacent to Somerset County (Enclosures 1 & 2). Green Brook separates the two counties (Somerset and Middlesex), and the Project is located along the southern bank of Green Brook. The floodwall and levee will be located within the floodplain of Green Brook: the floodwall at the south of Green Brook, west of Sebrings Mills Road bridge and the levee at the south of Green Brook, east of Sebrings Mills Road bridge. The Project area and the Township of Green Brook are primarily commercial. Dense residential areas abut the Project site to the south in the Borough of Middlesex.

Project construction activities would include the use of large equipment such as hydraulic and mechanical cranes, hydraulic excavators, backhoe loaders, paving breakers, vibratory rollers, tandem powered scrapers, crawler tractors, and a variety of loading and dumping trucks (Enclosure 3). This equipment would aid the construction of the floodwall, levee, tie-off, pump station, nine outfall structures, right bank flood-proofing, and landscaping. For the levee, 4,398 cubic yards of material would be excavated and 33,960 cubic yards of fill would be placed. The levee will be constructed with a variable elevation from 51.5 NGVD at the upstream and 49.1 NGVD at the downstream end with an average footprint with of 110 linear feet. For the floodwall, 28,400 cubic yards of material would be excavated and 24,349 cubic yards of fill would be placed. The concrete T-Wall and concrete-capped sheet pile floodwall will be constructed with an average top elevation of 49.1 NGVD at the upstream end to an elevation 44.9 NGVD at the downstream end. A pump station, capable of pumping 100 cubic feet per second, is located at River Station 47, adjacent to Sebrings Mills Road. Nine outfall structures to convey the discharge from pre-existing gravity storm drainage systems and local drainage through the floodwall and levee system. These outfall structures will be equipped with check valves and manually operated sluice gate valves to prevent flood stage river water intrusion.

Only a small portion of the Project would involve flood-proofing. Parking lot floodwalls and building flood-proofing is proposed to protect homes and business on the north bank of Green Brook, opposite bank of proposed levee location, where there will be no continuous levee or floodwall system.

The Corps proposes to utilize off-site mitigation credits available from the Finderne Farm Wetland Mitigation Site (Finderne Site) to compensate for 4.38 acres of unavoidable permanent adverse impacts to forested wetland from levee and floodwall construction, including tie-off,

pump station, and regrading (Table 1). In addition, 0.88 acre of unavoidable permanent impact to wetland transition area cannot be compensated onsite due to space constraints. The Finderne Site is located at Finderne Farms in Bridgewater, Somerset County, New Jersey, approximately 5 miles from the Project. The Service provided a separate FWCA report to the Corps on September 12, 2006 regarding the proposed Finderne Site.

Table 1. Permanent and Temporary Impacts from the Green Brook Segment B1 Project, Borough of Middlesex, Middlesex County and Township of Green Brook, Somerset County, New Jersey.

	Wetland Impact Permanent	Wetland Impact Temporary	Transition Area Impact Permanent	Transition Area Impact Temporary	State Open Water Impact Permanent	State Open Water Impact Temporary
Levee	3.11	0.17	0.164	0.008		
Floodwall	1.23	0.213	0.58	0.025		
Regrading	0.036		0.14			
Bridge						0.02
Total Impact (acres)	**4.38**	**0.38**	**0.88**	**0.03**		**0.02**

Additionally, the Project includes on-site landscaping plans to compensated for 0.03 acre of temporary impacts to transition areas and 0.38 acre of temporary impacts to forested wetlands. The landscaping plans include replanting native trees in the forested wetland of the proposed levee and applying a seed mix in the forested wetland of the proposed floodwall.

The Service strongly prefers non-structural flood control measures such as floodplain acquisition and restoration, floodplain zoning restrictions, early flood warning systems, and flood-proofing of buildings to structural solutions.

METHODS

The draft report is based on review of information provided by the Corps, the Service's files and library, and field notes prepared by URS. The Service has coordinated this review with the New Jersey Department of Environmental Protection (NJDEP), including NJDFW. Further, we have searched our Geographic Information System (GIS) database for known locations of federally listed species, wetlands, and other important habitat types within or near the project area. We also searched for State-listed species and State priority species in the project area using available GIS database information.

NATURAL RESOURCES

Green Brook Sub-basin (Green Brook – Bound Brook) Water Quality

The Green Brook sub-basin of the Raritan River Basin is within Watershed Management Area 9 and drains an area of 65 square miles, entering the main stem of the Raritan River in Bound Brook at river mile 20.4 (Rutkosky 1990, 1992; Corps 1997). The NJDFW classifies the basin

waters by their ability to support species of trout (Salmonidae) (New Jersey Division of Fish and Wildlife 2004). Currently, all Green Brook sub-basin waters are classified as FW-2-Non-Trout (New Jersey Division of Fish and Wildlife 2004).

Water quality problems in Green Brook are likely related to a high percent urban land use (71%) of the surrounding watershed. In addition to urban impacts, the Green Brook received a sub-optimal habitat rating and lacks stream habitat diversity, as the site is comprised mainly of pool habitat (60%). Evidence of water quality impacts includes turbid water clarity, high conductivity, high fine sediment composition, and heavy periphyton growth. Heavy algal growth may have contributed to a depleted dissolved oxygen concentration at the time of sampling in August 2004. Erosion was evident on both banks, which can add to sediment load, sediment deposition, and the degree of embeddedness (BFBM 2006).

Wetlands

The Green Brook sub-basin is characterized as largely suburban and industrialized. Because of the highly developed nature of the Green Brook sub-basin, wildlife resources are limited except for palustrine forested/scrub-shrub wetland floodplain within the riparian corridor. The 11-acre Project site is dominated by forested/shrub-scrub within the Green Brook floodplain. Greenbrook Road and commercial development along U.S. Route 22 border the site to the north and west. Green Brook and some undeveloped floodplain exist to the east and west, and a residential area in Middlesex Borough borders the Project to the south. The width of undeveloped floodplain varies along the length of the Project area. Where residential properties abut Green Brook to the southwest, the understory has been cleared and manicured lawns are maintained.

The Project site is primarily wooded, and best described as a small, bottomland, floodplain hardwood forest, with tree species and canopy structure typical of periodic flooding and poorly drained soil. The majority of soils at the Project area are classified and mapped as Bowmansville silt loam series along the south bank. The easternmost portion of the Project area contains Fluvaquents (loamy) soil (URS 2010). Most of the wetlands (Wetlands 1-3, see Enclosure 4) in the Project area contain soils that are Bowmansville silt loam. Evidence of hydrology within wetlands includes water marks, drift lines, and sediment deposits. Sources of hydrology include groundwater, surface runoff and flooding.

<u>Wetland 1 (South of Green Brook, East of Sebrings Road) – Levee Area</u>

Wetland 1 area is located within the south bank floodplain of the Green Brook, generally encompassing the entire floodplain up to the high water mark (Enclosure 4). The general vegetation of the area varies from maintained lawns to scrub-shrub, over-grown vines, and matures trees (including healthy, stressed and dead specimens); other areas are ponded or un-vegetated area (URS 2010).

The dominant hydrophytic plant species in the wetland includes the following: pin oak (*Quercus palustris*), box elder (*Acer negundo*), silver maple (*Acer saccharinum*), red maple (*A. rubrum*), American elm (*Ulmus americana*), and green ash (*Fraxinus pennsylvanica*), along with scrub-

shrub and vine vegetation such as multiflora rose (*Rosa multiflora*), green briar (*Smilax rotundifolia*), poison ivy (*Toxicodendron radicans*), and Japanese honey suckle (*Lonicera japonica*) (URS 2010). Other species that were observed include shagbark hickory (*Carya ovata*), black locust (*Robina pseudoacacia*), American sycamore (*Platanus occidentalis*), swamp white oak (*Q. bicolor*), black cherry (*Prunus serotina*), and black walnut (*Juglans nigra*).

Wetland 2 (North of Green Brook, East of Sebrings Road)

This wetland area is located within the north bank floodplain on the opposite bank of Green Brook from Wetland 1 (described above) (Enclosure 4), between Green Brook and Green Brook Road. Dominant hydrophytic plant species includes the following: pin oak, box elder, silver maple, red maple, American elm, and green ash and along with multiflora rose, green briar, poison ivy, and Japanese honey suckle (URS 2010).

Wetland 3 (South of Green Brook, West of Sebrings Road) – Floodwall Area

This wetland area is located within the south bank floodplain of Green Brook (Enclosure 4). Generally, the floodplain is a flat topographic feature above Green Brook's primary bank, where it varies from very narrow with steep banks to wide and flat or gentle-sloping before a steeper slope at the high water mark. This wetland is similar to the other wetland areas, in that it contained a variety of vegetation including the following: scrub-shrub such as multiflora rose and Japanese honey suckle, small tree species including box elder, pin oak, and limited numbers of American sycamore and shagbark hickory.

Wetland 4 (North of Green Brook, West of Sebrings Road)

This quadrant of the project site contains a strip mall on the corner of Sebrings Road and Route 22 E (Enclosure 4). The area extending from the edge of pavement to the stream's edge was investigated. The investigation revealed that the entire area has recently undergone scouring followed by deposition of alluvial deposits after storm events. Near the western boundary of the project area and continuing beyond is a low topographic "bowl." Flood waters appear to have slowed and ponded in this area. Most of the vegetation closest to the parking lot and back building appear to have been cleared in recent years. Mature trees near the brook have remained intact.

Within the bowl area saplings such as black locust, red maple, and silver maple were found along with red-oiser dogwood (*Cornus stolonifera*), black cherry, multiflora rose, Virginia spring beauty (*Claytonia virginica*), wormwood (*Artemisia biennis*), wood sorrel (*Oxalis acetosella*), and wild onion (*Allium ascalonicum*). Closer to the stream, mature trees of several species such as pin oak, American elm, silver maple, and red maple dominate the vegetation. In this area, there are also some shrub and understory species such as multiflora rose, black locust, and tartarian honeysuckle (*Lonicera tartarica*), along with troutlily (*Erythronium americanum*) and other herbaceous vegetation.

Of the vegetation species found within Project area, the Service has identified at least three plant species that are invasive: multiflora rose, Japanese honey suckle, and common reed. Control of these invasive exotic plants is recommended, as discussed below.

Environmental Contaminants

The Corps' Hazardous Toxic Radioactive Waste (HTRW) investigation did not yield any concern, given that it is a residential area. The property where the levee is being constructed is owned by New Jersey-American Water and had several wells located on it. These wells were decommissioned and sealed years ago. At this time, the HTRW report is not completed and the Service requests a copy prior to providing the final FWCA report.

Federally Listed Species

Indiana bat

The project site is located within the geographic range of the Indiana bat (*Myotis sodalis*), which is federally listed as endangered pursuant to the ESA. Indiana bats hibernate in caves and abandoned mine shafts from October through April. Between April and August, Indiana bats inhabit floodplain, riparian, and upland forests, roosting under loose tree bark during the day, and foraging for flying insects in and around the tree canopy at night. During these summer months, numerous females roost together in maternity colonies. Maternity colonies use multiple roost in both living and dead trees. From late August to mid-November, Indiana bats congregate in the vicinity of their hibernacula, building up fat reserves for hibernation (Harvey 1992). Protection of Indiana bats during all phases of their annual life cycle is essential to the long term conservation of this species. Threats to the Indiana bat include disturbance or killing of hibernating and maternity colonies; vandalism and improper gating of hibernacula; fragmentation, degradation, and destruction of forested summer habitats; and use of pesticides and other environmental contaminants. More recently, white-nosed syndrome has affected Indiana bats, as well as several other bat species.

The Service previously identified the Project area as potential habitat for Indiana bat. On May 3, 2010, the Corps submitted Indiana bat survey work plan for our review and approval. On May 6, 2010, the Service approved the work plan. The Corps contracted with Tetra Tech, Inc. (Tetra Tech) in association with Bat Conservation and Management Inc. (BCM), to perform an Indiana bat survey within Wetland 1 of the Project area. On June 2 and 3, 2010, staff from Tetra Tech and BCM conducted surveys for Indiana bats within Wetland 1. On June 16, 2010, the Service received Indiana bat survey report (Corps 2010).

The Indiana bat survey reported that a total of six (6) individual bats comprising two species were captured throughout the survey in Wetland 1 area. Five big brown bats (*Eptesicus fuscus*) were captured. The one other species captured was the little brown myotis (*Myotis lucifugus*). The little brown myotis was banded per the New Jersey State Scientific Collecting Permit Special Condition #7.

Because Indiana bats were not found to occur on the project site, tree clearing may proceed with no seasonal restriction if tree clearing is completed within a 2-year period.

Except for the Indiana bat, no other federally listed or proposed endangered or threatened flora or fauna under Service jurisdiction are known to occur within the vicinity of the project area. If Indiana bats or any other federally listed species or their habitats are documented in the project area during project planning or implementation, the Corps must reinitiate consultation under Section 7 of the ESA. Current information regarding federally listed and candidate species occurring in New Jersey is enclosed (Enclosure 5).

State-listed Species

The New Jersey's Landscape Project mapping identifies the Project area within State-listed (threatened) bald eagle (*Haliaeetus leucocephalus*) foraging habitat. The NJDEP has determined that the Project area is not a suitable foraging area for bald eagle.

Coordination with the NJDFW Endangered and Nongame Species Program and New Jersey Division of Parks and Forestry (NJDPF) Natural Heritage Program is ongoing to determine if any additional State-listed wildlife or plants are known to occur in the Project area. A list of State endangered and threatened wildlife species is enclosed (Enclosure 6).

Fish

The Project area within Green Brook is classified as a non-trout production and non-trout maintenance river by the NJDFW, but the river supports other freshwater fish species. During early 2000, the NJDEP's Bureau of Freshwater and Biological Monitoring (BFBM) began monitoring Green Brook with a fish index of biotic integrity (FIBI). A FIBI assesses the health of a stream based on multiple attributes of the resident fish assemblage. Each site sampled is scored based on its deviation from reference conditions (*i.e.*, what would be found in an unimpacted stream) and classified as "poor," "fair," "good," or "excellent." In addition, habitat is evaluated at each site and classified as "poor," "marginal," suboptimal," or "optimal" (BFBM 2006). During the summer of 2004, BFBM conducted FIBI at Green Brook (091) and identified a total of 16 fish species (n = 604) with order of abundance: spottail shiner (*Notropis hudsonius*) (n = 223), American eel (*Anguilla rostrata*) (n = 155), tessellated darter (*Etheostoma olmstedi*) (n = 82), white sucker (*Catostomus commersoni*) (n = 62), longnose dace (*Rhinichthys cataractae*) (n = 21), redbreast sunfish (*Lepomis auritus*) (n = 21), and fallfish (*Semotilus corporalis*) (n = 16) (BFBM 2006). The FIBI score was 36 out of 50, which is classified as "fair," and the habitat assessment score was 152 out of 200, classified as sub-optimal.

The overall fish abundance and species richness were high, but the species diversity was relatively low. The fish community lacked native species, which may be a result of habitat and water quality degradation. The high fine sediment load in the stream may be impacting the local fish community, as lithophilic spawning species are susceptible to siltation (BFBM 2006).

Mammals

The floodplain of the project area supports habitat for small mammals. Wildlife species that may be found in the Project area are those tolerant of urban to suburban land uses. Eastern chipmunk (*Tamias striatus*), eastern cottontail (*Sylvilagus floridanus*), gray squirrel (*Sciurus carolinensis*), meadow vole (*Microtus pennsylvanicus*), muskrat (*Ondatra zibehicus*), raccoon (*Procyon lotor*), red fox (*Vulpes vulpes*), striped skunk (*Mephitis mephitis*), Virginia opossum (*Didelphia virginiana*), woodchuck (*Marmota monax*), and white-tailed deer (*Odocoileus virginianus*) are likely to occur in the Project area.

Migratory Birds

Common bird species in the Project area include American robin (*Turdus migratorius*), European starling (*Sturnus vulgaris*), northern Cardinal (*Cardinalis cardinalis*), tufted titmouse (*Baeolophus bicolor*), gray catbird (*Dumetella carolinensis*), and American crow (*Corvus brachyrhynchos*).

Migratory birds are a Federal trust resource responsibility of the Service pursuant to the MBTA. Many species of migratory birds have experienced population declines in recent decades, largely due to direct and indirect destruction and fragmentation of their habitats (Dunne 1989).

The MBTA prohibits taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the Department of the Interior. Unlike the ESA, neither the MBTA nor its implementing regulations at 50 CFR Part 21 provide for permitting of "incidental take" of migratory birds. According to the *New Jersey Division of Fish and Wildlife Guidance Manual for the Protection of Fish and Wildlife Resources* dated June 2006, the appropriate timing restriction to protect nesting migratory birds from tree to shrub-scrub removal is March 15 to July 31.

SELECTED ALTERNATIVES

Of all alternatives studied in detail, the selected Plan E provides the least adverse impacts to the environment. With this Plan there is no upstream detention, which would be detrimental to wildlife habitat. Plan E provides protection to the Lower Basin which experiences the worst flood damages when considered on an average annual basis. Plan E, however, would have the least detrimental impact to environmental quality of the structural plans.

PROPOSED MITIGATION

As described in the mitigation plans, the Green Brook Flood Damage Reduction Project will utilize on-site and off-site mitigation for impacts to intermediate resource value, forested freshwater wetlands, and transition areas. Mitigation is proposed on-site within the Project area, but due to space limitations, additional mitigation off-site will be necessary. Removal of debris and eradication of invasive exotic plants is recommended on-site.

Temporary impacts to transition areas and forested wetland areas are mainly associated with temporary access areas. Temporary impacts are proposed to be mitigated on-site through landscape restoration plans that involve both seeding and planting native shrubs and trees along the levee alignment. The Project includes on-site landscaping to mitigate for 0.38 acres of temporary impacts to forested wetland and 0.03 acres of temporary impacts to transition areas. The Service recommends monitoring bank erosion and for survival of planted vegetation on-site for 5 years. Contingency plans are also recommended to provide corrective actions if necessary.

Off-site wetland and habitat mitigation are required for the Green Brook Flood Damage Reduction Project due to permanent impacts resulting from construction of levees and floodwalls, including the tie-off and levee pump station. Consistent with the Service's Mitigation Policy, compensatory mitigation, through creation of wetlands or restoration of existing wetlands, is recommended when minimization and avoidance of impacts are exhausted as alternatives.

The Corps' mitigation plans would implement the 2:1 mitigation ratio per the NJDEP Freshwater Wetlands Protection Act Rules (N.J.A.C. 7:&A-15.8). Specifically, the Corps plans to mitigate for unavoidable permanent adverse impacts to 3.11 acres of forested wetlands from the levee structure, 1.23 acres of forested wetlands from the floodwall structure, and 0.04 acres of forested wetlands from regrading (a total of 4.38 acres).

The forested wetlands at Finderne Site are generated through a combination of creation at a 2:1 ratio and enhancement at a 3:1 ratio. For this Project, the 4.38 acres of permanent wetland impacts were broken down to fit within the enhancement and creation ratio credits:

- 3.7 acres of the 4.38 will utilize creation at a 2:1 ratio = 7.40 acres
- 0.68 acres of the 4.38 acres will utilize enhancement at a 3:1 ratio = 2.04 acres

The Service is generally in agreement with the mitigation plan.

SERVICE RECOMMENDATIONS

1. Eradicate or control exotic, invasive species on the Green Brook flood plain, as project activities may introduce and/or facilitate the spread of invasive vegetation. The Corps should coordinate with NJDEP to ensure that regular surveys are conducted to identify and remove any undesirable plants (*e.g.*, multiflora rose, Japanese honeysuckle, and common reed) beginning to re-colonize during or after Project construction activities. A variety of measures exist for removing undesirable species. For sites with few invasive plants, physical removal may be least expensive method if the entire plant (including root system) can be extracted and if there are sufficient number of personnel to carry out the task. In cases where undesirable species have gained a substantial foothold, a glyphoshate-based herbicide engineered for wetland sites, such as *Rodeo* or *Gly-Pro*, is appropriate. Either of the above techniques would be effective at the Project sites.

2. Provide documentation of the applicability of and adherence to the Corps' HTRW Guidance for Civil Works Projects as part of the Project plan.

