USDA
United States Department of Agriculture
Research, Education, and Economics
Agricultural Research Service

August 10, 2015

Mr. Marcel Acosta, AICP
Executive Director National Capital Planning Commission
401 9th Street, N.W.
North Lobby, Suite 500
Washington, D.C. 20576

RE: Maryland Department of the Environment and Chesapeake Bay Trust Non-Tidal Wetland Grant Program-Wetland Restoration Project

Dear Mr. Acosta:

Enclosed for your review and preliminary approval request of the proposed project is located on the Beltsville Agricultural Research Center (BARC) at 10300 Baltimore Avenue, Beltsville, Maryland (Lat: 39.024025, Long: -76.935504). BARC will utilize portions of government-owned land for the subject property (known as the Spray Irrigation Field) for the purposes of this and one other wetland and stream restoration project currently underway. In concert, these two projects will result in over 13 acres of headwater wetland and 1,800 linear feet of stream restoration. The wetland/stream mitigation project is being provided to Prince George's County by GreenVest and will result in 2.94 acres of wetland creation/restoration and 1,484 linear feet of stream restoration. The attached concept plan depicts the location of PG County's mitigation project, which will be implemented during the summer/fall of 2015. This project, as proposed, was designed as an extension of and will be integrated with the Prince George's County project. The restoration areas will be permanently protected through the establishment and application of a federal land use covenant. BARC has applied this type of land protection mechanism on several areas of the site including several mitigation project undertaken by State Highway Administration as compensation for Inter-County Connector (ICC) related natural resource impacts. The site was selected based on its restoration potential, the historic presence of wetlands (see Historic Wetlands Map-Figure 5), ample sources of hydrology (measured/calculated by our team), high probability of success, diversity of mitigation types that can be restored, uplift to ecosystem services, plus its proximity to large ecologically sensitive wetland complexes in this highly developed/**First Priority Watershed**.

In accordance with the National Environmental Policy Act of 1969, a NEPA report has been attached for your review. Also included is a photo, drawings and the Categorical Exclusion for the construction.

This project has not been submitted to your office under the Federal Capital Improvement Program; however, BARC would like to submit this project under the NCPC Guidelines and Submission Requirements for Section 7, Delegation of Authority to Executive Director of Federal Property in the National Capital Region for your review.

I look forward the Commission's response regarding this project. Please contact me at the BARC, Real Property Section should you have any questions regarding this submission. I can be reached at 301-504-5221.

Thank you in advance.

Sincerely,

Claudette Joyner

Claudette Joyner
Realty Specialist
Real Property Section

Enclosures

BARC Spray Irrigation Field Email Attachment List 7-29-15

PDFs:

1. GreenVest authorization BARC 2-5-15
2. PG County Mitigation Plan
3. BARC Project Narrative
4. 24 July 2015 BARC Phase I Report
5. CBT Award Letter
6. Shop submittal letter
7. Test Pit Locations for Phase I
8. BARC SIF Archeological Summary Letter 7-21-15
9. Spray Irrigation Field Before and After Renderings

Emails

10. RE: Corps response for PG County CIP Project
11. NCPC and MHT Approval

February 5, 2015

Doug Lashley, Managing Member
GreenVest, LLC
210 Najoles Road, Suite 202
Millersville, MD 21108

RE: Proposed Wetland Restoration Project
United States Department of Agriculture
Agricultural Research Service
Beltsville Agricultural Research Center
Beltsville, Maryland

Dear Mr. Doug Lashley,

The United States Department of Agriculture (USDA), Agricultural Research Service (ARS), Beltsville Agricultural Research Center (BARC) endorses the GreenVest wetland restoration proposal on the North Farm parcel identified at BARC. The USDA-ARS currently owns the above-referenced property, and thoroughly supports the project goals to provide wetland functions to create habitat, recharge groundwater, reduce sediment and base load to the nearby stream, and improve water quality. We are willing to provide portions of the subject property for purposes of stream restoration and wetland creation. We understand that GreenVest, LLC, and associated subcontractors will need access to the site for preliminary study, design, implementation and monitoring of the restoration project.

The proposed project is in the Little Paint Branch subwatershed of the Anacostia River. The Anacostia Restoration Plan of the Metropolitan Washington Council of Governments (MWCOG) identified restoration targets for Anacostia subwatersheds, and wetland creation and restoration is one of the strategies in the Little Paint Branch subwatershed Action Plan. BARC is the largest Federal facility in the Anacostia watershed, and has collaborated with MWCOG, Maryland Department of Natural Resources, and local volunteers in reforestation projects and natural resource protection and enhancement throughout its three subwatersheds, including the Little Paint Branch subwatershed. In addition, the Maryland Intercounty Connector, Environmental Stewardship, and Compensatory Mitigation package included a stream, floodplain, and wetland restoration project incorporating Little Paint Branch. Furthermore, this project moves BARC closer to meeting the goals of Executive Order 13508 for improving the health of the Chesapeake Bay.

Mr. Doug Lashley

Thus, BARC has a strong record of environmental and natural resource stewardship, and we are excited at the prospect of GreenVest, LLC restoring a stream corridor and wetland to BARC property.

As owner of the subject property, we hereby authorize GreenVest, LLC to submit a grant application to the Maryland Department of the Environment and Chesapeake Bay Trust to fund the design and implementation of a wetland restoration project utilizing the above-referenced property, subject to BARC conditions regarding removal of existing infrastructure in the spray field. Permanent protection for the restoration area is assured by both Federal law and the Maryland Senate, which guarantee the land to be permanently maintained as Agricultural Open Space.

Sincerely,

For Ellen Harris, Director / Act Asst Dir BARC
Beltsville Agricultural Research Center (BARC)

August 10, 2015

Claudette Joyner
U.S. Department of Agriculture (USDA)
Beltsville Agricultural Research Center
10300 Baltimore Ave., Building 003, Room 308
Beltsville, Maryland 20705-2350

Re: Beltsville Agricultural Research Center (BARC)
Stream and Non-tidal Wetlands Creation/Restoration
Tax Map 0018, Grid 00D3, P/O Parcel 0092
Prince George's County, Maryland

Dear Ms. Joyner:

On July 27, 2015, the Maryland Historical Trust (Trust) received a copy of the report on the Phase I archeological survey conducted for the above-referenced proposed project, for review and comment.

We appreciate the project sponsors' cooperation in implementing the Phase I archeological survey, requested by the Trust in our prior correspondence dated June 8, 2015. Completion of the archeological survey enables the Trust, Maryland's State Historic Preservation Office, to conclude its review of the proposed project for its effects on historic and archeological resources, pursuant to Section 106 of the National Historic Preservation Act of 1966 and the Maryland Historical Trust Act of 1985. We offer the following comments.

The Trust reviewed the following report prepared and submitted by Stantec: *Phase I Archaeological Survey for A Stream and Wetland Restoration Project at the Henry A. Wallace Beltsville Agricultural Research Center in Prince George's County, Maryland* (Kreisa et al. 2015). The report presents detailed documentation on the goals, methods, results and recommendations of Phase I archeological survey conducted within a 25-acre parcel slated for installation of wetland and stream restoration projects. The document meets the reporting requirements of the Trust's *Standards and Guidelines for Archeological Investigation in Maryland*. We accept the current report as the final document for our library.

The survey strategy included background investigations and varying levels of pedestrian examination and sub-surface testing within the immediate 2.94 acre wetland and 1,484 linear-foot stream restoration as well as the larger 25-acre parcel slated for long term use for wetland and stream restoration actions. The survey did not identify any archeological resources within the immediate project areas and the 25 acre parcel as a whole, and revealed that the parcel has been extensively disturbed by various 20th c. land altering actions. Based on the survey results, the Trust concurs that no further archeological investigations are warranted for the entire 25 acre parcel. In our opinion, use of this entire parcel for wetland and stream restoration projects will have no effect on historic and archeological resources.

If you have questions or require further information, please contact me at beth.cole@maryland.gov or 410-514-7631. Thank you for providing us this opportunity to comment.

Sincerely,

Beth Cole

Beth Cole
Administrator, Project Review and Compliance
Maryland Historical Trust

BC/201503368

cc: Patrick Phillips (BMT Designers & Planners)
Paul Kreisa (Stantec)
Brett Berkley (GreenVest)
Kathy Anderson (COE)
Kelly Neff (MDE)
Derek Winogradoff (PG Co. DPW)
Jennifer Stabler (M-NCPPC)

CHECKLIST FOR ENVIRONMENTAL ISSUES TO CONSIDER WHEN EVALUATING FOR POTENTIAL ADVERSE IMPACT FOR USDA, ARS CONSTRUCTION PROJECTS

Project Name/Identification: North Farm Spray Field Irrigation Restoration to Stream and Wetlands

Date: July 7, 2015

Will the proposed construction action:

Yes No X Cause or contribute to soil erosion" by wind or water?

Yes No X Affect soil surface stability?

Yes No X Degrade water quality in a Sole-Source Aquifer?

Yes No X Decrease aquifer yield or affect water rights?

Yes No X Affect aquatic life?

Yes No X Cause or contribute to flow variation in a stream or spring?

Yes No X Degrade the aesthetic properties and/or potential uses of either ground or surface waters?

Yes No X Affect chemical quality of ground or surface waters (pH, dissolved oxygen, nutrients, dissolved solids, pesticides, etc.)?

Yes No X Affect physical quality of ground or surface waters (suspended solids, turbidity, color, oil, temperature, etc.)?

Yes No X Cause odors or release odoriferous substances to air or water?

Yes No X Release toxic substances into the air in quantities that could affect human health or safety, or environmental quality?

Yes No X Release particulate-matter into the air?

Yes No X Change local meteorological conditions or air movement patterns?

Yes No X Release substances for which there is a National Ambient Air Quality Standard (i.e., sulfur oxides, nitrogen oxides, carbon monoxide, lead, particulate matter, etc.)?

Yes No X Affect undisturbed natural areas or a wild and scenic river?

Yes No X Affect game animals or fish or their taking?

Yes No X Affect rare, threatened, or endangered species, or a critical habitat

Yes No X Affect species balance, especially among predators?

Yes No X Involve special hazards, such as radioactivity or electromagnetic radiation?

Yes No X Affect or be located in a wetland, flood plain, or the coastal zone?

Yes No X Affect a known or potential cultural, historical, or archaeological site, district, or area? (A consultation with the State Historical Preservation Officer has been conducted, Phase I STPs conducted – "No Effect" Determination .)

Affect local or regional systems related to:

Yes No X transportation?

Yes No X water supply?

Yes No X power and heating?

Yes No X solid waste management?

Yes No X sewer or storm drainage?

Affect local land use through effects on:

Yes No X flood plains or wetlands?

Yes No X location land use?

Yes No X aesthetics?

Yes No X access to minerals?

Affect socioeconomic aspects of an area, including:

Yes No X population?

Yes No X housing supply or demand?

Yes No X employment?

Yes No X commercial activities?

Yes No X industrial activities?

Yes No X cultural patterns?

Yes No X Cause or contribute to unacceptable noise level?

Yes No X Affect public health or safety?

Yes No X Cause public reaction or controversy?

MEMORANDUM FOR THE RECORD

15 July, 2015

To: The Project File
From: SOHES

Subject: CATEGORICAL EXCLUSION FOR THE GREEVEST (BARC) Wetland and Stream Restoration PROJECT TO CREATE 13 ACRES OF HEADWATER WETLAND, AND 1800 LINEAR FEET OF STREAM RESTORATION TO RESTORE THE HISTORIC SITE CONDITIONS

References: (a) THE WHITE HOUSE, COUNCIL ON ENVIRONMENTAL QUALITY, CEQ 40 CFR 1500-1508
(b) UNITED STATES DEPARTMENT OF AGRICULTURE USDA 7 CFR l b
(c) AGRICULTURAL RESEARCH SERVICE ARS 7 CFR 520
(d) ARS 242.1 FACILITY DESIGN STANDARDS
(e) MANUAL 160.0M-ARS - SAFETY, HEALTH AND ENVIRONMENTAL

1. **Per references (a-e)**: subject action has been reviewed under USDA procedures for implementing the National Environmental Policy Act (NEPA). A determination that the proposed action is recommended to be categorically excluded from additional NEPA review and documentation based on the evaluation of the effect of the proposed action on the human environment. An archeological survey was conducted to determine the presence of potential cultural resources in the area proposed for placement of the wetlands and stream and none were found.

2. **Proposed action**: Create 13 acres of headwater wetland, and restore and reconnect 1800 linear feet of stream to restore historic floodplain conditions.

3. **Anticipated Environmental Impacts:** Improved water quality to the Little Paint Branch and reduced TMDL loads to the Anacostia and Chesapeake Bay Watershed as required under the EO 13508 – Restoration of the Chesapeake Bay.

4. **Environmental Justice Determination:** In accordance with Executive Order 12898, this action will not have any impact to minority or economically disadvantaged populations in the region.

5. After full consideration this project has been determined not to have a significant negative environmental impact on the quality of the human health or natural resources, including public health, security, safety, nor that of any threatened or endangered species.

6. **Decision/Finding:** The proposed action has been reviewed and it has been determined that it meets the criteria for Categorical Exclusion mentioned in references (a-e) and may be excluded from further documentation under NEPA. Based on the initial site review and Phase I Archeological determination of no effect it is anticipated that MHT will issue a determination letter of “no effect.” In addition the proposed restoration/mitigation has also been reviewed and approved by the Maryland Department of the Environment, and Maryland Department of Natural Resources as part of a State program to reconnect historically disconnected agricultural flood plains back to the watershed. As such the BARC has determined that this project will only have positive effects on the environment and therefore approves the CATEX as the project is consistent with all applicable regulations.

MEMORANDUM FOR THE RECORD
USDA is an Equal Opportunity Employer

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- Proposed Stream Realignment/Restoration- 1,646 LF
- Wetland Restoration- 2.36 Acres
- Wetland Creation- 2.80 Acres
- Proposed Ditch Plugs
- Existing Watercourses/Streams
- Future Restoration

Data Sources: ESRI, Maryland MDE,GreenVest LLC

Beltsville Agricultural Research Center
Conceptual Mitigation Plan

10300 Baltimore Ave #302, Beltsville, MD 20705
Prince George's County, Maryland

GreenVest
One Step Ahead.
www.greenvestus.com

MARYLAND	NEW JERSEY	NORTH CAROLINA
210 Najoles Road, Suite 202 Millersville, MD 21108 410.987.5500 (p) 410.987.5501 (f)	91 Fieldcrest Ave. Raritan Plaza II, A-1 Edison, NJ 08837 732.902.6644 (p) 732.902.6643 (f)	4405 Dewees Court Raleigh, NC 27612 919.787.5829 (p) 410.268.5501 (f)

1 inch = 175 ft

Date: 10/21/2014

Maryland Department of the Environment and Chesapeake Bay Trust Non-Tidal Wetland Grant Program

PROJECT NARRATIVE

For:

USDA Agricultural Research Service
Beltsville Agricultural Research Center
WETLAND RESTORATION PROJECT

Beltsville
Prince George's County,
Maryland

Applicant:
GreenTrust Alliance Inc.
210 Najoles Road, Suite 200
Millersville, Maryland 21108
410.757.0023

TABLE OF CONTENTS

TABLES:

APPENDICES:

1.0 Introduction

GreenTrust Alliance Inc. (GTA) and its partners: United States Department of Agriculture- Agricultural Research Service (USDA-ARS), Metropolitan Washington Council of Governments (MWCOG), BMT Designers & Planners, Inc. (BMT), Environmental Quality Resources, LLC (EQR) and GreenVest, LLC (GV), are pleased to submit this proposal to the Maryland Department of Environment (MDE) – Chesapeake Bay Trust (CBT) Non-Tidal Wetlands Grant Program. Our Beltsville Agricultural Research Center (BARC) Wetland Restoration Project presents a viable and cost effective opportunity to implement compensatory mitigation using Maryland In-Lieu Fee (ILF) funds (i.e., Non-Tidal Wetlands Compensation Funds) collected for permanent freshwater wetland impacts within the Anacostia River Watershed (8-Digit Maryland watershed: 02140205). This project will promote State and Federal objectives of implementing compensatory mitigation with collected in-lieu fees, in addition to state and regional objectives for: watershed management, ecosystem restoration, water quality and wildlife habitat improvement, open space use/management, and green infrastructure connections by improving the ecosystem services on this urban site in the Anacostia Watershed, Beltsville, Prince George's County, MD.

Historic ILF rates on a per acre basis have not been robust enough to cover the actual costs of acquiring, designing, constructing, maintaining and monitoring wetland restoration projects—particularly in the more urban areas of Maryland. Therefore, to effectively replace lost functions and values, it is vital that funds collected be deployed "cost effectively" to achieve maximum functional uplift on a per acre basis. An option to control costs and improve functional uplift on a cost/acre basis, employed herein, is to utilize land that has been acquired by the local, State or Federal governments for the express purpose of preservation, public benefit and/or natural resource management. Our proposal seeks to apply available funding to restore ecosystem services provided by the unique and diverse natural systems that once existed on the BARC Site. This project, as proposed, is a feasible, efficient and economical means of effectively maximizing the application of collected ILF funds in this heavily developed watershed and region of Maryland.

Two options for the BARC Wetland Restoration project have been developed and provided for your consideration under this application. Option A will provide 10.33 AC of wetland restoration inclusive of the required buffer and 330 LF of stream restoration (see attached concept plan). The reduced scope of Option B will provide 5.65 AC of wetland restoration, required buffer and 330 LF of stream restoration. The GTA team seeks funding under **Application Track 1** to design, implement, maintain and monitor this project, at an average estimated cost of **$73,300** per acre for option A or **$95,300** per acre for option B. Option A will provide 12.08 AC of restoration at a total cost of **$885,230**. Option B will provide 6.91 AC of restoration at a total cost of **$658,223**. Additional acreage suitable for wetland restoration is available on the BARC site, and the project could be expanded at a maximum per acre cost of $73,300 should additional funding be available.

The BARC site possesses significant restoration potential with highly achievable opportunities for ecological uplift and presents the following advantages: 1) The site is located on open space that is owned and maintained by the USDA, thereby eliminating property acquisition expenses while also benefiting USDA by sourcing funds to its underfunded natural resources management programs, 2) The site ensures long-term stewardship of the land, in that USDA is already committed to provide post monitoring stewardship beyond the two year monitoring period, 3) The project is in a contextually appropriate area, in that a former, historic, headwater wetland/stream complex can be cost effectively restored, 4) This surface water dominated system is served by a large tributary area that will provide more than adequate wetland hydrology, 5) This project is a part of a larger restoration effort that will result in over 13 acres of restored headwater wetlands and more than 1,800 linear feet of zero and first order stream all tributary to Little Paint Branch. 6) The stream and wetland restoration will result in in-situ and downstream changes in hydrology and hydraulics that will result in significant reductions in sediment input, decreases in volume and velocity of runoff (time of concentration) during storm events, increases in water quality and stabilization of more than ½ a mile of Spray Irrigation Tributary. 7) This mitigation project will occur in a first priority watershed and densely developed urban area characterized by and outstanding mitigation need and a dearth of viable/feasible mitigation sites, 8) The site is identified as a "priority" for wetland restoration by

MDE's Watershed Resources Registry Tool, 9) The project area abuts and will be integrated into a documented Green Infrastructure Corridor, and 10) The site was recommended for wetland restoration under MDE's Prioritizing Sites for Wetland Restoration, Mitigation, and Preservation in Maryland, and was also targeted for restoration by MWGOC, USFWS and USACE

2.0 Project Description

The proposed project is located on the Beltsville Agricultural Research Center at 10300 Baltimore Avenue, Beltsville, Maryland (Lat: 39.024025, Long: -76.935504). The United States Department of Agriculture (USDA) owns and actively manages the property, supports the project goals (see attached letter of support/permission) and is willing to utilize portions of the subject property (known as the Spray Irrigation Field) for the purposes of this and one other wetland and stream restoration project currently underway. In concert, these two projects will result in over 13 acres of headwater wetland and 1,800 linear feet of stream restoration. The wetland/stream mitigation project is being provided to Prince George's County by GreenVest and will result in 2.94 acres of wetland creation/restoration and 1,484 linear feet of stream restoration. The attached concept plan depicts the location of PG County's mitigation project, which will be implemented during the summer/fall of 2015. This project, as proposed, was designed as an extension of and will be integrated with the PG County project. The restoration areas will be permanently protected through the establishment and application of a federal land use covenant. BARC has applied this type of land protection mechanism on several areas of the site including several mitigation project undertaken by SHA as compensation for Inter-County Connector (ICC) related natural resource impacts. The site was selected based on its restoration potential, the historic presence of wetlands (see Historic Wetlands Map-Figure 5), ample sources of hydrology (measured/calculated by our team), high probability of success, diversity of mitigation types that can be restored, uplift to ecosystem services, plus its proximity to large ecologically sensitive wetland complexes in this highly developed/**First Priority Watershed**.

The BARC facility is comprised of over 6,600 acres of agricultural fields, offices, and research laboratories. The proposed project consists of restoring wetland areas located within the footprint of former spray irrigation fields. The propose restoration area was historically comprised of a mix of forested, scrub-shrub and emergent headwater wetlands containing several zero and first order stream threads. MWCOG, USGS and ACE have mapped this sites historic composition as jurisdictional streams and wetlands (reference: Little Paint Branch Baseline Conditions report, MWCOG, 2009). A summary of the various project components is presented below.

*Wetland Restoration Area (*Option A: ±10.33 acres or Option B: ±5.65 acres*)* – Involves the re-establishment of previously, disturbed/degraded wetlands by restoring headwater hydrology/hydraulics (HH) and community composition, diversity and structure. The BARC site is fully enclosed by deer fence and deer populations are actively managed which will prevent deer browse and facilitate re-establishment of targeted community structure and composition. Please note that additional construction cost savings will be realized because the perimeter fence is already in place.

*Buffer Restoration Area (*Option A: ±1.75 acres or Option B: ±1.26 acres*)* - Proposed activities will re-establish upland/wetland forested and understory habitat on existing spray irrigation fields adjacent to the Wetland restoration areas. This will be accomplished through re-vegetation and creation of micro topography.

3.0 Project Benefits

Regional Context (Anacostia River watershed)

BARC lies within three sub-watersheds, including Little Paint Branch, where the restoration proposed herein is located. The Little Paint Branch sub-watershed lies in a highly urbanized section of the greater Anacostia watershed possessing over 20% impervious surface area (ISA) with only 8.5% of all historic wetland systems remaining. EPA studies have shown (Hicks 2000) that aquatic systems within watersheds possessing greater than 15% ISA experience severe biological, chemical and physical impairments. This fact is a documented condition of the Little Paint Branch sub-watershed. BARC has successfully collaborated with MWCOG, MDNR, SHA and others on several ecosystem restoration projects throughout its 3 sub-watersheds, including the Little Paint Branch. In addition, the Maryland ICC Environmental Stewardship and Compensatory Mitigation package included a stream, floodplain, and wetland restoration project incorporating Little Paint Branch on BARC property. MWCOG has conducted numerous restoration projects at BARC, including a tree planting projects to provide shade and vegetative cover to several tributaries around the subject restoration site.

In 2010 MWCOG, in conjunction with several other state and federal organizations (Army Corps, MDE, MDNR, etc), released the Anacostia River Watershed Restoration Plan and Report which summarized the present conditions in the Anacostia watershed and steps to be taken to restore its environmental health. Additionally, sub-watershed action plans were developed for the greater Anacostia River watershed. The proposed project will support the action plan for the Little Paint Branch by restoring a host of important wetland functions such as, re-stablishing shallow groundwater storage, restoring groundwater discharge/recharge, sediment and nutrient load reductions, and improvements to water quality.

Located adjacent to the BARC facility are approximately 12,800 acres of pristine wildlife habitat located in the USFWS's Patuxent Research Refuge. In October of 2013, the USFWS released their final Comprehensive Conservation Plan (CCP) for the refuge in order to establish a long-term management and conservation plan for the facility. A central goal of the plan is to restore and maintain the environmental health of wetlands, aquatic environments and other diverse habitats in the Anacostia, Patuxent, and Little Patuxent watersheds (USFWS, 2013).

One stream restoration project was implemented up-gradient of the spray field installing 200 linear feet (lf) of regenerative stormwater conveyance. Two stream restoration and two wetland restoration projects were installed down gradient of the subject site. Once of these projects included ~1,000 feet of stream restoration, with an additional 100 lf of restoration occurring in a similar project. Cumulatively, 3 acres of wetlands have been restored between these two down gradient. Projects were conducted on a mixture of private and public lands located solely within Prince George's County's jurisdiction (MWCOG, 2010).

The BARC wetland restoration project will extend this trend by restoring over 10 acres of headwater wetlands and 330 linear feet of stream under this grant, which will be integrated with an additional 3 acres of wetland and 1,483 lf of stream restoration for PG County. The 13± acres of headwater wetlands plus 1,813 lf of zero and first order stream restoration will result in significant ecological uplift, incrementally adding benefit in concert with projects implemented by others onsite (including restoration underway by our team) and within the region. Finally, the project as proposed supports the goals and objectives of federal, regional and regional watershed, land planning, open space, habitat and water quality improvement initiatives.

The BARC Wetland Restoration Project will restore historic hydrology and hydraulics, re-establish an historically present, rich, organic A horizon, surficial groundwater storage, and a native plant community with associated structure and function. All of the restoration acreage, subject to this proposal, will be protected by implementing a federal land use covenant as outlined above. Please note that BARC has implemented several land use covenants the most recent of which were tied to the mitigation implemented by SHA to compensate for ICC related wetland, stream and forest impacts.

Project based goals include:

- **Provide** cost effective, **compensatory mitigation** by deploying ILF funds collected in the Anacostia Watershed.

- **Expand and integrate** the proposed restoration with previous stream bank stabilization & reforestation projects plus our team's adjacent stream and wetland restoration project.
- **Restore** hydrology/hydraulics by recapturing tributary area, stream restoration, excavation, creating micro-topographic relief plus surface depressions and controlling the flow of surface water across the site (greatly increasing time of concentration) to restore historic wetland hydrology.
- **Restore** the historic A horizon and thus a surficial groundwater storage cell vital to maintaining headwater hydrology/hydraulics. This will be accomplished by re-establishing an organically rich layer of topsoil within the entire restoration footprint above a tight silt/clay B horizon which is presently at the surface due to decades of uncontrolled stormwater runoff and erosion.
- **Improve** the **chemical, biological** and **physical processes** of this headwater wetland/stream system, their downstream receiving waters and associated aquatic habitats of the Little Paint Branch and Anacostia River watersheds.
- **Restore** aquatic and terrestrial avian, reptile and amphibian **species habitat**.
- **Lift** myriad **functions, values and ecosystem services**, including: sediment cycling, nutrient cycling, flood storage and groundwater discharge/recharge, and surface water quality discharging to the Little Paint Branch/Anacostia River System.
- **Support** Federal, State, County and Municipal open space programmatic objectives without taxing overburdened and underfunded acquisition/restoration programs.
- **Support the enhancement, protection and preservation goals** coincident with this proposed restoration project for wildlife habitats identified in the Anacostia Watershed Environmental Baseline Conditions & Restoration Report (1-8-10) & Little Paint Branch Environmental Baseline Conditions & Restoration Report (11-30-09) prepared by MWCOG.
- **Support the watershed management, water quality improvement, ecosystem restoration/habitat diversity and restoration goals** of the Anacostia River Watershed Restoration Plan and Report, Little Paint Branch sub-watershed action plan, USFWS Patuxent Research Refuge Comprehensive Conservation Plan, Anacostia Watershed Restoration Partnership, and PG County Watershed Implementation Plan.

4.0 Project Methodology

This project's primary focus is the re-establishment of stream and wetland hydrology/hydraulics by re-capturing historic tributary area, controlling the flow of water (time of concentration) across the topographic gradient (NW to SE), removing hard water control structures and restoring over 1,800 lf of historic stream valley (associated with the PG County Project), restoring an organically rich A horizon plus shallow surface water depressions and groundwater storage cells. Once HH is re-established, a comprehensive native planting plan will be implemented, thereby re-establishing a community composition, structure and diversity. Please note headwater wetland systems are typically dominated by surface water inputs (direct precipitation, channelized and over land runoff) and this system is no different. Wet weather and dry weather observations/measurements were augmented with preliminary engineering calculations and water budget computations. These were based on recapturing a large tributary area located up-gradient of the site and closing the system, thereby increasing time of concentration and re-establishing an historic hydroperiod. We will also be re-establishing a shallow groundwater storage compartment above a tight layer of silt and clay, further augmenting and restoring typical, seasonal patterns of groundwater discharge/recharge in headwater wetland systems. This seasonal pattern is characterized by the filling of groundwater and surface water storage compartments in the fall, winter and early spring months. These water storage compartments act as a source during the early spring, and conversely as a sink during the drier months of growing season. This site was selected for its overall "restorability" and prioritized due to its location in the Anacostia River Basin. Therefore, the restoration as proposed is contextually appropriate and we are confident that this approach will result in a successful headwater restoration project with the added cumulative benefits as described herein. The text that follows, presents our proposed scope of work and estimated schedule to implement the project as proposed (see attached concept plan).

Project Planning, Design and Permitting (June 2015 through Fall/Winter 2015)
Conduct site investigations, complete biological surveys, develop restoration plans/proposals and secure required permits. The following tasks will be completed to achieve this objective.
Task 1: Complete Topographic Survey & Metes/Bounds Description
Task 2: Complete Cultural Resources Phase 1A & MHT Coordination
Task 3: Continue Ground & Surface Water Monitoring (Commenced October 2014)
Task 4: Complete Functional Wetland Assessment/ Wetland Delineation
Task 5: Complete T&E Surveys and Habitat Evaluations
Task 6: Complete Soil/Geotechnical Investigations
Task 7: Complete Water Budget & HH Modeling
Task 8: Develop Engineering Plans
Task 9: Prepare Mitigation Proposal & Obtain Approvals
Task 10: Permit Application Preparation, Submission & Permit Acquisition

Construction (Spring 2016)
Task 11: Wetland Restoration (Option A: ± 10.33acres or Option B: ± 5.65 acres)
Eradicate invasive vegetation (minor amounts of cattail removal), clear/grub, excavate to target elevations, import/place/grade topsoil/compost mix, discing/bedding to create micro-topography, place woody debris, apply seed and mulch and install native plants to restore floodplain forest and scrub-shrub wetlands.

Task 12: Buffer Zone Restoration (Option A: ±1.75 acres or Option B: ±1.26 acres)
Clearing, grubbing, discing/bedding to create micro-topography, place woody debris, apply seed and mulch and install native plants to restore a forested-scrub/shrub community. Please note that the required 25’ buffer will be provided in the form of our teams PG County Mitigation Project along the interior edge and will be comprised of wetland/upland restoration along the exterior edge.

Post Construction Maintenance & Monitoring: (2016 & 2017 Growing Seasons)
Task 13: Maintenance and Monitoring (2 years)
It is assumed that planting will be completed no later May 1st 2016, therefore triggering the commencement of the monitoring period at the completion of construction. The approved maintenance and monitoring plan will be implemented following the completion of construction for a two-year period or until all permitted performance standards have been met. Once construction is complete, the team will submit an as-built plan and construction completion report for agency review and approval. The Team will begin monitoring the site immediately following the completion of construction and maintain the restoration as needed through the end of the monitoring period. The first monitoring visits will examine projects initial response to the restoration actions completed. Subsequent monitoring visits will provide a regular schedule for data gathering, maintenance, and corrective action as needed. A flexible, adaptive management approach shall be applied to address any problems or deficiencies as they arise. Required maintenance activities will be implemented as needed including but not limited to: herbicide treatments, erosion/sediment control, re-planting as required ensuring compliance with MDE guidelines including 85% aerial coverage and less than 5% invasive noxious species in the mitigation area. Annual monitoring reports will be prepared and submitted on or before December 31st in each of the two years of monitoring. At the end of the maintenance and monitoring period the Team will secure final regulatory release upon successful achievement of all required performance standards.

Monitoring will measure key biological and physical characteristics of the mitigation project and shall include:

- As-built survey/monitoring plan after completion of construction and in year 2 to close out the monitoring period;
- Photograph Documentation;
- Soils Documentation;

- Documentation of vegetative composition and structure; and
- Documentation of Hydrology.

5.0 Applicant & Project Partner Descriptions

Green Trust Alliance Inc. (GTA), a 501(c)(3) non-profit organization recognized by the Internal Revenue Service, is partnering with the United States Department of Agriculture-Beltsville Agricultural Research Service (USDA-ARS), Metropolitan Washington Council of Governments (MWCOG), BMT Designers & Planners, Inc. (BMT), Environmental Quality Resources, LLC (EQR) and GreenVest, LLC (GV) to design and implement this project. GTA is dedicated to perpetuating conservation uses for its land holdings and the projects it participates in. GTA was founded 14 years ago with the purpose of acting as fee title holder and long-term steward of mitigation bank and other restoration projects. GTA has evolved over the years to include cutting edge research on ecosystem services and ecosystem restoration. GTA, as the grant applicant, would serve as grant administrator. GTA will administer the funding and be responsible for project accounting, project deliverables and QA/QC. GTA will coordinate all actions contributed by the various team members and be responsible for reporting to the CBT and MDE as required pursuant the Grant Fund Guidelines.

The **United States Department of Agriculture- Agricultural Research Service (USDA-ARS)** Beltsville Agricultural Research Center (BARC) has long supported the protection of the Anacostia watershed a major sub-watershed of the Chesapeake Bay (Bay) and has contributed significantly to improvement of agricultural methods to increase watershed protection through its research. One of BARC's major goals is meeting the continued challenge of protecting, enhancing, and restoring its natural resources when they receive no direct funding for those activities. The BARC is largest Federal facility in the Anacostia watershed, encompassing approximately 6,500 acres in the Chesapeake Bay Watershed. The land use consists of 1,621 acres of production and research, 351 acres of pasture, 172 acres of meadow, 888 acres of turf, 2883 acres of forest, 26 miles of streams of which 22 miles has some form of riparian buffer, 672 acres of wetlands, and 30 acres of ponds. Because the BARC is a large research and production farm it has created and adheres to a strict nutrient management plan that is revised annually to prevent nutrient loading of stream runoff. The BARC also practices sustainable agriculture to keep nearly 100 percent of its 1,600 plus farmed acres in some form of cover or crop year-round. USDA-ARS is the project sponsor and will be providing the land upon which the restoration will be conducted and has agreed to permanently deed restrict this acreage. USGS-ARS will provide input for collaborative project design, oversight of project implementation, post construction monitoring, routine maintenance and long term stewardship.

Since 1957, the **Metropolitan Washington Council of Governments (MWCOG)** has been the regional, non-profit organization of the Washington area's major local governments and their governing officials, plus area members of the Maryland and Virginia legislatures and the U.S. Senate and House of Representatives. MWCOG provides a focus for action on issues of regional concern such as the restoration of the Potomac and Anacostia rivers. Since 1988, MWCOG has been working cooperatively with the members of the Anacostia Watershed Restoration Partnership, the United States Department of Agriculture, Agricultural Research Service, Beltsville Area (BARC), and other key affiliates on various projects and initiatives designed to further the restoration of the Anacostia River and its tributaries. Since then, MWCOG has assisted BARC in many tasks such as identifying stormwater retrofit, stream rehabilitation, comprehensive stream assessment monitoring, wetland creation and restoration, and riparian reforestation projects; coordinating and providing key guidance and input to the Partnership in developing the 2010 Anacostia Restoration Plan. MWCOG will provide collaborative project design input and guidance on project implementation.

GreenVest, LLC (GV) is an established leader in the ecosystems services industry, performing as a principal developer of mitigation projects and banks and as an advisory services provider to our clients in MD and throughout the Mid-Atlantic Region. GV provides highly specialized, multidisciplinary, advisory services including real-estate, finance, land valuation, regulatory compliance, green infrastructure master planning, land planning, ecological restoration design, restoration implementation, maintenance and monitoring, ecological asset development and many other services for over 20 years. GV has extensive experience in the due diligence, land acquisition, regulatory compliance and permitting, design, construction, oversight, maintenance and monitoring of dozens of complex wetland mitigation projects in NJ. GV currently manages the operation of several State and Federally approved mitigation banks and turnkey mitigation projects throughout the Mid-Atlantic. GV will act as overall program manager collaborating on the design development and permitting. GV will be responsible for collaborative project design, baseline ecological work, preparing water budgets, oversight of project implementation, financial assurances/bonding, conservation restrictions, post construction monitoring/reporting and routine maintenance oversight.

BMT Designers & Planners is a full service, multi-disciplinary, environmental services and engineering firm located in Arlington, Virginia. BMT has been providing diverse environmental consulting services to the U.S. Federal government, and the USDA at the Beltsville Agricultural Research Center (BARC) in particular, for almost 20 years. BMT has been supporting USDA's Agricultural Research Service (ARS) with their environmental programs since their initial involvement with the Superfund program in 1994. BMT has in-depth knowledge of the BARC facility, and well established capabilities that include site assessment, permitting, Geographic Information Systems (GIS) and mapping services, quality assurance, human health and ecological risk assessment, wetlands and regulatory evaluation, feasibility studies, and remedial technologies and cleanup. BMT will be responsible for hydrology analysis, engineering design and plan production as engineer of record. BMT will also collaborate on monitoring and reporting.

Environmental Quality Resources, LLC (EQR), is a multidisciplinary ecological construction company that excels in stream restoration, wetland mitigation, low impact development, native plant landscaping, and invasive plant management. EQR's team combines scientific backgrounds, construction knowledge and respect for the environment to provide a full range of installation and maintenance services. EQR has completed many key restoration projects in the Anacostia watershed, including the ICC mitigation project known as "Paint Branch-85" on BARC property. EQR has over 20 years of experience in wetland creation, restoration and enhancement projects, and unmatched construction experience working within Maryland Watersheds. EQR will be responsible for collaborative design and serve as the prime contractor to complete the proposed construction and routine maintenance activities (replanting, herbicide treatments, erosion control, and herbivory control).

Note: See Appendix D for descriptions of previous projects completed by the project partners.

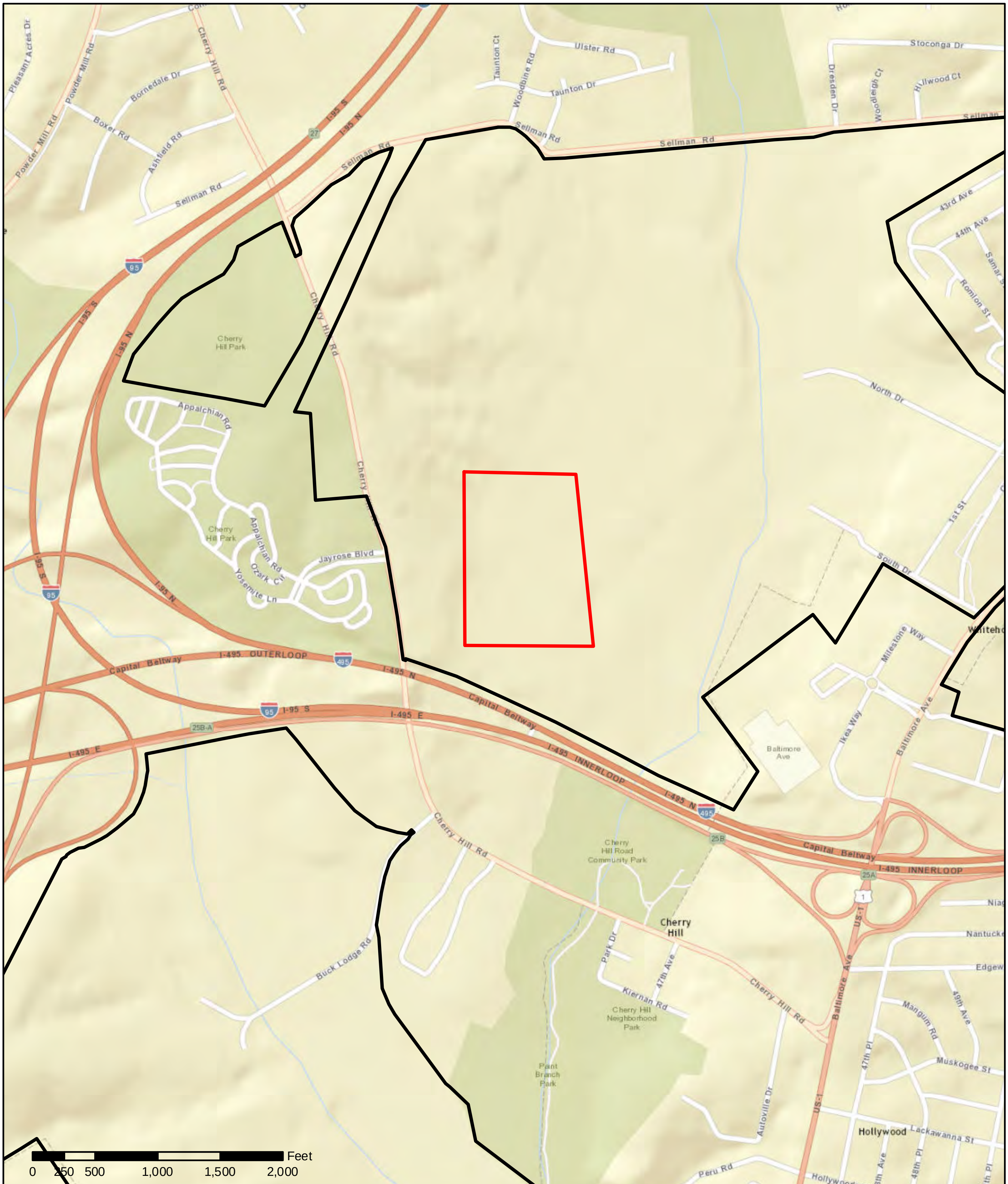
TABLES

Table 1: Project Implementation Schedule (USDA-BARC Wetland Restoration Project)

Goal	Task	Anticipated Start Date	Anticipated End Date	Responsible Party	Deliverable
	T1: Supplimental Topographic Survey	6/1/2015	6/30/2015	GV/ Survey Sub Consultant	Survey
	T2: Cultural/Historical Resources Investigations	6/15/2015	7/30/2015	GV/ Sub Consultant	MHT Clearance
	T3: Ground Water/ Surface Water Monitoring	10/1/2014	10/15/2015	BMT/GV	Hydrographs & Water Budget Data
	T4: Functional Wetland Assessment/ Delineation	7/1/2015	7/30/2015	GV	Wetland Delineation/ Habitat & Functional Assessment
1- Project Planning, Design & Permitting	T5: T&E Surveys and Habitat Evaluations	7/1/2015	7/30/2015	GV	Report
	T6: Soil Investigation/ Geotechnical Analysis	7/1/2015	7/30/2015	BMT/GV	Report
	T7: Water Budget/ Modeling	9/1/2015	9/30/2015	BMT/GV	Report
	T8: Engineering Plans	10/1/2015	12/15/2015	BMT/GV/EQR	Completed Plan Set
	T9: Mitigation Proposal Prep & Approval	10/15/2015	12/15/2015	BMT/GV	Report/ Approvals
	T10: Permitting	12/15/2014	3/15/2016	BMT/GV	Permit Approvals
2-Construction/Implementation	T11: Wetland Restoration Area	4/1/2016	6/1/2016	EQR	Completed Site Work
	T12: Upland Buffer Zone Restoration Area	4/1/2016	6/1/2016	EQR	Completed Site Work
3- Post Construction Maintenance & Monitoring	T13A: As-Built Survey/Metes and Bounds Description	6/1/2016	7/1/2016	GV/Survey Sub Consultant	Survey & Legal Descriptions
	T13B: Post Construction Maintenance & Monitoring	6/1/2016	12/1/2018	EQR/BMT/GV	Monitoring Reports & Successful Mitigation Project

APPENDICES

APPENDIX A - FIGURES



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Mitigation Area Limits

BARC Facility Boundary

Figure: 1

Street Map

Beltsville Agricultural Research Center

10300 Baltimore Ave #302, Beltsville, MD 20705

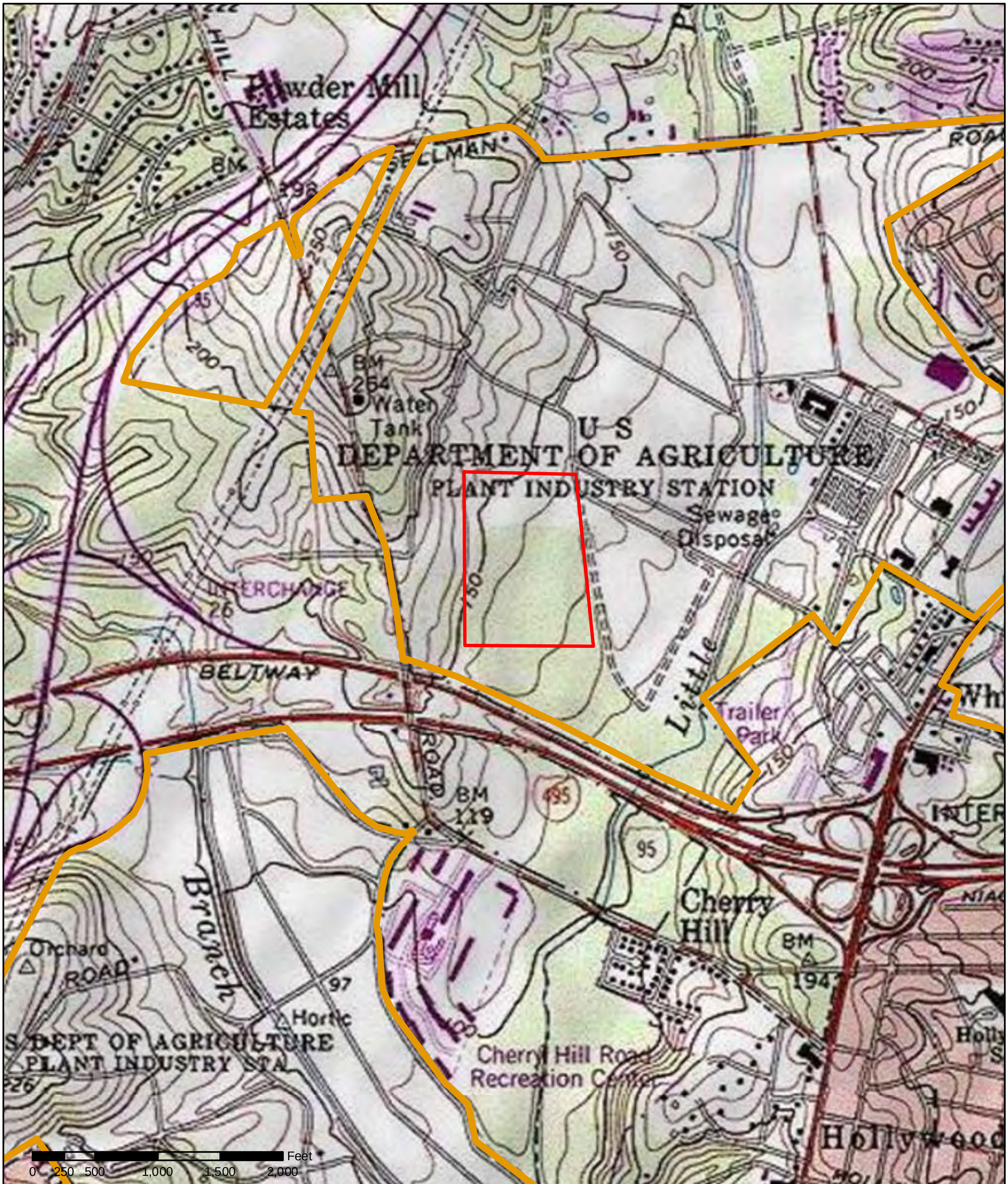
GreenVest

www.greenvestus.com

MARYLAND	NEW JERSEY	NORTH CAROLINA
210 Najoles Road, Suite 202 Millersville, MD 21108 410.987.5500 (p) 410.987.5501 (f)	91 Fieldcrest Ave. Raritan Plaza II, A-1 Edison, NJ 08837 732.902.6644 (p) 732.902.6643 (f)	4405 Dewees Court Raleigh, NC 27612 919.787.5829 (p) 410.987.5501 (f)

Scale: 1 in = 1,000 ft   Date: 03/12/2015

Data Sources: ESRI Open Street Map, Maryland MDE



N
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Mitigation Area Limits

BARC Facility Boundary

Figure: 2

USGS Quadrangle Map

Beltsville Agricultural Research Center

10300 Baltimore Ave #302, Beltsville, MD 20705

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Raleigh, NC 27612
919.787.5829 (p)
410.987.5501 (f)

Scale: 1 in = 1,000 ft

Date: 03/12/2015

Data Sources: ESRI Open Street Map, Maryland MDE

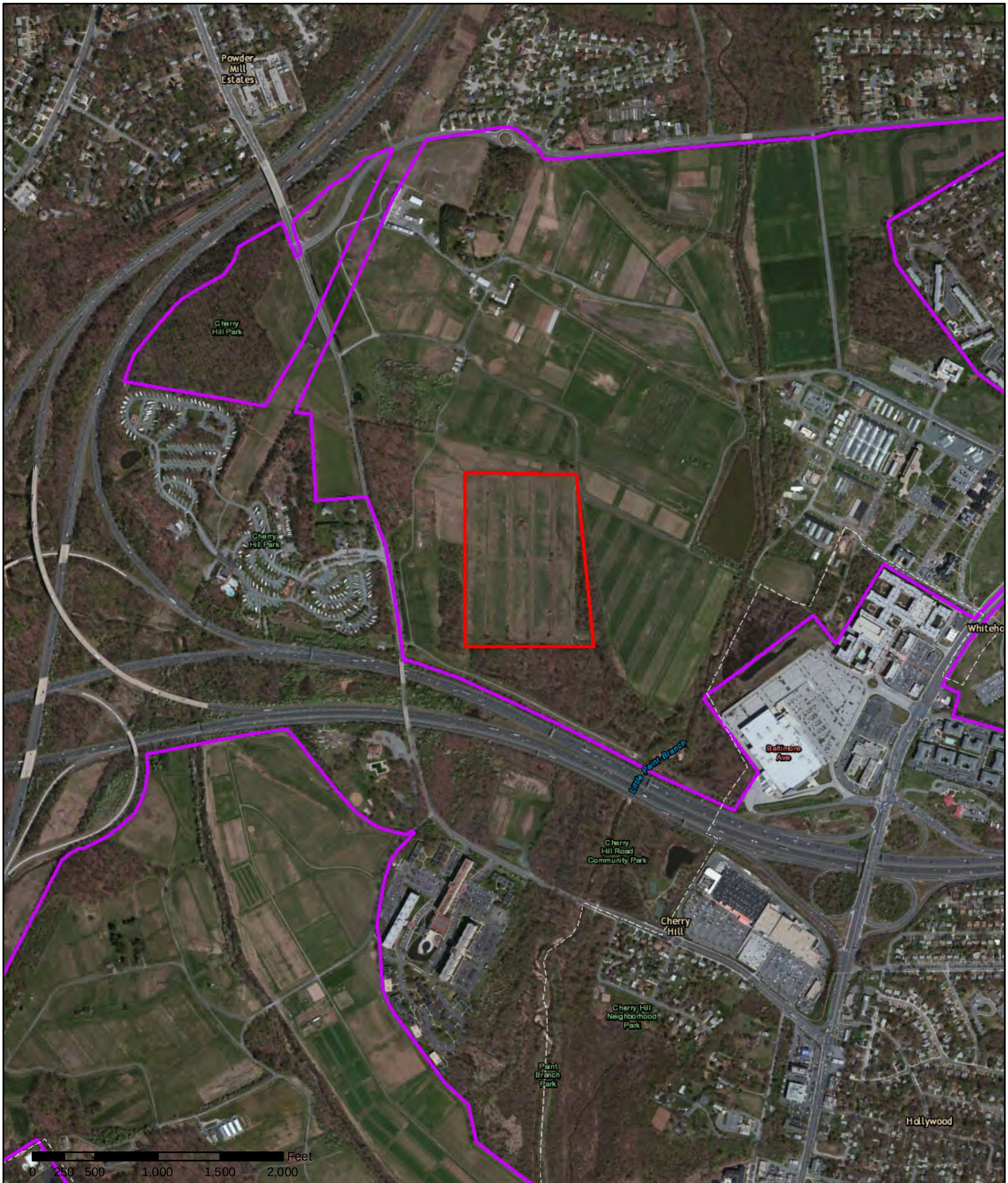

Figure: 3

Aerial Map

Beltsville Agricultural Research Center

10300 Baltimore Ave #302, Beltsville, MD 20705

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NORTH CAROLINA
4405 Dewees Court
Raleigh, NC 27612
919.787.5829 (p)
410.987.5501 (f)

Scale: 1 in = 1,000 ft

Date: 03/12/2015

Data Sources: ESRI Open Street Map, Maryland MDE

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USDA Soil Limits

Mitigation Area Limits

Figure: 4

USDA Soil Survey Map

Beltsville Agricultural Research Center

10300 Baltimore Ave #302, Beltsville, MD 20705

GreenVest

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210 Najoles Road, Suite 202
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919.787.5829 (p)
410.987.5501 (f)

Scale: 1 in = 1,000 ft

Date: 03/12/2015

Data Sources: ESRI Open Street Map, Maryland MDE

APPENDIX B – SITE PHOTOLOG

VIEW # 1

Low altitude aerial view looking northwest at spray irrigation fields and project area (outlined in red).