3. Continue to coordinate with the NJDFW's Endangered and Nongame Species program for current information regarding State-listed wildlife species in the Project area.

4. Continue to coordinate with the NJDPF's Natural Heritage Program for current information regarding State-listed plant species in the Project area.

5. Conform to a standard State seasonal restriction and best management practices on in-stream work between April 1 and June 30 to protect aquatic resources, including anadromous fish.

6. Implement tree and shrub removal seasonal restriction from March 15 to July 31 to ensure compliance with MBTA.

7. Remove trash, abandoned materials, or other human-generated debris as part of the clearing process.

8. Remove the introduced species, meadow foxtail (*Alopecurus pratensis*), from the floodplain mix for the landscape seeding plan for the mitigation project.

9. Conduct monitoring for potential bank erosion during earthwork activities and post-project for 5 years.

10. Monitor the survival of vegetation planted in the on-site mitigation/restoration areas for 5 years and take corrective actions if vegetation does not develop as expected.

11. Specific recommendations for the Fiderne Farm Mitigation Site have been provided to the Corps in our FWCA report dated September 12, 2006. Please use the FWCA report as a reference.

CONCLUDING REMARKS

The Service recognizes the need to reduce temporary flooding along the Raritan River that may occur during the interim build-out period of the Green Brook Flood Control Project. The Service recommends that the Corps continue to coordinate with the non-Federal sponsor, landowners, and other interested stakeholders to implement the recommendations provided above.

The Service appreciates the opportunity to comment on the proposed plan and is pleased to submit this draft FWCA Section 2(b) report as technical input to the *Green Brook Flood Control Project: B1 Segment*. Should you have any questions, please contact Ron Popowski at Ron_Popowski@fws.gov.

Sincerely,

J. Eric Davis Jr.
Supervisor

REFERENCES

Literature Cited

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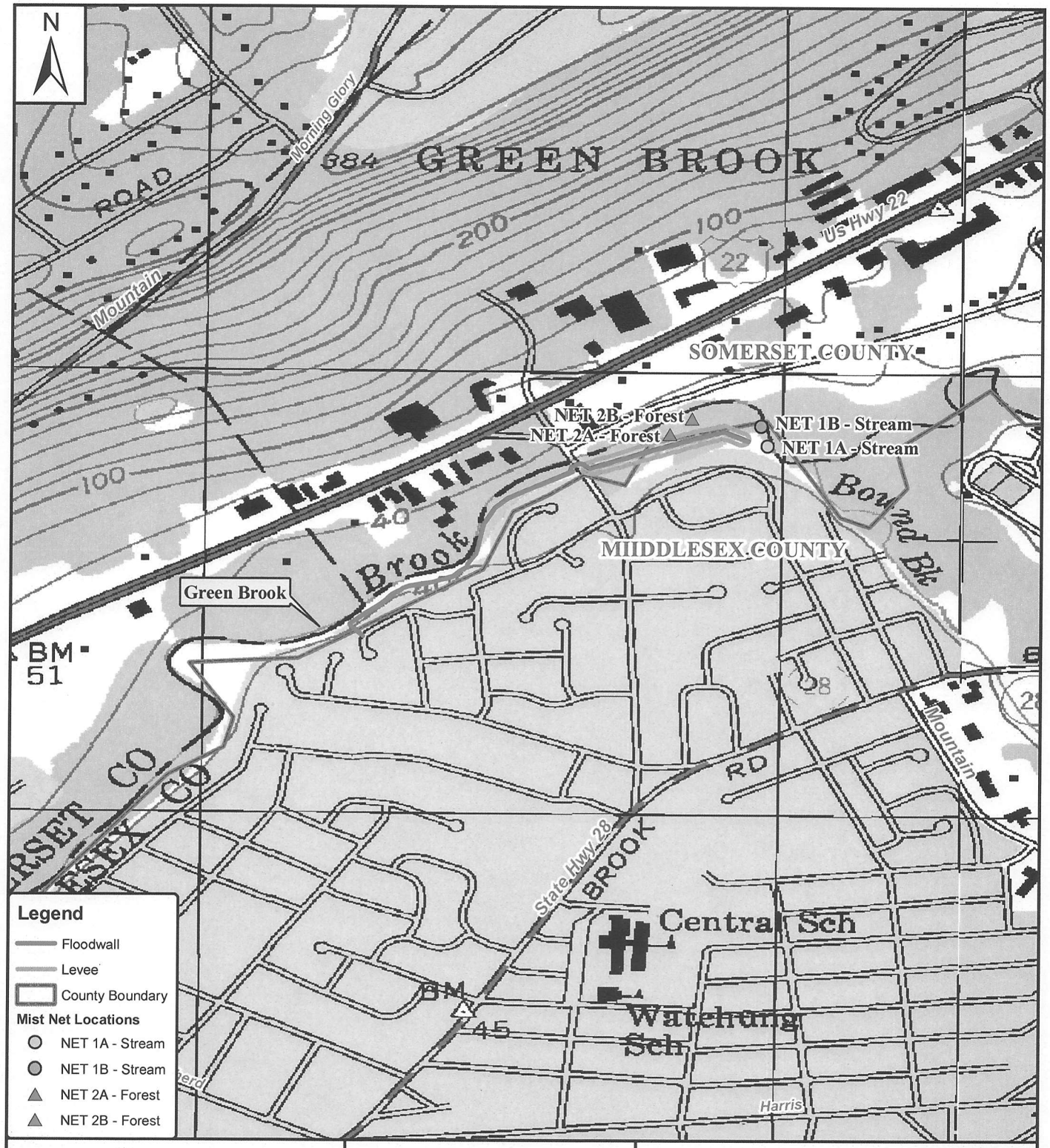

Source: USGS 7.5' Topographic Digital Raster Graphic (DRG) Downloaded from: http://data.geocomm.com/ April 2010. DRG used: Bound Brook, New Jersey 1970. Net location data, Tetra Tech April 2010. Floodwall and levee data provided by USACE March 2010.

Figure 1. Survey Location for Indiana Bat Survey, Green Brook Flood Damage Reduction Project, Middlesex County, New Jersey.

Prepared By: US Army Corps of Engineers® New York District

Date: 4/10

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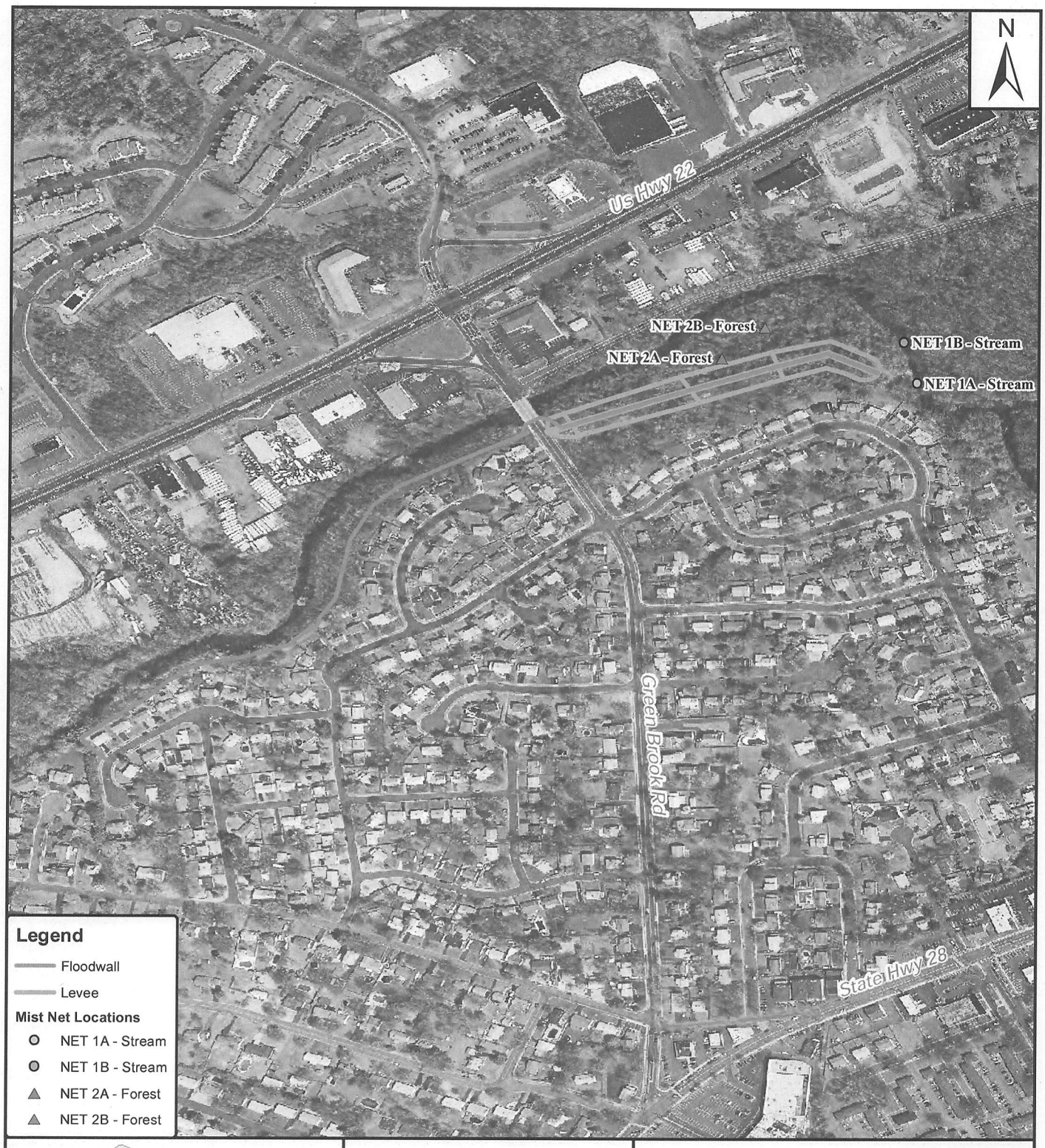

Source: NJ Office of Information Technology (NJOIT), Office of Geographic Information Systems (OGIS) 2008. Net location data, Tetra Tech April 2010. Floodwall and levee data provided by USACE March 2010.

Figure 2. Mist Net Locations for Indiana Bat Survey, Green Brook Construction Element, Segment B1, Green Brook Flood Damage Reduction Project, Middlesex County, New Jersey.

Prepared By: US Army Corps of Engineers® New York District

Date: 4/10

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List of Equipment used to construct levee, floodwall, pump station and landscaping activities. Green Brook Flood Damage Reduction Project, Middlesex and Somerset County, New Jersey.

Equipment Description

AIR COMPRESSOR, 250 CFM (7 CMM), 100 PSI (689 KPA)
AIR HOSE, 1.5" (38 MM) DIA x 100' (31 M) LENGTH, HARDROCK (USE AS DRILLING ACCESSORY)
ASPHALT DISTRIBUTOR, 3,000 GAL (11,355 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)
ASPHALT FINISHER, 10' WIDE SCREED, WHEEL, W/19' 6" SCREED EXTENSION, 215 CF HOPPER
BUCKET, CONCRETE, GENERAL PURPOSE, 1.0 CY (0.8 M3)
BUCKET, DRAGLINE, 0.8 CY (0.6 M3) MEDIUM WEIGHT
CHAINSAW, 16" - 24" (406-610 MM) BAR
CONCRETE FINISHER, ROTO TROWEL, 46" (1,168 MM) DIA, 4 BLADE
CONCRETE MIXER, PLASTER/MORTAR, 12 CF (0.3 M3), W/TRAILER
CONCRETE PUMP, 117 CY/HR, 75' BOOM, TRUCK MTD
CONCRETE SAW, 13" (330 MM) DEPTH, SELF PROPELLED
CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR
CRANE, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 20 TON (18 MT), 70' (21.3 M) BOOM, 4X4
CRANE, MECHANICAL, LATTICE BOOM, CRAWLER, DRAGLINE/CLAMSHELL, 0.75 CY (0.6 M3), 25 TON (23 MT), 100' (30.5 M) BOOM
CRANE, MECHANICAL, LATTICE BOOM, TRUCK MOUNTED, 125 TON (113 MT), 240' (73.2 M) BOOM
CRANES, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 30 TON, 95' BOOM, 4X4
CRANES, HYDRAULIC, SELF-PROPELLED, YARD, 10 TON, 30' BOOM, 4X4, NON-ROTATING OPERATOR'S CAB

CRANES, HYDRAULIC, TRUCK MTD, 70 TON, 115' BOOM, 8X4
CRANES, HYDRAULIC, TRUCK MTD, ALL TERRAIN, 25 TON, 94' BOOM, 6X4X2
DUMP TRUCK, HIGHWAY, 10 - 13 CY (7.6 - 9.9 M3) DUMP BODY, 35,000 LBS (15,900 KG) GVW, 2 AXLE, 4X2
DUMP TRUCK, HIGHWAY, 16 - 20 CY (12.2 - 15.3 M3) DUMP BODY, 75,000 LBS (34,000 KG) GVW, 2 AXLE, 6X4
GRADER, MOTOR, ARTICULATED, 135 HP (101 KW), 12' (3.6 M) BLADE WIDTH

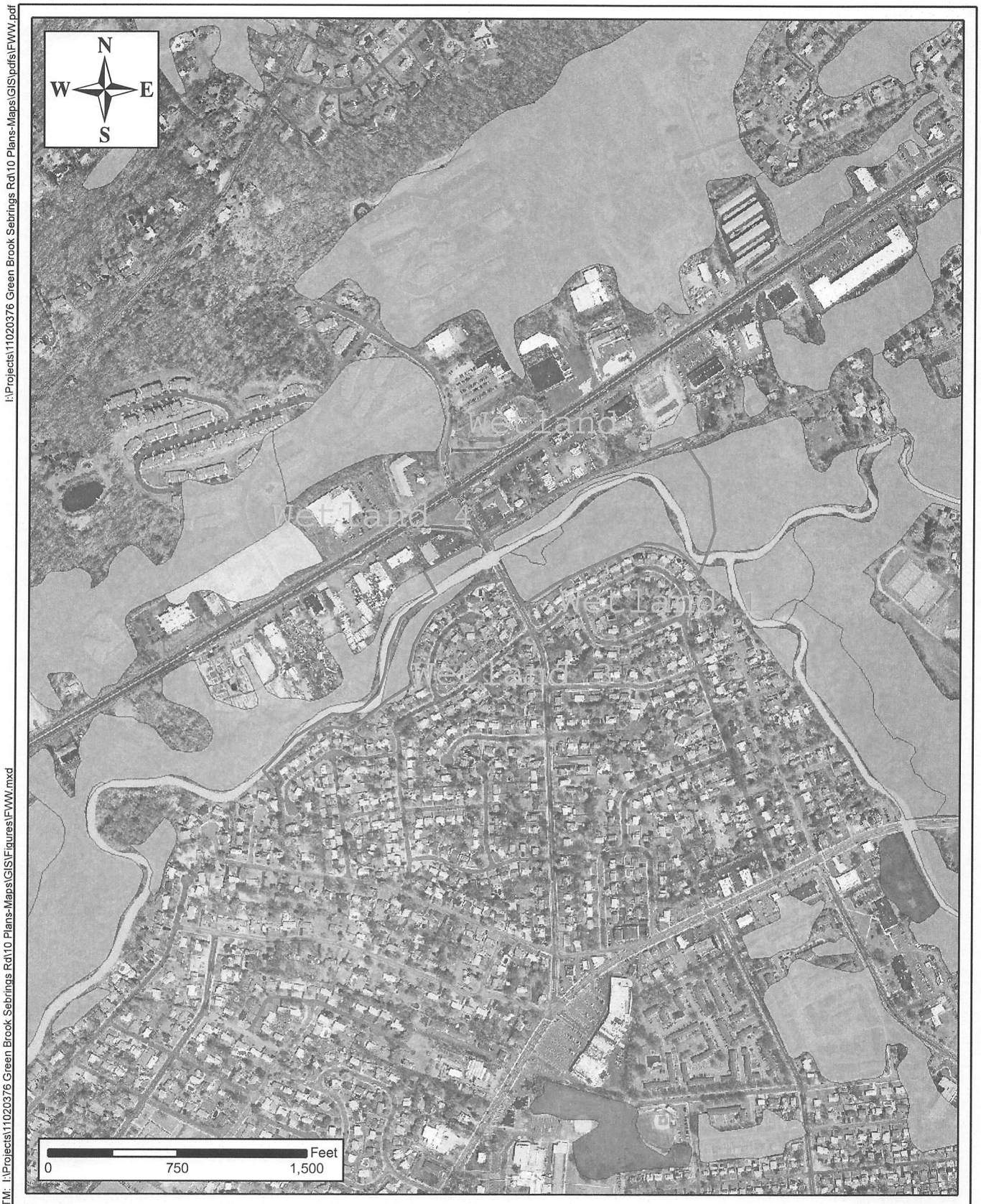
GRADER, MOTOR, ARTICULATED, 6X4, 12' BLADE W/17 TEETH SCARIFIERS
HYDRAULIC EXCAVATOR, CRAWLER, 24,640 LBS, 0.60 CY BUCKET, 16.50' MAX DIGGING DEPTH
LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4
LOADER, FRONT END, CRAWLER, 1.30 CY BUCKET
LOADER, FRONT END, WHEEL, SKID-STEER, 14.3 CF, 60" BUCKET
LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)
LOADER/BACKHOE, WHEEL, 0.80 CY (0.6 M3) FRONT END BUCKET, 9.8' (3.0 M) DEPTH OF HOE, 24" (0.61 M) DIPPER, 4X4
LOADER/BACKHOE, WHEEL, 1.25 CY (0.9 M3) FRONT END BUCKET, 12.0' (3.7 M) DEPTH OF HOE, 24" (0.61 M) DIPPER, (0.2 M3), 4X2 11.06
PAVING BREAKER, 66 LB (30 KG) (ADD 100 CFM (2.8 CMM) COMPRESSOR)
PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 2" (50 MM) DIA X 50' (15 M) WITH COUPLING (PER SECTION)
PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 2" (51 MM) DIA x 20' (6.1 M) LENGTH, W/COUPLING/SECTION
PUMP, WATER, DIAPHRAGM, SKID MTD, ENGINE DRIVE, 2" (51 MM) DIA, 2,000 GPH (7,571 LPH) @ 25' (7.6 M) HEAD (ADD HOSES)

RIPPER, 3-SHANKS & BEAM, HYDRAULIC (ADD TO 341-440 HP (254-328 KW) DOZER & COST FOR POINT WEAR)
RIPPER, SHANK, EACH (ADD TO 340-440 HP (254-328 KW) DOZER & COST FOR POINT WEAR)
ROLLER, STATIC, SELF-PROPELLED, PNEUMATIC, 14.25 TON, 68" WIDE, 9 TIRE, ASPHALT COMPACTOR
ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 2.9 TON, 47.2" WIDE, 2X1, ASPHALT COMPACTOR
ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 7.8 TON, 66.1" WIDE, 2X1, ASPHALT COMPACTOR
ROLLER, VIBRATORY, TOWED, SINGLE DRUM, SHEEPSFOOT, 25.5 TON, 72" WIDE (ADD 180 HP TOWING UNIT)
SCRAPER, TANDEM POWERED, STANDARD LOADING, 21 CY, 24 TON, 4X4, D-9 ASSISTED LOADING
SCRAPER, TANDEM POWERED, STANDARD LOADING, 34 CY, 37.5 TON, 4X4, D-10 ASSISTED LOADING
SCRAPER, TOWED, 12-18 CY (9-14 M3), 18 TON (16.3 MT) (ADD 285 HP (213 KW) TRACTOR)
TRACTOR, CRAWLER (DOZER), 240 HP, LOW GROUND PRESSURE, W/7.70 CY STRAIGHT BLADE
TRACTOR, CRAWLER (DOZER), 300-340 HP (224-254 KW), POWERSHIFT, W/UNIVERSAL BLADE
TRACTOR, CRAWLER (DOZER), 310 HP, POWERSHIFT, W/15.3 CY SEMI-U BLADE
TRACTOR, CRAWLER (DOZER), 341-440 HP (254-328 KW), POWERSHIFT, W/UNIVERSAL BLADE