VIEW # 2

Another low altitude aerial view looking north northwest at spray irrigation fields and project area.

GreenVest One Step Ahead.

PHOTOGRAPHS & DESCRIPTIONS
BARC Wetland Restoration Project-Grant Funding Proposal

MUNICIPALITY: Beltsville
COUNTY: Prince George's County

VIEW # 3

View looking west (upstream) at the outlet ditch/swale proposed to be plugged in an effort to restore wetland hydrology onsite.

VIEW # 4

View looking northwest across spray irrigation fields to be restored to forested wetlands through implementation of the proposed project.

GreenVest
One Step Ahead.

PHOTOGRAPHS & DESCRIPTIONS
BARC Wetland Restoration Project-Grant Funding Proposal

MUNICIPALITY: Beltsville
COUNTY: Prince George's County

VIEW # 5

Another view looking north across spray irrigation fields to be restored to forested wetlands through implementation of the proposed project.

VIEW # 6

View looking east (downstream) at the outlet ditch to be plugged through implementation of the proposed project.

GreenVest One Step Ahead.

PHOTOGRAPHS & DESCRIPTIONS
BARC Wetland Restoration Project-Grant Funding Proposal

MUNICIPALITY: Beltsville
COUNTY: Prince George's County

APPENDIX C – CONCEPTUAL MITIGATION PLANS

Existing Watercourses/Streams

MDE/CBT Stream Restoration - 330 LF

MDE/CBT Wetland Restoraton - 10.33 ac

MDE/CBT Buffer - 1.75 ac

Proposed Ditch Plugs

PG County Stream Restoration - 1,483 LF

PG County Restoration - 2.94 ac

Data Sources: ESRI, Maryland MDE,GreenVest LLC

Conceptual Mitigation Plan - Option A

Beltsville Agricultural Research Center

10300 Baltimore Ave #302, Beltsville, MD 20705

Prince George's County, Maryland

GreenVest
One Step Ahead.
www.greenvestus.com

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410.987.5501 (f)

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732.902.6643 (f)

NORTH CAROLINA
4405 Dewees Court
Raleigh, NC 27612
919.787.5829 (p)
410.268.5501 (f)

1 inch = 175 ft

Date: 3/12/2015

- Existing Watercourses/Streams
- MDE/CBT Stream Restoration - 330 LF
- MDE/CBT Wetland Restoration - 5.65 ac
- MDE/CBT Buffer - 1.26 ac
- Proposed Ditch Plugs
- PG County Stream Restoration - 1,483 LF
- PG County Restoration - 2.94 ac

N W E S

Data Sources: ESRI, Maryland MDE,GreenVest LLC

Conceptual Mitigation Plan - Option B

Beltsville Agricultural Research Center

10300 Baltimore Ave #302, Beltsville, MD 20705
Prince George's County, Maryland

GreenVest
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210 Najoles Road, Suite 202 Millersville, MD 21108 410.987.5500 (p) 410.987.5501 (f)	91 Fieldcrest Ave. Raritan Plaza II, A-1 Edison, NJ 08837 732.902.6644 (p) 732.902.6643 (f)	4405 Dewees Court Raleigh, NC 27612 919.787.5829 (p) 410.268.5501 (f)

1 inch = 175 ft

Date: 3/12/2015

APPENDIX D – PREVIOUS PROJECT EXPERIENCE/DESCRIPTIONS

GreenVest
One Step Ahead.

Pleasant Grove Mitigation Site

Location: 133 West Pleasant Grove Rd, Township of Jackson, Ocean County, NJ;

Description: This 130± acre site was historically cleared, ditched and dammed for intensive cranberry and row crop production. The Site is located in the headwater and is directly tributary to Toms River within the Barnegat Bay Watershed.

Purpose: GreenVest provided fixed price, turnkey mitigation project to the NJ Turnpike Authority to compensate for the unavoidable, permitted impacts in WMA 13 associated with the Garden State Parkway 83 to 100 Improvements Project.

Mitigation Provided: The mitigation provided compensation for permanent impacts to freshwater wetlands, riparian zone and critical wildlife habitat located within WMA 13.

- Forested Headwater and Riparian Emergent/Scrub-shrub Wetlands,
- Wet Meadow
- Forested Upland and Wetland Riparian Zone
- 800 linear feet of zero order stream restoration/historic dam removal

Project Status: Approved in June of 2012; Construction completed in April 2013; Year 1 monitoring completed in Decemeber 2013; currently in 2nd year of monitoring.

PROJECT INFORMATION:
The 130+ acre Pleasant Grove Mitigation Site is located within the Barnegat Bay Watershed Management Area 13. This mitigation project was designed and constructed to replace natural resource functions and values that will be lost as a result of the permitted impacts tied to proposed Garden State Parkway improvements. GreenVest selected this Mitigation Site due to its large size, high restoration/ enhancement feasibility, potential for ecological lift and the diverse mitigation opportunities it provides. A key component of the construction included removing an earthen dam which created a two pool impoundment used for irrigation, and restoring 800 linear feet of stream channel that has been impaired since 1930. Restoration of this site included re-establishing approximately 65 acres of wetland/upland forested riparian zone and enhancing modified agricultural wetlands. The project resulted in restoring 70 and fully integrated an additional 60 acres for a total of 130 acres of headwater, forested wetlands and riparian zone including the protection two vigorous stands of Atlantic White Cedar on site. GreenVest assumed 100% of the financial liability and responsibility for success as outlined under the permitted performance standards for this project.

CLIENT INFORMATION:
New Jersey Turnpike Authority, John Withers, PE, PP – Supervising Engineer

Phone: (732) 750-5300 Ext. 8283, Email: Withers@turnpike.state.nj.us

ECOLOGICAL BENEFITS / UPLIFT:

- Enhance/restore and maintain the integrity of a large scale forested headwater system in the Barnegat Bay Watershed; functionally re-establishing targeted native plant communities and integrating them with existing systems onsite.
- Contribute to improving the downstream chemical, physical and biological integrity of Toms River; an EPA listed 303(d) water body and the Barnegat Bay.
- Enhance, restore and preserve a critical, common and TE wildlife habitat including a large area of interior forest. Create a regional hub for migratory and resident wildlife species.
- Increase surface water connectivity and restore fluvial flow through the dam removal, stream and wetland riparian restoration. This reach of Myles Brook has not seen the light of day since the early 1800's.
- Restore flood storage and the overall acreage of floodway/floodplain on site.
- Restore groundwater recharge/discharge functions.
- Restore bank stability and sediment trapping/cycling.
- Restore nutrient cycling.
- Contribute to the goals outlined in the NJWAP and Barnegat Bay National Estuary Program for the Northern Pinelands Region and the Barnegat Bay Watershed respectively.

FLAT SWAMP MITIGATION BANK

NORTH CAROLINA
PROJECT SHEET

GreenVest
One Step Ahead.

LOCATION: Craven County, North Carolina
Middle Neuse River Basin – HUC 03020202

DESCRIPTION: The Bank site is a 386-acre tract, originally supporting forested wetlands, which was converted to agriculture in the mid-1970's resulting in severe degradation to resource functions and values

PURPOSE: The former hydrology and forest vegetation of the entire site has been restored to provide mitigation for future impacts to similar resource values.

MITIGATION: Nutrient and Neuse Riparian Buffer Credits

PROJECT INFORMATION:

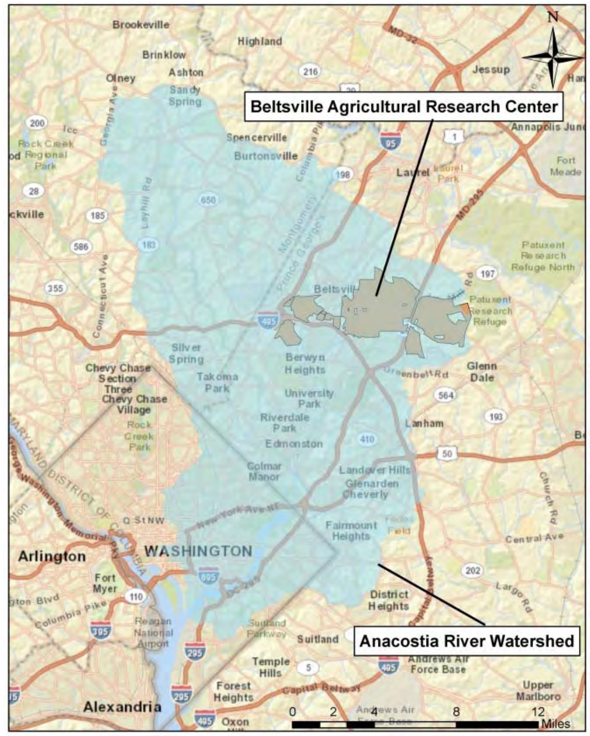
GreenVest's Flat Swamp Mitigation Bank (FSMB), constructed in 2009, is located in Craven County, North Carolina. Counties served by the FSMB include Craven, Lenoir, Pitt, Wayne and the northern portion of Jones. The FSMB site is a 386-acre tract, originally supporting forested wetlands, which was converted to agriculture in the mid-1970's resulting in severe degradation to resource functions and values including: water quality, soils, biodiversity, wildlife habitat and aesthetics. The former hydrology and forest vegetation of the entire site has been restored to provide mitigation for future impacts to similar resource values.

The FSMB is strategically-located in the headwaters of Flat Swamp Creek, a major tributary to the Neuse River. The Neuse River is one of the most threatened river basins in the eastern United States and continues to degrade because of agriculture and urban development. The FSMB is providing a significant improvement to the water quality, biodiversity and habitat of this degraded section of the Middle Neuse River Watershed by providing a diverse forested habitat and returning natural hydrology to the area.

The FSMB currently offers Neuse Riparian Buffer and Nutrient Offset credits. Credit prices are negotiated depending on the type and volume purchased. For large projects, a volume discount can be given. As of October 1, 2012 we have 592,701.91 lbs. of Nutrient Offset credits and 20.76 acres of Neuse Riparian Buffer credits currently available for purchase. The Bank is fully approved by the North Carolina Department of Environment and Natural Resources, Division of Water Quality and monitoring activities comply with all protocols set by the NCDWQ. The Bank has successfully completed four of the required five years of monitoring as the Bank's hardwood wetland communities are trending towards fully meeting its success criteria. Contact Robert Kessler to learn more, (919) 943-3374.

BMT Designers & Planners

Beltsville Agricultural Research Center



Location: 10300 Baltimore Avenue, Beltsville, Prince George's County, Maryland

Project Description: Since 1995, BMT has provided environmental services including site assessment, risk assessment, and remediation to the U.S. Department of Agriculture at the 6,600-acre Beltsville Agricultural Research Center (BARC) – a Superfund NPL site. BMT initiated CERCLA program activities at BARC with the completion of a comprehensive site discovery program employing historical aerial photography, record and file searches, employee interviews, and site reconnaissance. In conjunction with ARS and EPA Region 3, BMT developed a site screening program (SSP) protocol consisting of a streamlined human health and ecological risk assessment that has been applied to determine its progression in the CERCLA process. The SSP program enables a risk management approach to site specific decision-making which has efficiently reduced the number of areas of concern (AOCs) requiring cleanup. Based on screening level human health risk assessments conducted during the SSP, five (5) of the AOCs requiring cleanup were identified for the completion of a CERCLA Remedial Investigation (RI) and Feasibility Study (FS) to further characterize the AOC and evaluate remedial alternatives.

As part of the RI process, we have collected samples from all media including surface water and sediment, installed and sampled monitoring wells, conducted topographic surveys, and performed hydrogeological evaluations, groundwater modeling, wetlands delineation, and detailed contaminant fate and transport studies. The RI process at the facility has successfully evaluated potential receptors and exposure pathways, defined the nature and extent of contamination, evaluated contaminant fate and transport on a site-specific basis, evaluated site specific ecological risk, and has included a comprehensive human health risk assessment.

BARC is centrally located within the Anacostia River watershed and encompasses portions of several subwatersheds including Upper Beaverdam Creek, Indian Creek, Little Paint Branch, and Paint Branch. BMT has almost 20 years of experience conducting environmental investigations at BARC and has a comprehensive knowledge of these subwatersheds, the physical and environmental setting of the facility, and its connection to the Anacostia River and the Chesapeake Bay. Details of specific projects similar in nature and scope to the proposed wetlands mitigation project are provided below.

VEGETATIVE BIO-REACTIVE LANDFILL COVER PILOT STUDY AT THE COLLEGE PARK LANDFILL:
The 30 acre College Park Landfill (CPLF) was operated as a municipal landfill from 1954 until 1978. As part of the CERCLA investigation, BMT designed and implemented a Pilot Study to evaluate the application of a compost amended vegetative bio-reactive landfill cover as a final closure remedy for the landfill. Project components included:

- Design, construction, operation, and maintenance of performance monitoring systems including percolation and surface water run-off measurement systems, weather stations, and landfill gas flow measurement systems.
- Planting of native herbaceous and woody vegetation.

- Vegetation monitoring for a period of three years including vegetation survival and growth and herbaceous biomass assessment.
- Assessment of soil conditions.
- Hydrologic evaluation to assess evapotranspiration of the vegetative bio-reactive landfill cover.

BMT produced a Pilot Study Findings Report and presented the findings to the Maryland Department of the Environment and the EPA. Findings were incorporated in the Feasibility Study for the final closure remedy at the landfill and will serve as the basis for the selection of the vegetative bio-reactive landfill cover as the final remedy at the CPLF. A Record of Decision for the site is anticipated in 2014.

BEAVERDAM ROAD LANDFILL PERMEABLE REACTIVE BARRIER:
The installation of a permeable reactive barrier (PRB) was the selected remedy to address groundwater contamination associated with the Beaverdam Landfill site. The PRB is composed of a mixture of sand, mulch, and compost which creates the conditions for microbially mediated degradation of groundwater contaminants before they impact downgradient streams and wetlands associated with Beaverdam Creek. BMT recently completed the design and installation of the PRB. Project components included:

- A comprehensive physical setting and hydrologic evaluation of the site and surrounding area.
- Delineation of the extent of wetlands within and adjacent to the project area.
- Delineation of the extent of groundwater contamination at the site.
- PRB design development in conjunction with USDA research staff at BARC.
- Threatened and endangered species review and compliance with MDE permit requirements.
- Installation and monitoring of sediment and erosion control measures to protect a nearby stream and wetlands during construction.
- PRB installation with a single pass trenching machine under a revocable permit issued by BARC.
- PRB monitoring well installation, water quality monitoring, and performance assessment.
- Site restoration including grading and seeding.

BMT is currently monitoring conditions within the biowall on a biweekly basis and is assessing biowall performance by contaminant reduction and plume toxicity on a quarterly basis. BMT is conducting semi-annual surface water quality on an unnamed tributary to Beaverdam Creek. Current PRB conditions are consistent with a reducing environment and contaminant degradation is being observed.

CLIENT INFORMATION:
Mr. Dana Jackson, PG, Senior Remedial Project Manager, Beltsville Agricultural Research Center, Safety, Occupational Health, and Environmental Staff

Phone: (301) 504-6025, Email: Dana.Jackson@ars.usda.gov

Grasslands Wetland Mitigation Bank

Client: Buchanan Partners
Project Manager: Ken Williams
Completion Date: November 2011
Contract Amount: $ 511,454

Project Location:
Off of Austin Grove and Ridgeside Roads
Bluemont, VA 20135

Description:

Environmental Quality Resources, LLC was selected by Buchanan Partners, to construct a non-tidal wetland. EQR constructed a 77.27 acre wetland consisting of 26.6 acres graded to a lower profile and the remaining 50.67 acres used grading techniques to manage the water through the site. Construction included installing nine rock vanes and four channel plugs. Extensive grading, seeding and matting were integral to the successful completion of the project.

Reference:

Gary Jellick
Acorn Environmental
708 Laurel Lane
Severna Park, MD 21146
(410) 274-0622 direct
(410) 729-1470 cell

Charlie Turner
Vice President; Buchanan Partners
9841 Washington Blvd
Gaithersburg, MD 20878
(301) 417-0510

APM TERMINALS WETLAND CREATION

Client: APM Terminals North America, Inc.
Project Started: March 2006
Project Completed: September 2006
Contract Amount: $1,668,619
Contract Number: NFK-COX-2005-039

Description:

APM Terminals North America, Inc. affected a large wetland area while expanding their facilities, and as a result, selected Environmental Quality Resources, LLC to create a 16 acre tidal wetland near their Portsmouth terminal in Virginia. The created wetland primarily consists of four cells, all of which required vast excavation and grading, as well as the associated sediment and erosion controls. Because the area is tidal, significant issues were encountered involving water-logged soils and placement of berms to efficiently handle machine traffic while limiting soil compaction. Bridge mats were frequently used during construction.

Inflow and outflow channels were created throughout the cells to allow the tides access to more distant areas within the cells' boundaries. The channels generate a variety of habitats due to the heterogeneity of grades and subsequent water depths. The majority of the wetland area is emergent; open water exists in patches.

In addition to the 60,000 cubic yards of grading, EQR was also responsible for invasive species control, as well as seeding and planting. Phragmites was a significant problem at this site; EQR personnel sprayed the acres of plants with herbicide, then removed the stands and hauled them offsite to an approved refuse location. When construction was complete, EQR crews planted more than 550 shrubs along the perimeters of the cells, and almost 199,000 two-inch plug wetland plants.

Reference: **Guy Buzzoni**
Project Manager; APM Terminals North America, Inc.
4400A Coastguard Boulevard
Portsmouth, VA 23703
(757) 484-2026

ENVIRONMENTAL QUALITY RESOURCES, LLC

Goose Creek Stream Mitigation and Wetland Creation

Client: The Nature Conservancy of Virginia/Bluewildlife LLC
Project Manager: Ken Williams
Completion Date: May 2009
Contract Amount: $1,694,834

Description:

EQR was selected by Williamsburg Environmental Group to enhance, realign, and otherwise restore Bolling Branch and its floodplain located in Fauquier County, VA. Over 5000 linear feet of perennial main stem and tributaries, and more than five acres of wetland creation/enhancement were included in the project.

Realignment/channel creation methods were used to mitigate incised, straightened channels that were disconnected from their floodplains. Sinuosity, elevated thalweg, and appropriately benched banks were features produced during grading activities. In-stream grade control structures included cobble riffle series, stone sills, stone J-hook vanes, and cross vanes. Root wads and stone toes contributed to bank protection. Coir matting was installed on the banks for the entire length of the main stem for stabilization and sediment control.

Ox-bow wetlands were created from portions of the abandoned channel, and grading to a lower elevation in suitable soils adjacent the stream generated additional emergent wetland areas. Enhancement of existing (scrub-shrub) wetlands and creation of a riparian buffer consisted of eradicating invasive species and planting native species. Root raking occurred prior to seeding to ensure a high success rate among species seeded.

1 Churchview Rd • Millersville, MD 21108 • Phone (410) 923-8680 • Fax (410) 923-8683

Reference: **Karen Johnson**
Land Protection Specialist, The Nature Conservancy of Virginia
530 East Main Street, Suite 820
Richmond, VA 23219
(804) 644-5800

Travis Crayosky
Williamsburg Environmental Group
5209 Center Street
Williamsburg, VA 23188
(757) 220-6869

APPENDIX E – LETTERS OF SUPPORT

February 5, 2015

Doug Lashley, Managing Member
GreenVest, LLC
210 Najoles Road, Suite 202
Millersville, MD 21108

RE: Proposed Wetland Restoration Project
United States Department of Agriculture
Agricultural Research Service
Beltsville Agricultural Research Center
Beltsville, Maryland

Dear Mr. Doug Lashley,

The United States Department of Agriculture (USDA), Agricultural Research Service (ARS), Beltsville Agricultural Research Center (BARC) endorses the GreenVest wetland restoration proposal on the North Farm parcel identified at BARC. The USDA-ARS currently owns the above-referenced property, and thoroughly supports the project goals to provide wetland functions to create habitat, recharge groundwater, reduce sediment and base load to the nearby stream, and improve water quality. We are willing to provide portions of the subject property for purposes of stream restoration and wetland creation. We understand that GreenVest, LLC, and associated subcontractors will need access to the site for preliminary study, design, implementation and monitoring of the restoration project.

The proposed project is in the Little Paint Branch subwatershed of the Anacostia River. The Anacostia Restoration Plan of the Metropolitan Washington Council of Governments (MWCOG) identified restoration targets for Anacostia subwatersheds, and wetland creation and restoration is one of the strategies in the Little Paint Branch subwatershed Action Plan. BARC is the largest Federal facility in the Anacostia watershed, and has collaborated with MWCOG, Maryland Department of Natural Resources, and local volunteers in reforestation projects and natural resource protection and enhancement throughout its three subwatersheds, including the Little Paint Branch subwatershed. In addition, the Maryland Intercounty Connector, Environmental Stewardship, and Compensatory Mitigation package included a stream, floodplain, and wetland restoration project incorporating Little Paint Branch. Furthermore, this project moves BARC closer to meeting the goals of Executive Order 13508 for improving the health of the Chesapeake Bay.

Mr. Doug Lashley

Thus, BARC has a strong record of environmental and natural resource stewardship, and we are excited at the prospect of GreenVest, LLC restoring a stream corridor and wetland to BARC property.

As owner of the subject property, we hereby authorize GreenVest, LLC to submit grant applications to both the Maryland Department of the Environment and Chesapeake Bay Trust to fund the design and implementation of a wetland restoration project utilizing the above-referenced property. In addition, we acknowledge and approve the use of this BARC acreage to address mitigation needs for impacts in Prince Georges County. The above approvals are subject to BARC conditions regarding removal of existing infrastructure in the spray field. Permanent protection for the restoration area is assured by both Federal law and the Maryland Senate, which guarantee the land to be permanently maintained as Agricultural Open Space.

Sincerely,

for Ellen Harris, Director / [signature] Acting Asst. Dir. BARC
Beltsville Agricultural Research Center (BARC)

Metropolitan Washington Council of Governments

One Region Moving Forward

District of Columbia
*Bladensburg**
Bowie
Charles County
College Park
Frederick
Frederick County
Gaithersburg
Greenbelt
Montgomery County
Prince George's County
Rockville
Takoma Park
Alexandria
Arlington County
Fairfax
Fairfax County
Falls Church
Loudoun County
Manassas
Manassas Park
Prince William County

**Adjunct Member*

May 12, 2014

Executive Director
GreenTrust Alliance, Inc
210 Najoles Road, Suite 200
Millersville, Maryland 21108

RE: Proposed Wetland Restoration Project
United States Department of Agriculture
Agricultural Research Service
Beltsville Agricultural Research Center
Beltsville, Maryland

Dear Executive Director:

The Metropolitan Washington Council of Governments (COG) is pleased to strongly endorse GreenTrust Alliance's wetland restoration proposal for the United States Department of Agriculture (USDA) Agricultural Research Service (ARS) Beltsville Agricultural Research Center (BARC).

COG coordinates the Anacostia Watershed Restoration Partnership (AWRP) represented by local, state (to include Maryland Department of the Environment (MDE)), federal and other members. As a longstanding federal member to the AWRP, BARC is the one of the larger and unique Anacostia landholder with a mix of agriculture, mature forest and non-tidal wetland land use/cover in an urbanized Anacostia Watershed. BARC's commitment through preservation and restoration of such land cover provides the reference-based conditions for the many highly urbanized Coastal Plain subwatersheds. As important, this over 8 acres of proposed wetland restoration/creation project would work towards AWRP's ***'Goal # 4 - Increase in Wetland Acreage'.***

As the largest urban area in the Chesapeake Bay watershed, the COG region will depend on such funding as the MDE and Chesapeake Bay Trust Non-Tidal Wetland Grant Program to enhance or increase the watershed's non-tidal wetland areas. As a project partner, we support this grant proposal and look forward to working with GreenTrust Alliance, Inc. (GTA), and other project partners: United States Department of Agriculture-Beltsville Agricultural Research Center (BARC), BMT Designers & Planners, Inc. (BMT), Environmental Quality Resources, LLC (EQR) and GreenVest, LLC (GV).

Sincerely,

Chuck Bean
Executive Director

PHASE I ARCHAEOLOGICAL SURVEY FOR A STREAM AND WETLAND RESTORATION PROJECT AT THE HENRY A. WALLACE BELTSVILLE AGRICULTURAL RESEARCH CENTER IN PRINCE GEORGE'S COUNTY, MARYLAND

Stantec

Prepared for:

BMT Designers and Planners, Inc.
4401 Ford Avenue, Suite 1000
Alexandria, Virginia 22302

Prepared by:

Paul P. Kreisa, PhD, RPA
Jacqueline M. McDowell, MA
Geri J. Knight-Iske, MA
Nancy L. Powell, BA

July 2015

PHASE I ARCHAEOLOGICAL SURVEY FOR A STREAM AND WETLAND RESTORATION PROJECT AT THE HENRY A. WALLACE BELTSVILLE AGRICULTURAL RESEARCH CENTER IN PRINCE GEORGE'S COUNTY, MARYLAND

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Prepared By:

Paul P. Kreisa, PhD, RPA
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Geri J. Knight-Iske, MA
Nancy L. Powell, BA

Paul P. Kreisa, PhD, RPA
Principal Investigator

Stantec Consulting Services Inc.
6110 Frost Place
Laurel, Maryland 20707

July 2015

MANAGEMENT SUMMARY

This report documents the results of a Phase I archaeological survey investigation undertaken by Stantec Consulting Services Inc. (Stantec) at the U.S. Department of Agriculture's Henry A. Wallace Beltsville Agricultural Research Center (BARC) in Prince George's County, Maryland. BMT Designers and Planners is a member of the team undertaking a stream and wetland restoration project on the Spray Irrigation Field located in the North Farm portion of this federally owned facility. The archaeological Phase I survey was conducted in consultation with the Maryland Historical Trust (MHT) to determine whether archaeological resources were present within the proposed project area as required in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA). The investigations were designed to meet the standards of the Secretary of the Interior's *Standards and Guidelines for Archeological and Historic Preservation* (Federal Register 1983) and the *Standards and Guidelines for Archeological Investigations in Maryland* (Shaffer and Cole 1994). The scope of the field investigations was approved by MHT in advance of implementation.