TRUCK OPTION, DUMP BODY, REAR, 10.0 CY (7.7 M3) (ADD 35,000 LB (15,876 KG) GVW TRUCK)
TRUCK OPTION, DUMP BODY, REAR, 12 CY (9.2 M3) (ADD 45,000 LB (20,412 KG) GVW TRUCK)
TRUCK OPTION, FLATBED, 8' (2.4 M) x 20' (6.1 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)
TRUCK OPTION, FLATBED, 8' (2.4M) x 12' (3.7 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)
TRUCK, HIGHWAY, 20,000 LBS (9,000 KG) GVW, 2 AXLE, 4X2 WITH FLATBED

TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)
TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)
TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)
TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)

Enclosure 4



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Legend

- River
- Deciduous Wooded Wetland
- Deciduous Scrub/Shrub Wetland
- Herbaceous Wetland
- Managed Wetland
- Project Location

NJDEP Freshwater Wetland Map
Green Brook Flood Control Project
Greenbrook and Middlesex, New Jersey

Map Source:
Aerial Photo: New Jersey 2007 High Resolution Orthophotography, NJ Image Warehouse
Wetlands Data: NJDEP Wetlands of Middlesex and Somerset Counties, New Jersey 1986

URS
Wayne, New Jersey

Figure 4

FEDERALLY LISTED AND CANDIDATE SPECIES IN NEW JERSEY

	COMMON NAME	SCIENTIFIC NAME	STATUS
FISHES	Shortnose sturgeon*	*Acipenser brevirostrum*	E
REPTILES	Bog turtle	*Clemmys muhlenbergii*	T
	Loggerhead sea turtle*	*Caretta caretta*	T
BIRDS	Piping plover	*Charadrius melodus*	T
	Red knot	*Calidris canutus rufa*	C
	Roseate tern	*Sterna dougallii dougallii*	E
	Red-cockaded woodpecker	*Picoides borealis*	E+
MAMMALS	Eastern cougar	*Puma concolor couguar*	E+
	Indiana bat	*Myotis sodalis*	E
	Gray wolf	*Canis lupus*	E+
	Delmarva fox squirrel	*Sciurus niger cinereus*	E+
INVERTEBRATES	Dwarf wedgemussel	*Alasmidonta heterodon*	E
	Northeastern beach tiger beetle	*Cicindela dorsalis dorsalis*	T
	Karner blue butterfly	*Lycaeides melissa samuelis*	E+
	Mitchell's satyr butterfly	*Neonympha m. mitchellii*	E+
	American burying beetle	*Nicrophorus americanus*	E+
PLANTS	Small whorled pogonia	*Isotria medeoloides*	T
	Swamp pink	*Helonias bullata*	T
	Bog asphodel	*Narthecium americanum*	C
	Knieskern's beaked-rush	*Rhynchospora knieskernii*	T
	Hirsts' panic grass	*Dichanthelium hirstii*	C
	American chaffseed	*Schwalbea americana*	E
	Sensitive joint-vetch	*Aeschynomene virginica*	T
	Seabeach amaranth	*Amaranthus pumilus*	T

STATUS:		
E	Endangered Species	Any species that is in danger of extinction throughout all or a significant portion of its range
T	Threatened Species	Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range
C	Candidate Species	Species that appear to warrant listing. Although these species receive no substantive or procedural protection under the Endangered Species Act, Federal agencies and other planners are encouraged to consider these species in environmental planning.
*	Except for sea turtle nesting habitat, principal responsibility for these species is vested with the National Marine Fisheries Service	
+	Presumed extirpated from New Jersey	

Note: For a complete listing of Endangered and Threatened Wildlife and Plants, refer to 50 CFR 17.11 and 17.12. For complete listings of taxa under review as candidate species, refer to Federal Register Vol. 72, No. 234, December 6, 2007 (Endangered and Threatened Wildlife and Plants; Review of Native Species that are Candidates or Proposed for Listing as Endangered or Threatened).

For further information, please visit our website at:
http://www.fws.gov/northeast/njfieldoffice/Endangered/

or contact:

U.S. Fish and Wildlife Service
New Jersey Field Office
927 N. Main Street, Building D
Pleasantville, New Jersey 08232
Phone: (609) 646-9310
Fax: (609) 646-0352

Revised 04/02/2008

Conserve Wildlife

New Jersey Department of Environmental Protection
Division of Fish & Wildlife
Endangered & Nongame Species Program

New Jersey's Endangered and Threatened Wildlife

Endangered Species are those whose prospects for survival in New Jersey are in immediate danger because of a loss or change in habitat, over-exploitation, predation, competition, disease, disturbance or contamination. Assistance is needed to prevent future extinction in New Jersey.

Threatened Species are those who may become endangered if conditions surrounding them begin to or continue to deteriorate.

There are other classifications for wildlife as well, including Stable, Species of Special Concern Special Concern and Undertermined.

Species names in the below tables link to PDF documents containing identification, habitat and status and conservation information. Additionally, in 2003 twelve species were highlighted as part of the celebration of the 30th anniversary of the NJ Endangered Species Conservation Act. See the "2003 Species of the Month" page for more information.

BIRDS			
Endangered		**Threatened**	
Bittern, American	*Botaurus lentiginosos* BR	Bobolink	*Dolichonyx oryzivorus* BR
Eagle, bald	*Haliaeetus leucocephalus* BR **	Eagle, bald	*Haliaeetus leucocephalus* NB **
Falcon, peregrine	*Falco peregrinus*	Hawk, Cooper's	*Accipiter cooperii*
Goshawk, northern	*Accipiter gentilis* BR	Hawk, red-shouldered	*Buteo lineatus* NB
Grebe, pied-billed	*Podilymbus podiceps*	Night-heron, black-crowned	*Nycticorax nycticorax* BR
Harrier, northern	*Circus cyaneus* BR	Night-heron, yellow-crowned	*Nyctanassa violaceus*
Hawk, red-shouldered	*Buteo lineatus* BR	Knot, red	*Calidris canutus* BR
Owl, short-eared	*Asio flammeus* BR	Osprey	*Pandion haliaetus* BR
Plover, piping	*Charadrius melodus***	Owl, barred	*Strix varia*
Sandpiper, upland	*Batramia longicauda*	Owl, long-eared	*Asio otus*
Shrike, loggerhead	*Lanius ludovicianus*	Rail, black	*Laterallus jamaicensis*
Skimmer, black	*Rynchops niger* BR	Skimmer, black	*Rynchops niger* NB
Sparrow, Henslow's	*Ammodramus henslowii*	Sparrow, grasshopper	*Ammodramus savannarum* BR
Sparrow, vesper	*Pooecetes gramineus* BR	Sparrow, Savannah	*Passerculus sandwichensis* BR
Tern, least	*Sterna antillarum*	Sparrow, vesper	*Pooecetes gramineus* NB
Tern, roseate	*Sterna dougallii***	Woodpecker, red-headed	*Melanerpes erythrocephalus*
Wren, sedge	*Cistothorus platensis*		
**Federally endangered or threatened			
BR - Breeding population only; NB - non-breeding population only			

REPTILES			
Endangered		**Threatened**	
Rattlesnake, timber	*Crotalus h. horridus*	Snake, northern pine	*Pituophis m. melanoleucus*
Snake, corn	*Elaphe g. guttata*	Turtle, Atlantic green	*Chelonia mydas***
Snake, queen	*Regina septemvittata*	Turtle, wood	*Clemmys insculpta*
Turtle, bog	*Clemmys muhlenbergii***		
Atlantic hawksbill	*Eretmochelys imbricata***		
Atlantic leatherback	*Dermochelys coriacea***		
Atlantic loggerhead	*Caretta caretta***		
Atlantic Ridley	*Lepidochelys kempi***		
**Federally endangered or threatened			

AMPHIBIANS			
Endangered		**Threatened**	
Salamander, blue-spotted	*Ambystoma laterale*	Salamander, eastern mud	*Pseudotriton montanus*
Salamander, eastern tiger	*Ambystoma tigrinum*	Salamander, long-tailed	*Eurycea longicauda*
Treefrog, southern gray	*Hyla chrysocelis*	Treefrog, pine barrens	*Hyla andersonii*

INVERTEBRATES			
Endangered		**Threatened**	
Beetle, American burying	*Nicrophorus mericanus***	Elfin, frosted (butterfly)	*Callophrys irus*
Beetle, northeastern beach tiger	*Cincindela d. dorsalis***	Floater, triangle (mussel)	*Alasmidonta undulata*
Copper, bronze	*Lycaena hyllus*	Fritillary, silver-bordered (butterfly)	*Bolaria selene myrina*
Floater, brook (mussel)	*Alasmidonta varicosa*	Lampmussel, eastern (mussel)	*Lampsilis radiata*
Floater, green (mussel)	*Lasmigona subviridis*	Lampmussel, yellow (mussel)	*Lampsilis cariosa*
Satyr, Mitchell's (butterfly)	*Neonympha m. mitchellii***	Mucket, tidewater (mussel)	*Leptodea ochracea*
Skipper, arogos (butterfly)	*Atrytone arogos arogos*	Pondmussel, eastern (mussel)	*Ligumia nasuta*
Skipper, Appalachian grizzled (butterfly)	*Pyrgus wyandot*	White, checkered (butterfly)	*Pontia protodice*
Wedgemussel, dwarf	*Alasmidonta heterodon***		
**Federally endangered or threatened			

MAMMALS	
Endangered	
Bat, Indiana	*Myotis sodalis***
Bobcat	*Lynx rufus*
Whale, black right	*Balaena glacialis***
Whale, blue	*Balaenoptera musculus***
Whale, fin	*Balaenoptera physalus***
Whale, humpback	*Megaptera novaeangliae***
Whale, sei	*Balaenoptera borealis***
Whale,sperm	*Physeter macrocephalus***
Woodrat, Allegheny	*Neotoma floridana magister*
**Federally Endangered	

FISH	
Endangered	
Sturgeon, shortnose	*Acipenser brevirostrum***
**Federally Endangered	

List updated 3/11/04

DEPARTMENT OF THE ARMY
NEW YORK DISTRICT, CORPS OF ENGINEERS
JACOB K. JAVITS FEDERAL BUILDING
NEW YORK, N.Y. 10278-0090
August 18, 2010

REPLY TO
ATTENTION OF
Environmental Analysis Branch

Mr. J. Eric Davis Jr.
Field Supervisor
U.S. Fish and Wildlife Service
New Jersey Field Office
927 N. Main St.
Building D
Pleasantville, NJ 08232

Dear Mr. Davis:

This letter serves as a response to your 21 July 2010 Draft Fish and Wildlife Coordination Act Report (FWCAR) (Enclosure 1) for the proposed Sebrings Mills project as part of the Green Brook Flood Control Project Middlesex Borough, Middlesex County, New Jersey.

The following are responses to your recommendations:

1) Recommendation 1, *Eradicate or control exotic, invasive species on the Green Brook flood plain.*

   The Corps will implement invasive species management as needed to ensure the success of the on-site mitigation during construction. Once completed, the non-federal sponsor is responsible for the operations and maintenance of the flood damage reduction structures, including mitigation sites. A component of the maintenance will include general vegetation management within 15 feet from the toe and the levee in order to comply with the Corps Engineering Technical Letter 1110-2-571 *Guidelines for Landscape Planting and Vegetation Management at Levees, Floodwalls, Embankment Dams and Appurtenant Structures.*

   Any invasive species management will be conducted in compliance with New Jersey state regulations and will utilize the most appropriate and effective measures. To assist the non-federal sponsor in their maintenance obligations, language can be placed in the Operations and Maintenance Manual detailing the types of management measures specific to the invasive species found on site and permits that may potentially be obtained.

2) Recommendation 2, *Provide documentation of the applicability of and adherence to the Corps' HTRW Guidance for Civil Works Projects as part of the Project plan.*

Investigations conducted by the Corps indicate that underground storage tanks (UST) containing heating oil are located within 300 feet of the Project area, however none were leaking.

Additionally, the proposed levee is located on property owned by the New Jersey American Water Company. A 1994 HTRW report completed as part of the Green Brook Flood Control Project Feasibility Study discussed that a supply well located on this property, designated the Sebrings Mill Well No. 6 (Well #6), is contaminated with the volatile organic compounds trichloroethylene and perchloroethylene (Enclosure 2).

A subsequent report prepared by the Corps in 1996 documented that the well underwent an unspecified level of air stripping (Enclosure 3). Further, the Corps has verified with the New Jersey American Water Company that the wells were decommissioned and sealed with concrete. Based on the New Jersey Department of Environmental Protection (NJDEP), Well Abandonment Report prepared in 2005 obtained by the Corps, Well # 6 was abandoned in July of 2005 with the reason "No longer in use" (Enclosure 4).

The 2005 NJDEP Well Abandonment Report noted that Well #6 was installed to a depth of 412 feet below grade and a distance of 500 feet from Green Brook Road. Excavation of the levee will be to a maximum of 5 feet below grade. Due to the location and depth of the well in relation to the depth and location of the levee footprint, it is unlikely that if the well is still contaminated, that construction would expose contaminated water.

Therefore, the Corps does not anticipate any exposure or release of contaminants during construction. In addition, the contractor will be required to prepare an Environmental Protection Plan that outlines how the contractor will address any contaminants encountered during construction.

3) Recommendations 3 and 4, *Continue to coordinate with NJDFW's Endangered and Nongame Species program for current information regarding State-listed wildlife species and the NJDPF's Natural Heritage Program for current information regarding State-listed plant species in the Project area.*

The District will continue coordination with two programs as necessary.

4) Recommendation 5, *Conform to a standard State seasonal restriction and best management practices on in-stream work between April 1 and June 30 to protect aquatic resources, including anadromous fish.*

The Corps will comply with any seasonal restrictions imposed by the State within the Freshwater Wetlands or Flood Hazard Area Control Act permits.

5) Recommendation 6, *Implement tree and shrub removal seasonal restriction from March 15 to July 31 to ensure compliance with MBTA.*

The Corps has included this window in the construction specifications due to the time constraints associated with obligating the American Reinvestment and Recovery Act monies through which this project is funded. However, as this is the first time we have been made aware of this window and we have concerns about how it may impact construction of other civil works projects, we would like to coordinate further with your office to better understand the aspects of the seasonal restrictions.

6) Recommendation 7, *Remove trash, abandoned materials, or other human-generated debris as part of the clearing process.*

Any trash or debris found during clearing and construction activities within the project footprint will be removed as necessary.

7) Recommendation 8, *Remove meadow foxtail from proposed flood plain mix in Section 02450.*

Meadow foxtail will be removed from the seed mix.

8) Recommendation 9, *Conduct monitoring for potential bank erosion during earthwork activities and post-project.*

The Corps concurs.

9) Recommendation 10, *Monitor the survival of vegetation planted in the on-site mitigation/restoration areas for 5 years and take corrective actions if vegetation does not develop as expected.*

The Corps will monitor the on-site mitigation for five years as per Corps regulations and in compliance with the permits issued by NJDEP. An adaptive management plan will be developed if it is determined that the onsite mitigation is failing. The Corps will coordinate this plan with your office, should you so desire.

10) Recommendation 11, *Refer to FWCA report dated September 12, 2006 for specific recommendations for the Finderne Farm Mitigation Site.*

The Corps reviewed the cited FWCA. Construction of the mitigation site was completed in June 2006 and monitoring has been on-going since 2006. An Adaptive Management Plan (AMP) was developed in 2009 in response to areas of the mitigation site which are not trending toward the permitted success.

To date, the Corps has conducted herbicide treatments of areas infested with Japanese hops, purple loosestrife, common reed and lesser celadine and has initiated field investigations to evaluate the hydrologic conditions of the site. A report documenting the results of the field

investigations and recommending adaptive management measures based on the results are expected to be completed this winter.

The Adaptive Management Plan and 2009 Monitoring Report can be found at the project website: http://www.nan.usace.army.mil/business/prjlinks/flooding/greenbk/index.htm

Recommendations from the September 12, 2006 FWCA report that will be incorporated into adaptive management measures include:

a) Recommendation 1, *Avoid clearing of trees 6 inches dbh or greater between April 1 and September 30*;
b) Recommendation 2: *Plant species used by Indiana bats;* and
c) Recommendation 3, *Re-establish forest understory cover to improve wildlife habitats.*

We look forward to continued coordination your office on this project. Should any questions arise, or additional information is needed, please contact Ms. Kimberly Rightler at (917) 790-8722.

Sincerely,

Nancy Brighton
Chief, Watershed Section

Enclosures

Appendix C

Air Emissions Analysis
and
Record of Non-Applicability

Green Brook Flood Damage Reduction Project
Equipment Specifications and Hours of Operation