In June 2015, Stantec undertook background research for and conducted field investigations at the North Farm wetland and stream restoration area within the BARC. The project area was defined as three overlapping parcels that were investigated at different levels of intensity as each area will be restored at different times. The first area is the 2.94-acre wetland and 1,483-linear-foot stream restoration areas, planning and data gathering for which is actively being undertaken. Next is a 15-acre area, within which the former two areas are located, and which may be restored in the near future. Finally, a larger 25-acre area, inclusive of the 15-acre area, is suitable for additional wetland and stream restoration projects in the future. This 25-acre area was used as a Spray Irrigation Field during the 1970s-1980s and hence is referred to as the SIF.

Background research for the 25-acre SIF indicated that Native American archaeological sites are common in the floodplain and terraces along Little Paint Branch, which lies approximately 400 m to the east. The North Farm 25-acre SIF historically consisted of a similar landform, perhaps suggesting a high potential for Native American sites. However, research, including site plans provided by USDA Agricultural Research Center (ARS), indicates that the area was historically a wetland (not adjacent to a wetland) and that extensive site grading and earth moving activities were conducted in the 1970s during the construction of the SIF. These factors lessen the potential for the presence of intact Native American resources within the 25-acre SIF, and especially within its southeast half.

Subsequently, field investigations conducted within the 2.94-acre wetland restoration area and the 1,483-linear-foot stream restoration corridor located within a portion of the larger 25-acre SIF. The investigations consisted of the excavation of STPs at 20-m intervals with all soils removed screened through ¼-inch mesh hardware cloth. Fifteen (15) STPs were excavated within the 2.94-acre wetland restoration area. Based on comparisons to soils described for the project area, the STP profiles appear to consist of modern alluvial or effluent spray deposited horizons, or a combination of both, over Bt horizon soils. The original A horizon, E horizon, and upper portion of the B horizon was absent and was most likely removed during the 1970s land leveling that occurred during the construction of the SIF. Twenty-two (22) STPs were excavated along the proposed 1,483-linear-foot stream restoration corridor. These STPs exhibited a similar profile as the wetland restoration area with no A, E or upper B horizon present. Finally, based on the results of the field investigations within the 2.94-acre wetland and 1,483-linear-foot stream restoration areas, Stantec excavated six (6) judgmentally placed STPs in adjacent fields comprising the 15-acre wetland restoration areas. These STPs exhibited a modern A horizon overlying Bt horizon deposits. No artifacts or other archaeological resources were identified in any of the survey areas.

Based on the results of the Phase IB survey, no archaeological resources are present in the BARC North Farm 2.94-acre wetlands restoration area or the 1,483-linear-foot stream restoration area, most likely due to prior impacts (soil removal) and the likelihood that the area was within (not adjacent to) an historical wetland. Such locations are typically not consistent with the presence of Native American resources. As such, Stantec concludes that no additional archaeological investigations within the 2.94-acre wetland and 1,483-linear-foot stream restoration areas are needed. In addition, based on the results of background research and reconnaissance-level field investigations, Stantec suggests that the adjacent fields comprising the larger 15-acre wetland restoration area also have a low probability for the presence of intact archaeological resources and suggests that archaeological investigations are unlikely to encounter any resources in those fields.

TABLE OF CONTENTS

Page

LIST OF FIGURES

Figure Page

LIST OF TABLES

1.0 INTRODUCTION

This report presents the results of intensive and reconnaissance-level Phase I archaeological surveys conducted at a portion of the North Farm within the United States Department of Agriculture Henry A. Wallace Beltsville Agricultural Research Center (BARC), located in Prince George's County, Maryland (Figure 1). The investigations were conducted by Stantec Consulting Services Inc. (Stantec) in June 2015.

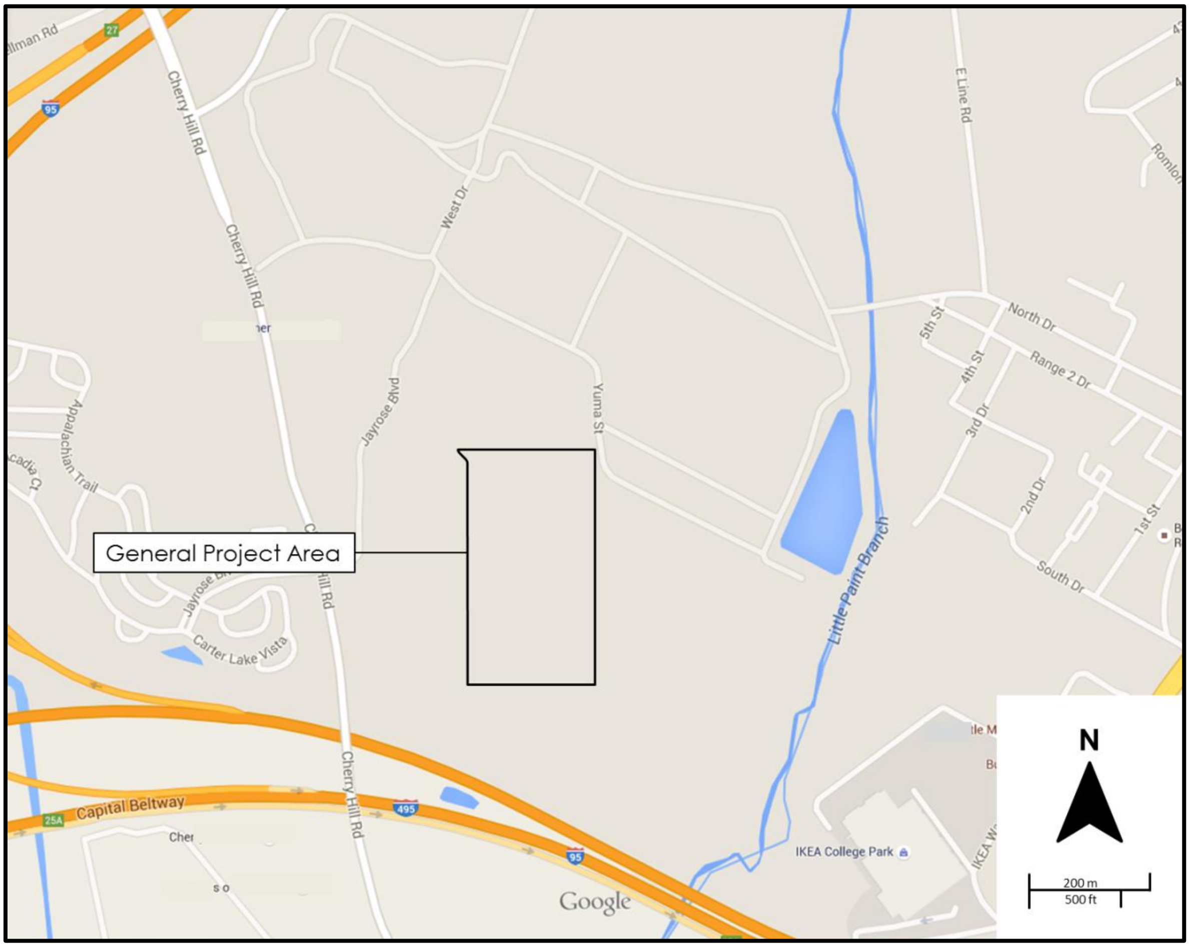

Figure 1. General location of the BARC property (Google 2015).

1.1 Proposed Undertaking

BMT Designers and Planners is undertaking a stream and wetland restoration project at the Spray Irrigation Fields (SIF) located in the North Farm of the Henry A. Wallace Beltsville Agricultural Research Center in Prince George's County, Maryland (Figures 1 and 2). The project area consists of three overlapping parcels that were investigated at different levels of intensity as each area will be restored at different times. The first area is the 2.94-acre wetland and 1,483-linear-foot stream restoration areas, planning and data gathering for which is actively being

Figure 2. Plan of the 25-acre SIF stream and wetland restoration area (north at left of page).

undertaken. The areas are depicted in green and blue in Figure 2. Next is a 15-acre area, depicted in orange in Figure 2, which may be restored in the near future. Finally, a larger 25-acre area, enclosed by a dashed line in Figure 2, and inclusive of the 15-acre area, is suitable for additional wetland and stream restoration projects in the future. This 25-acre area was used as a Spray Irrigation Field during the 1970s-1980s and hence is referred to as the SIF. Stantec is providing historical/archival and archaeological services for this effort.

The scope of this intensive and reconnaissance-level Phase I survey was approved by MHT in advance of work implementation. The investigations were designed to meet the standards of the Secretary of the Interior's *Standards and Guidelines for Archeological and Historic Preservation* (Federal Register 1983) and the *Standards and Guidelines for Archeological Investigations in Maryland* (Shaffer and Cole 1994). This investigation was also designed to address the requirements of Section 106 of the National Historic Preservation Act of 1966, as amended.

1.2 Project Area Description

The BARC is located in Beltsville in northwest Prince George's County, Maryland (Figure 3). The Spray Irrigation Field project area lies east of Cherry Hill Road and north of the Capital Beltway. The 25-acre SIF project area is located in an upland setting, between Little Paint Branch to the east and Paint Branch to the west. Little Paint Branch is approximately 400 m to the east. Historically, the parcel was rural, with both agricultural fields and a woodlot present. More recently, the area was used as a Spray Irrigation Field (SIF) during the 1970s and 1980s. Currently, the parcel is grass covered.

1.3 Geology and Soils

The project area is located in the Glen Burnie Rolling Upland District of the Western Shore Uplands Region of the Atlantic Coastal Plain Province, an area characterized by an undulating upland with slopes typically less than 8 degrees and underlain by Cretaceous to Pliocene sediments. Fluvial and estuarine terraces flank the major drainages, especially the Patuxent River (Figure 4) (Reger and Cleaves 2008).

The BARC is located within the Beltsville-Leonardtown-Chillum soil association, which consists of moderately deep, well-drained to poorly drained dominantly sloping soils with a compact subsoil or substratum (Kirby et al. 1975). Specific soils within the Spray Irrigation Field project area are mapped as Russett-Christiana complex, 2 to 5 percent slopes, and Elkton silt loam, 0 to 2 percent slopes (U.S. Department of Agriculture, Natural Resources Conservation Service 2013).

Russett-Christiana complex, 2 to 5 percent slopes, is present in the western half of both the 25-acre and 15-acre SIF project areas. Russett-Christiana complex, 2 to 5 percent slopes, also comprise the entire 2.94-acre wetland restoration area and the north half of the 1,483-linear-foot stream restoration area.

Russett soils are moderately drained deep soils found on swales, broad interstream divides, interfluves, and drainhead complexes (U.S. Department of Agriculture, Natural Resources Conservation Service 2013, 2015a). A typical profile consists of an A horizon from 0–4 inches (0–10.2 cm) composed of very dark gray (10YR3/1) fine sandy loam, a Bt1 horizon of yellowish brown (10YR5/4) sandy loam from 4–7 inches (10.2–17.8 cm), a Bt2 horizon from 7–13 inches (17.8–33.0 cm) of yellowish brown (10YR5/6) sandy clay loam, a Bt3 horizon of yellowish brown (10YR5/8) sandy clay loam from 13–19 inches (33.0–48.3 cm), and a Bt4 horizon from 19–26 inches (48.3–66.0 cm) of yellowish brown (10YR5/8) sandy clay loam. The underlying Bt5 horizon is a complex mix of 40 percent yellowish brown (10YR5/8), 30 percent red (2.5YR5/8), 20 percent light gray (5Y7/1), and 10 percent yellowish brown (10YR5/4) sandy clay loam and silty clay loam from 26–46 inches (66.0–116.8 cm). Below the Bt5 horizon is a Btg/BCg from 46–57 inches (116.8–144.8 cm) consisting of 60 percent light gray (10YR 7/1) clay loam (Btg part) and 40 percent sandy loam (BCg part). The Cg horizon, from 57–77 inches (144.8–195.6 cm), is grayish brown (10YR5/2) loam.

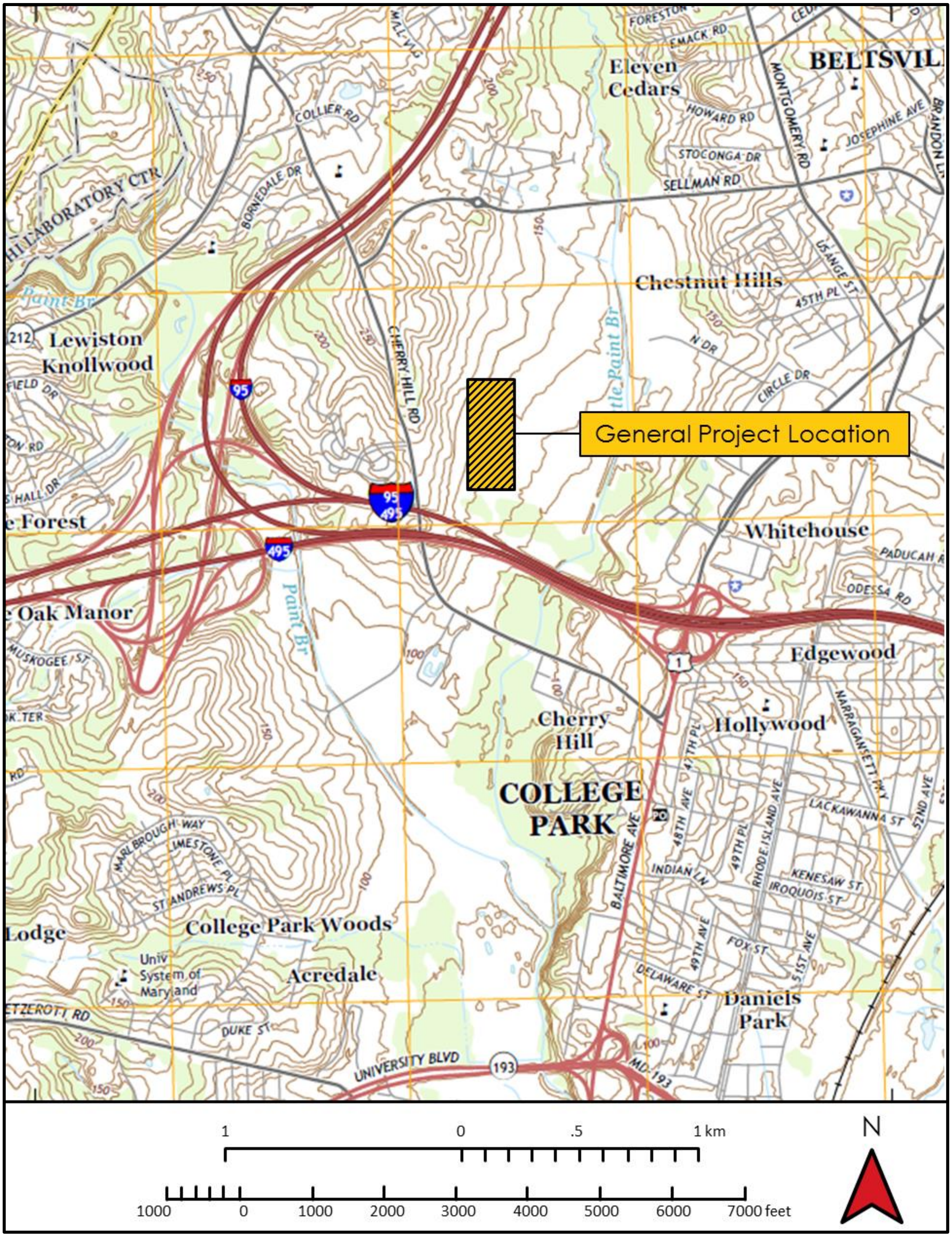

Figure 3. Beltsville 7.5-minute quadrangle showing the general project location.

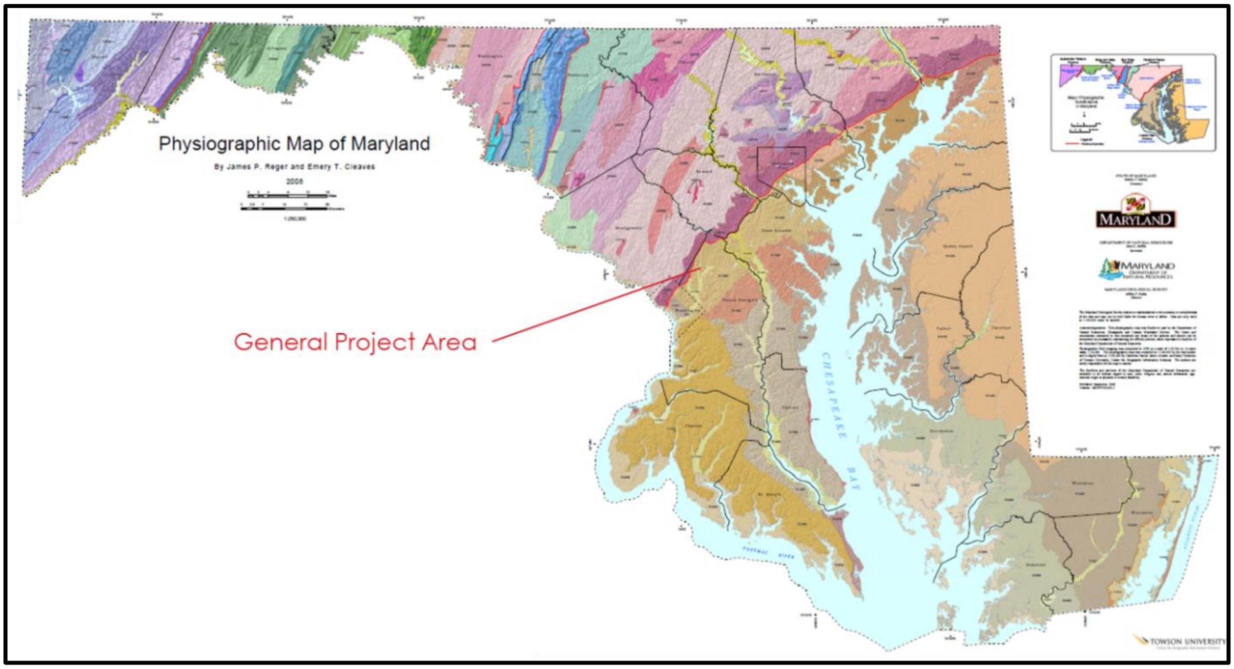

Figure 4. Maryland and Washington, D.C., physiographic provinces (after Reger and Cleaves 2008).

Christiana soils are moderately well-drained deep soils that are found on swales, interfluves, hillslopes, and drainhead complexes (U.S. Department of Agriculture, Natural Resources Conservation Service 2013, 2015b). A typical profile consists of an Oi horizon from 0–2 inches (0–5.1 cm) of slightly decomposed needles, leaves, twigs and other woody materials. Beneath that is an A horizon from 2–3 inches (5.1–7.6 cm) composed of black (2.5Y2.5/1) silt loam, an E horizon of yellowish brown (10YR5/4) silt loam from 3–6 inches (7.6–15.2 cm), a BE horizon from 6–10 inches (15.2–25.4 cm) of brownish yellow (10YR6/6) silt loam, a Bt1 horizon of strong brown (7.5YR5/6) silty clay loam from 10–21 inches (25.4–53.3 cm), a Bt2 horizon from 21–35 inches (53.3–88.9 cm) of yellowish red (5YR5/6) silty clay loam, a Bt3 horizon of red (2.5YR 4/6) silty clay from 35–49 inches (88.9–124.5 cm), a Bt4 horizon from 49–63 inches (124.5–160.0 cm) of reddish brown (5YR 5/4) clay loam, and a BC horizon of yellowish brown (10YR 5/6) clay loam from 63–99 inches (160.0–251.5 cm).

Elkton silt loam, 0 to 2 percent slopes, is found in the eastern half of both the 25-acre and 15-acre SIF project areas. This soil type is also present within the south half of the 1,483-linear-foot stream restoration area. Elkton soils are poorly drained, nearly level to gently sloping, and found on upland flats. The water table is typically encountered within 0–10 inches (0–25.4 cm). A typical profile consists of an Ap horizon of grayish-brown (10YR5/2) silt loam from 0–7 inches (0–17.8 cm), an A2g horizon of light brownish gray (2.5Y6/2) silt loam from 7–10 inches (17.8–25.4 cm), a B1g horizon from 10–16 inches (25.4–40.4 cm) composed of light brownish-gray (2.5Y6/2) silty clay loam, a B21tg horizon of light brownish-gray (2.5Y6/2) silty clay from 16–23 inches (40.4–58.4 cm), a B22tg horizon composed of gray of light gray (5Y6/1) clay from 23–34 inches (58.4–86.4 cm), a B23tg horizon of gray or light gray (5Y6/1) silty clay from 34–47 inches (86.4–119.4 cm), and a B3b horizon from 47–96+ inches (119.4–243.8+ cm) of yellowish-red (5YR4/8) silt clay (Kirby et al. 1975:31).

1.4 Report Organization

Following this introduction, the report is presented in six additional sections: Research Methods, Cultural Context, Site Potential Assessment, Results of Investigations, Summary and Recommendations, and References Cited. Qualifications of Key Personnel are presented in Appendix A.

2.0 RESEARCH METHODS

A number of research methods, including archival research, field investigations, and laboratory analysis, were employed for the intensive and reconnaissance-level Phase I archaeological survey of the 25-acre SIF, 15-acre SIF, and 2.94-acre wetland and 1,483-linear-foot stream and restoration project areas at the BARC.

2.1 Background and Archival Research

The identification of the potential for archaeological resources in and within the vicinity of the BARC began with background and archival research. The initial literature search was conducted at the Maryland Historical Trust Library and consisted of a review of existing surveys and identified archaeological sites. This determined the level of previous identification studies and the nature of archaeological sites within the general project area. Contract reports documenting the results of previous archaeological investigations conducted in the general project area were reviewed, as were the Maryland archaeological site files. The archaeological site files were reviewed to determine whether any archaeological sites in or near the subject properties had previously been registered with MHT. Background research also entailed the evaluation of cartographic material at applicable repositories or their Internet sites, including the Library of Congress, the Maryland State Archives, the Maryland-National Capital Park and Planning Commission's PGAtlas, and NETR Online. BMT completed a review of the North Farm wetland and stream restoration area and provided that information to Stantec. Stantec reviewed the BMT provided historical aerial photography, historical topographic maps, site construction plans, site boring logs, and interviews with knowledgeable BARC staff, and has incorporated this information into Section 3.3.

2.2 Field Methods

The scope of the field investigation was approved by MHT in advance of implementation. An intensive survey grid of shovel test pits (STPs) spaced at 20-m intervals was excavated within the 2.94-acre wetland and 1,483-linear-foot stream restoration portions of the project area. Twenty-two (22) STPs were placed within the stream restoration course and fifteen (15) STPs were excavated within the proposed wetland restoration area. Six (6) judgmentally placed STPs , were excavated at selected locations in adjacent fields that constitute the 15-acre SIF of potential future wetland restoration areas. No field investigations, other than a general pedestrian reconnaissance of the area, were conducted in the remaining fields that constitute the entire 25-acre SIF project area. All STPs were excavated through A horizon strata and into the culturally sterile B horizon subsoil. Excavated soils were screened through 1/4-inch hardware cloth to ensure uniform recovery of cultural materials. All STPs were documented on standardized recording forms. Documentation also included narrative notes and photographs. Lastly, a plan map depicting STP locations was prepared.

2.3 Laboratory Methods and Curation

No artifacts were recovered from the Phase I investigations. Since the BARC is a federal facility located on federally owned property, the documentation for this project remains the property of the BARC. Upon completion of this project, all documentary materials will be submitted to BARC for curation at a federally approved facility.

3.0 CULTURAL CONTEXT

This section presents a general outline of precontact Native American and Historic period cultural development in the Mid-Atlantic region in general, and more specifically in Prince George's County, Maryland. It is based on the precontact Native American context developed for Maryland (Maryland Historical Trust 2005) and other more-specific studies to form the basis for the sequence of regional prehistory and history that is present below. The project area is situated in Research Unit 11, the Riverine Potomac Drainages Unit, as designated by the Council for Maryland Archeology (Figure 5). This overview provides an interpretive framework for evaluating archaeological resources in the subject property.

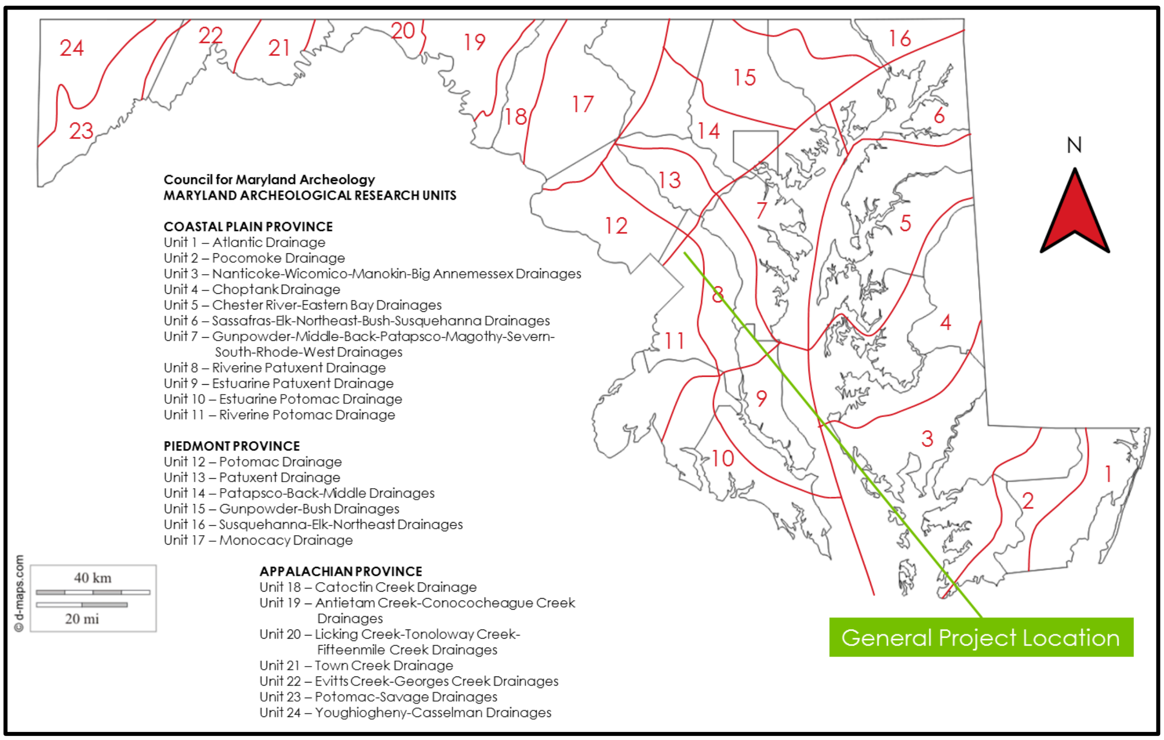

Figure 5. Maryland archeological research units with project location noted (redrawn from Council for Maryland Archeology original using base map from D-maps.com [2015]).