Nonroad Vehicles - Equipment Description	Equip Hrs	Horsepower	Fuel Type	Sources and Assumptions
AIR COMPRESSOR, 250 CFM (7 CMM), 100 PSI (689 KPA) (ADD HOSE)	102.68	85	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
AIR HOSE, 1.5" (38 MM) DIA x 100' (31 M) LENGTH, HARDROCK (USE AS DRILLING ACCESSORY)	205.36	NA	NA	No emissions
ASPHALT DISTRIBUTOR, 3,000 GAL (11,355 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	793.33	245	Diesel	Truck hp from specifications from equipmentwatch.com; fuel type assumed
ASPHALT FINISHER, 10' WIDE SCREED, WHEEL, W/19' 6" SCREED EXTENSION, 215 CF HOPPER	11.65	158	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
BUCKET, CONCRETE, GENERAL PURPOSE, 1.0 CY (0.8 M3)	5.83	NA	NA	No emissions
BUCKET, DRAGLINE, 0.8 CY (0.6 M3) MEDIUM WEIGHT (ADD TEETH WEAR COST)	48.59	NA	NA	No emissions
CHAINSAW, 16" - 24" (406-610 MM) BAR	180.00	5.7	Gasoline	Specifications from Husqvarna.com
CONCRETE FINISHER, ROTO TROWEL, 46" (1,168 MM) DIA, 4 BLADE	376.96	9	Gasoline	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CONCRETE MIXER, PLASTER/MORTAR, 12 CF (0.3 M3), W/TRAILER	188.48	13	Gasoline	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CONCRETE PUMP, 117 CY/HR, 75' BOOM, TRUCK MTD	863.29	210	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CONCRETE SAW, 13" (330 MM) DEPTH, SELF PROPELLED (ADD WATER AND COST FOR SAWBLADE WEAR)	45.25	66	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR	923.01	7.5	Diesel	Hp provided in description; fuel type assumed
CRANE, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 20 TON (18 MT), 70' (21.3 M) BOOM, 4X4	74.40	152	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CRANE, MECHANICAL, LATTICE BOOM, CRAWLER, DRAGLINE/CLAMSHELL, 0.75 CY (0.6 M3), 25 TON (23 MT), 100' (30.5 M) BOOM (ADD BUCKET)	48.59	150	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CRANE, MECHANICAL, LATTICE BOOM, TRUCK MOUNTED, 125 TON (113 MT), 240' (73.2 M) BOOM	39.24	197	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CRANES, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 30 TON, 95' BOOM, 4X4	23.50	152	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CRANES, HYDRAULIC, SELF-PROPELLED, YARD, 10 TON, 30' BOOM, 4X4, NON-ROTATING OPERATOR'S CAB	20.16	62	Gasoline	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CRANES, HYDRAULIC, TRUCK MTD, 70 TON, 115' BOOM, 8X4	16.08	400	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
CRANES, HYDRAULIC, TRUCK MTD, ALL TERRAIN, 25 TON, 94' BOOM, 6X4X2	70.72	250	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
GRADER, MOTOR, ARTICULATED, 135 HP (101 KW), 12' (3.6 M) BLADE WIDTH	620.00	135	Diesel	Hp provided in description; fuel type assumed
GRADER, MOTOR, ARTICULATED, 6X4, 12' BLADE W/17 TEETH SCARIFIERS	5.67	135	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
HYDRAULIC EXCAVATOR, CRAWLER, 24,640 LBS, 0.60 CY BUCKET, 16.50' MAX DIGGING DEPTH	1,480.42	79	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4	809.72	67	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
LOADER, FRONT END, CRAWLER, 1.30 CY BUCKET	3.86	90	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
LOADER, FRONT END, WHEEL, SKID-STEER, 14.3 CF, 60" BUCKET	100.00	46	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)	63.25	46	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
LOADER/BACKHOE, WHEEL, 0.80 CY (0.6 M3) FRONT END BUCKET, 9.8' (3.0 M) DEPTH OF HOE, 24" (0.61 M) DIPPER, 4X4	6.20	67	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
LOADER/BACKHOE, WHEEL, 1.25 CY (0.9 M3) FRONT END BUCKET, 12.0' (3.7 M) DEPTH OF HOE, 24" (0.61 M) DIPPER, (0.2 M3), 4X2 11.06	11.06	92	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
PAVING BREAKER, 66 LB (30 KG) (ADD 100 CFM (2.8 CMM) COMPRESSOR)	205.22	35	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 2" (50 MM) DIA X 50' (15 M) WITH COUPLING (PER SECTION)	80.00	10	Gasoline	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 2" (51 MM) DIA x 20' (6.1 M) LENGTH, W/COUPLING/SECTION	40.00	10	Gasoline	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
PUMP, WATER, DIAPHRAGM, SKID MTD, ENGINE DRIVE, 2" (51 MM) DIA, 2,000 GPH (7,571 LPH) @ 25' (7.6 M) HEAD (ADD HOSES)	40.00	4	Gasoline	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
RIPPER, 3-SHANKS & BEAM, HYDRAULIC (ADD TO 341-440 HP (254-328 KW) DOZER & COST FOR POINT WEAR)	1.14	440	Diesel	Hp provided in description; fuel type assumed
RIPPER, SHANK, EACH (ADD TO 340-440 HP (254-328 KW) DOZER & COST FOR POINT WEAR)	1.14	440	Diesel	Hp provided in description; fuel type assumed
ROLLER, STATIC, SELF-PROPELLED, PNEUMATIC, 14.25 TON, 68" WIDE, 9 TIRE, ASPHALT COMPACTOR	18.79	70	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 2.9 TON, 47.2" WIDE, 2X1, ASPHALT COMPACTOR	50.00	33	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 7.8 TON, 66.1" WIDE, 2X1, ASPHALT COMPACTOR	3.49	108	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
ROLLER, VIBRATORY, TOWED, SINGLE DRUM, SHEEPSFOOT, 25.5 TON, 72" WIDE (ADD 180 HP TOWING UNIT)	26.49	50	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
SCRAPER, TANDEM POWERED, STANDARD LOADING, 21 CY, 24 TON, 4X4, D-9 ASSISTED LOADING	3,377.42	330	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
SCRAPER, TANDEM POWERED, STANDARD LOADING, 34 CY, 37.5 TON, 4X4, D-10 ASSISTED LOADING	115.40	450	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
SCRAPER, TOWED, 12-18 CY (9-14 M3), 18 TON (16.3 MT) (ADD 285 HP (213 KW) TRACTOR)	50.95	285	Diesel	Hp provided in description; fuel type assumed
TRACTOR, CRAWLER (DOZER), 240 HP, LOW GROUND PRESSURE, W/7.70 CY STRAIGHT BLADE (ADD ATTACHMENTS)	1,098.13	240	Diesel	Hp provided in description; fuel type assumed
TRACTOR, CRAWLER (DOZER), 300-340 HP (224-254 KW), POWERSHIFT, W/UNIVERSAL BLADE	1.14	340	Diesel	Hp provided in description; fuel type assumed
TRACTOR, CRAWLER (DOZER), 310 HP, POWERSHIFT, W/15.3 CY SEMI-U BLADE (ADD ATTACHMENTS)	554.41	310	Diesel	Hp provided in description; fuel type assumed
TRACTOR, CRAWLER (DOZER), 341-440 HP (254-328 KW), POWERSHIFT, W/UNIVERSAL BLADE	60.23	440	Diesel	Hp provided in description; fuel type assumed

Highway Vehicles - Equipment Description	Equip Hrs	Horsepower	Fuel Type	Sources and Assumptions
DUMP TRUCK, HIGHWAY, 10 - 13 CY (7.6 - 9.9 M3) DUMP BODY, 35,000 LBS (15,900 KG) GVW, 2 AXLE, 4X2	2.80	265	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
DUMP TRUCK, HIGHWAY, 16 - 20 CY (12.2 - 15.3 M3) DUMP BODY, 75,000 LBS (34,000 KG) GVW, 2 AXLE, 6X4	4,177.00	400	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
TRUCK OPTION, DUMP BODY, REAR, 10.0 CY (7.7 M3) (ADD 35,000 LB (15,876 KG) GVW TRUCK)	11.06	265	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
TRUCK OPTION, DUMP BODY, REAR, 12 CY (9.2 M3) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	4.20	230	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
TRUCK OPTION, FLATBED, 8' (2.4 M) x 20' (6.1 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)	10.13	210	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
TRUCK OPTION, FLATBED, 8' (2.4M) x 12' (3.7 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)	6.03	210	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
TRUCK, HIGHWAY, 20,000 LBS (9,000 KG) GVW, 2 AXLE, 4X2 WITH FLATBED	0.32	210	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	16.16	210	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	793.33	265	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	11.06	265	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8
TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)	4.20	230	Diesel	USACE Construction Equipment Ownership and Operating Expense Schedule EP 1110-1-8

Green Brook Flood Damage Reduction Project
Total Project Emissions

Equipment Description	THC (VOC) (lbs)	NOx (lbs)	PM-10 (lbs)	PM-2.5 (lbs)	CO (lbs)	SO2 (lbs)
Nonroad Equipment						
AIR COMPRESSOR, 250 CFM (7 CMM), 100 PSI (689 KPA) (ADD HOSE)	1.49	24.82	2.48	2.40	19.61	0.04
AIR HOSE, 1.5" (38 MM) DIA x 100' (31 M) LENGTH, HARDROCK (USE AS DRILLING ACCESSORY)	NA	NA	NA	NA	NA	NA
ASPHALT DISTRIBUTOR, 3,000 GAL (11,355 L) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	48.03	659.84	55.62	53.09	288.21	1.24
ASPHALT FINISHER, 10' WIDE SCREED, WHEEL, W/19' 6" SCREED EXTENSION, 215 CF HOPPER	0.45	6.25	0.77	0.74	3.18	0.01
BUCKET, CONCRETE, GENERAL PURPOSE, 1.0 CY (0.8 M3)	NA	NA	NA	NA	NA	NA
BUCKET, DRAGLINE, 0.8 CY (0.6 M3) MEDIUM WEIGHT (ADD TEETH WEAR COST)	NA	NA	NA	NA	NA	NA
CHAINSAW, 16" - 24" (406-610 MM) BAR	75.97	1.44	12.19	12.19	448.72	0.00
CONCRETE FINISHER, ROTO TROWEL, 46" (1,168 MM) DIA, 4 BLADE	28.15	7.02	0.95	0.95	1056.22	0.00
CONCRETE MIXER, PLASTER/MORTAR, 12 CF (0.3 M3), W/TRAILER	22.40	5.59	0.76	0.76	840.67	0.00
CONCRETE PUMP, 117 CY/HR, 75' BOOM, TRUCK MTD	44.80	615.45	51.88	49.52	268.82	1.16
CONCRETE SAW, 13" (330 MM) DEPTH, SELF PROPELLED (ADD WATER AND COST FOR SAWBLADE WEAR)	0.74	12.16	1.71	1.67	14.06	0.02
CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR	3.61	28.22	3.28	3.22	26.97	0.04
CRANE, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 20 TON (18 MT), 70' (21.3 M) BOOM, 4X4	1.93	26.80	2.36	2.25	9.33	0.05
CRANE, MECHANICAL, LATTICE BOOM, CRAWLER, DRAGLINE/CLAMSHELL, 0.75 CY (0.6 M3), 25 TON (23 MT), 100' (30.5 M) BOOM (ADD BUCKET)	1.24	17.27	1.52	1.45	6.01	0.03
CRANE, MECHANICAL, LATTICE BOOM, TRUCK MOUNTED, 125 TON (113 MT), 240' (73.2 M) BOOM	1.32	18.32	1.10	1.10	5.50	0.04
CRANES, HYDRAULIC, SELF-PROPELLED, ROUGH TERRAIN, 30 TON, 95' BOOM, 4X4	0.61	8.47	0.74	0.71	2.95	0.02
CRANES, HYDRAULIC, SELF-PROPELLED, YARD, 10 TON, 30' BOOM, 4X4, NON-ROTATING OPERATOR'S CAB	11.43	2.85	0.39	0.39	428.84	0.00
CRANES, HYDRAULIC, TRUCK MTD, 70 TON, 115' BOOM, 8X4	1.04	15.24	0.91	0.91	5.12	0.03
CRANES, HYDRAULIC, TRUCK MTD, ALL TERRAIN, 25 TON, 94' BOOM, 6X4X2	3.02	41.90	2.51	2.51	12.57	0.08
GRADER, MOTOR, ARTICULATED, 135 HP (101 KW), 12' (3.6 M) BLADE WIDTH	20.69	284.15	34.84	33.75	144.80	0.54
GRADER, MOTOR, ARTICULATED, 6X4, 12' BLADE W/17 TEETH SCARIFIERS	0.19	2.60	0.32	0.31	1.32	0.00
HYDRAULIC EXCAVATOR, CRAWLER, 24,640 LBS, 0.60 CY BUCKET, 16.50' MAX DIGGING DEPTH	28.90	476.14	66.93	65.41	550.68	0.83
LOADER / BACKHOE, WHEEL, 0.80 CY FRONT END BUCKET, 24" DIP, 4.3 CF, 12' DIGGING DEPTH, 4X4	10.55	91.42	17.83	17.33	152.71	0.18
LOADER, FRONT END, CRAWLER, 1.30 CY BUCKET	0.07	0.59	0.11	0.11	0.98	0.00
LOADER, FRONT END, WHEEL, SKID-STEER, 14.3 CF, 60" BUCKET	1.36	11.12	1.43	1.38	8.39	0.01
LOADER, FRONT END, WHEEL, SKID-STEER, 9-11 CF (0.2-0.3 M3), 60" (1.5 M) BUCKET {BOBCAT}, 13 CWT (590 KG)	0.86	7.03	0.90	0.88	5.31	0.01
LOADER/BACKHOE, WHEEL, 0.80 CY (0.6 M3) FRONT END BUCKET, 9.8' (3.0 M) DEPTH OF HOE, 24" (0.61 M) DIPPER, 4X4	0.08	0.70	0.14	0.13	1.17	0.00
LOADER/BACKHOE, WHEEL, 1.25 CY (0.9 M3) FRONT END BUCKET, 12.0' (3.7 M) DEPTH OF HOE, 24" (0.61 M) DIPPER, (0.2 M3), 4X2 11.06	0.20	1.71	0.33	0.33	2.86	0.00
PAVING BREAKER, 66 LB (30 KG) (ADD 100 CFM (2.8 CMM) COMPRESSOR)	1.91	32.21	2.32	2.25	10.42	0.04
PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 2" (50 MM) DIA X 50' (15 M) WITH COUPLING (PER SECTION)	0.33	0.84	0.07	0.07	14.53	0.00
PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 2" (51 MM) DIA x 20' (6.1 M) LENGTH, W/COUPLING/SECTION	0.16	0.42	0.04	0.04	7.27	0.00
PUMP, WATER, DIAPHRAGM, SKID MTD, ENGINE DRIVE, 2" (51 MM) DIA, 2,000 GPH (7,571 LPH) @ 25' (7.6 M) HEAD (ADD HOSES)	0.07	0.17	0.01	0.01	2.91	0.00
RIPPER, 3-SHANKS & BEAM, HYDRAULIC (ADD TO 341-440 HP (254-328 KW) DOZER & COST FOR POINT WEAR)	0.11	1.70	0.14	0.14	0.84	0.00
RIPPER, SHANK, EACH (ADD TO 340-440 HP (254-328 KW) DOZER & COST FOR POINT WEAR)	0.11	1.70	0.14	0.14	0.84	0.00
ROLLER, STATIC, SELF-PROPELLED, PNEUMATIC, 14.25 TON, 68" WIDE, 9 TIRE, ASPHALT COMPACTOR	0.33	5.35	0.75	0.74	6.19	0.01
ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 2.9 TON, 47.2" WIDE, 2X1, ASPHALT COMPACTOR	0.62	9.61	0.90	0.88	5.02	0.01
ROLLER, VIBRATORY, SELF-PROPELLED, DOUBLE DRUM, SMOOTH, 7.8 TON, 66.1" WIDE, 2X1, ASPHALT COMPACTOR	0.09	1.13	0.16	0.15	0.65	0.00
ROLLER, VIBRATORY, TOWED, SINGLE DRUM, SHEEPSFOOT, 25.5 TON, 72" WIDE (ADD 180 HP TOWING UNIT)	0.33	5.39	0.76	0.74	6.24	0.01
SCRAPER, TANDEM POWERED, STANDARD LOADING, 21 CY, 24 TON, 4X4, D-9 ASSISTED LOADING	246.45	3783.72	318.93	304.44	1870.11	7.15
SCRAPER, TANDEM POWERED, STANDARD LOADING, 34 CY, 37.5 TON, 4X4, D-10 ASSISTED LOADING	11.48	176.29	14.86	14.18	87.13	0.33
SCRAPER, TOWED, 12-18 CY (9-14 M3), 18 TON (16.3 MT) (ADD 285 HP (213 KW) TRACTOR)	3.59	49.30	4.16	3.97	21.53	0.09
TRACTOR, CRAWLER (DOZER), 240 HP, LOW GROUND PRESSURE, W/7.70 CY STRAIGHT BLADE (ADD ATTACHMENTS)	65.13	894.71	75.42	71.99	390.79	1.69
TRACTOR, CRAWLER (DOZER), 300-340 HP (224-254 KW), POWERSHIFT, W/UNIVERSAL BLADE	0.09	1.32	0.11	0.11	0.65	0.00
TRACTOR, CRAWLER (DOZER), 310 HP, POWERSHIFT, W/15.3 CY SEMI-U BLADE (ADD ATTACHMENTS)	38.00	583.46	49.18	46.95	288.38	1.10
TRACTOR, CRAWLER (DOZER), 341-440 HP (254-328 KW), POWERSHIFT, W/UNIVERSAL BLADE	5.86	89.97	7.58	7.24	44.47	0.17
Highway Vehicles						
DUMP TRUCK, HIGHWAY, 10 - 13 CY (7.6 - 9.9 M3) DUMP BODY, 35,000 LBS (15,900 KG) GVW, 2 AXLE, 4X2	0.07	0.89	0.03	0.02	0.39	0.001
DUMP TRUCK, HIGHWAY, 16 - 20 CY (12.2 - 15.3 M3) DUMP BODY, 75,000 LBS (34,000 KG) GVW, 2 AXLE, 6X4	113.82	1335.70	34.86	27.90	622.96	2.086
TRUCK OPTION, DUMP BODY, REAR, 10.0 CY (7.7 M3) (ADD 35,000 LB (15,876 KG) GVW TRUCK)	0.28	3.53	0.10	0.08	1.53	0.005
TRUCK OPTION, DUMP BODY, REAR, 12 CY (9.2 M3) (ADD 45,000 LB (20,412 KG) GVW TRUCK)	0.11	1.34	0.04	0.03	0.58	0.002
TRUCK OPTION, FLATBED, 8' (2.4 M) x 20' (6.1 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)	0.17	1.68	0.05	0.04	0.64	0.004
TRUCK OPTION, FLATBED, 8' (2.4M) x 12' (3.7 M) (ADD 25,000 LB (11,340 KG) GVW TRUCK)	0.10	1.00	0.03	0.03	0.38	0.002
TRUCK, HIGHWAY, 20,000 LBS (9,000 KG) GVW, 2 AXLE, 4X2 WITH FLATBED	0.01	0.05	0.00	0.00	0.02	0.000
TRUCK, HIGHWAY, 25,000 LB (11,340 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	0.28	2.68	0.08	0.07	1.03	0.006
TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	20.41	253.53	7.27	5.89	109.92	0.380
TRUCK, HIGHWAY, 35,000 LB (15,876 KG) GVW, 4X2, 2 AXLE (ADD ACCESSORIES)	0.28	3.53	0.10	0.08	1.53	0.005
TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE (ADD ACCESSORIES)	0.11	1.34	0.04	0.03	0.58	0.002
Total Project Emissions (lbs)	**819.43**	**9,609.69**	**780.15**	**741.70**	**7,802.53**	**17.45**
Total Project Emissions (tons)	**0.41**	**4.80**	**0.39**	**0.37**	**3.90**	**0.01**

GENERAL CONFORMITY - RECORD OF NON-APPLICABILITY

Project/Action Name: *Segment B2 Green Brook Flood Damage Reduction Project*

Project/Action Identification Number:*N/A*

Project/Action Point of Contact: *Kimberly Rightler, (917) 790-8722*

Begin Date: *To Be Determined*

End Date: *To Be Determined*

General Conformity under the Clean Air Act, Section 176 has been evaluated for the project described above according to the requirements of 40 CFR 93, Subpart B. The requirements of this rule are not applicable to this project/action because:

_____ The project/action is an exempt action under 40 CFR 93.153(c) or (d), (*SPECIFY APPLICABLE EXEMPTION CATEGORY AND REGULATORY CITATION*)

OR

__X__ Total direct and indirect emission from this project/action have been estimated at 3.90 tons CO, 0.41 tons VOC, 4.80 tons NOx and 0.37 tons PM, and are below the conformity threshold value established at 40 CFR 93.153(b) of *100 tons CO, 100 tons NOx, 100 tons PM and 50 tons VOC.*

AND

The project/action is not considered regionally significant under 40 CFR 93.153(i).

Supporting documentation and emissions estimates are

(X) ATTACHED

( ) APPEAR IN THE NEPA DOCUMENTATION (*PROVIDE REFERENCE*)

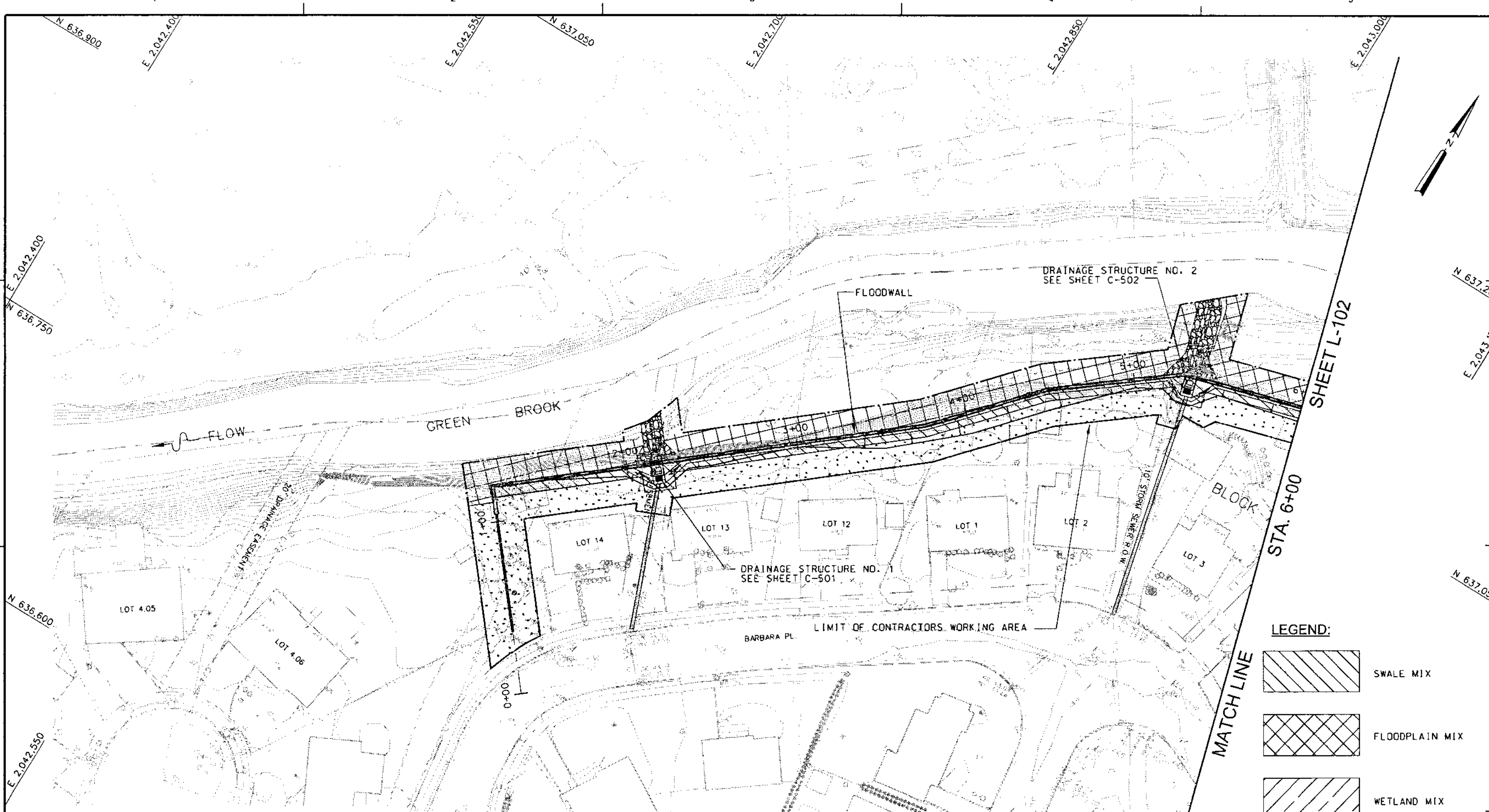
( ) OTHER _____.

SIGNED L. Houston.

(*Leonard Houston, Chief, Environmental Branch, Planning Division*)

Appendix D

Project Plans



NOTE:
1. SEE TOPSOIL AND SEEDING SPECIFICATION FOR SEED MIX COMPOSITION.

* LAWN MIX SHALL BE SEEDED IN ALL WORK AREAS NOT OTHERWISE DESIGNED TO RECEIVE HARD SURFACE OR ONE OF THE ABOVE LISTED MIXES

** THE ACREAGE OF SEEDING AREAS WILL BE BASED ON THE FINAL LAYOUT OF THE WORK AREA EXPANSION OF THE WORK AREA MAY REQUIRE AN INCREASE IN SEED MIX QUANTITY.

ALL DIMENSIONS/EXISTING CONDITIONS SHOWN SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE GOVERNMENT FOR CLARIFICATIONS. DRAWING SHALL NOT BE SCALED TO OBTAIN DIMENSIONS OR DISTANCES.

Submitted by:
THOMAS C. MacALLEN DATE
N.J. PROFESSIONAL ENGINEER
Lic. No. 24GE02594500

US Army Corps of Engineers New York District

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U. S. ARMY ENGINEER DISTRICT
NEW YORK
http://www.nan.usace.army.mil

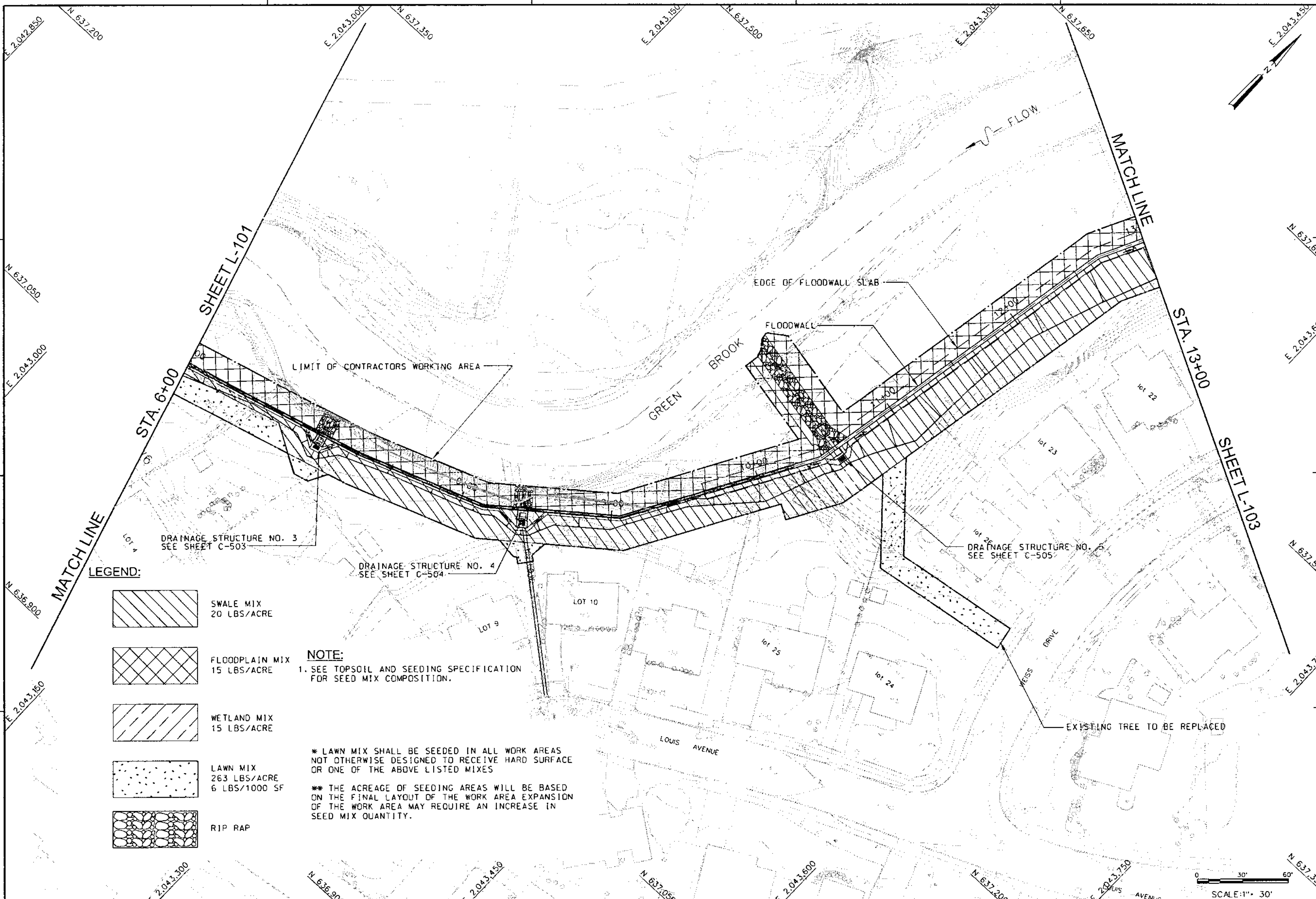
URS Corporation
Consulting Engineers
201 Willowbrook Blvd., Wayne,
N.J. 07470 - TEL. 973-785-0700

DESIGNED BY: G.O'B		DATE: JUNE, 2010
DWN BY: O.B.	CKD BY: S.A.	SOLICITATION NO.:
SUBMITTED BY: T.C.M.		CONTRACT NO.:
FILE NAME: 129_GB_SEBRNG_SEG B1_L-101FLW.dgn		
SIZE: ANSI D	PLOTTED BY: Onsy_Moawad	PLOT DATE: 5:52:09 PM

GREEN BROOK FLOOD DAMAGE REDUCTION PROJECT - SEGMENT B-1 SEBRINGS MILLS BRIDGE, PS, FLOODWALL, & LEVEE (MIDDLESEX & GREEN BROOK, NJ)

LANDSCAPE PLAN
STA. 0+00 TO STA. 6+00

SHEET REFERENCE NUMBER
L-101
SHEET 129 OF 281



LEGEND:

SWALE MIX
20 LBS/ACRE

FLOODPLAIN MIX
15 LBS/ACRE

WETLAND MIX
15 LBS/ACRE

LAWN MIX
263 LBS/ACRE
6 LBS/1000 SF

RIP RAP

NOTE:

1. SEE TOPSOIL AND SEEDING SPECIFICATION FOR SEED MIX COMPOSITION.

* LAWN MIX SHALL BE SEEDED IN ALL WORK AREAS NOT OTHERWISE DESIGNED TO RECEIVE HARD SURFACE OR ONE OF THE ABOVE LISTED MIXES

** THE ACREAGE OF SEEDING AREAS WILL BE BASED ON THE FINAL LAYOUT OF THE WORK AREA EXPANSION OF THE WORK AREA MAY REQUIRE AN INCREASE IN SEED MIX QUANTITY.

ALL DIMENSIONS/EXISTING CONDITIONS SHOWN SHALL BE CHECKED AND VERIFIED BY THE CONTRACTOR AT THE SITE. ANY DISCREPANCIES SHALL BE IMMEDIATELY REPORTED TO THE GOVERNMENT FOR CLARIFICATIONS. DRAWING SHALL NOT BE SCALED TO OBTAIN DIMENSIONS OR DISTANCES.

Submitted by:
THOMAS C. MacALLEN DATE
N.J. PROFESSIONAL ENGINEER
Lic. No. 24GE02594500

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

US Army Corps of Engineers
New York District

U. S. ARMY ENGINEER DISTRICT
NEW YORK
http://www.nan.usace.army.mil

URS Corporation
Consulting Engineers
201 Willowbrook Blvd., Wayne,
N.J. 07470 - TEL. 973-785-0700

DESIGNED BY: G.O'B	DATE: JUNE. 2010
DWN BY: O.B. / CKD BY: S.A.	SOLICITATION NO.:
SUBMITTED BY: T.C.M.	CONTRACT NO.:
FILE NAME: 130_GB_SEBRNG_SEG B1_L-102FLW.dgn	
SIZE: ANSI D / PLOTTED BY: Onay_Moawad	PLOT DATE: 5:52:17 PM

GREEN BROOK FLOOD DAMAGE REDUCTION PROJECT - SEGMENT B-1
SEBRINGS MILLS BRIDGE, PS, FLOODWALL, & LEVEE (MIDDLESEX & GREEN BROOK, NJ)

LANDSCAPE PLAN
STA. 6+00 TO STA. 13+00

SHEET REFERENCE NUMBER
L-102
SHEET 1 OF 2

MAY 2009 NYD BORDER

Submitted by: Onay_Moawad Plot Date: 6/29/2010 5:52:17 PM
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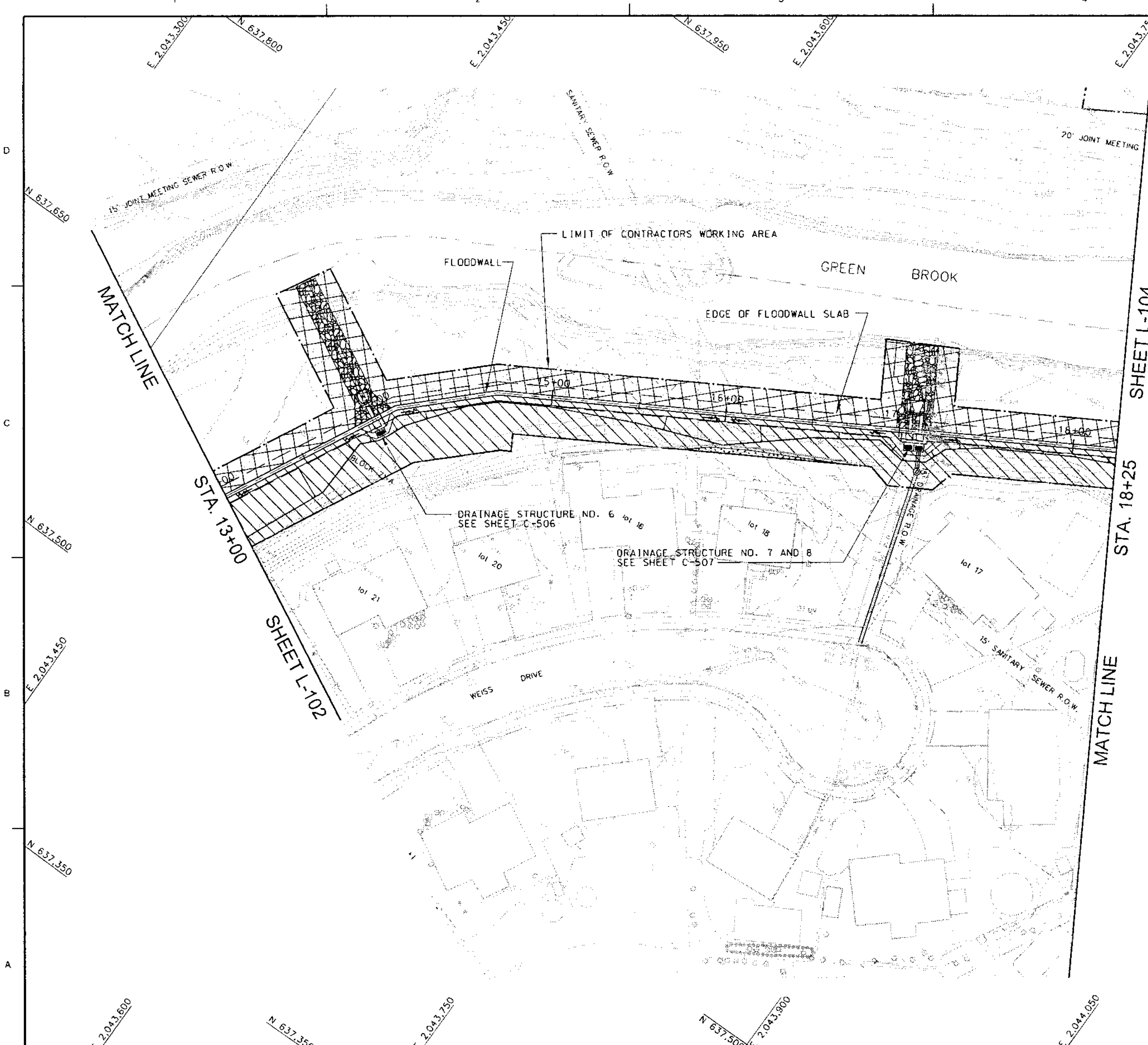

NOTE:

1. SEE TOPSOIL AND SEEDING SPECIFICATION FOR SEED MIX COMPOSITION.

* LAWN MIX SHALL BE SEEDED IN ALL WORK AREAS NOT OTHERWISE DESIGNED TO RECEIVE HARD SURFACE OR ONE OF THE ABOVE LISTED MIXES

** THE ACREAGE OF SEEDING AREAS WILL BE BASED ON THE FINAL LAYOUT OF THE WORK AREA EXPANSION OF THE WORK AREA MAY REQUIRE AN INCREASE IN SEED MIX QUANTITY.

LEGEND:

- SWALE MIX
- FLOODPLAIN MIN
- WETLAND MIX
- LAWN MIX
- RIP RAP

SCALE: 1" = 30'

US Army Corps of Engineers, New York District

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URS Corporation
Consulting Engineers
201 Willowbrook Blvd., Wayne, N.J. 07470 - TEL: 973-785-0700

DESIGNED BY: G.O'B	DATE: JUNE, 2010
DWN BY: O.B. / CKD BY: S.A.	SOLICITATION NO.:
SUBMITTED BY: T.C.M.	CONTRACT NO.:
FILE NAME: 131_GB_SEBRNG_SEG B1_L-103FLW.dgn	
SIZE: ANSI D / PLOTTED BY: Onsy_Mosaad	PLOT DATE: 5:52:25 PM

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

GREEN BROOK FLOOD DAMAGE REDUCTION PROJECT - SEGMENT B-1 SEBRINGS MILLS BRIDGE, PS, FLOODWALL, & LEVEE (MIDDLESEX & GREEN BROOK, NJ)

LANDSCAPE PLAN
STA. 13+00 TO STA. 18+25

SHEET REFERENCE NUMBER
L-103

Submitted by:
THOMAS C. MacALLEN
N.J. PROFESSIONAL ENGINEER
Lic. No. 24GE02584500
DATE

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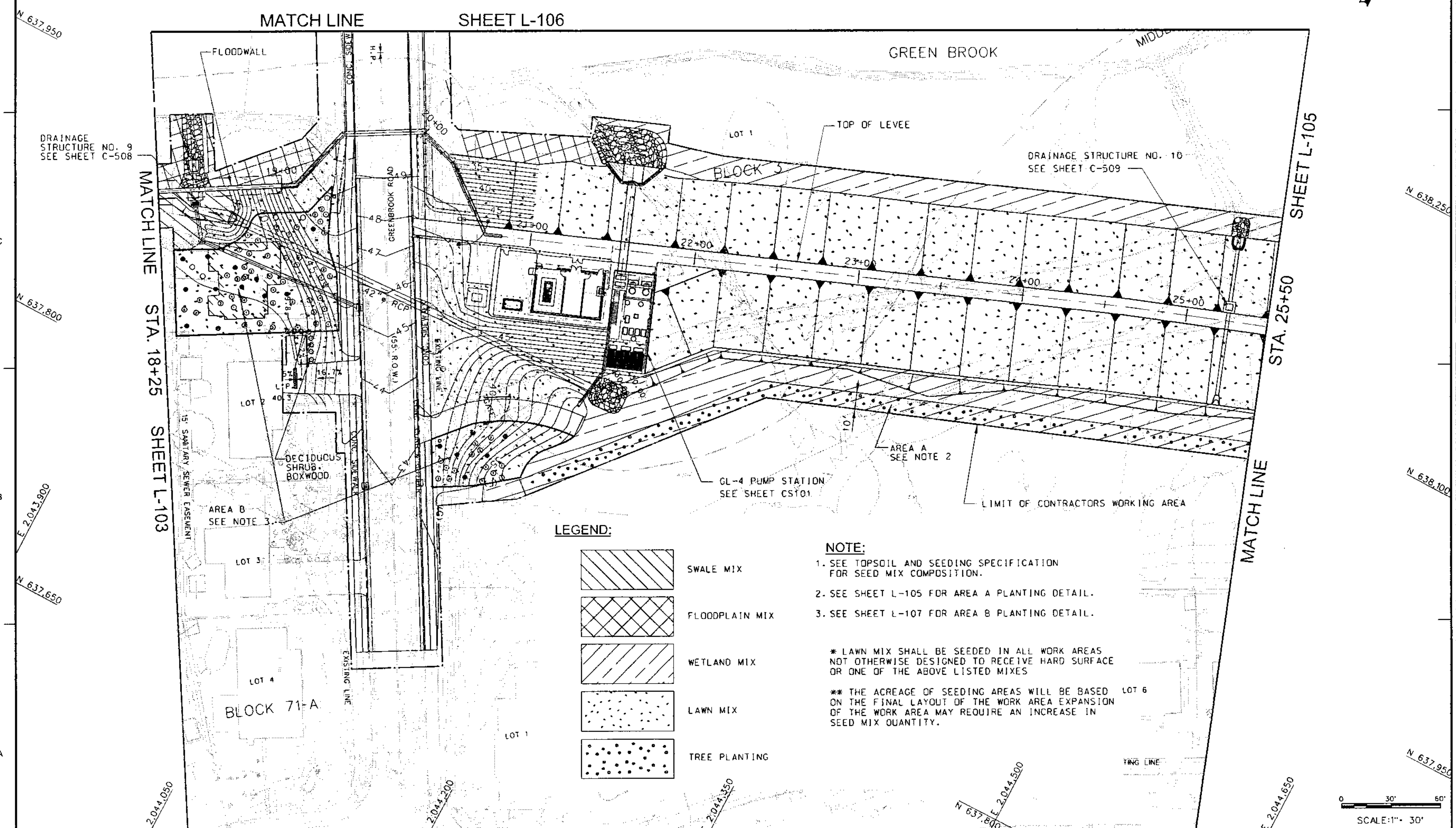

LEGEND:

Pattern	Mix
(hatch)	SWALE MIX
(cross-hatch)	FLOODPLAIN MIX
(hatch)	WETLAND MIX
(dots)	LAWN MIX
(dots)	TREE PLANTING

NOTE:

1. SEE TOPSOIL AND SEEDING SPECIFICATION FOR SEED MIX COMPOSITION.
2. SEE SHEET L-105 FOR AREA A PLANTING DETAIL.
3. SEE SHEET L-107 FOR AREA B PLANTING DETAIL.