3.1 NATIVE AMERICAN CONTEXT

The Maryland Historical Trust has developed precontact Native American contexts that provide a necessary framework for the description and analysis of all known or expected archaeological resources, and the basis for evaluating the significance of those resources (Maryland Historical Trust 2005). These contexts are organized by region, time period, and theme (Figure 6).

3.1.1 Paleoindian Period (12,000 – 9000 BC)

The Paleoindian period reflects a pattern of cultural adaptation based on environmental conditions that marked the shift from the Late Pleistocene to the Early Holocene epoch (Figure 6).

	Period	Subperiod	Tradition / Phase
AD 1600	WOODLAND	Late Woodland	Algonquian Tribes Late Woodland II (Shell-tempered / Potomac Creek) Late Woodland I (Townsend Ware)
AD 900		Middle Woodland	Mockley Popes Creek
500 BC		Early Woodland	Accokeek Marcey Creek / Selden Island
1000 BC	ARCHAIC	Late Archaic	Fishtail Tradition Broadspear Tradition Laurentian / Piedmont Tradition
3000 BC		Middle Archaic	Stemmed Cluster (Stanly, Morrow Mountain) Bifurcate
6500 BC		Early Archaic	Kirk
9000 BC	PALEOINDIAN	Late Paleoindian	Dalton / Hardaway
		Early Paleoindian	Fluted / Clovis
12,000 BC			

Figure 6. Regional precontact Native American chronology of Maryland.

During this period of glacial retreat, the climate was probably three to eight degrees colder than at present, and vegetation initially consisted of spruce, pine, fir, and alder (Brush 1986:149; LeeDecker and Holt 1991:72). By the end of this period, vegetation patterns comprised a mosaic of microhabitats, with mixed deciduous gallery forests near rivers, mixed coniferous forests and grasslands in foothill and valley floor settings, and coniferous forests on high ridges (Custer 1984; Kavanagh 1982). Native American settlements at this time consisted of small hunting camps that were tied to sources of high-quality lithic raw materials. The primary means of subsistence was the hunting of large game such as moose, elk, and deer (Kavanagh 1982).

Dent (1995:132–133) suggests that three distinct environmental zones can be identified within the Chesapeake Bay region during the Paleoindian period. The first zone consists of areas along the ancestral Susquehanna River and its tributaries, including those along the modern Potomac and Anacostia Rivers. This zone is seen as providing ample resources to early inhabitants. The second zone lies to the west and is the Inner Coastal Plain region where resources were more diffuse. Last, the third zone is the area where the Inner Coastal Plain transitions to the Piedmont region. Ecotonal diversity would have provided increased potential for subsistence resources while the area also contains ample lithic resources. Dent (1995:133–134) also suggests that the area of the Chesapeake Bay region south of the James River in Virginia differed significantly from those areas to the north. The area south of the James River contained more temperate plant species than areas to the north and had larger wetland areas, indicating that this area had a more diverse ecosystem than areas to the north.

Traditional characterizations often suggest that Paleoindian settlements consisted of small hunting camps associated with sources of high-quality lithic raw materials. Gardner (1983, 1989) identifies six different functional categories for Paleoindian sites in the nearby Shenandoah Valley: lithic quarries, reduction stations, quarry-related base camps, base-camp maintenance stations, hunting stations, and isolated point find spots. Custer (1984) suggests that these site types may be applicable to the wider Mid-Atlantic region as a whole. Acquisition of high-quality lithics served as a focal point for this system with hunting as its subsistence base, which focused on large game such as moose, elk, and deer (Kavanagh 1982). In contrast, the Shawnee-Minisink site provides evidence that other foodstuffs were exploited as well. The remains of fish, edible seeds, and plants were found in Paleoindian deposits at that site (McNett 1985). Dent (1995:128) notes that there is virtually no evidence for subsistence practices in the Chesapeake Bay region, although he postulates that it was not based on hunting megafauna (Dent 1995:106).

More recently, Dent (1995) has reviewed Paleoindian sites and settlement patterns in the Chesapeake Bay region. At that time, attributes of 25 known Paleoindian sites were reviewed as were the characteristics of hundreds of isolated (off-site) finds reported in the Chesapeake Bay region. Most of the sites are surface manifestations, with relatively few intact, buried Paleoindian deposits having been located in the region (Dent 1995:122–124). Most sites and isolated finds have been identified south of the James River, while a more moderate number has been found north of the Potomac River. Interestingly, the fewest sites and isolates have been found between the James and Potomac Rivers (Dent 1995:120–121).

In contrast to the highly diverse site type model proposed by Gardner and accepted by Custer as discussed above, Dent (1995:137–138) suggests that only two site types can be defined for the

Chesapeake Bay region. Larger residential bases, often with multiple, distinct artifact loci, are situated along the ancestral Susquehanna River and its tributaries and along the western margin of the Inner Coastal Plain. These sites tend to be located in areas where a higher diversity of resources would have been available to site inhabitants. The second site type is the “location.” Locations are smaller sites often located in less productive zones at which few or specific tasks were being undertaken. While many locations in the Chesapeake Bay region are situated near wetlands, the most extreme example of these sites is the isolated find. Dent (1995:138) suggests that this settlement system indicates a high degree of mobility in Paleoindian culture that perhaps was based on seasonal availability of resources and weather patterns. There is some indication that site locations were selected to maximize solar warming while minimizing exposure to prevailing winter winds (Dent 1995:124). Dent (1995) further suggests that sites deviating from this pattern may indicate an occupation in warm-season months.

In the archaeological record, early Paleoindian sites are usually characterized by the presence of large, fluted, lanceolate-shaped projectile points such as Clovis, while later Paleoindian components are identified with projectile point types such as Dalton and Hardaway (Dent 1995:124; Justice 1987). Clovis points have been found throughout North America, from the West Coast to the East Coast, and as far north as Nova Scotia. Most archaeologists suggest that preferred lithic materials for these projectile points were high-quality cryptocrystalline stones such as jasper and chert. Once again, Dent (1995) has questioned the applicability of these generalizations to the Chesapeake Bay region. In reviewing raw material types used at Paleoindian residential bases in the region, Dent (1995:124–127) notes that lower-quality material comprises 25 percent to as much as 75 percent of these assemblages. Quartz, quartzite, silicified wood, slate, and jasper tend to dominate these assemblages. In contrast, high-quality cryptocrystalline materials dominate the location assemblages and are an especially dominant raw material for isolated finds. Paleoindian tool kits in the Chesapeake Bay region include such items as fluted bifaces, end and side scrapers, generalized bifaces, spokeshaves, gravers, awls, drills, denticulates, wedges, and cores (Dent 1995:124–127). Sites with high diversities of tools such as these are most often associated with residential camps. Dent (1995:127) also notes that utilized flakes are numerous at residential camps.

Paleoindian materials are rare along the Anacostia and Potomac Rivers. In 1988, Turner (1989:80) indicated that fewer than five Paleoindian projectile points per county have been found in the Virginia counties that border the Potomac River. The continuing Virginia Paleoindian fluted point survey documented eight additional points in Fairfax County, six in Loudoun County, and one in Prince William County, between 1988 and 2011 (PIDBA 2011). The Smithsonian Institution collections, many obtained in the late nineteenth century when the area was more agricultural, include three Paleoindian projectile points from along the Anacostia River (Humphrey and Chambers 1985:8). Also of note, a Clovis point was found near the Aquasco district in south-central Prince George’s County in Maryland (Gibb 2006). One reason for the paucity of Paleoindian projectile points and sites along these rivers may be the rise in water levels, in part due to the melting of the glaciers and the subsequent inundation of low-lying areas. While site burial has long been recognized in floodplain and terrace contexts, more recently site burial in upland formations has been demonstrated to have occurred as well (Wagner 2012).

3.1.2 Early Archaic Period (9000 – 6500 BC)

The Pre-Boreal/Boreal climatic episode, dating from 8500 to 6700 BC, for the most part corresponds to the Early Archaic period (Figure 6). Glacial recession continued and deciduous forests expanded, possibly leading to a greater proliferation of game species during this period. This climatic period, and the cultural period as well, in many ways marks a transition from late Pleistocene to Holocene patterns. Summer temperatures became warmer while the winters continued to be wetter than at present. This resulted in an expansion of coniferous and deciduous trees at the expense of grasslands. The distribution of forests consisted of pine and hemlock on slopes, mixed coniferous-deciduous forests in valley floors, and hydrophytic gallery forests along rivers (Carbone 1976; Kavanagh 1982:9). Kavanagh (1982:9) suggests that while little faunal evidence is available for this period, the environment most likely supported bear, deer, elk, and a variety of small game that were adapted to a northern climate. Evidence for this view comes from the Cactus Hill site (44SX202) faunal assemblage, which contains species that are still common in the region today (Whyte 1995). After 7000 BC, the spread of deciduous woodlands into upland areas, which had previously been predominantly spruce, hemlock, and pine forests, opened new habitats to be exploited by both animals and humans (Custer 1990).

Some researchers have emphasized that the Early Archaic period in the Mid-Atlantic region evidences continuity in lifeways from the Paleoindian period, with the exception of changes in projectile point styles (see Dent 1995). However, Dent (1995:167) notes that our understanding of the Early Archaic period in the Chesapeake region is still dependent on information from sites outside of this area. With that said, the most distinctive cultural characteristic of the Early Archaic period was the appearance of notched projectile points, most notably the corner-notched types such as the Kirk varieties along with the Palmer, Charleston, and Amos types (Dent 1995:168; Justice 1987). Other point types associated with the initial portion of the Early Archaic period include Hardaway, Kessel, Taylor, and Big Sandy, all side-notched types, although the Palmer Side-Notched type may be more common in the District (Dent 1995:168; Fiedel et al. 2008:9; Justice 1987). These notched projectile points are more characteristic of the initial portion of the Early Archaic period, typically dating between about 10,000 and 8,500 years ago (Dent 1995:157, 168). Dent (1995:157) suggests that the overall stone-tool assemblages associated with the notched projectile points have similarities with the earlier Paleoindian assemblages, including an emphasis on the use of a core-flake manufacturing process and especially scraper styles (Dent 1995:169–170). Distinctive bifurcate base projectile points, including such types as LeCroy, St. Albans, and Kanawha, are more characteristic of the later portion of the period between approximately 9,000 and 7,250 years ago, with some types persisting into the Middle Archaic period (Dent 1995:156–157, 168). Unfortunately, few radiocarbon dates are available for Early Archaic period sites in the Chesapeake region. The stone tools associated with these projectile points are less formal, more expedient, and appear to evidence use of a bipolar reduction strategy (Dent 1995:157, 170). Utilized flakes also appear to be more common.

There was also a continuation in the use of high-quality lithic materials until the later portion of this period when quartz and quartzite began to be more frequently used. Archaeological investigations in the Patuxent River drainage show that the majority of Kirk points found are made of rhyolite. This indicates that people either traveled long distances to obtain preferred lithic raw materials or that long-range trade networks had been established by this time

(Steponaitis 1980:68). However, Dent (1995:170) suggests that the choice of lithic material changed during this period. Assemblages associated with the notched projectile points, generally during the initial portion of the Early Archaic period, tend to be made from nonlocal materials. The later bifurcate base projectile point assemblages more commonly are made from local materials. Dent (1995:170) suggests that this change may be related to an increasingly restricted social landscape that limited group mobility. Lastly, the first ground-stone tools are associated with the Early Archaic period, including flaked and ground axes, celts, abraders, and adzes (Dent 1995:170).

Settlement systems and site locations during the Early Archaic period appear to reflect a dichotomy in landscape use between ecologically diverse floodplains and less ecologically diverse areas, such as uplands. Dent (1995:171) characterizes the distribution of Early Archaic period sites in the Chesapeake region as consisting of small sites widely distributed across the landscape. In a wider perspective, settlement appears to include larger residential camps that are located in the ecologically diverse floodplain settings and smaller, short-term occupation camps that are found in less ecologically diverse areas (Dent 1995:165). This bifurcation between floodplain and upland settings continues through the Middle Archaic period and may indicate the initial reliance on aquatic resources. If so, this appears to signal an increasing shift toward a generalized use of many available food resources. Dent (1995:172) also views the widespread distribution of Early Archaic period sites in the Chesapeake region as an effort to both feed and integrate peoples through the minimization of risk by information and resource sharing. In the Southeast, subsistence strategies included the collection of a number of mast species, seeds, and fruits, and hunting of amphibians, reptiles, and mammals as well as fish (Dent 1995:165–166). This pattern is mirrored to some extent in the Chesapeake region (Dent 1995:172–173). It has been suggested that the expansion of projectile point styles may be associated with the diversification of the Early Archaic period subsistence base.

Dent (1995:163, 170) notes that Early Archaic period sites are generally multicomponent sites, suggesting that in some instances this is due to frequent reoccupation. One aspect of the changing environment, increasingly predictable seasonal patterns, may have promoted repeated visits to locations through greater resource predictability (Dent 1995:195). Hearths are more frequent in number and more formal than the earlier Paleoindian hearths. They include the more formal prepared hearths as well as the less formal unprepared hearths, with prepared hearths more common in association with bifurcate point strata. Dent (1995:163, 198) suggests that this change may reflect a shift in lifeways and cooking techniques during the Early Archaic period. The less formal hearths are often clusters of fire-cracked rock measuring less than 1 m in diameter and most likely representing dumps of boiling stones (Dent 1970:171).

3.1.3 Middle Archaic Period (6500 – 3000 BC)

The beginning of the Middle Archaic period coincides with the Atlantic climatic episode, a warm, humid period associated with a gradual rise in sea level that led to the development of inland swamps (Barse and Beauregard 1994:9) (Figure 6). It was a time marked by increased summer droughts, sea level rise, grassland expansion into the Eastern Woodlands, and the appearance of new plant species (Carbone 1976:106; Hantman 1990:138). By 5000 BC, there was the onset of a cooling trend. Gardner (1982) suggests that the climatic changes resulted in a zonally patterned floral and faunal species distribution across the region, leading to an increased emphasis on seasonal availability of resources. Unfortunately, Dent (1995:173) suggests that the Middle Archaic period is one of the least understood periods of precontact Native American history in the Chesapeake region.

Tool types that were common in Paleoindian and Early Archaic lithic assemblages, including unifacial tools and formal end scrapers, decreased in number during the Middle Archaic period (Dent 1995:175; Egloff and McAvoy 1990:64). Modified flakes increased in number, and projectile points and generalized bifaces, many of which appear to be multifunctional tools, became the dominant chipped-stone tool types (Dent 1995:175). The bifurcate tradition of projectile points, including the LeCroy, St. Albans, and Kanawha types, continued during this time, and ground-stone tools (axes, adzes, mauls, grinding stones, and nutting stones) also became widely utilized as subsistence and settlement patterns changed (Dent 1995:176). Ground-stone tools were completely pecked or ground during this period, in contrast to those associated with the Early Archaic period (Dent 1995:176). The other significant marker of the Middle Archaic period is the stemmed projectile point style (Dent 1995:157). Stemmed projectile points dating to this period include the Stanly Stemmed/Neville, Morrow Mountain I and II, Guilford, and Piscataway types (Justice 1987). In general, these stemmed types date to the initial portion of this period, between about 8,000 and 6,000 years ago (Dent 1995:175). The Piscataway type is found late in this time period and at its earliest dates to the transition from the Middle Archaic to the Late Archaic period (Kavanagh 1982:50). Side-notched projectile points dating to the later portion of the Middle Archaic period, from 6,000 to 5,000 years ago, include the Halifax, Otter Creek, and Brewerton types (Dent 1995:175; Justice 1987). Dent (1995:175) also notes that Middle Archaic period points are less numerous in the northern part of the Chesapeake region. The use of high-quality lithic material for tools was not as common during this period as it was during the preceding periods, with the trend toward using local materials, first noted during the later portion of the Early Archaic period, continuing into this period (Dent 1995:176; Fiedel et al. 2008:10).

While many have characterized the Middle Archaic period settlement system as something of an enigma, the riverine base camps/upland short-term camps noted during the Early Archaic period seem to have continued, although this generally consisted of numerous small sites scattered across the landscape in the Chesapeake region (Dent 1995:165, 177). Middle Archaic sites in Maryland tend to be clustered along tributaries of rivers and not in the estuarine sections of drainages (Steponaitis 1980). Settlements consisted of small base camps located in or near inland swamps that were convenient to seasonally available subsistence resources, as well as smaller temporary upland hunting camps. Researchers have noted that few components dating to the Paleoindian and Early Archaic periods are present at Middle Archaic period sites. Gardner (1989:34) suggests that the immediate local ecology of the Paleoindian and Early Archaic sites became increasingly less suited to the needs of Native American groups as climate and vegetation changed during the Middle Archaic period.

Outside of the Chesapeake region, Middle Archaic period sites have yielded evidence of prepared floors and post molds, some of the earliest direct evidence for the existence and nature of structures (Dent 1995:164). Formal cemeteries are also known. In the Chesapeake region sites appear to represent a series of reoccupations. Formal hearths became more common during this period and researchers have been able to identify discrete activity areas at such sites (Dent 1995:176). Such activities often include tool manufacture or maintenance and subsistence and processing activities. Turning to subsistence, the greater variety of plant resources allowed for an increase in general foraging as a supplement to hunting, continuing a trend first detected at Early Archaic period sites (Dent 1995:177; Kavanagh 1982:50). Dent (1995:177) suggests that this Middle Archaic period subsistence strategy represents a diffuse adaptation. However, Smith (1986) suggests that during this period, populations became increasingly focused on the exploitation of specific resources such as mollusks or oysters.

3.1.4 Late Archaic Period (3000 – 1000 BC)

Dent (1995) views the Late Archaic period as a time when the region's occupants were adapting to a number of environmental changes (Figure 6). The environment during the Late Archaic period includes a warmer and drier climate, a continued rise in sea level, the expansion of oak-hickory forests onto valley floors and hillsides, and the reappearance of grasslands (Carbone 1976:189). As well, the distribution of faunal species characteristic of the early Historic period was established at this time. For the Chesapeake Bay region, perhaps the most important change was the establishment of the estuary system, which resembled the modern system only near the end of the Late Archaic period (Dent 1995:199).

Dent (1995:160) suggests that the Late Archaic period can be divided into two time-based segments that may reflect the adaptation of groups to changes in the Chesapeake region environment. The earlier segment is characterized by a predominance of narrow-blade stemmed projectile points such as Bare Island, Lackawaxen, Claggett, Holmes, and Piscataway, along with a few side-notched types more characteristic of the Middle Archaic period such as Brewerton, Halifax, and possibly Otter Creek (Dent 1995:178–180). Dent (1995:180) suggests that these narrow-blade types date to the period of approximately 3000 BC to 1500 BC. Beginning at 2200 BC, and thus overlapping with the last half of the narrow-blade tradition, is the broad-blade tradition that continues to approximately 1000 BC (Dent 1995:181). Some researchers have designated this time period as the Terminal Archaic (e.g., Fiedel et al. 2008:11; Kavanagh 1982). Characteristic of this tradition are types such as Savannah River, Susquehanna, Crispin, and Perkiomen, with derivatives such as Orient Fishtail and Dry Brook also present (Dent 1995:180). Dincauze (1976) suggests that the narrow-blade tradition evolved in situ from local Middle Archaic period populations while the broad-blade tradition was a result of diffusion from the Southeast. Dent (1995:201–202) appears to support this interpretation as well.

Turning to the remainder of the material culture assemblage associated with Late Archaic period sites, Dent (1995:161–162, 181) notes broad similarities between the artifact assemblages of the two projectile-point traditions. Chipped-stone tools were made using both bipolar and biface reduction techniques, and projectile points were most likely multipurpose tools. The reliance on multipurpose tools appears to have reduced the diversity of Late Archaic period tool types. Specific tool types include generalized bifaces, expedient flake scrapers, drills, perforators, and utilized flakes (Dent 1995:182). Drills and scrapers were often made from exhausted projectile points. Besides the formal chipped-stone tools used during the Late Archaic period, there appears to have been an increase in the production of expedient tools made from flakes and crude cores (Klein and Klatka 1991:98). Lithic material varies by location, although an emphasis on local materials is characteristic of both traditions, and some preference for quartzite appears to be associated with the broad-blade tradition (Dent 1995:182). Throughout this period, quartz and quartzite were the most frequently used lithics, although rhyolite and argillite were occasionally used in stone-tool manufacture. However, large quarries, often centering on quartzite acquisition, such as the Piney Branch quarries located in the District of Columbia, appear to be associated with the broad-blade tradition (Dent 1995:203; Fiedel et al. 2008). Nonlocal materials, when present, appear to have been procured from “down-the-line” trading networks (Dent 1995:182). The use of ground-stone tools also increased during the Late Archaic period and especially with the broad-blade tradition, perhaps reflecting an increase in woodworking activities (Dent 1995:182). Ground-stone tools include adzes, celts, gouges, axes, manos, metates, mortars, net weights, and atlatl weights (Dent 1995:182). Steatite or soapstone bowls were also produced during the Late Archaic period in the Chesapeake region, once again more so with the broad-blade tradition (Dent 1995:161, 182–183).

Aside from projectile point styles, Dent (1995) stresses that the greatest differences between the two traditions is in terms of settlement and site structure. Settlement patterns associated with the narrow-blade tradition consist of a large number of relatively small sites that are equally divided between riverine and upland locations, with wetlands, forests, diverse habitats near streams, and riparian floodplain plant communities offering predictable resources (Dent 1995:185, 197). Because of this, the Inner Coastal Plain was more heavily occupied than the Outer Coastal Plain (Dent 1985:197). Such a strategy also was effective in enhancing contact between groups and in terms of risk mitigation through information and resource sharing (Dent 1995:197). Sites that appear to be larger are most often the result of a palimpsest of frequent occupations by small groups, with the frequency of reoccupation associated with resource predictability (Dent 1995:199). Subsistence appears to have been based on forest mast, deer, and turkey (Dent 1995:187). Seasonal hunting and foraging continued, but exploitation of riverine resources rapidly became an important part of the subsistence base. Several settlement trends are associated with these changes, including an intensified occupation of the uplands, the initial establishment of large semi-sedentary base camps along rivers and streams, and an overall increase in the number of sites dating to this period. Internally, narrow-blade tradition sites evidence a limited range of features, including discrete activity areas and scatters of fire-cracked rock (Dent 1995:184).

The broad-blade tradition reflects an adaptation to the increased availability of estuarine environments in the Chesapeake region, an adaptation referred to as an intensification effort and characterized as an appropriation of nature (Dent 1995:188, 200). Dent (1995:205) characterizes this adaptational change as a shift to a logistically organized collector strategy. Dent (1995:201), suggests that, like the broad-blade projectile points themselves, the adaptation for intensification, which allowed populations to take advantage of the stabilized, ecologically productive coastal areas, was imported into the Chesapeake region. Reflecting this change is a shift in site location that emphasizes proximity to linear river valleys that allowed an increase in the population and a subsistence focus on estuarine resources (Dent 1995:186, 201). Both site size and total number of sites increased, with sites as large as 2 ha present while smaller sites average 450 square meters (Dent 1995:186). Dent (1995:186) characterizes this settlement system as representing an annual cycle of fusion and fission with settlements including multiband base camps, band camps, and microband foray sites. In contrast, Steponaitis (1986:285) sees the settlement pattern of the Patuxent River area as being unchanged throughout the entire Late Archaic period. Features associated with the sites also became more diverse. Formal hearths and platform hearths, perhaps having a fish-processing function, are increasingly common. Shell accumulations, pits, and burial pits have also been reported.

Definite evidence for structures, though, is lacking (Dent 1995:185). As may be surmised from the shift in settlement toward estuarine environments, greater evidence for fish and shellfish use is associated with the broad-blade tradition (Dent 1995:187). Mast use appears to have been seasonally determined, as perhaps were aspects of hunting (Dent 1995:187).

3.1.5 Early Woodland Period (1000 – 500 BC)

The Early Woodland period, roughly dated between 1000 BC and 300 BC, generally coincides with the Sub-Boreal climatic episode, an episode that approximates modern conditions although attenuated cycles of climatic change have been identified (Carbone 1976) (Figure 6). Johnson and Peebles (1983) and Brush (1986) indicate that by this time period, forest composition was essentially similar to that of the modern period although differences in the frequency of species may have been present. Similarly, Eshelman and Grady (1986) suggest that a modern array of faunal species were present in the region at this time.

Culturally, ceramic manufacture and increased sedentism traditionally mark the beginning of the Early Woodland period. The earliest types of ceramics found along the Coastal Plain of Maryland are the steatite-tempered Marcey Creek and Selden Island wares, which are associated with fishtail-type points, including Orient and Dry Creek. Some researchers have characterized these ceramic types as "experimental" wares (e.g., Dent 1995:225; Wise 1975), and they can be described as trough- or bowl-shaped vessels with flat bottoms molded from slabs of clay (Dent 1995:225). Egloff (1991) suggests the early ware types, such as Marcey Creek and Seldon, are derived from Southeast pottery traditions. The Marcey Creek and Selden Island wares were replaced by the sand- or crushed-quartz-tempered Accokeek wares. These ceramics are associated with Calvert and Rossville point types (Wesler et al. 1981:183). Accokeek ware is the earliest example of this pottery technology on the Western Shore. By about 900 BC, coil production techniques began to be used, with globular vessels having cord- or net-impressed exterior surfaces being fashioned (Dent 1995:227). Aside from projectile points, much of the Early Woodland lithic assemblage is similar to that of the preceding Late Archaic period (Dent 1995:228).