* LAWN MIX SHALL BE SEEDED IN ALL WORK AREAS NOT OTHERWISE DESIGNED TO RECEIVE HARD SURFACE OR ONE OF THE ABOVE LISTED MIXES

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Submitted by:
THOMAS C. MacALLEN DATE
N.J. PROFESSIONAL ENGINEER
Lic. No. 24GE02594500

US Army Corps of Engineers New York District

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

U. S. ARMY ENGINEER DISTRICT
NEW YORK
http://www.nan.usace.army.mil

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DESIGNED BY: G.O'B | DATE: JUNE, 2010
DWN BY: O.B. | CKD BY: S.A. | SOLICITATION NO.:
SUBMITTED BY: T.C.M. | CONTRACT NO.:
FILE NAME: 132_GB_SEBRNG_SEG B1_L-104LEV.dgn
SIZE: ANSI D | PLOTTED BY: Onsy_Moawad | PLOT DATE: 5:52:33 PM

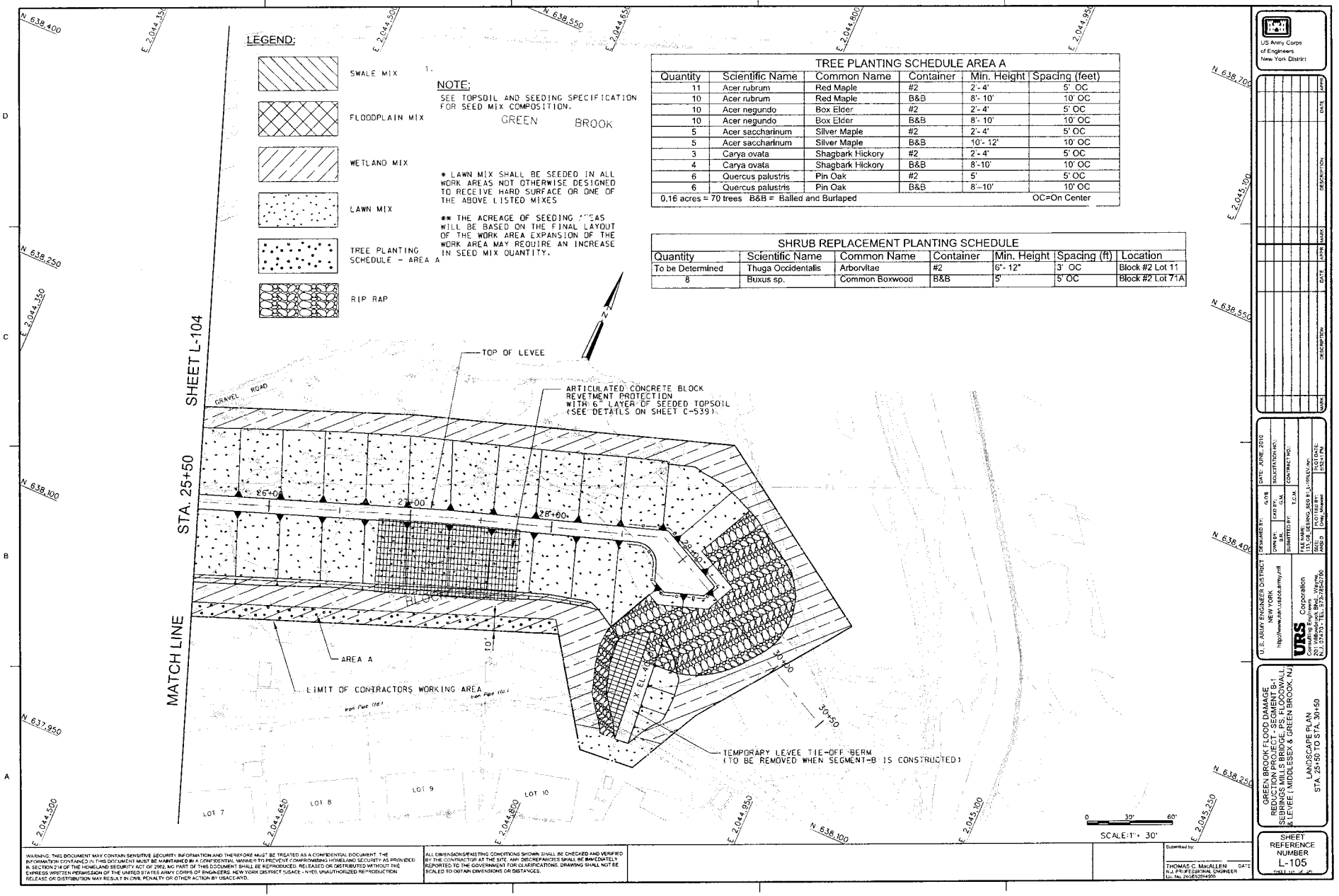
GREEN BROOK FLOOD DAMAGE REDUCTION PROJECT - SEGMENT B-1 SEBRINGS MILLS BRIDGE, PS, FLOODWALL, & LEVEE (MIDDLESEX & GREEN BROOK, NJ)

LANDSCAPE PLAN
STA. 18+25 TO STA. 25+50

SHEET REFERENCE NUMBER
L-104
SHEET 102 OF 281

Submitted by: Onsy_Moawad Plot Date: 6/29/2010 5:52:33 PM
FILE NAME : K:\CADD\11023710GB\PLANS\132_GB_SEBRNG_SEG B1_L-104LEV.dgn

MAY 2009 NYD BORDER



TREE PLANTING SCHEDULE AREA A

Quantity	Scientific Name	Common Name	Container	Min. Height	Spacing (feet)
11	Acer rubrum	Red Maple	#2	2'- 4'	5' OC
10	Acer rubrum	Red Maple	B&B	8'- 10'	10' OC
10	Acer negundo	Box Elder	#2	2'- 4'	5' OC
10	Acer negundo	Box Elder	B&B	8'- 10'	10' OC
5	Acer saccharinum	Silver Maple	#2	2'- 4'	5' OC
5	Acer saccharinum	Silver Maple	B&B	10'- 12'	10' OC
3	Carya ovata	Shagbark Hickory	#2	2'- 4'	5' OC
4	Carya ovata	Shagbark Hickory	B&B	8'-10'	10' OC
6	Quercus palustris	Pin Oak	#2	5'	5' OC
6	Quercus palustris	Pin Oak	B&B	8'-10'	10' OC

0.16 acres = 70 trees B&B = Balled and Burlaped OC=On Center

SHRUB REPLACEMENT PLANTING SCHEDULE

Quantity	Scientific Name	Common Name	Container	Min. Height	Spacing (ft)	Location
To be Determined	Thuga Occidentalis	Arborvitae	#2	6"- 12"	3' OC	Block #2 Lot 11
8	Buxus sp.	Common Boxwood	B&B	5'	5' OC	Block #2 Lot 71A

US Army Corps of Engineers New York District

U.S. ARMY ENGINEER DISTRICT NEW YORK http://www.nan.usace.army.mil

URS Corporation Consulting Engineers 257 West Genesee Street Buffalo, New York 14202 Tel: (716) 856-5636 Fax: (716) 856-2545

DESIGNED BY: K.P.B. DRAWN BY: B.R. SUBMITTED BY: T.C.M. CHECKED BY: G.M.A. DATE: JUNE, 2010 CONTRACT NO.: FILE NAME: 131_GB_SEBRNG_SEG B_L-105LEV.dgn SCALE: AS NOTED PLOT DATE: 6/29/2010

GREEN BROOK FLOOD DAMAGE REDUCTION PROJECT, SEGMENT-I SEBRINGS MILLS BRIDGE, PS, FLOODWALL & LEVEE (MIDDLESEX & GREEN BROOK, NJ.

LANDSCAPE PLAN STA. 25+50 TO STA. 30+50

SHEET REFERENCE NUMBER L-105

Submitted by: THOMAS C. MacALLEN N.J. PROFESSIONAL ENGINEER Lic. No. 24GE02594900 DATE

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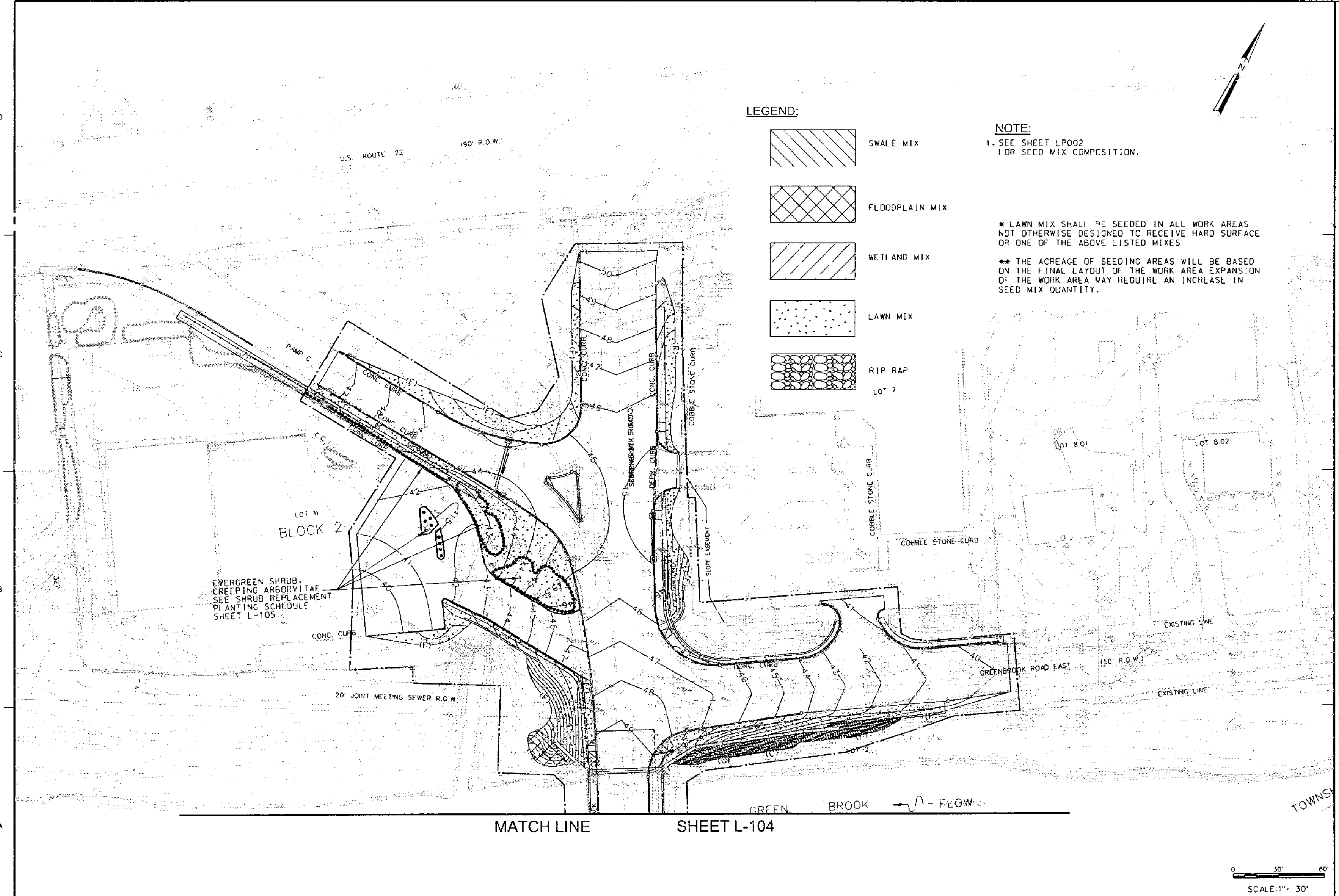
MAY 2009 NYD BORDER

Submitted by: Gray,Maxwell Plot Date: 6/29/2010 5:52:41 PM
FILE NAME : K:\CADD\11020371GB\PLANS\133_GB_SEBRNG_SEG B\L-105LEV.dgn



LEGEND:

- SWALE MIX
- FLOODPLAIN MIX
- WETLAND MIX
- LAWN MIX
- RIP RAP

NOTE:

1. SEE SHEET LP002 FOR SEED MIX COMPOSITION.

* LAWN MIX SHALL BE SEEDED IN ALL WORK AREAS NOT OTHERWISE DESIGNED TO RECEIVE HARD SURFACE OR ONE OF THE ABOVE LISTED MIXES

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Submitted by:
THOMAS C. MacALLEN DATE
N.J. PROFESSIONAL ENGINEER

US Army Corps of Engineers
New York District

MARK	DESCRIPTION	DATE	APPR.	MARK	DESCRIPTION	DATE	APPR.

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Consulting Engineers
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DESIGNED BY: G.O'B | DATE: JUNE, 2010
DWN BY: O.B. | CKD BY: S.A. | SOLICITATION NO.:
SUBMITTED BY: T.C.M. | CONTRACT NO.:
FILE NAME: 134_GB_SEBRNG_SEG B1_L-106NRD.dgn
SIZE: ANSI D | PLOTTED BY: Onsy_Moawad | PLOT DATE: 5:52:50 PM

GREEN BROOK FLOOD DAMAGE REDUCTION PROJECT - SEGMENT B-1
SEBRINGS MILLS BRIDGE, PS, FLOODWALL, & LEVEE (MIDDLESEX & GREEN BROOK, NJ)

LANDSCAPE PLAN
SHEET 6

SHEET REFERENCE NUMBER
L-106

MAY 2009 NYD BORDER

Submitted by: Onsy_Moawad Plot Date: 6/29/2010 5:52:50 PM
FILE NAME : K:\CADD\11020371GB\PLANS\134_GB_SEBRNG_SEG B1_L-106NRD.dgn

TREE SHRUB PLANTING SCHEDULE AREA B						
Quantity	Scientific Name	Common Name	Container	Min. Height	Spacing (feet)	Legend
10	Amelanchier canadensis	Service Berry	B&B	4'-5'	5' OC	(1)
8	Carpinus caroliniana	Ironwood	B&B	4'-5'	5' OC	(2)
8	Cercis canadensis	Redbud	B&B clumped	5'-6'	5' OC	(3)
14	Cornus racemosa	Gray Dogwood	#2	2'-3'	5' OC	(4)
8	Cratageous crus-galli	Cockspur	B&B	4'-5'	5' OC	(5)
4	Nyssa sylvanica	Black Gum	#2	3'	5' OC	(6)
18	Pinus strobus	Eastern White Pine	B&B	8'-10'	10' OC	●
5	Quercus palustris	Pin Oak	B&B	5'-6'	10' OC	○
11	Viburnum dentatum	Arrowwood	B&B	3'-4'	5' OC	(7)
0.17 acres = 81 trees/shrubs (B&B) Balled and Burlaped			OC=On Center			

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Submitted by:
THOMAS C. MacALLEN DATE
N.J. PROFESSIONAL ENGINEER
Lic. No. 24GE02554500

US Army Corps of Engineers
New York District

MARK	DESCRIPTION	DATE	APPR	MARK	DESCRIPTION	DATE	APPR

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N.J. 07470 - TEL. 973-785-0700

DESIGNED BY: G.O'B | DATE: JUNE, 2010
DWN BY: B.R. | CKD BY: S.A | SOLICITATION NO.:
SUBMITTED BY: T.C.M. | CONTRACT NO.:
FILE NAME: 135_GB_SEBRNG_SEG B1_L-107.dgn
SIZE: ANSI D | PLOTTED BY: Onsy_Mawad | PLOT DATE: 5:53:00 PM

GREEN BROOK FLOOD DAMAGE REDUCTION PROJECT - SEGMENT B-1
SEBRINGS MILLS BRIDGE, PS, FLOODWALL, & LEVEE (MIDDLESEX & GREEN BROOK, NJ)

LANDSCAPE PARTIAL PLAN
AREA B AND PLANTING SCHEDULE

SHEET REFERENCE NUMBER
L-107

Submitted by: Onsy_Mawad Plot Date: 6/29/2010 5:53:00 PM
FILE NAME : K:\CADD\11020371GB\PLANS\135_GB_SEBRNG_SEG B1_L-107.dgn

MAY 2009 NYD BORDER

Appendix E

Pertinent Correspondence

DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK, NY 10278-0090

REPLY TO
ATTENTION OF

March 17, 2010

Environmental Assessment Section
Environmental Analysis Branch

Mr. Daniel Saunders
Deputy State Historic Preservation Officer
Historic Preservation Office
New Jersey Department of Environmental Protection
PO Box 404
Trenton, New Jersey 08625-0404

Dear Mr. Saunders:

The U.S. Army Corps of Engineers, New York District (Corps) in partnership with NJDEP Division of Engineering and Construction, is proceeding with the Green Brook Flood Damage Reduction Project (GBFDRP). A Programmatic Agreement for the project was signed in 1998. The agreement was based on the results of a cultural resources survey conducted by Hunter Research Inc. in 1988/89 and an evaluation of structures conducted by Panamerican Consultants in 1997 and 1999. To date, construction has concentrated on segments in the Borough of Bound Brook. Design for those segments is largely complete and construction is anticipated to be finished there in 2013. Detailed design and engineering is starting for protection measures on Segments C, H, B and D just upstream of Bound Brook in the Green Brook sub-basin in the Borough of Middlesex, Middlesex County and Township of Green Brook, Somerset County (Enclosure 1). The first element of work is on Segment B, in the northwest (upper left) of the enclosed map. Sebrings Mill Road Bridge, built in 1974, will be replaced. The floodwall northwest of the bridge and the levee to the southwest of the bridge will be constructed. The option of flood proofing or buy-out will be made available to the owners of 17 structures along Green Brook Road and US Route 22 (circled and in yellow on the map). The flood wall and levee along the Bound Brook, also shown as part of Segment B, will not be part of this next phase of work. As such a long time has elapsed since the previous studies were reviewed by your office this letter is to update you on the project and provide your staff with information on the next segment of the GBFDRP work.

Archaeological work associated with the bridge and adjacent floodwall and levee was documented in the Hunter Research study. Shovel testing along the alignment of the floodwall and levee yielded no significant artifacts and no sites were identified. No further work was recommended.

The levee however runs through the well field of American Water. This property that was not previously evaluated for historic significance although was subject to archaeological testing. The testing was limited due to standing water on the property at the time of the survey. The Watchung Water Company first operated a well field here in 1897. The area is presently a wooded floodplain. Several wells exist on the site that were until recently in use (Enclosure 2). American Water demolished all standing structures on the property as evidenced by the debris piles in the locations of mapped structures observed on 11 March by the project archaeologist. Given that there is little evidence remaining of the historic operation and little to be gained from the site on the technology of historic water supply the property is not considered eligible for the National Register of Historic Places (NRHP). No further work is recommended for this property.

The replacement of Sebrings Mills Road Bridge was of concern due to the fact that, as suggested by the name, a mill once stood near this crossing. Research indicated that the mill was likely in use by the mid-18th century. A 1923 map depicts a mill and its raceways on the northwest side of the bridge. Comparison with the modern landscape indicated that the road was widened and about one third of the mill building is under the present roadway. Three test trenches were excavated but were located considerably west of the bridge due to concern with undermining the bridge (Enclosure 3).

Based on archaeological evidence the Hunter report states "substantial and informative remains are unlikely to survive" due to extensive changes to the landscape except perhaps beneath the bridge embankments. Acknowledging that the mill complex was historically important the recommendation however was for no further work as any remains encountered would form just a part of the mill complex and therefore not be eligible for the NRHP. The bridge was designed with the knowledge that in time the flood control measures would be constructed so the existing bridge abutment could be raised to the needed height and reused. At present, it is assumed that the existing abutments will be reused. The Corps' opinion is that no further archaeological work will be undertaken at the Sebrings Mill Road Bridge. If the plans change as detailed engineering and design proceeds the Corps may revisit with your office the need for further archaeological work. However, recent borings taken through each of the four corners of the bridge did not encounter any stone or timber or other indications of mill remains (Enclosure 4).

The architectural survey conducted by Panamerican consultants surveyed 14 of the 17 structures proposed for flood proofing or buy-out (Enclosure 5; Structure Nos. 33 - 44). All were residential or commercial/industrial structures dating from 1950 to 1996. None of the structures were determined significant. Due to an apparent oversight three structures in this area were not surveyed. They were evaluated in 1999 by Panamerican and were determined not eligible (Enclosure 6; Structure Nos. 165 - 167). No further cultural resources studies will be conducted for the structures proposed to be flood proofed or bought out. Following a recent public meeting, the Corps is evaluating the possibility of buying out two additional structures on Green Brook Road (adjacent to structure No. 167). These two dwellings are similar to the other houses in the neighborhood dating to *circa* 1960 and are not considered eligible for the NRHP.

Please review the enclosed attachments and provide Section 106 comments, pursuant to 36 CFR 800.5. If you or your staff require additional information or have any questions, please contact Lynn Rakos, Project Archaeologist, at (917) 790-8629.

Sincerely,

Leonard Houston
Chief, Environmental Analysis Branch

Enclosures

CC (w/ enclosures)
D'Amico, SCCHC

REPORTS

Hunter Research, Inc
1990 A CULTURAL RESOURCE SURVEY FOR THE GREEN BROOK FLOOD CONTROL PROJECT IN THE CITY OF PLAINFIELD THE BOROUGHS OF BOUND BROOK, MIDDLESEX, DUNELLEN, NORTH PLAINFIELD AND SOUTH PLAINFIELD AND THE TOWNSHIPS OF GREEN BROOK AND BRIDGEWATER, MIDDLESEX, SOMERSET AND UNION COUNTIES, NEW JERSEY (Revised) Ian Burrow and Richard Hunter, Hunter Research, Inc.

Panamerican Consultants, Inc.
1997
EVALUATION OF BRIDGES AND FLOOD PROOFING/BUY OUT STRUCTURES FOR THE GREEN BROOK FLOOD CONTROL PROJECT MIDDLESEX, UNION, AND SOMERSET COUNTIES, NEW JERSEY. Panamerican Consultants, Inc., Kelly Nolte, Michael Cinquino.

1999
EVALUATION OF NINETEEN FLOOD PROOFING/BUY OUT STRUCTURES FOR THE GREEN BROOK FLOOD CONTROL PROJECT MIDDLESEX, UNION, AND SOMERSET COUNTIES, NEW JERSEY. Panamerican Consultants, Inc., Kelly Nolte, Michael Cinquino.

HPO-E2010-021
03-0308-16

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION
NATURAL & HISTORIC RESOURCES, HISTORIC PRESERVATION OFFICE
PO Box 404, Trenton, NJ 08625-0404
TEL: (609) 984-0176 FAX: (609) 984-0578
www.state.nj.us/dep/hpo

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

May 5, 2010

Leonard Houston
Chief, Environmental Analysis Branch
Department of the Army
Corps of Engineers, New York District
Jacob K. Javits Federal Building
26 Federal Plaza
New York, NY 10278-0090

Dear Mr. Houston:

As Deputy State Historic Preservation Officer for New Jersey, in accordance with 36 CFR Part 800: Protection of Historic Properties, as published in the *Federal Register* on December 12, 2000 (65 FR 77725-77739) and amended on July 6, 2004 (69 FR 40544-40555), I am providing continuing consultation comments for the following proposed undertaking:

Somerset County, Bound Brook Borough
Green Brook Flood Control Project

I concur with the finding that the homes proposed for flood-proofing or buy-out are not eligible for listing on the New Jersey or National Register of Historic Places. I also concur that no further archaeological work is required for Segment B of the project. The project elements, as discussed in the submission, will have **no adverse effect** on historic properties.

If you have any questions regarding this letter please contact Michelle Hughes at (609) 984-6018 regarding architecture and Vincent Maresca at (609) 633-2395 regarding archaeology. Thank you.

Sincerely,

Daniel D. Saunders
Deputy State Historic
Preservation Officer

CC: Tom D'Amico, Somerset County Cultural and Heritage Commission

URS

May 26, 2010

Mr. Dennis Contois, Supervisor
NJDEP – Land Use Regulation
PO Box 439
Trenton, NJ 08625

RE: Application submitted by: NJDEP
Green Brook Flood Damage Reduction Project – Segment B-1
Middlesex Borough, Middlesex County &
Green Brook Township, Somerset County

Dear Mr. Contois:

Please find enclosed a complete application for both a Flood Hazard Area Individual Permit and a Freshwater Wetlands Individual Permit for the above referenced project. All technical items have been addressed as set forth by the regulations (N.J.A.C. 7:13 and 7:7A) as well as the guidance provided by NJDEP at the pre-application meeting held on April 28, 2010.

As you are aware, Mr. John Moyle, of NJDEP Dam Safety and Flood Control is the applicant in this matter. Please contact Mr. Moyle or myself for any comments you may have. We look forward to working with you and your staff during the application review process.

Sincerely,
URS Group Inc

Thomas C. Mac Allen

Thomas C. Mac Allen, P.E.
Vice President
Agent for the Applicant

Copy to: J. Moyle (NJDEP)
S. Rice-Mc Donnell (USACE)
K. Rightler (USACE)

URS Group Inc.
201 Willowbrook Blvd 3rd fl.
Wayne, NJ 07470
Tel: 973.785.0700
Fax: 973.785.0023
www.urscorp.com

United States Department of the Interior

FISH AND WILDLIFE SERVICE

New Jersey Field Office
927 North Main Street, Building D
Pleasantville, New Jersey 08232
Tel: 609-646-9310 Fax: 609-646-0352
http://www.fws.gov/northeast/njfieldoffice

IN REPLY REFER TO:
2010-I-0153

JUN 29 2010

Ms. Kimberly Rightler
U.S. Army Corps of Engineers
New York District
Environmental Analysis Branch
Jacob K. Javits Federal Building
New York, New York 10278-0090
Fax Number: (212) 264-0961

Reference: Indiana Bat Survey, Green Brook Flood Damage Reduction Project, Sebrings Mills Road, Middlesex County, New Jersey

The U.S. Fish and Wildlife Service (Service) has reviewed the above-referenced proposed project pursuant to the Endangered Species Act of 1973 (87 Stat. 884, as amended; 16 U.S.C. 1531 *et seq.*) (ESA) to ensure the protection of federally listed endangered and threatened species. The following comments do not address all Service concerns for fish and wildlife resources and do not preclude separate review and comment by the Service as afforded by other applicable environmental legislation.

A known occurrence or potential habitat for the following federally listed or candidate species is located on or near the project's impact area. However, the Service concurs that the proposed project is not likely to adversely affect federally listed or candidate species for the reasons listed below.

Species	Basis for Determination
Indiana bat (*Myotis sodalis*), endangered	June 2010 Indiana bat survey report – no Indiana bats were captured on site; loss of potential roosting and foraging habitat from project implementation is insignificant.

Except for the above-mentioned species, no other federally listed or proposed threatened or endangered flora or fauna under Service jurisdiction are known to occur within the proposed project's impact area. Therefore, no further consultation pursuant to the ESA is required. If additional information on federally listed species becomes available, or if project plans change, this determination may be reconsidered.

Please refer to this office's web site at http://www.fws.gov/northeast/njfieldoffice/Endangered/ for further information including federally listed and candidate species lists, procedures for requesting ESA review, the National Bald Eagle Management Guidelines, and contacts for obtaining information from the New Jersey Natural Heritage and Endangered and Nongame Species Programs regarding State-listed and other species of concern.

Reviewing Biologist: Annette Scherer
Annette Scherer

Authorizing Supervisor:
Ron Popowski

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF LAND USE REGULATION
501 East State Street, Station Plaza 5, 2nd Floor
P.O. Box 439, Trenton, New Jersey 08625-0439
Fax: (609) 777-3656 or (609) 292-8115
www.state.nj.us/dep/landuse

PERMIT

In accordance with the laws and regulations of the State of New Jersey, the Department of Environmental Protection hereby grants this permit to perform the activities described below. This permit is revocable with due cause and is subject to the limitations, terms and conditions listed below and on the attached pages. For the purpose of this document, "permit" means "approval, certification, registration, authorization, waiver, etc." Violation of any term, condition or limitation of this permit is a violation of the implementing rules and may subject the permittee to enforcement action.

Approval Date
AUG 05 2010

Expiration Date
AUG 05 2015

Permit Number/s	Type of Approval/s	Enabling Statutes
0000-10-0044.1 FHA 100001 0000-10-0044.1 FWW 100003	Flood Hazard Area Individual Permit Freshwater Wetlands Individual Permit	NJSA 58:10A NJSA 13:9B NJSA13:1D-1 NJSA 58:16A-50

Applicant	Site Location
New Jersey Department of Environmental Protection Engineering and Construction 501 East State Street Trenton, NJ 08625	Green Brook Flood Control Project, Segment B-1 Borough of Green Brook, Somerset County Borough of Middlesex, Middlesex County New Jersey

The applicant, New Jersey Department of Environmental Protection (NJDEP), is proposing structural flood protection (levee system and floodwall), along the Green Brook in the Borough of Middlesex in Middlesex County on both the east and west sides of Sebring Mills Road. The project is known as Segment B-1 of the Green Brook Flood Control Project.

The levee system will consist of 950 linear foot earthen levee, a 100 CFS pumping station and construction of nine outfall structures, 1950 linear feet of cast in place concrete T-wall floodwall and reconstruction of Sebring Mills Road Bridge in order to provide an elevation closure for the proposed levee and flood walls. The levee height in the project location ranges from 51.5 NVGD at the upstream end to 49.1 NGVD at the downstream end, with 2.5:1 side slopes, a 110 foot wide footprint, and a 10 foot wide access way on top of the levee in order to provide maintenance and inspection access. The overall purpose of this project is to protect homes along the Green Brook in Middlesex Borough and Green Brook Borough.

The floodwall and levee system will result in disturbances of the following: the temporary disturbance of 0.38 of an acre of freshwater wetlands, and 0.033 of an acre of wetland transition areas. The permanent disturbance of 4.38 acres of freshwater wetlands, and 0.88 acres of transition area. **The permittee must mitigate for the temporary loss of 0.38 acres forested wetlands through an on-site restoration project and the permanent loss of 4.38 acres of palustrine forested wetlands through use of the Finderne Farm Wetland Mitigation Project as detailed below.**

Prepared by

Andrew Clark
Supervising Specialist

Received or Recorded by County Clerk

THIS PERMIT IS NOT EFFECTIVE AND NO CONSTRUCTION APPROVED BY THIS PERMIT, OR OTHER REGULATED ACTIVITY, MAY BE UNDERTAKEN UNTIL THE APPLICANT HAS SATISFIED ALL PRE-CONSTRUCTION CONDITIONS AS SET FORTH IN THIS PERMIT.

This permit is not valid unless authorizing signature appears on the last page.

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STANDARD CONDITIONS:

1. **Extent of approval:**
   a. This document grants permission to perform certain activities that are regulated by the State of New Jersey. The approved work is described by the text of this permit and is further detailed by the approved drawings listed herein. All work must conform to the requirements, conditions and limitations of this permit and all approved drawings.

   b. If you alter the project without prior approval, or expand work beyond the description of this permit, you may be in violation of State law and may be subject to fines and penalties. Approved work may be altered only with the prior written approval of the Department.

   c. You must keep a copy of this permit and all approved drawings readily available for inspection at the work site.

2. **Acceptance of permit:** If you begin any activity approved by this permit, you thereby accept this document in its entirety, and the responsibility to comply with the terms and conditions. If you do not accept or agree with this document in its entirety, **do not begin** construction. You are entitled to request an appeal within a limited time as detailed on the ***Administrative Hearing Request Checklist and Tracking Form*** which can be found at www.nj.gov/dep/landuse/forms/index.html.

3. **Recording with County Clerk:** You must record this permit in the Office of the County Clerk for each county involved in this project. You must also mail or fax a copy of the front page of this permit to the Department showing the received stamp from each County Clerk within 30 days of the issuance date of the permit.

4. **Notice of Construction:** You must notify the Department in writing at least 7 days before you begin any work approved by this permit by submitting a construction report. The Construction Reports are also available at www.nj.gov/dep/landuse/forms/index.html.

5. **Expiration date:** All activities authorized by this permit must be completed by the expiration date shown on the first page unless otherwise extended by the Division. At that time, this permit will automatically become invalid and none of the approved work may begin or continue until a replacement permit is granted. (Some permits may qualify for an extension of the expiration date. Please contact the Department for further information.)

6. **Rights of the State:**
   a. This permit is revocable and subject to modification by the State with due cause.

   b. Representatives from the State have the statutory authority to enter and inspect this site to confirm compliance with this permit and may suspend construction or initiate enforcement action if work does not comply with this permit.

   c. This permit does not grant property rights. The issuance of this permit shall not affect any action by the State on future applications, nor affect the title or ownership of property, nor make the State a party in any suit or question of ownership.

7. **Other responsibilities:** You must obtain all necessary local, Federal and other State approvals before you begin work. All work must be stabilized in accordance with the *Standards for Soil Erosion and Sediment Control in New Jersey,* and all fill material must be free of toxic pollutants in toxic amounts as defined in section 307 of the Federal Act.

SPECIAL CONDITIONS IN ADDITION TO THE STANDARD CONDITIONS:

8. The permittee shall immediately inform the Department of any unanticipated adverse effects on the environment not described in the application or in the conditions of this permit.

9. Any regulated activities undertaken on the site before a copy of this recorded permit is submitted to the Department will be considered in violation of the implementing rules and this permit.

10. Consistency with the Areawide Water Quality Management Plan

    The Division of Land Use Regulation has not reviewed this application for consistency with the Areawide Water Quality Management Plan and the issuance of this permit shall not be construed as an approval of any wastewater management plan for this project or site. There shall be no construction of any sewage generating structures unless and until the proposed development has been found to be consistent with the appropriate areawide water quality management plan.

11. Any discharge of fill material shall consist of suitable material free form toxic pollutants and shall be maintained in accordance with the Soil Conservation Service's approved plan.

12. The applicant shall be responsible for preserving and minimizing vegetation disturbances within wetlands, transition areas and along streams. All temporary disturbances shall be replanted with native herbaceous and woody vegetation.

13. In order to protect the general fishery resources within the Green Brook, any proposed grading or construction activities within the banks of these or any other watercourses on site are prohibited between May 1st and July 31st of each year. In addition, any activity within the 100-year flood plain or flood hazard area of this watercourse that could introduce sediment into said watercourse or that could cause an increase in the natural level of turbidity is also prohibited during this period. The Department reserves the right to suspend all regulated activities on site should it be determined that the applicant has not taken proper precautions to ensure continuous compliance with this condition.

14. FRESHWATER MITIGATION PERMIT CONDITIONS:

Failure to comply with the standards herein constitutes a violation of the Freshwater Wetlands Protection Act and subjects the permittee to appropriate enforcement action and/or suspension or revocation of the permit.

15. In accordance with N.J.A.C. 7:7A-15 et seq, mitigate for the **permanent impact to 4.38 acres of forested freshwater wetlands through** use of the off-site advance mitigation project designed and implemented by the U. S. Army Corps of Engineers for impacts associated with the Green Brook Flood Control project titled Finderne Farm (NJDEP Permit No. 1806-02-0013.1 FHA 050001). The approved Finderne Farm Advance Mitigation Project approved a plan to create approximately 22.6 acres of forested wetlands, enhance 12.65 acres to forested wetlands, enhance 6.1 acres to scrub-shrub wetlands, enhance 4.69 acres to emergent wetlands and preserve 5.56 acres of existing emergent wetlands and State open waters. In addition, the plan approved the restoration of 800 linear feet of stream and 26.98 acres of riparian forest along the Raritan River to be restored and enhanced with trees. Additionally, 6.2 acres of upland forest were approved to

be enhanced through invasive removal and planting and 39.3 acres of grassland bird habitat were approved to be enhanced.

16. In accordance with N.J.A.C. 7:7A 15.3 (a)(1), the mitigation project must be conducted prior to or concurrent with the construction of the approved project. The Division acknowledges the Finderne Farm Advance Mitigation Project was constructed in 2006 in anticipation of permanent impacts associated with the full implementation of the Greenbrook Flood Control Project.

17. In accordance with N.J.A.C. 7:7A-15 et seq, mitigate for the **temporary impact to 0.38 acres of forested freshwater wetlands and 0.02 acres of State open waters**. In accordance with N.J.A.C. 7:7A 15.11 (a) (1) at least **90 days prior to the initiation of regulated activities authorized by this permit,** for the on-site restoration of temporary impacts the permittee must submit a revised mitigation proposal to the Division of Land Use Regulation (Division) for review and approval. Prior to commencement of regulated activities authorized by this permit, the Division must approve of the proposed temporary restoration project in writing.

    a. Please remove *Agrostis gigantea*, *Elymus villosus* and *Alopecurus pratensis* from the proposed seed mixes.

    b. Please submit revised plans showing all the proposed restoration for all temporary impacts. The plans currently only include the restoration of a 0.16 acres wetlands area.

    c. The permittee must submit a **final design** of the mitigation project and include all the items listed on the checklist entitled Checklist for Completeness: Creation, Restoration or Enhancement for a Freshwater Wetland Mitigation Proposal located on the Internet at http://www.nj.gov/dep/landuse/forms/index.html.

18. At least thirty (30) days in advance of the start of construction of the wetland mitigation project, the permittee shall notify the Division, in writing, for an on-site pre-construction meeting between the permittee, the contractor, the consultant and the Division.

19. The mitigation designer must be present on-site during critical stages of construction of the mitigation project. The mitigation project includes the mitigation site for permanent impacts as well as temporarily impacted restoration areas. Critical stages of construction includes but is not limited to herbicide applications, commencement of construction through completion of all earthmoving activities, sub-grade inspection, final grade inspection, and planting inspection to ensure the intent of the mitigation design and its predicted wetland hydrology is realized in the landscape. This is specifically to ensure that highly invasive plants, if present, are carefully managed through the construction process so that these plants are not spread into new areas. Applicants should reference the Invasive Plants Atlas for a list of plants considered to be invasive at: http://www.invasiveplantatlas.org/index.html. This is to ensure the success of the mitigation project by preventing invasive plant colonization rather than trying to eradicate the invasive plants after the mitigation projects have been completed. To ensure that this is done successfully will require an extra level of construction oversight. It is imperative that **all equipment, especially tracks and tires, be thoroughly cleaned** each time equipment or vehicles move from an area

containing invasives or from off-site to the mitigation area. In addition, the soil containing root fragments and above-ground vegetative material from invasive plants must be carefully managed during earthmoving activities and disposed of off site rather than mulched and reused or stockpiled elsewhere on the site.

20. Mitigation designs are not static documents and changes may be necessary to ensure success of the project. Should the mitigation designer determine that the mitigation plan as designed and approved by the Division will not achieve the proposed wetland condition due to the actual conditions encountered during construction, the mitigation designer must immediately notify the Division. The mitigation designer must propose an alternative plan to achieve the proposed wetland condition that must be approved by the Division in writing. If the Division provides the mitigation designer with comments on the alternative plan, the mitigation designer shall revise the plan to conform to the Division's comments. Solely the Division shall make the determination as to whether or not the alternative plan as submitted conforms to the Divisions comments. Any modifications to the plan that are approved by the Division must be shown on a signed and sealed revised plan. The As-Built plans required as a part of the Construction Completion Report may serve as the signed and sealed revised plans required to be submitted as part of the construction modification process described above if time constraints warrant such action and have been approved by the Division in writing.

21. Following the final grading of the mitigation site and prior to planting, the permittee shall notify the Division for a post-grading construction meeting between the permittee, contractor, consultant and the Division. The permittee must give the Division at least thirty (30) days notice prior to the date of this meeting.