Researchers have suggested that the Early Woodland settlement pattern reflects an intensification of the logistical-collector strategy adopted in the broad-blade tradition of the Late Archaic period (Dent 1995:230). It appears that part of this intensification included increased sedentism, with larger sites being occupied for longer periods of time (Dent 1995:230; Mouer 1991). These larger sites were serviced by smaller resource-extraction sites (Dent 1995:230; Gardner 1982). The larger sites were riverine-based and often located at the junction of freshwater and brackish streams in interior regions. Smaller camps were established seasonally in areas where there was high potential for the exploitation of numerous and differing resources. Gardner (1982:60) has proposed that the settlement-subsistence system of this period included a series of base camps where populations aggregated to exploit seasonal resources. Groups occupying the base camps harvested anadromous fish in the spring and early summer and exploited estuarine resources in the fall and early winter. The increased sedentism is reflected by the features identified at the large base camps. It is during the Early Woodland period that the earliest evidence for food storage is found. Small food-storage pits are common, as are formal hearths with dense deposits of fire-cracked rock (Dent 1995:230). Other characteristics of the large base camps indicative of increased sedentism include dense midden deposits, including shell middens. However, few remains of structures have been identified (Dent 1995:230).

3.1.6 Middle Woodland Period (500 BC – AD 900)

Dent (1995:235) suggests that the Middle Woodland was a period of technological homogenization, in that projectile point type variability decreases in the Chesapeake region. In contrast, a diversification of ceramic vessel sizes, forms, and styles of surface decoration, including net-, cord-, and fabric-impressed, characterizes the Middle Woodland period (Dent 1995:221). The major ceramic type in the region was the shell-tempered Mockley type (characteristic of the Mockley phase), which evolved from the sand-tempered Popes Creek type (Barse and Beauregard 1994:14; Dent 1995:221, 235) (Figure 6). Popes Creek ceramics typically date from about 2,500 years ago to 1,800 years ago and are thick-walled and sand-tempered with net-impressed exteriors (Dent 1995:235–236). Projectile points associated with Popes Creek ceramics include Calvert and Rossville types as well as unnamed stemmed types (Dent 1995:236). Mockley ceramics date from 1,800 to 1,100 years ago and are shell-tempered with cord- and net-impressed exteriors (Dent 1995:236). Projectile point types associated with the Mockley ceramics are Fox Creek and Selby Bay (knives) (Dent 1995:237). The presence of non-local rhyolite, argillite, and jasper lithics at a few sites suggests that localized exchange networks may have operated between the Coastal Plain and areas in both western Maryland and at the New Jersey fall line (Barse and Beauregard 1994:15; Dent 1995:222, 237). There is some suggestion that the rhyolite was traded into the region in the forms of blanks and preforms (Dent 1995:237; Stewart 1992:21). However, much of the stone-tool assemblage associated with the Middle Woodland period is similar to that of the preceding Early Woodland period, although bone tools are more common (Dent 1995:239).

Settlement during the Middle Woodland period continues the generalized pattern of seasonal aggregation and dispersal that perhaps began as early as the Middle Archaic period. In general, it appears that base-camp settlements located at freshwater/brackish water junctions, a common location for Early Woodland period camps, were abandoned in favor of broad floodplain sites where maximal resource exploitation of tidal and non-tidal aquatic resources was possible (Davis et al. 1997; Dent 1995:222). Dent (1995:241) discusses the Popes Creek site, which appears to represent a major settlement in the fall and winter seasons. The group would disperse in spring to take advantage of anadromous fish runs and to collect shellfish and hunt in the summer. Potter (1993) suggests that during the later portion of this period, smaller groups would seasonally congregate and disperse, whereas by the end of the period, larger, village-sized groups would seasonally congregate. Custer (1989) presents a similar model for the northern portion of the Chesapeake region. However, he identifies mortuary and exchange centers as additional elements of this system. These sites tend to be located in ecologically unproductive areas but are well-situated along potential lines of trade. Such sites are seen as indicators of increased regional interactions and also the coalescence of distinct territories (Dent 1995:242).

As the previous paragraph implies, Middle Woodland sites exhibit an extensive range in size, in one part of the Chesapeake region from .1 ha to 5 ha, that appears to be correlated with site function (Dent 1995:240). Features associated with Middle Woodland sites include dense midden rings, shell middens, subterranean storage pits, storage pits reused as trash receptacles, hearths, roasting pits, and concentrations of fire-cracked rock (Dent 1995:240). However, structural remains are not well-represented in the archaeological record. Available evidence suggests that houses had prepared floors, interior pits, and a pole-supported structure. Many of the subsistence trends noted for the Early Woodland period continued into the Middle Woodland period, especially the large-scale exploitation of oysters and other shellfish (Dent 1995:242). Deer, turkey, small mammals, and other bird species were important as well. Nuts and seeds were collected, with the increase in the representation of seeds such as amaranth and chenopod at sites suggesting that these species were intensively promoted and harvested (Dent 1995:243). Analyses of human remains indicate an increase in carbohydrate consumption when compared with earlier populations, possibly reflecting the increased consumption of amaranth, chenopod, as well as wild rice (Dent 1995:243). Dent (1995:243) suggests that the subsistence strategy during the Middle Woodland period can be characterized as a mix of hunting, foraging, and agriculture.

3.1.7 Late Woodland Period (AD 900 – 1600)

The single most important, and common, element across much of eastern North America during the Late Woodland period was the adoption of agriculturally based subsistence systems (Anderson and Mainfort 2002). In the Mid-Atlantic region, the establishment of a system of stable agriculture during the Late Woodland period led to the development of sedentary floodplain village communities, some of which were fortified by palisades (Turner 1992). Kavanagh (1983) notes four major changes that occurred during the Late Woodland period in the Monocacy River valley: the appearance of large, permanent or semipermanent villages made possible by the cultivation of maize, beans, and squash; the presence of ceramics at numerous sites, including open camps and habitations; an intensification of riverine orientation through time; and a shift towards the use of local lithic resources, implying a breakdown in procurement networks. Hunting, gathering, and fishing were still practiced but to a lesser extent than before.

The predominant Coastal Plain ceramics of the period include the fabric-impressed Townsend series and the cord-marked Potomac Creek series (Figure 6). The Townsend series ceramics have the same distribution as that of the Middle Woodland Mockley ware, and Dent (1995:244) notes that some archaeologists view Townsend as a derivative of the earlier Mockley ware. Ceramic decoration and embellishment appear to be very important and increasing at this time. Townsend ware has been divided into four distinct types that appear to evidence both temporal and geographic variation, with some types continuing into the Contact period. The Potomac Creek ceramics became abundant after AD 1300 in the western shore of Maryland (Dent 1995:245). Potomac Creek ceramics are believed to have been made by Piscataway groups. Dent (1995:245) also emphasizes that while the Late Woodland ceramic types have been shown to have a core area of use, their area of distribution is often larger. This dispersal is attributed to extensive interaction between regional groups. Triangular projectile points possessing a variety of names are almost exclusively associated with the Late Woodland period (Dent 1995:245). The stone-tool assemblage largely consists of local materials with tools made from small expedient cores and flakes (Dent 1995:247). The tools include a variety of scrapers, perforators, choppers, and hoes, along with ground-stone items such as axes, mauls, mortars, pestles, grinding stones, and abraders (Dent 1995:248). Bone and antler points were also fashioned, as were other bone tools and ornaments. Clay tobacco pipes and copper beads and pendants are also attributed to the Late Woodland period (Dent 1995:249).

Late Woodland period site patterns appear to consist of varying-sized larger sites surrounded by smaller sites, with the size and complexity of the larger sites increasing after about AD 1300 (Dent 1995:250). This site pattern may reflect a larger permanent village that was associated with smaller, resource-extraction hamlets. Village location may have been influenced by proximity to agriculturally suitable soils (Potter 1993). And as across much of eastern North America, Late Woodland groups in the Chesapeake region were becoming increasingly sedentary, with sites described as nucleated or dispersed villages and small hamlets (Dent 1995:249–250). Refuse and shell middens can be substantial at Late Woodland sites, and ditches, trenches, and palisades were constructed at some sites. While some subterranean storage facilities are found on Late Woodland sites, Dent (1995:249) suggests that the period witnessed a shift toward the use of above-ground storage facilities such as warehouses and granaries. Domestic structures appear variable and include longhouses, semi-subterranean pit houses, and smaller, oval house structures (Dent 1995:249). Some of the variability might be explained by site function. One last site type is the ossuary. Ossuaries are places of secondary interment of large numbers of individuals and are often associated with nearby village sites (Dent 1995:255).

In some respects, the Late Woodland subsistence pattern was similar to that of earlier periods. Faunal resources included deer, smaller mammals, ducks, turkey, and other birds, oysters and other shellfish, turtle, and a variety of fish, especially anadromous species (Dent 1995:251). Nuts, starchy and oily seeds, such as amaranth and chenopod, and tubers were also important. But the archaeological remains also indicate that fundamental changes to subsistence and diet occurred during this period. Eight-rowed flint variety maize was being grown as early as AD 825 in the region, and evidence for the growing of squash and beans has also been found (Dent 1995:254). Potter (1993) suggests that the emphasis on tropical cultigens intensified after AD 1300.

After AD 1500, there was an increase in social and political activity among native tribes in Maryland and Virginia, and it has been suggested that an alliance of coastal plain Algonquian groups had formed prior to European contact (Potter 1993:151) (Figure 6). Dent (1995:267) identifies the date of about AD 1500 as marking the appearance of ranked societies known as chiefdoms in the Chesapeake region. There has been considerable debate among researchers as to the nature of Late Woodland social organization in this region prior to AD 1500. For instance, Turner (1992) characterizes the socio-political organization of groups settled on the Coastal Plain as being ranked, while Hantman and Klein (1992) indicate that, at least for the Piedmont region, archaeologists have interpreted Late Woodland societies as ranging from egalitarian, to temporary hierarchies, to chiefdoms. As noted here, with the transition to the Contact period, many of these issues are resolved.

3.2 Historic Period Context

The MHT also has developed Historic period contexts that provide a framework for the description of expected historical resources, and serve as the basis for evaluating their significance (Figure 7). The contexts presented below are also organized by region, period, and theme and are drawn from The Maryland Preservation Plan (Maryland Historical Trust 2005).

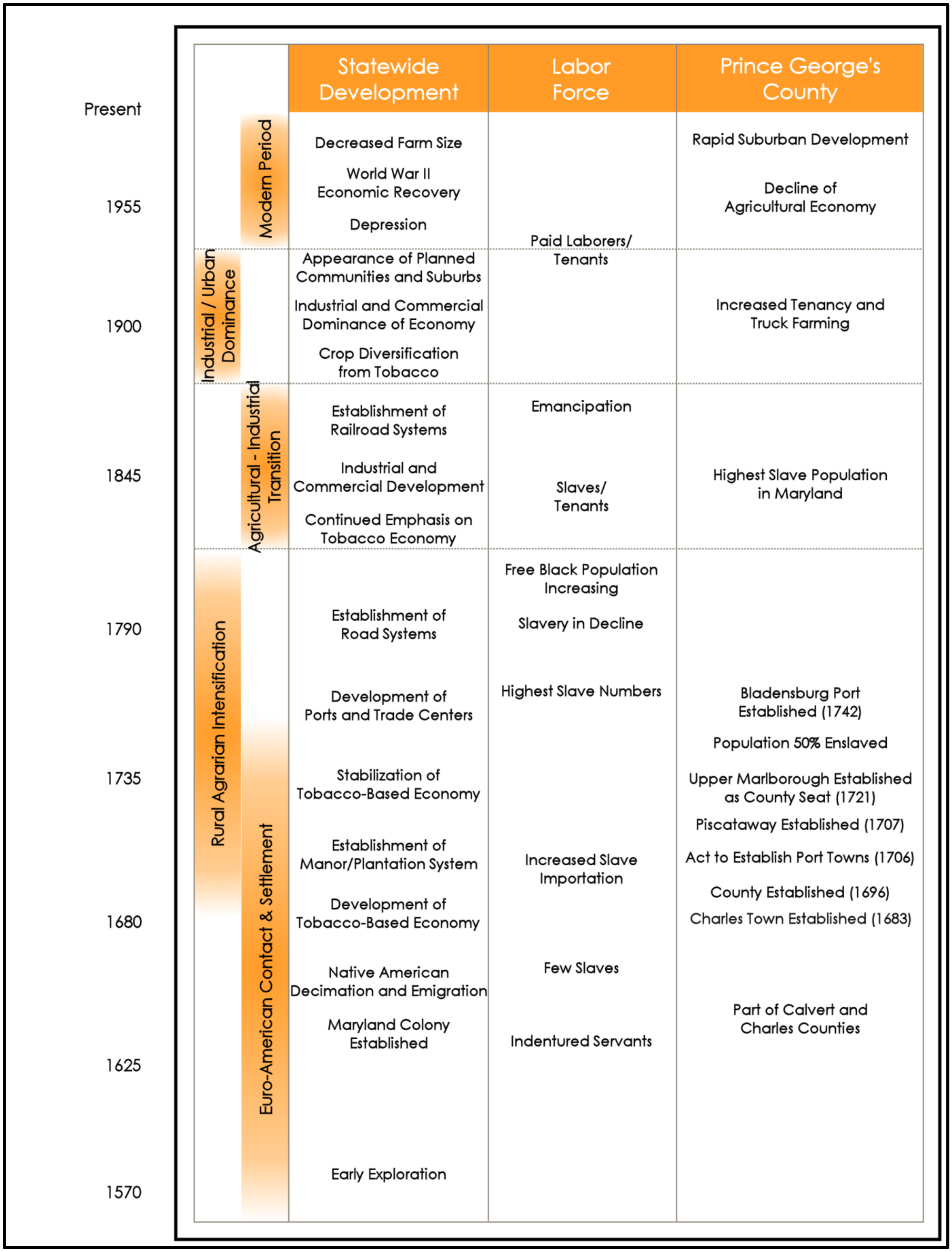

Figure 7. Historic period chronology of Maryland.

3.2.1 Euro-American Contact and Settlement Period (AD 1570 – 1750)

Early exploration of the Chesapeake Bay area began in the late 1500s. Spanish missionaries may have explored parts of southern Maryland during the sixteenth century, but it was not until John Smith's voyages on the Potomac in 1608 that documented contact occurred between Europeans and Native Americans in the region. Dent (1995:262) indicates that the region was populated by Algonquian speakers but was ringed by other groups: Iroquoian to the north, Siouan to the northwest, and various groups to the west. Smith recorded 166 different settlements and indicated the presence of social and political groupings by identifying villages with "King's Houses" or "Ordinary Houses" (Dent 1995:261). Powhatan, the major group in the region, was located south of Maryland and the District of Columbia (Dent 1995:262). Groups in the District or Maryland areas may have been loosely allied with Powhatan or were independent. The Piscataway, living north of the Potomac River, were also well-documented during the Contact period. This group was led by a paramount chief and consisted of six or seven groups each headed by a subchief (Dent 1995:264).

At this time, the material culture of the natives began to shift away from artifacts made of stone and bone toward those of European manufacture such as brass arrow points, glass trade beads, and other iron and brass objects. Maryland was established as an English colony in 1634 and quickly became an important tobacco-producing colony. Historic period settlement of the inner coastal plain area began in the middle seventeenth century, although settlement was focused along the Potomac and Patuxent Rivers. The relations between Native Americans and Europeans in southern Maryland were strained from the start and deteriorated as colonists continually encroached upon the land of the natives. By the beginning of the eighteenth century, most local Native American tribes had either migrated from Maryland or had been decimated by disease.

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3.2.3 Rural Agrarian Intensification (1680 – 1815)

In the Rural Agrarian Intensification phase of Maryland's development, and in the Western Shore region of the state, a stable agricultural society based heavily on tobacco was established.

Early landowners in the area established manors and plantations that covered many hundreds of acres. Early in this process, labor for the plantation was supplied mainly by indentured servants (Engerman et al. 2006). However, by 1690 this pattern began to change. Between 1698 and 1703 an average of 750 slaves per year were imported into Maryland, whereas after 1703, the average increased to 1,500 per year. Engerman et al. (2006) suggest that the reasons for this change include the scarcity of indentured servants, better life expectancy among slaves, and the increased demand for Chesapeake tobacco.

The growth of trade and shipping also led to the development of port towns and trading centers. The governmental system in Maryland changed from proprietary to provincial to state. Religious, social, cultural, and educational institutions were established and small local industries began to appear. Transportation in the eighteenth century relied at first on rivers, but as the century progressed, roads were built to facilitate the connection between port towns and churches.

3.2.4 Agricultural-Industrial Transition (1815 – 1870)

During the Agricultural-Industrial Transition period, the development of new manufacturing technologies began to influence the traditionally agricultural society. Commerce and industry became increasingly important in the Western Shore region of Maryland, and the impacts of the Industrial Revolution were felt most strongly here in the new transportation systems and local manufacturing industries. Agricultural development expanded, and the number of small farms began to increase, especially along the rivers and branches. By 1870, the area was still largely agricultural, with crossroads communities, rural churches, schools, mills, blacksmith shops and other small enterprises supporting a largely agricultural economy.

This economy was based on the existence of plantations whose slave labor accounted for more than half the population. Engerman et al. (2006) illustrate the wealth that this system created in the slave-holding states. For instance, the value of slaves themselves rose for $291 million in 1805 to $3 billion in 1860 in the slave-holding states. Also, in cotton-growing states (which Maryland was not), 44 percent of all wealth was represented by slaves. Maryland may have run somewhat counter to this trend. The slave population fell in Maryland between 1790 and 1860, such that the number of free blacks in the state nearly equaled the number of slaves (Engerman et al. 2006). Whether slavery was a profitable institution appears to be a continued area of debate among historians.

Although Maryland had the highest number of free blacks of any state during this period, Prince George's County had the largest number of slaves of all the counties in Maryland, and by the beginning of the Civil War it had the fewest free blacks in the state (Maryland State Archives 2010). This population was especially concentrated around Upper Marlboro, the county seat. Research also indicates that newspapers of the Antebellum period carried more notices of runaway slaves from Prince George's County (22 percent of all notices) than any other county in Maryland. The proximity of the area to Washington, D.C., which had a significant number of Underground Railroad participants and free blacks, probably encouraged slaves from Prince George's County to attempt to flee to freedom. It is likely that slaves made extensive use of their kinship networks on the plantations in Prince George's County as well as those in Washington, D.C., and other Maryland counties. The Civil War brought emancipation to the slaves in Maryland in 1865.

3.2.5 Industrial/Urban Dominance (1870 – 1930)

At the end of the Civil War, much of Prince George's County remained agricultural, forested, and dotted with small rural communities. The county was still a major producer of tobacco, but the large plantations were shrinking, due in part to the loss of a slave-based economy. The plantations were gradually replaced by smaller tenant farms and more diversified crops. Truck farmers in Prince George's County grew cash crops for sale in the urban markets of Washington, D.C., and the development of several railroad lines allowed fresh produce to be shipped to cities all along the Eastern Seaboard.

3.2.6 Modern Period (1930 – Present)

As across the state, the effects of the Depression and then post-World War II prosperity were seen in Prince George's County. Although tobacco production continued, higher land prices and federal regulation of tobacco acreage and production cut the size of the average farm. Most of the area retained its nineteenth-century character, a mixture of farms and small villages, well into the late twentieth century. The permanent transformation of the area began with the increased use of the automobile and the post-World War II-era expansion of Baltimore and Washington, D.C. But now, the traditional agricultural landscape and historical resources of the area are being replaced by large-scale development.

3.3 Project Area History

Prior to the establishment of the BARC, the project area was rural in nature. The earliest detailed map of Prince George's County (Martenet 1861) shows no residences within the project area (Figure 8). One is shown nearby and to the southwest under the name of Owens. Brown's Tavern lies east of the project area, and residences attributed to Thomas B. Beall and George C. Seible are to the north.

The 1878 Hopkins map shows these same structures with the addition of an unattributed structure within or very near the northwest portion of the project area (Figure 9) (Hopkins 1878). This structure most likely represents one occupied by an individual who did not choose to pay to be named on the map. The residence formerly attributed to Owens on the 1861 map was now the residence of William J. Aiken.

The 1907 15-minute Laurel quadrangle map shows no structures in the project area (Figure 10). Neither the unattributed structure nor the Aiken residence shown on the 1878 Hopkins map are depicted on the 1907 quadrangle map. The structures attributed to Thomas Beall and George Seible still appear to the north, and two new structures are depicted near the road to the west (now Cherry Hill Road). The unattributed structure depicted on the 1878 Hopkins map may be one of the two structures depicted to the west on the 1907 quadrangle map.

The Beltsville Agricultural Research Center was established in Beltsville in 1910 with significant property acquisitions in the 1930s and 1940s. A 1938 aerial photograph shows the project area as it would have appeared soon after its incorporation into the BARC (Figure 11). Most of the land was in agricultural production except for a woodlot located at the eastern portion of the project area. It is not known whether the woodlot was more extensive prior to the property's acquisition by the federal government. Aerial photographs continue to show wooded patches

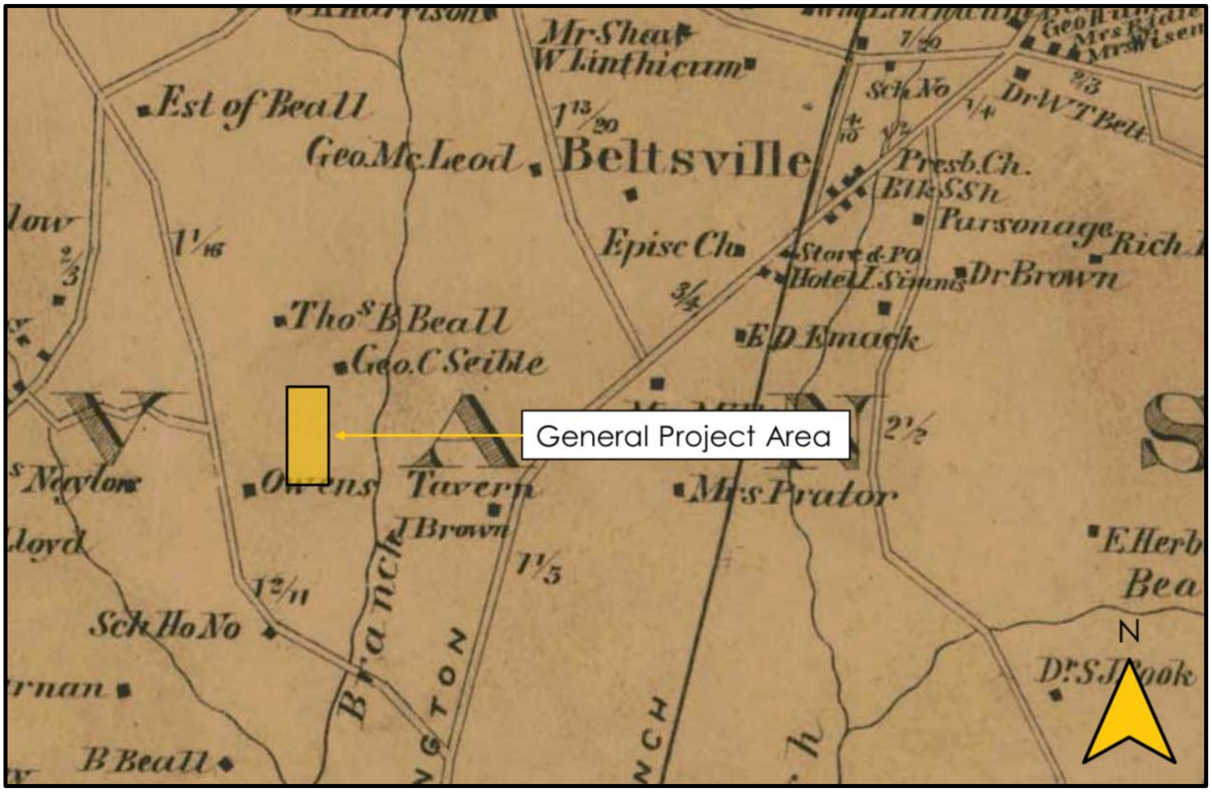

Figure 8. 1861 Martenet map showing the project area (Martenet 1861).

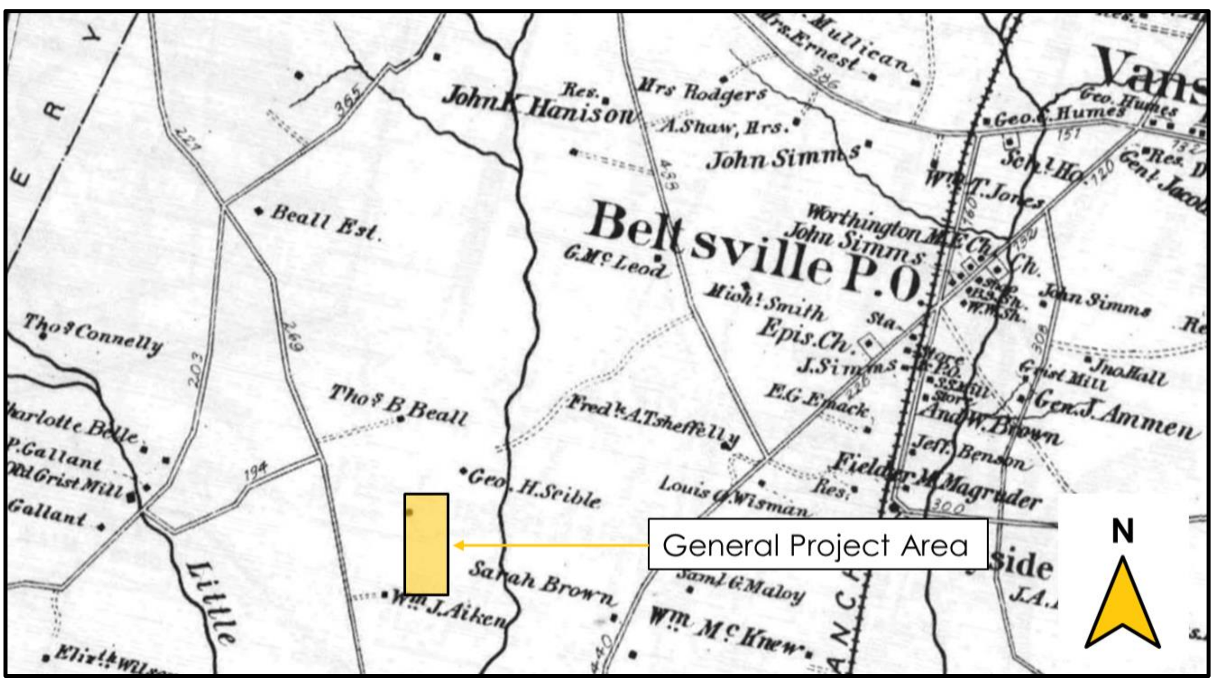

Figure 9. 1878 Hopkins map showing the project area (Hopkins 1878).

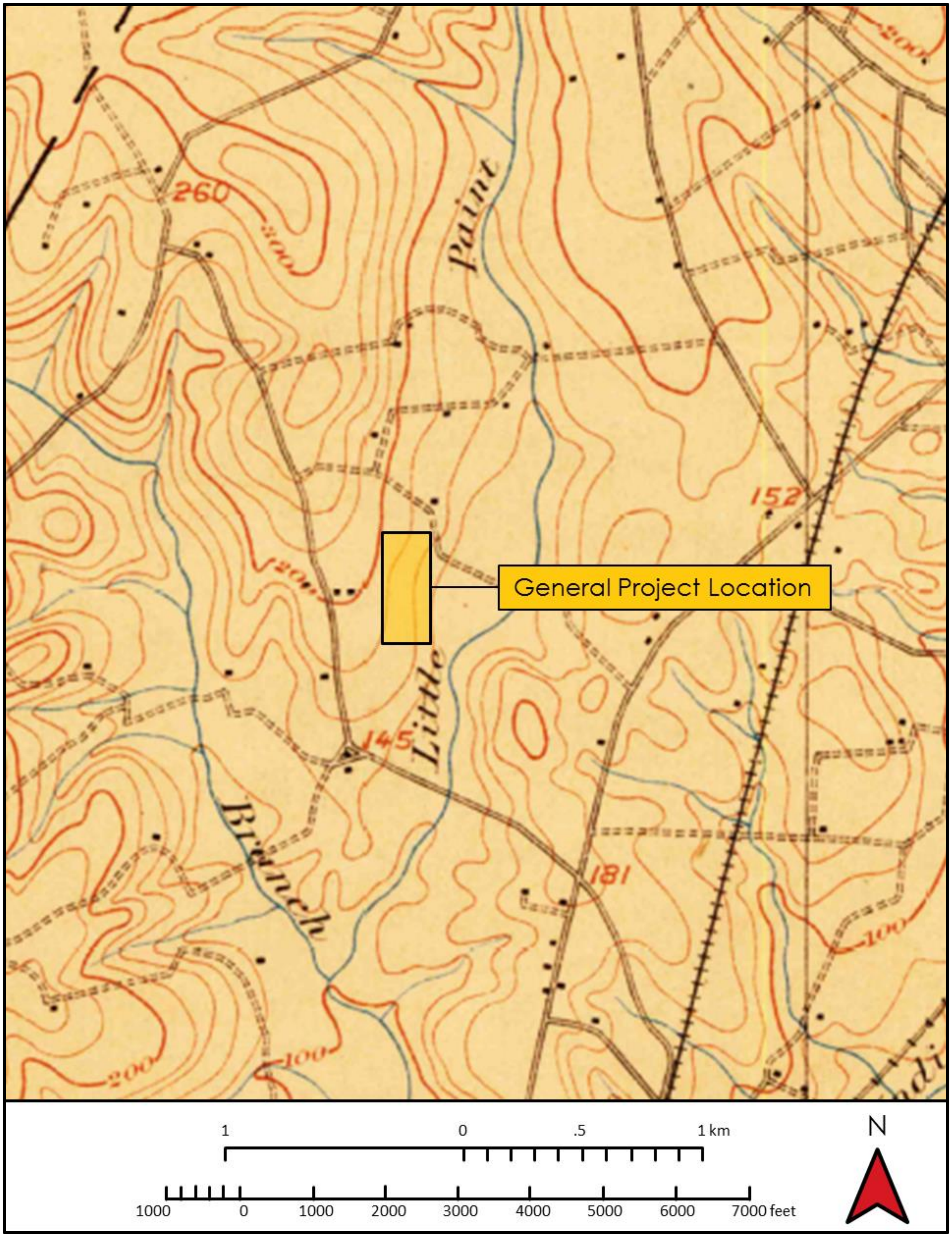

Figure 10. 1907 Laurel 15-minute quadrangle map showing the project area.

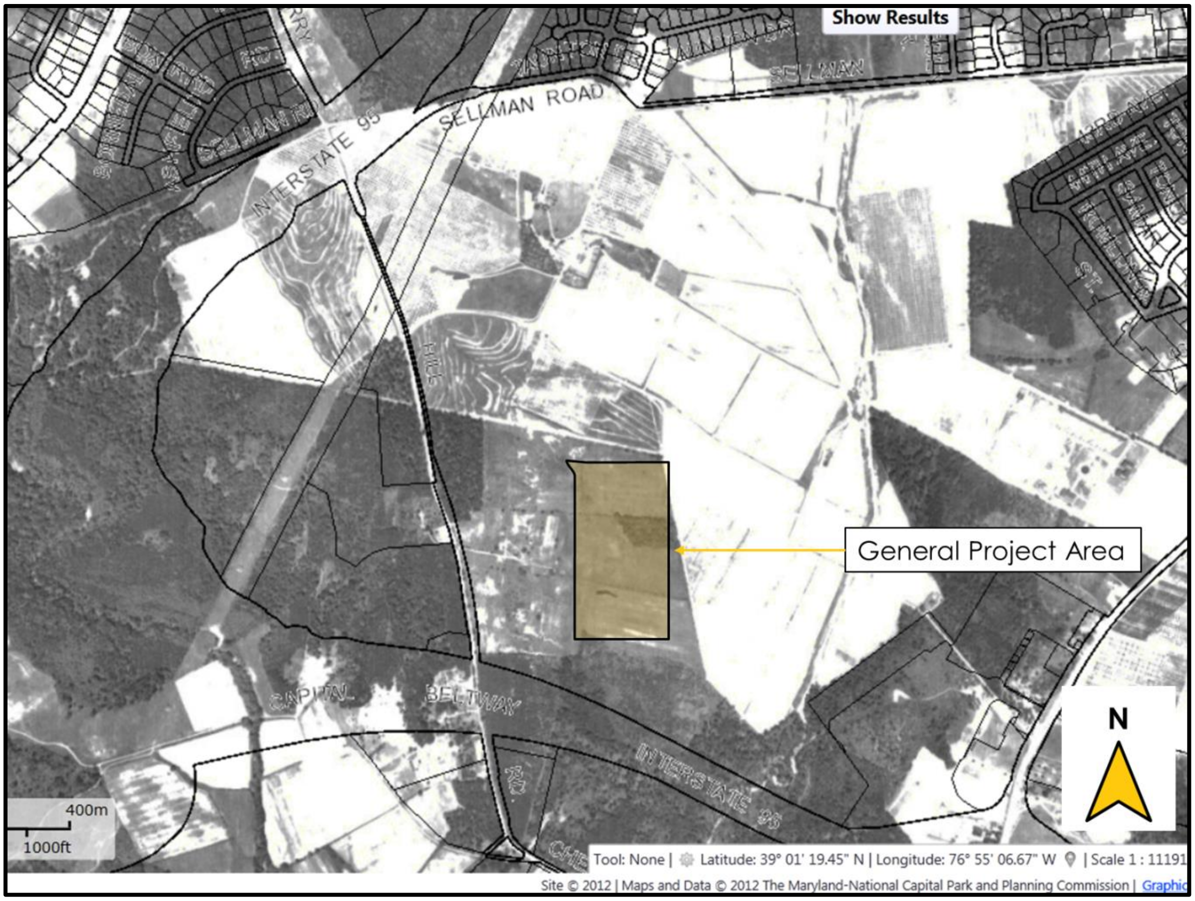

Figure 11. 1938 aerial photograph showing the project area (Maryland-National Capital Park and Planning Commission 2012).

into the 1970s, but by 1977, the parcel was used to disperse effluents from a nearby waste water facility. It was and continues to be known as the Spray Irrigation Field (SIF).

Materials provided by BMT Designers and Planners to MHT for project review indicate that, in the 1970s, a major construction project reshaped the fields to promote drainage and support spray irrigation. This resulted in the removal of 10–25 feet of soil across an unknown portion of the landform in the vicinity of the project area in order to shape the fields for maximizing drainage. Such landform cutting would have removed the plow zone and/or A horizon as well as portions or all of the B horizon. Documentation examined by BMT Designers and Planners included historical aerial photography, historical topographic maps, site construction plans, site boring logs, and interviews with knowledgeable BARC staff. Stantec then compared elevations depicted on the revised 1945 Beltsville 15-minute quadrangle with that of the modern quadrangle to provide an estimate of the effects of the 1970s grading on the SIF project area.

In general, the 1945 quadrangle depicts an elevation of approximately 130 feet above sea level rising to 180 feet above sea level from southeast to northwest within the 25-acre SIF area. The current quadrangle depicts an elevation change of approximately 120 feet above sea level to 160 feet above sea level, once again southeast to northwest (see Figure 3). This suggests that most of the landform cutting took place in the northwest half of the Spray Irrigation Field, but that it is likely that between 10 feet and 20 feet of elevation decrease took place across the 25-acre SIF between 1945 and the current date. This visual analysis of elevation change within the 25-acre SIF project area is in keeping with the scale of removal of earth as told to the BMT Designers and Planners by BARC personnel. It also suggests that the entire 25-acre SIF, the 15-acre portion, and the 2.94-acre wetland and 1,483-linear-foot stream restoration areas, were all impacted by between 10 feet and 20 feet of soil removal.

3.4 Previous Archaeological Investigations

Eleven formal archaeological investigations have been conducted within 1 mile of the project area. These are described below.

An early study was undertaken in 1978 for a 12-mile water main running parallel to I-495, the Capital Beltway, from New Hampshire Avenue to Central Avenue (Gardner and Stewart 1978). Site models suggested the project area had high probability for Native American transient camps and low probability for base camps. Archival research indicated no Historic period sites were likely to be present. Field investigations centered on the areas of high probability and consisted of pedestrian survey, auger testing, and test unit (2-x-2-foot) excavation. A single Native American site was identified in the project area. Various pieces of lithic debris were recovered, including flakes, cobbles, and cores, but no temporally diagnostic artifacts were found. No additional investigations were recommended for this site.

MAAR Associates conducted a Phase I survey of 110 acres in 1992 for a proposed USDA Office and Research Facility at the BARC (Thomas et al. 1992). Field methods included windshield survey, pedestrian walkover, and the excavation of more than 800 shovel test pits. The investigations identified two previously recorded sites (Native American sites 18PR94 and 18PR115), four newly recorded sites (18PR423 [Native American], 18PR424 [early to mid-nineteenth-century farmstead], 18PR425 [early to mid-nineteenth-century farmstead], and 18PR426 [small family cemetery dating from ca. 1860–1864]), and two isolated finds. Phase II NRHP evaluation was recommended for 18PR94, 18PR424 and 18PR425. Formal marking of the cemetery (18PR426) was recommended to protect it from any future development.

MAAR then conducted the Phase II NRHP evaluations at 18PR94, 18PR424, and 18PR425 and prepared a report of its findings (Hoffman and Cosans-Zeebooker 1993). The investigations included archival research for the two Historic period sites as well as the excavation of close-interval shovel tests and test units and machine stripping of trenches and blocks at all three sites. The investigations revealed no significant intact deposits at any of the sites. All three sites were recommended as ineligible for listing in the NRHP.

In 1994, the M–NCPPC undertook a Phase I archaeological survey for a proposed trail from Lakeland to Cherry Hill Road (Bodor and Creveling 1994). The project area measured approximately 3.5 miles in length and 20 feet in width and was located along Paint Branch and Little Paint Branch. Archival research indicated low potential for Historic period resources and good potential for Native American resources only along two low terraces adjacent to the streams that had not been previously disturbed. Shovel tests excavated in these areas revealed no significant cultural resources. No further archaeological investigations were recommended.

In 1997, R. Christopher Goodwin & Associates conducted a Phase I survey within a proposed ca. 45.5-acre development project near the intersection of U.S. Route 1 and I-495 (Sheehan et al.

1998). Specifically, the investigations focused on a .5-acre area surrounding the previously identified Brown's Tavern (MIHP PG:66-1; 18PR552), which dated to the late eighteenth and early nineteenth centuries and contained an extant 1834 structure. While the excavations revealed a number of artifacts and features, they were more typical of a nineteenth-century farmstead signature than that of a tavern. No evidence of an earlier 1780 tavern was located, and part of the project area, including the later farmstead, had been adversely impacted by construction of a motel in ca. 1940. The site was recommended as ineligible for listing in the NRHP and Maryland Register of Historic Places.

John Milner Associates conducted a Phase I survey in 1999 for a proposed sewer improvement project located at the U.S. Department of Agriculture's Plant Industry Station in Beltsville (Kellogg et al. 1999). The project area measured 3,300 feet in length with a 50-foot wide right-of-way. Pedestrian reconnaissance and shovel-test excavation were conducted along the proposed route except where hazardous materials studies were underway. The excavations revealed significant previous disturbance relating to flood-control measures. No archaeological sites were identified during the project, and no further investigations were recommended.

Potomac Crossing Consultants conducted a Phase I survey in 2001 for a proposed fish-passage restoration project at Little Paint Branch on the BARC as part of the Woodrow Wilson Bridge project (Morin et al. 2001). The investigations included the excavation of 22 shovel test pits and revealed extensive cut and fill activities along the eastern bank of Little Paint Branch and fill along the western bank. No archaeological sites were identified, and no further archaeological investigations were recommended.

In 2004, Ward and Davidson (2005) conducted a Phase I survey for a 22-acre development in College Park. Although the project area had good potential for both Native American and Historic period archaeological sites, the pedestrian survey and 21 shovel tests revealed extensive soil deflation and only modern artifacts likely associated with dumping activities. No further archaeological investigations were recommended.

Phase I investigations were also conducted in 2004 for proposed lane additions and stormwater management ponds for I-495 in both Montgomery and Prince George's County (Diamanti et al. 2008). The entire project entailed the excavation of 1110 shovel tests and 15 test units and resulted in the identified of nine new archaeological sites and ten isolated finds and the reidentification of two previously recorded sites. Of these sites, five are located within 1 mile of the current project area: 18PR742, 18PR746 (both Historic period field dumps), 18PR745 (Native American quartzite processing site), 18PR744 (Native American lithic scatter), and 18PR750 (possible Native American habitation site). Of these five sites, Phase II NRHP evaluation was recommended only for 18PR750, the possible Native American habitation site. Diamanti et al. (2008) suggested the site may have served as a base camp for populations over time and that distinct assemblages and features associated with these occupations could be present.

In 2011, Rummel, Klepper, & Kahl conducted Phase I and Phase II investigations for a Maryland State Highway stream restoration and wetland creation project associated with the Intercounty Connector (Emory 2012). The ca. 14-acre project area was located within the Paint Branch Golf Course and on the BARC grounds. Site 18PR1024, a predominately Middle Woodland period lithic reduction worksite, was identified by the survey. The site retained intact deposits, and Phase II investigations were conducted to determine its NRHP eligibility. These investigations revealed an intact hearth feature, and the site was recommended eligible for the NRHP. Because the site could not be avoided by the project as proposed, Phase III data recovery investigations were recommended.

Also in 2011, Greenhorne & O'Mara conducted a Phase I survey for a groundwater remediation project at the BARC (Kreisa 2011). Forty-five shovel tests were excavated in the proposed location of a ca. 1,000-foot biowall corridor. Two Native American sites, 18PR1021 and 18PR1022, were identified. Both are lithic scatters that parallel Beaverdam Creek and are characterized by low numbers of artifacts associated with the acquisition and reduction of quartz and quartzite cobbles. Based on this site profile and the lack of deeply buried artifacts, neither site was recommended as eligible for listing in the NRHP.

Background research at MHT also revealed two Quadrangle File Notes near the project area: 5 and 19. QF 5 is a report of a platform pipe, and QF 19, an unconfirmed site report.

These formally reported investigations, as well as others with less documentation or of avocational origin, have resulted in the identified of 17 archaeological sites within 1 mile of the project area (Table 1). These consist of two Archaic period sites, one possibly Archaic sites, one Woodland (possibly Middle) site, six Native American sites, two early twentieth-century sites, two sites with multiple Native American components, and three sites with both Historic period and Native American components. Eleven of the sites have not been evaluated for NRHP eligibility while five have been determined not eligible for the NRHP. One site, 18PR1024, has been determined eligible for NRHP listing. Most of these sites (n=8) are located on low terraces or extend into the floodplain. Two sites are located entirely on floodplains, high terraces, and hillslopes or hilltop/bluffs.

Table 1. Archaeological sites recorded within 1 mile of the project area.

Site No.	*Time Period*	*Site Type*	*Landform*	*NRHP Status*
18PR85	Archaic	Lithic scatter	Low terrace	Not evaluated
18PR86	Late Woodland; 19th century	Resource procurement; Unknown	Low terrace, Floodplain	Not evaluated
18PR87	Native American	Unknown	Low terrace	Not evaluated
18PR88	Archaic	Lithic scatter	Low terrace, Floodplain	Not evaluated
18PR89	Early Archaic; Late Archaic; Middle Woodland	Resource procurement	Low terrace	Not evaluated
18PR111	Archaic?	Resource procurement	Low terrace	Not evaluated
18PR113	Native American	Resource procurement	Low terrace	Not evaluated
18PR208	Woodland (Middle?)	Resource procurement	High terrace	Not evaluated
18PR361	Late Archaic; Early Woodland	Base camp	Hillslope	Not evaluated
18PR423	Native American	Lithic scatter	Hillslope	Not eligible
18PR552	19th century; Middle Woodland	Tavern; Lithic scatter	Terrace	No formal determination (not eligible per report)
18PR742	Early 20th century	Field dump	Hilltop/Bluff	Not eligible
18PR744	Native American	Lithic scatter	High terrace	Not eligible
18PR745	Native American	Quartz procurement	High terrace	Not eligible
18PR746	Early 20th century	Field durmp	Low terrace	Not eligible
18PR750	Native American	Short-term camp	Floodplain	Not evaluated
18PR1024	Early Woodland; Middle Woodland	Tool manufacture and maintenance area	Floodplain	Eligible

4.0 SITE POTENTIAL ASSESSMENT

Stantec conducted a review of the MHT Archaeological Site Database for an approximately 1-mile radius surrounding the 25-acre SIF North Farm wetland and stream restoration project areas in June 2015. As discussed in Section 3, the results of that review indicated that 11 field investigations have been undertaken within 1 mile of the current project area and 17 archaeological sites have been identified. All but one of these sites contained Native American components, ranging from the Early Archaic to Late Woodland periods, while two also contained nineteenth- and twentieth-century components. Only one site, dating to the early twentieth century, lacked a Native American component. Excluding this Historic period site, 14 of 16 Native American sites were located on floodplain or terrace locations, and in that respect, are on landforms similar to the 25-acre SIF North Farm wetland and stream restoration project areas. Based on the similarity of the 25-acre SIF project areas to previously located Native American sites in the vicinity, the North Farm 2.94-acre wetland and 1,483-linear-foot stream restoration project area has a high potential for the presence of Native American archaeological sites. Ms. Beth Cole, Project Review and Compliance Administrator with MHT, in a letter dated 8 June 2015, specifically cites the proximity of known Native American sites to Little Paint Branch in her determination that the project area has a high potential for archaeological resources. The 25-acre SIF North Farm wetland and stream restoration project area is approximately 400 m west of Little Paint Branch.

While the general location of the 25-acre SIF North Farm wetland and stream restoration project area indicates that the location has a high potential for Native American resources, two factors mitigate that potential and reduce the probability that intact archaeological resources are present. First, the Metropolitan Washington Council of Governments (2009) indicates that the 25-acre SIF North Farm project area is located within a band of wetlands that were historically present to the west of Little Paint Branch (Figure 12). While areas adjacent to such wetlands would have a high potential for the presence of Native American sites, locations within the wetlands would have a lesser potential. More significantly, though, the 25-acre SIF North Farm project area was converted into use as a Spray Irrigation Field during the 1970s. Stantec's land-use review presented in Section 3 indicates that in 1938 the land was used for agricultural cultivation. In the 1970s, a major construction project reshaped the fields to promote drainage and support spray irrigation. This resulted in the removal of 10–25 feet of soil across the landform in the vicinity of and including the project area. Such landform cutting removed the plow zone and/or A horizon as well as the B horizon.

Therefore, while the general location of the North Farm wetland and stream restoration project area has a high potential for Native American archaeological resources, the specific location as an historical wetland and having been impacted by a significant amount of soil removal during the twentieth century suggests that there is a low probability for the presence of intact archaeological resources within the overall 25-acre SIF project area.

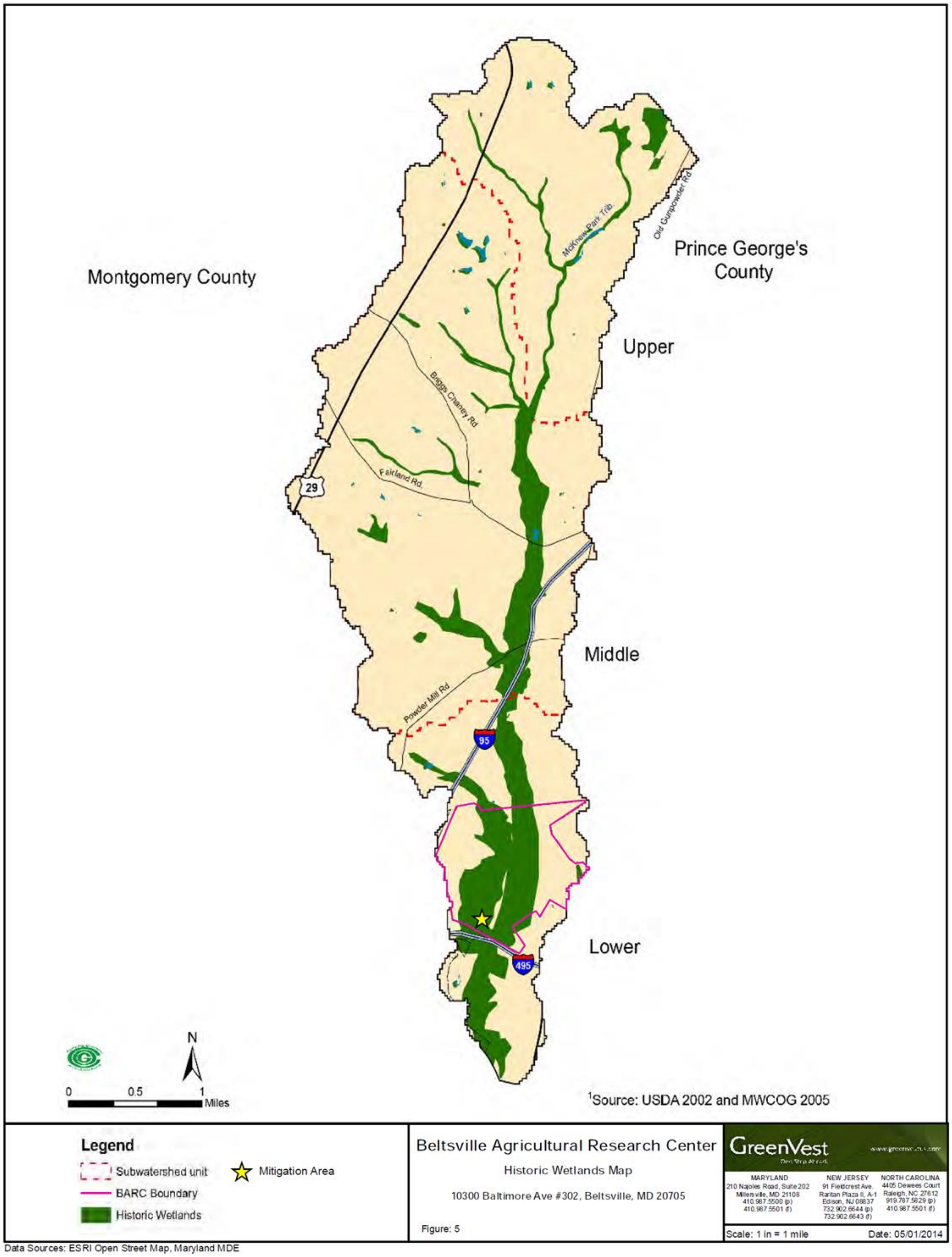

Figure 12. Location of historical wetlands within the Little Paint Branch watershed with the project area depicted.

5.0 RESULTS OF INVESTIGATIONS

Field investigations were undertaken by a crew from Stantec in June 2015. During a pre-field work reconnaissance of the project area, it was noted that the entire 25-acre SIF, including the ca. 2.94-acre wetland restoration and 1,483-linear-foot stream restoration area Limit of Disturbance (LOD), is within a flat urban/suburban setting north of Interstate 495 and west of Route 1 in Beltsville (Figure 13). The 25-acre SIF area, including the ca. 2.94-acre wetland restoration and 1,483-linear-foot stream restoration area LOD currently consists of open grass-covered fields that historically had been used as agricultural and effluvial spray fields. Each of the fields within the 25-acre SIF are approximately 50 m wide and divided by linear drainages (see Figure 2). The investigations included an initial general reconnaissance of the 25-acre SIF LOD followed by the systematic excavation of screened STPs within the ca. 2.94-acre wetland restoration and 1,483-linear-foot stream restoration areas, with a total of 43 STPs excavated. Finally, several supplemental tests were judgmentally placed and excavated in the adjacent 15-acre SIF wetland restoration fields. None of the tests recovered artifacts. The results of field investigations are detailed below.

Figure 13. General view of the wetland and stream restoration areas (view to south).