22. In accordance with N.J.A.C. 7:7A 15.16, within 30 days following the final planting of the mitigation project, the permittee shall submit a Construction Completion Report to the Division detailing as-built conditions (see below) and any changes to the approved mitigation plan that were made during construction. The Construction Completion Report shall contain, at a minimum, the following information:

    1. A completed Wetland Mitigation Project Completion of Construction Form. This form is located on the Internet at http://www .nj.gov/dep/landuse/forms/index.html and certifies that the mitigation project has been constructed as designed and that the proposed area of wetland creation, restoration or enhancement has been accomplished;

    2. As-Built plans which depict final grade elevations at one foot contours and include a table of the species and quantities of vegetation that were planted including any grasses that may have been used for soil stabilization purposes;

    3. Photos of the constructed wetland mitigation project with a photo location map as well as the GPS waypoints in NJ state plane coordinates NAD 1983;

    4. The permittee shall post the mitigation area with permanent sign(s), which identify the site as a wetland mitigation project and that all-terrain vehicle use, motorbike use, mowing, dumping, draining, cutting and/or removal of

plant materials of the property is prohibited and that violators shall be prosecuted and fined to the fullest extent under the law;

5. The signs must also state the name of the permittee, Department's permit number along with a contact name and phone number.

23. The permittee shall monitor the mitigation project for 5 full growing seasons if it is a proposed forested or scrub/shrub wetland and 3 full growing seasons for an emergent wetland or State open water beginning the year after the mitigation project has been completed. The permittee shall submit monitoring reports to the Division of Land Use Regulation no later than December 31st of each full monitoring year. All monitoring reports must include the standard items identified in the checklists entitled Wetland Mitigation Monitoring Project Checklist and Tidal Wetland Mitigation Monitoring Checklist and the information requested below. The Wetland Mitigation Monitoring Project Checklist and Tidal Wetland Mitigation Monitoring Checklist are located on the Internet at http://www.nj.gov/dep/landuse/forms/index.html.

24. Once the required monitoring period has expired and the permittee has submitted the final monitoring report, the Division will make the finding that the mitigation project is either a success or a failure. This mitigation project will be considered successful if the permittee demonstrates all of the following:

    1. That the goals of the wetland mitigation project including acreage and the required transition area, as stated in the approved wetland mitigation proposal and the permit, has been satisfied. The permittee must submit a field wetland delineation of the wetland mitigation project based on the Federal Manual for Identifying and Delineating Jurisdictional Wetlands (1989) which shows the exact acreage of State open waters, emergent, scrub/shrub and/or forested wetlands in the mitigation area;

    2. The site has an 85 percent survival and 85 percent area coverage of the mitigation plantings or target hydrophytes which are species native to the area and similar to ones identified on the mitigation planting plan. All plant species in the mitigation area are healthy and thriving. All trees are at least five feet in height;

    3. The final monitoring report must include documentation demonstrating the site is less than 10 percent occupied by invasive or noxious species.

    4. The site contains hydric soils or there is evidence of reduction occurring in the soil; and,

    5. The proposed hydrologic regime as specified in the mitigation proposal has been satisfied. This criteria must be satisfied to prove the mitigation site is a wetland.

25. In accordance with N.J.A.C. 7:7A 15.16 (f) the permittee shall assume all liability for accomplishing corrective work should the Division determine that the compensatory mitigation has not been 100% successful. If the mitigation project is considered a failure, the permittee is required to submit a revised mitigation plan in order to meet the success criteria identified in Condition No. 13 above. The plan shall be submitted within 30 days of receipt of the letter from the Division indicating the wetland mitigation project was a failure. The financial surety, if

required, will not be released by the Division until such time that the permittee satisfies the success criteria as stipulated in condition number 13.

26. If the permittee fails to perform mitigation within the applicable time period the acreage of mitigation required shall be increased by 20% each year after the date mitigation was to begin.

RIPARIAN ZONE COMPENSATION CONDITIONS

27. Compensate for the loss of 0.83 acres of forested riparian zone at a ratio of at least 2:1 through the use of the off-site advance mitigation project designed and implemented by the U. S. Army Corps of Engineers for impacts associated with the Green Brook Flood Control project titled Finderne Farm (NJDEP Permit No. 1806-02-0013.1 FHA 050001). The approved Finderne Farm Advance Mitigation Project approved a plan to create approximately 22.6 acres of forested wetlands, enhance 12.65 acres to forested wetlands, enhance 6.1 acres to scrub-shrub wetlands, enhance 4.69 acres to emergent wetlands and preserve 5.56 acres of existing emergent wetlands and State open waters. In addition, the plan approved the restoration of 800 linear feet of stream and 26.98 acres of riparian forest along the Raritan River to be restored and enhanced with trees. Additionally, 6.2 acres of upland forest were approved to be enhanced through invasive removal and planting and 39.3 acres of grassland bird habitat were approved to be enhanced.

28. Compensate for the temporary impact to 0.05 of an acres of forested riparian zone. The compensation proposal must be submitted to the Division for review and approval 90 days **prior to the initiation of regulated activities authorized by this permit**. Activities authorized by this permit shall not begin until the compensation proposal is approved and the compensation has begun.

29. The compensation project must be conducted prior to or concurrent with the construction of the approved project. The Division acknowledges the Finderne Farm Advance Mitigation Project was constructed in 2006 in anticipation of permanent impacts associated with the full implementation of the Greenbrook Flood Control Project.

30. All replanting of vegetation shall be accomplished in accordance with the Flood Hazard Area Control Act Rules (N.J.A.C. 7:13).

31. As per N.J.A.C. 7:13-10.2, all riparian zone compensation must be deed restricted against future development that would remove the vegetation being planted. The conservation restriction shall conform to the format and content of the Riparian Zone Compensation Area model conservation restriction located at http://www.nj.gov/dep/landuse/forms/index.html. The restriction shall be included on the deed, and recorded in the office of the County Clerk (the Registrar of Deeds and Mortgages in some counties), in the county wherein the lands of the compensation project are located, within 10 days of completion of construction of the compensation project. Within 10 days of filing the conservation restriction, the permittee must send a copy of the conservation restriction to the Department for verification.

32. In the event that there is a conflict between the permit conditions and the approved riparian zone compensation plans and proposal, the permit conditions take precedent.

33. If the riparian compensation project is considered a failure, the permittee is required to submit a revised riparian compensation plan in order to meet the success criteria identified in Condition No. 4 above. The plan shall be submitted within 60 days of receipt of notification from the Division indicating the riparian compensation project was a failure.

34. If the Division determines that the riparian zone compensation project is not constructed in conformance with the approved plan, the permittee will be notified in writing and will have 60 days to submit a proposal to indicate how the project will be corrected.

35. As per N.J.A.C. 7:13-10.2, the permittee shall monitor the riparian project for at least three (3) years beginning the year after the riparian zone compensation project has been completed. The permittee shall submit monitoring reports to the Division of Land Use Regulation, project manager no later than December 31st of each full monitoring year.

    a. All monitoring reports except the final one must include documentation that it is anticipated, based on field data, that the goals of the riparian zone compensation project, as stated in the approved riparian zone compensation proposal and the permit will be satisfied. If the permittee is finding problems with the compensation project and does not anticipate the site will be a full success, then recommendations on how to rectify the problems must be included in the report with a time frame in which they will be completed.

    b. The final monitoring report must document the following:

        1. That the goals of the riparian zone compensation project including acreage as stated in the approved riparian zone compensation proposal and the permit has been satisfied.

        2. The site has an 85 percent survival and 85 percent area coverage of the compensation planting which are species native to the area and similar to ones identified on the compensation planting plan. All plant species in the compensation area are healthy and thriving. All trees are at least 5 feet in height;

        3. Documentation demonstrating the site is less than 10 percent occupied by invasive or noxious species.

36. **The drawings hereby approved** are ninety four (94) drawings prepared by the URS Group, Inc., dated May 2, 2010, last revised June 30, 2010 , unless otherwise noted, entitled: "GREEN BROOK FLOOD DAMAGE REDUCTION PROJECT – SEGEMENT B-1 FLOOD HAZARD AREA INDIVIDUAL PERMIT APPLICATION (MIDDLESEX & GREEN BROOK, NJ) "

    "KEY MAP", Sheet G-101, 3 of 104

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    "FLOODWALL PLAN STA.6+00 TO STA. 13+00", Sheet C102, 5 of 104,

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"FLOODWALL AND LEVEE PLAN STA. 18+25 TO STA. 25+50", Sheet C104, 7 of 104,

"LEVEE PLAN STA. 25+25 TO STA. 30+50", Sheet C105, 8 of 104,

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"PROPOSED BRIDGE GENERAL PLAN AND ELEVATION", Sheet S102, 10 of 104,

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"ROADWAY GRADING PLAN", Sheet C107, 12 of 104,

"FLOODWALL AND LEVEE PROFILE STA. 0+00 TO STA. 15 + 00", Sheet C-201, 13 of 104,

"LEVEE PROFILE STA. 15+00 TO STA. 30+50", Sheet C202, 14 of 104,

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"LEVEE CROSS SECTIONS STA. 28+00 TO STA. 29+00", Sheet C313, 29 of 104,

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"GREEN BROOK FLOOD BOUNDARY MAP AND CROSS SECTION LOCATIONS," Sheet C102, 64 of 104; last revised July 21, 2010,

"GREEN BROOK WATER SURFACE PROFILE," Sheet C204, 65 of 104; last revised July 21, 2010,

"GREEN BROOK CROSS SECTION G56," Sheet C315, 66Aof 104, last revised July 21, 2010,

"GREEN BROOK CROSS SECTION G55, "Sheet C316, 66B of 104, last revised July 21, 2010,

"GREEN BROOK CROSS SECTION G54, "Sheet C317, 66C of 104, last revised July 21, 2010,

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"GREEN BROOK CROSS SECTION G39.5," Sheet C329, 80 of 104; last revised July 21, 2010,

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"GREEN BROOK CROSS SECTION G38 AND G37.6," Sheet C331, 82 of 104; last revised July 21, 2010,

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"RIPARIAN IMPACT PLAN, STA. 25+50 TO STA. 30+50", Sheet VH 111,

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"LANDSCAPE PLAN, STA. 0+00 TO STA.6+00", Sheet L101, 98 OF 104,

"LANDSCAPE PLAN, STA. 6+OO TO 13+00", Sheet L102, 99 of 104,

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R. Langbein for,
Rick Reilly, Manager
Bureau of Inland Regulation

8/5/2010
Date

Water Quality Certificate

This letter of authorization to conduct a regulated activity in a wetland or open water includes a Water Quality Certificate for these activities.

Prepared by:

8/5/10

Andrew Clark
Supervisiong Specialist
Bureau of Inland Regulation

Approved by:

R. Langbein 8/5/2010

Richard L. Langbein
Section Chief
Bureau of Inland Regulation

Appendix F

Hazardous, Toxic and Radioactive Waste Documentation

Elizabethtown Water Company Green Brook Wellfield

The Elizabethtown Water Company Green Brook Well Field is situated between Washington Avenue, Jefferson Street, Greenbrook Road, and the Green Brook. The well field currently produces 4 million gallons of water per day. The wells are approximately 350 feet deep and the pumps are set at 211 feet below ground surface. There is a TCE and PCE contamination problem so the water is treated by an air stripper prior to distribution. A representative from the Elizabethtown Water Company indicated that neither the source, extent, nor the migratory path of the contamination is known. However, contaminant levels in the water range from non-detect to 6 ppb.

Proposed FCP-related work in the vicinity of the Green Brook Well Field includes stream realignment and the construction of levees immediately to the east and south. The groundwater problem will not affect the FCP because the contaminated groundwater is in the deep aquifer which is at least 200 feet below ground surface.

F&M Tire (Sheet Number 27)

F&M Tire is located at 925 Route 22, approximately ½ mile north of the FCP. Due to the distance of this site from the FCP, the potential to impact the FCP is considered to be low and no additional information regarding this site was obtained during this investigation.

Getty Service Station (aka John's Getty) (Sheet Number 27)

The Getty Service Station (aka John's Getty), located at 58-62 Greenbrook Road, is approximately 300 feet northeast and across Stony Brook from the FCP. This site is a known contaminated site due to two incidents of LUSTs. Contaminated soil and groundwater (petroleum hydrocarbons, arsenic, and lead) have been detected. The NJDEP issued a letter, dated February 8, 1994, to request that additional investigation be conducted. Due to the fact that this site is separated from the FCP by Stony Brook, no impact to the FCP is anticipated.

URS
A PROFESSIONAL SERVICES ORGANIZATION

URS CONSULTANTS, INC.
MACK CENTRE II
MACK CENTRE DRIVE
PARAMUS, NEW JERSEY 07652-3905
(201) 262-7000
FAX (201) 262-9199

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32140

MEMORANDUM

Meeting With: Dr. Ronald Cohen
Middlebrook Regional Health Commission

Meeting By: Andrew Leong

Date: October 5, 1992

Subject: Green Brook Flood Control Project
Reconnaissance Level Hazardous, Toxic and Radioactive Waste Assessment

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The meeting of October 5, 1992 at Middlesex Boro Hall proceeded with Dr. Cohen reviewing hazardous sites town by town while using 4000' scale map as a mark-up (see attached):

Bound Brook

- Chips Amoco near Middle Brook and Route 28, 8000 gallon gasoline spill, site has been remediated. However future excavation may potentially reveal previously undetected contamination.

- Municipal landfill near GB Pond GR2, closed 1971. The landfill extends approximately from GB Sec G14 downstream to Main Street bridge and from the Green Brook eastward towards East Street and High Street.

- TIFA (Blue Spruce) Co. pesticide leak in Pond RL1 near Main Street and Columbus Place. Monitor wells continue with on-going monitoring.

- Department of Energy (DOE) low level radioactive waste at confluence of Green Brook and GT2 near GB Sections G19-G20 (FUSRAP site (?)). Currently being remediatied, completion pending. DOE contacts for follow-up:

  - Susan Cange, Site Manager
    Oak Ridge, TN 37831, 615-576-5724
  - Steven Liedle, Project Manager
    Bechtel Environmental, Inc.
    Oak Ridge, TN 37831, 615-576-3997

This is one of five sites in NJ. URS will contact DOE to inquire where other 4 sites are.

Middlesex

- Nuclear waste site at Marine Base located on Mountain Avenue near Egel and Wood Avenue, south of NJ Central and Lehigh Valley Railroad contains 65,000 CY low level radioactive contaminated soil.
- Note: Chipman Chemical a.k.a. Rhone Poulenc located on 5 Factory Lane/Lincoln Blvd. Cleanup contracted to Woodward Clyde.
- Note: All along RR berm a french drain exists designed to maintain water table along RR. Has been used for illegal dumping in the past. Pipe drains into Green Brook at confluence with Raritan R. Potential impact if required to excavate RR berm.
- Getty Oil has abandoned oil pipeline (PA to Linden) crossing the Green Brook and Bound Brook in Middlesex (also other towns in the study area?). URS will follow up to determine locations and status.
- Note: Piscataway Sewer line parallel to Ambrose Brook conducts industrial waste.
- Ambrose Brook upper limits (outside project area) runs thru most heavily industrialized parts of Piscataway and South Plainfield. Great potential for problems in lower limits i.e. at confluence with Green Brook, if there are future spills upstream.

Green Brook

- Getty gas station at Route 22 and Rock Avenue. Gasoline leak into Municipal Brook contaminating Elizabethtown Water Wellfields. Wellfields are located near Municipal Brook's confluence with Green Brook (bet. Jefferson and Washington Avenue). Elizabethtown Water subsequently installed air strippers to remove volatiles from supply.

Plainfield

- National Starch has abandoned sewer outfall to Green Brook along Rock Avenue.

Watchung

- Watchung Lake has abandoned lake chlorination system. Previously used for swim club.
- Township has mostly isolated coliform pollution problems from package sewage treatment plants or septic system overflows.

Dr. Cohen emphasized that chronologic files are on record at Middlesex Department of Health. Since files are large, reproduction should be limited to those that most severely impact the project. Case digests of most files are smaller and may be more easily reproduced if their level of detail is adequate.

cc: Ronald Cohen
Thomas MacAllen
Werner Mueller
Jennifer Phelan
Central Files

32140
memo.006

DWR-020
9/05

New Jersey Department of Environmental Protection
Division of Water Supply - Bureau of Water Systems & Well Permitting

WELL ABANDONMENT REPORT

MAIL TO: **Bureau of Water Systems & Well Permitting**
PO Box 426
Trenton, NJ 08625-0426

WELL PERMIT # Unknown of well sealed

DATE WELL SEALED 7/31/06

PROPERTY OWNER New Jersey American Water Company

ADDRESS 1341 North Avenue, Plainfield, NJ 07061

WELL LOCATION Greenbrook Road, Middlesex Borough, Middlesex County
Street & No., Township, County

6	19	70F
Well No.	Lot No.	Block No.

USE OF WELL PRIOR TO ABANDONMENT: Public Community

REASON FOR ABANDONMENT: No longer in use

WAS A NEW WELL DRILLED? ☐ YES ☑ NO PERMIT # OF NEW WELL _____

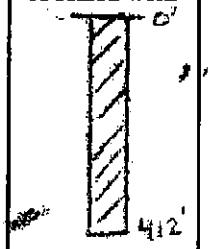
TOTAL DEPTH OF WELL	412'
DIAMETER	12"
CASING LENGTH	22'
SCREEN LENGTH	-
NUMBER OF CASINGS	1

MATERIAL USED TO DECOMMISSION WELL:

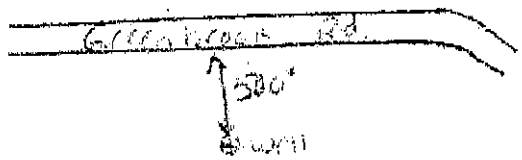
1848	Gallons of Water
28952	Lbs. of Cement
	Lbs. of Bentonite
	Lbs. of Sand/Gravel
	(none if well is contaminated)

FORMATION: X Consolidated
_____ Unconsolidated

Cross-section of sealed well



Draw a sketch showing distance and relations of well site to nearest roads, buildings, etc.



AS-BUILT WELL LOCATION
(NAD 83 HORIZONTAL DATUM)
NJ STATE PLACE COORDINATE IN US SURVEY FEET

N

NORTHING: _____ EASTING: _____
OR
LATITUDE: ___ ___ ' ___ . __ " LONGITUDE: ___ ___ ' ___ . __ "

To permit adequate grouting, the casing should remain in place, but ungrouted liner pipes or any other obstructions must be removed. Pressure grouting is the only accepted method.

WAS CASING LEFT IN PLACE? ☑ YES ☐ NO CASING MATERIAL: Steel

WERE OTHER OBSTRUCTIONS LEFT IN WELL? ☐ YES ☑ NO WHAT WERE THE OBSTRUCTIONS: _____

IF "YES", AUTHORIZATION GRANTED BY _____ ON _____
(NJDEP Official) (Date)

Was an alternative decommissioning method used and/or approval to decommission granted by a DEP official? ☐ YES ☐ NO

Permission to seal well without a permit number

IF "YES", authorization granted by Steve Reya ON 7/25/06
(NJDEP Official) (Date)

I certify that this well was sealed in accordance with N.J.A.C. 7:9D-3 et seq.

Dennis Wenk/Samuel Stothoff Co Inc	PO Box 306, Flemington, NJ 08822	8/11/06
Performing Work (Print or Type) Name of NJ Licensed Well Driller	Address	Mailing Date
Signature of NJ Licensed Well Driller Performing Work		Registration # 35314

COPIES: White - Water Allocation Yellow - Owner Pink - Health Dept. Goldenrod - Driller

Samuel
STOTH$_2$OFF
Co., Inc.

Well Drilling
Pump Maintenance
Water Treatment

July 19, 2006

Mr. Steve Reya
NJ Dept. of Environmental Protection
Bureau of Water Allocation
PO Box 426
Trenton, NJ 08625-0426

Ref: NJ American Water Company
Block 70F, Lot 19, Middlesex Boro.
Greenbrook Road & Starlit Drive
WELL #6

Dear Steve:

On June 30, 2006 our driller Dennis Wene drilled out well number 6 to a depth of 412' to match the permit number 45-00043 however even though the record shows it as well number 6, the diameter of the well is actually 12" not 10". We plan on abandoning this well by pumping a cement slurry through a tremie line from the bottom of the well to ground surface. Please let me know if we have permission and if we should use that permit number.

Thank you,

Laurie M. Wille

Laurie M. Wille
Office Manager

APPROVAL TO SEAL GRANTED
7/25/06
Steve Reya

(REFERENCE WELL AS WELL #6 ON ABANDONMENT REPORT.
CORRECT PERMIT # AND MATCHIN WELL RECORD NOT AVAILABLE