5.1 Survey Results

The project area consisted of a generally flat Spray Irrigation Field that was divided by a system of drainage ditches and berms (Figures 13 and 14). The STP excavations were divided into three survey tracts: the wetland restoration area of 2.94 acres, the stream restoration corridor comprising approximately 1,483 linear feet, and the 15-acre SIF adjacent fields that in the future that could be included in wetland restoration efforts.

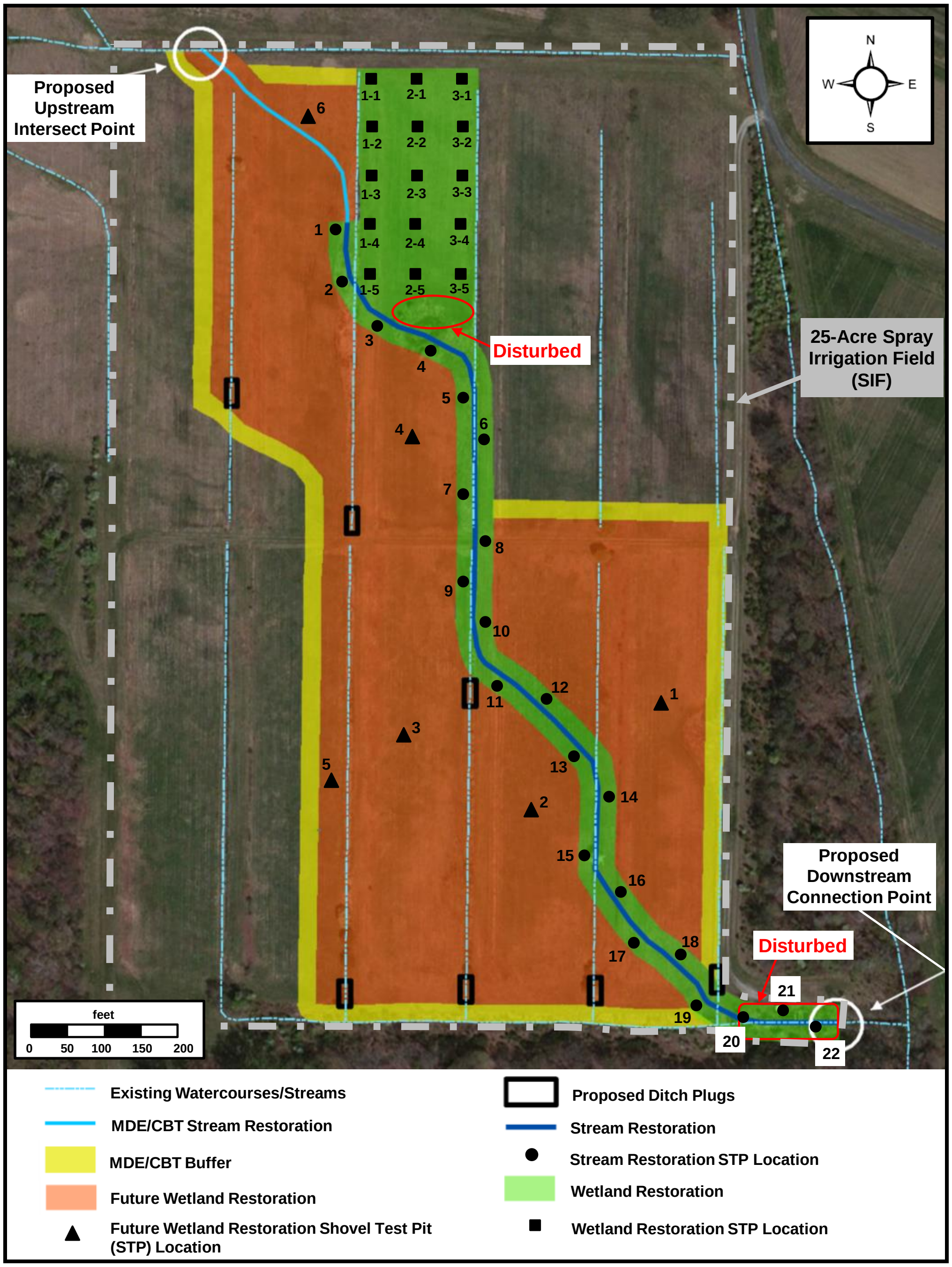

Figure 14. Location of wetland and stream restoration area STPs.

The first area surveyed was the 2.94-acre wetland restoration area (Figure 14). Three transects were established, east-to-west across the field, with each individual transect oriented north-to-south (Figure 14). The transects were confined by a farm road to the north, a pond/tree stand to the south, and ditches to the east and west. Transects 1, 2, and 3 contained five STPs each for a total of 15 STPs excavated within the wetland restoration area. The southernmost three STP locations were not excavated due to prior disturbance. All of the STPs in the wetland area exhibited two soil strata that are interpreted to be modern A and B or C horizons (Figure 15). The first stratum consisted of clay loam variously described as brown (10YR4/3) or dark grayish brown (10YR4/2) clayey loam, silty clay loam, or sandy loam. This stratum typically was between 10 cm and 20 cm thick and is interpreted to represent a modern A horizon deposited either due to flooding or through the spraying or effluents, or most likely, through both processes. This was followed by yellowish brown (10YR5/4 to 5/6) clay loam or silty clay, at times with dense clay content. This second stratum was most often between 10 cm and 15 cm thick. The Russett-Christiana soil complex contains Bt2 through Bt5 horizons characterized as yellowish brown sandy clay loam. Aside from increased sand content, this description is similar to the STP profiles from the wetland restoration area. No artifacts were found in these STPs.

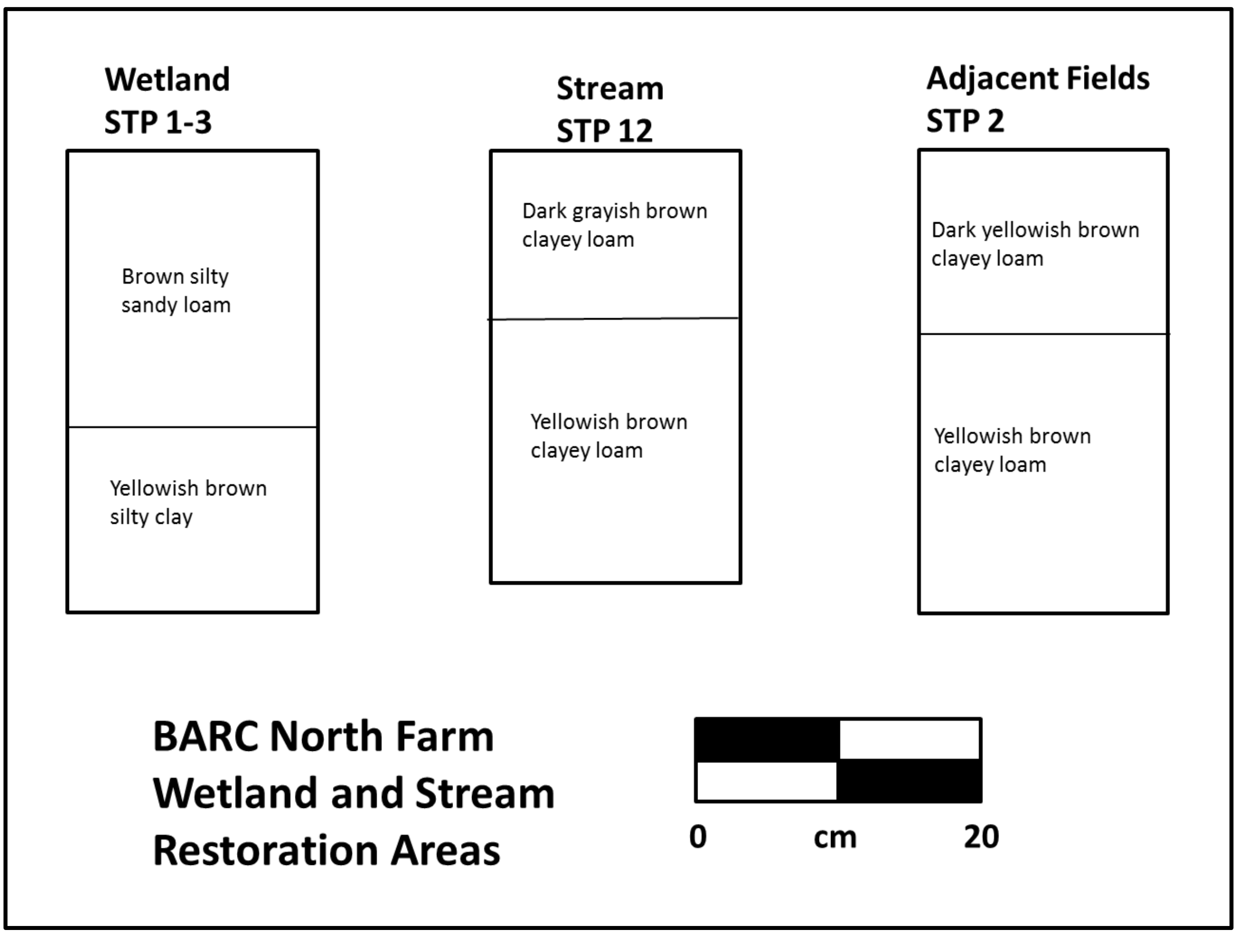

Figure 15. Representative soil profiles from the BARC North Farm wetland and stream restoration areas.

Next, the 1,483-linear-foot stream restoration corridor was surveyed (Figure 14). The Stream STPs were placed along the proposed stream restoration corridor at 20-m intervals. These STPs were excavated along the center line or a 5-m offset along alternate sides of the center line. In all, 22 STPs were excavated. The stream restoration area STPs exhibited similar strata to those in the wetlands restoration area (Figure 15). The first stratum consisted of clay loam variously described as dark grayish brown (10YR4/2) or brown (10YR4/3) and at times containing gravel or degrading rock (Figure 15). This stratum typically was between 8 cm and 30 cm thick. The second stratum was a 10–20-cm thick yellowish brown (10YR5/8) sandy clay or clayey loam, which in locations was very compact. STPs 20, 21, and 22 were placed at the end of the proposed stream, north of the concrete structure. All three exhibited disturbed soil stratum with high amounts of gravel. The first stratum was a very dark grayish brown sandy loam (10YR3/2). The second stratum was mottled light grayish brown clay silt (10YR6/2) with brownish yellow clay silt (10YR6/8). This stratum was typically 10–15 cm thick. No artifacts were found in the stream restoration STPs.

Finally, an additional six STPs were place in the 15-acre SIF future wetland restoration areas (Figure 14). The six STPs were judgmentally placed within the adjacent fields to provide a comparison with the results of the current wetland and stream restoration project areas. Although the STPs were widely distributed across the adjacent fields, all exhibited soil strata similar to those documented in the adjacent wetland and stream restoration areas (Figure 15). The first stratum consisted of brown (10YR4/3), dark grayish brown (10YR4/2), or dark yellowish brown (10YR4/6) clayey loam mixed with yellowish brown (10YR5/8) clayey silt in STP 5. This stratum was typically 8–32 cm thick. The second stratum varied more widely with location. In STPs 1, 2, 3, and 4, it consisted of a yellowish brown (10YR5/8) clayey loam mottled with gray clay (10YR6/1). In STP 6, the second stratum consisted of strong brown (7.5YR4/6) compact clayey sand. The second stratum was typically 8–11 cm thick. Once again, no artifacts were recovered from these STPs.

5.2 Summary

In sum, 43 STPs were excavated in three areas: a rectangular 2.94-acre wetland restoration area, a 1,483-linear-foot stream restoration corridor, and judgmentally within the 15-acre SIF adjacent fields that may in the future be used as stream restoration areas. All STPs had generally similar strata, consisting or grayish brown to brown silty clay or clayey silt. This initial stratum was quite thin, often 15 cm or less. This horizon is interpreted to be a modern A horizon based on its clayey consistency and lighter coloration than characterizes the Russett-Christiana soil complex that is mapped for the project area. This could be the result of the removal of the original darker, sandy silt or silt loam A horizon by the 1970s grading and the subsequent use of the fields as an effluent dispersal area as well as by flooding. The second stratum, yellowish brown clay loam, is consistent with Bt2 through Bt5 horizons of the Russett soil type. No artifacts were found in any of the STPs.

6.0 SUMMARY AND RECOMMENDATIONS

In June 2015, Stantec undertook background research for and conducted field investigations at the 25-acre Spray Irrigation Field (SIF) wetland and stream restoration area within the North Farm of BARC. The background research indicated that Native American archaeological sites are common in the floodplain and terraces along Little Paint Branch, which lies approximately 400 m to the east of the project area. The 25-acre SIF wetland and stream restoration area historically consisted of a similar landform, perhaps suggesting a high potential for Native American sites. However, research also indicates that the area was historically within (not adjacent to) a wetland and was extensively graded, both lessening the potential for the presence of intact Native American resources.

The field investigations conducted within the 25-acre SIF wetland and stream restoration area consisted of a general pedestrian reconnaissance across the entire area, judgmentally placed STPs within a 15-acre portion of the area, and intensive excavations of STPs within the 2.94-acre wetland and 1,483-linear-foot stream restoration areas, all within the larger 25-acre SIF area. Investigation of the 2.94-acre wetland restoration area and the 1,483-linear-foot stream restoration corridor consisted of the excavation of STPs at 20-m intervals with all soils removed screened through ¼-inch mesh hardware cloth. Fifteen (15) STPs were excavated within the wetland restoration area, and an additional three (3) STPs were not excavated due to prior disturbance. Based on comparisons to soils described for the project area, the STP profiles appear to consist of modern alluvial or effluvial-spray deposited horizons, or both, over Bt horizon soils. The original A horizon, E horizon, and upper portion of the B horizon was absent and was most likely removed during the 1970s land leveling. Twenty-two (22) STPs were excavated along the proposed stream restoration corridor. These STPs exhibited a similar profile as the wetland restoration area with no A, E or upper B horizon present. Subsequently, based on the results of the 2.94-acre wetland restoration area and the 1,483-linear-foot stream restoration corridor field investigations, Stantec excavated six (6) judgmentally placed STPs in adjacent fields that constitute potential future wetland restoration areas within a 15-acre portion of the larger 25-acre SIF. These STPs exhibited a modern A horizon overlying Bt horizon deposits. No artifacts or other archaeological resources were identified in any of the survey areas. Given the similarity of profiles across the survey tracts, we conclude that all areas investigated by shovel test pits were likely subjected to some degree of cutting during the 1970s.

Based on the results of the Phase IB survey, no archaeological resources are present in the BARC North Farm 2.94-acre wetlands restoration area or the 1,483-linear-foot stream restoration area, most likely due to prior impacts (soil removal) and perhaps because the area is within an historical wetland. As such, Stantec recommends no additional archaeological investigations within the project area.

Based on the results of background research and field investigations, Stantec also suggests that the adjacent fields, inclusive of the 25-acre SIF and the 15-acre portion of the SIF, both areas of potential future wetland restoration, have a low probability for the presence of intact archaeological resources. Archaeological investigations are unlikely to encounter any resources in those areas.

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APPENDIX A:

QUALIFICATIONS OF KEY PERSONNEL

PAUL P. KREISA, PhD, RPA. Senior Archaeologist, Principal Investigator
PhD, Anthropology, University of Illinois at Urbana-Champaign, 1990
MA, Anthropology, Northern Illinois University, 1984
BA, Anthropology, University of Wisconsin, Oshkosh, 1981
Register of Professional Archaeologists (RPA)

Dr. Kreisa is a Senior Archaeologist and Principal Investigator for Stantec (formerly Greenhorne & O'Mara). Since joining the company in 2005, he has directed the investigations of several Colonial and Antebellum plantation sites; conducted numerous survey and evaluation projects for public and private sector clients in Maryland, Pennsylvania, Virginia, West Virginia, and Washington, DC; and created a Postbellum archaeological context for Prince George's County, Maryland, and an archaeological resources management plan for the redevelopment of St. Elizabeths Hospital in Washington, DC. With more than 30 years' experience at all levels of archaeological consulting, Dr. Kreisa has directed numerous Phase I survey, Phase II evaluation, and Phase III mitigation investigations at Historic and precontact Native American sites in the Mid-Atlantic, Mid-South, Southeast, Midwest, and Great Plains. Clients have included DoD facilities, US Army Corps of Engineers districts, GSA, NPS, state transportation agencies, local governments, and private developers. He has experience in completing Section 106 and NEPA documentation and complying with state and local regulations. Dr. Kreisa was previously a member of the Wisconsin SHPO staff and president of the Council for Maryland Archeology, the organization of professional archaeologists in Maryland, from 2011–2012.

JACQUELINE M. MCDOWELL, MA. Background and Archival Research
MA, Anthropology, Northern Illinois University, 1986
BS, Anthropology, Northern Illinois University, 1984

Ms. McDowell joined Stantec (formerly Greenhorne & O'Mara) as a planner in 2009. Since 2005, she has conducted research for cultural resources projects in Maryland, Pennsylvania, Virginia, West Virginia, and Washington, DC. She has nearly 20 years' experience in conducting archival research with primary and secondary sources and incorporating the research into historic contexts and background research sections for reports. Ms. McDowell also has nearly 30 years of field and research experience in all phases of archaeological research and reporting in the Mid-Atlantic and Midwest, including both precontact Native American and Historic period sites. She has authored numerous reports for clients including DoD and GSA as well as state agencies and private developers for Section 106, NEPA, and state-level historic preservation legislation.

GERI J. KNIGHT-ISKE, MA. Archaeologist
MA, Anthropology, Monmouth University, 2015
BA, Anthropology, University of Nebraska at Lincoln, 2009

Mrs. Knight-Iske joined Stantec (formerly Greenhorne & O'Mara) in 2011 and has four years of archaeological experience in New Jersey, Maryland, Virginia, West Virginia, and Washington, DC, and four years of archaeological experience in Nebraska. She has performed and supervised fieldwork, artifact analysis, archival research, report production, and GIS map making for reports. Mrs. Knight-Iske also has experience in NEPA and Section 106 compliance.

NANCY L. POWELL, BA. Field Crew Chief, Laboratory Director
BA, Anthropology, Millersville University, 2006

Ms. Powell joined Stantec (formerly Greenhorne & O'Mara) in 2006 and has nine years of archaeological experience in Maryland, Pennsylvania, Virginia, West Virginia, and Washington, DC. She has performed and supervised fieldwork, artifact analysis, archival research, and report production for all phases of archaeological investigation. Ms. Powell directs the archaeology laboratory at Stantec's office in Laurel, Maryland. She also has experience in NEPA compliance, preparing documents such as Categorical Exclusion reports, Environmental Assessments, and Environmental Impact Statements.

June 15, 2015

Mr. Shane Mudd
Operations Manager
GreenTrust Alliance Inc.
210 Najoles Road, Suite 200
Millersville, MD 21108

Dear Mr. Glass:

The Chesapeake Bay Trust thanks the GreenTrust Alliance Inc. for your proposal. The Trust received a high level of requests in this round of the Nontidal Wetland Grant Program. I am pleased to report approval of a grant in the amount of $885,230 for the proposed wetland creation at the Beltsville Agricultural Research Center. Funds support the design, construction, monitoring, and maintenance of "Option A" outlined in your proposal.

Please sign and return the enclosed Grant Agreement within sixty days of the date of this letter or the Trust reserves the right to cancel the grant award and apply funds to other projects.

Your grant award will be distributed in multiple phases based upon milestones achieved towards project implementation that are outlined in #6 of the Grant Agreement that follows. The phased payments are contingent on key elements that are required prior to the release of each payment. The signed Grant Agreement, other contingencies, and status and final reports must be submitted by logging into the Chesapeake Bay Trust Online Grant System account accessed through the link https://www.GrantRequest.com/SID_1520 with the same username and password used when you applied.

If you should have any questions regarding our decision, please feel free to contact Tom Leigh at 410-974-2941, ext. 101. The Chesapeake Bay Trust greatly appreciates the time you invested in proposal development and looks forward to working with you in the future.

Sincerely,

Jana Davis

Jana Davis, Ph.D.
Executive Director

Grant #: 13078
Project Leader: Brett Berkley

Grant Agreement between the Chesapeake Bay Trust
and GreenTrust Alliance, Inc.

June 15, 2015

The total amount of the grant award for grant number 13078 is $885,230**.** Delivery of this grant is made subject to receipt by the Chesapeake Bay Trust (Trust) of a signed copy of this Agreement, which confirms that:

1) The grant award is in the amount of $885,230 for the proposed wetland creation at the Beltsville Agricultural Research Center. Funds support the design, construction, monitoring, and maintenance of "Option A" outlined in your proposal. By accepting this award, grantee agrees that said monies will be used to accomplish deliverables and budgeted items in your grant application received on March 12, 2015, and approved in this grant agreement.

2) Significant changes to project scope must be approved by the Trust in advance of the change. Please visit www.cbtrust.org/forms to download the Grant Revision Request Form. Significant changes include, but are not limited to:

   a. Changes in project design, project site, or other technical aspects of the design. Any design changes must be approved by the Trust;
   b. Changes in key personnel or key project partners;
   c. Changes in budget that result in a greater than 3% shift in funds across budget categories (e.g., supplies, personnel, contractual);
   d. Changes in budget that result in addition of a new line item;
   e. Changes in project deliverables as proposed in your original application.

   Your final report will include a budget section and a deliverables section that should match your proposed budget and deliverables. **If changes are made without Trust approval you will be required to refund the award.**

3) The grantee agrees to initiate, organize, and schedule a **mandatory post-award meeting** to discuss the terms of the agreement within 90 days of receipt of award letter to include Trust, the landowner, and the applicant.

4) The grantee agrees to initiate, organize, and **schedule a mandatory pre-construction** meeting after the construction contract with the prime contractor has been awarded and within 30 days of the construction start date, to include Trust and MDE staff, the landowner, the applicant, the contractor, and the project engineer.

5) **Construction must be initiated by 4/1/2016,** otherwise the award may be terminated by the Trust.

6) Your grant award will be distributed in multiple phases based upon milestones achieved towards project implementation described below. Phased payments for phases III-IX may be combined at the discretion of the Trust based on outcomes and reporting of the previous phase(s).

   Phase I payment of $84,310 to be distributed for project planning including the cultural resources study, hydrology study and analysis, wetland delineation, Rare, Threatened, and Endangered (RTE) Species coordination, soil investigations, topographic land survey, wetland water budget preparation, and conservation restriction development. This payment phase is contingent upon submission by 8/1/15 to and approval by the Trust of the following:
   a) the signed Grant Agreement;

b) documentation that the funding has been secured for the pending stream restoration project that runs through the proposed wetland area;
c) written statement that the soils used in the proposed restoration site are not sourced from a contaminated site, nor are the existing soils to be excavated and transferred off-site known to be contaminated such that they would be a concern to water quality or human health;
d) a copy of the property's master plan for the site indicating consistency with this site maintained in perpetuity as a wetland and a written statement signed by the property owner that the project will be maintained as a wetland and protected from future disturbances.

Phase II of $37,307 to be distributed for planning, engineering, design and permitting including: engineering design / plan development, mitigation proposal prep, and approval of environmental resource permitting. This payment phase is contingent upon submission by 9/30/15 to and approval by the Trust of a status report that includes:

a) Products of the previous phase, including the H&H study, cultural resources study, and analysis and documentation of RTE species, soil information, survey information, wetland water budget, and wetland delineation;
b) A short narrative description of progress in the tasks accomplished in the previous phase, including any challenges;
c) Full documentation of expenditures that illustrates the previous funding phase has been exhausted.

Phase III of $75,090 to be distributed for mobilization, erosion and sediment control, and site preparation. This payment phase is contingent upon:

a) completion of the **pre-construction meeting as described in #4** above, and
b) submission by 3/15/16 to and approval by the Trust of a status report that includes:
   i. Final design and specifications and construction cost estimate;
   ii. Final permits;
   iii. A narrative description of progress in the tasks accomplished in the previous phase;
   iv. Full documentation of expenditures and illustrates that the previous funding phase has been exhausted.

Phase IV of $100,000 to be distributed for construction including wetland restoration and upper buffer zone restoration and stream restoration. This payment phase is contingent upon:

a) completion of a construction site inspection by the Trust and;
b) submission by 4/15/16 to and approval by the Trust of a status report that includes:
   i. A narrative description of progress in the tasks accomplished in the previous phase;
   ii. Full documentation of expenditures and illustrates that the previous funding phase has been exhausted.

Phase V of $100,000 to be distributed for continued construction. This payment phase is contingent upon:

a) completion of a construction site inspection by the Trust and;
b) submission by 4/30/16 to and approval by the Trust of a status report that includes:
   i. A narrative description of progress in the tasks accomplished in the previous phase;
   ii. Full documentation of expenditures and illustrates that the previous funding phase has been exhausted.

Phase VI of $100,000 to be distributed for continued construction. This payment phase is contingent upon:

a) completion of a construction site inspection by the Trust and;
b) submission by 5/15/16to and approval by the Trust of a status report that includes:
   i. A narrative description of progress in the tasks accomplished in the previous phase;
   ii. Full documentation of expenditures and illustrates that the previous funding phase has been exhausted.

Phase VII of $100,000 to be distributed for continued construction, stabilization, and planting. This payment phase is contingent upon:
a) completion of a construction site inspection by the Trust and;
b) submission by 6/15/16to and approval by the Trust of a status report that includes:
   i. A narrative description of progress in the tasks accomplished in the previous phase;
   ii. Full documentation of expenditures and illustrates that the previous funding phase has been exhausted.

Phase VIII of $100,000 to be distributed for continued construction, stabilization, and planting. This payment is contingent upon:
a) completion of a construction site inspection by the Trust and;
b) submission by 7/15/16 to and approval by the Trust of a status report that includes:
   i. A narrative description of progress in the tasks accomplished in the previous phase;
   ii. Full documentation of expenditures and illustrates that the previous funding phase has been exhausted.

Phase IX of $100,000 to be distributed for completion of construction and other final tasks. This payment phase is contingent upon:
a) completion of a construction site inspection by the Trust and;
b) submission by 9/1/16 to and approval by the Trust of a status report that includes:
   i. A narrative description of progress in the tasks accomplished in the previous phase;
   ii. Full documentation of expenditures and illustrates that the previous funding phase has been exhausted.

Phase X of $88,523 to be distributed upon:
a) submission to the Trust of as-built surveys, metes and bounds description, final construction budget, and summary of monitoring and maintenance activities accomplished after completion of the construction phase.
b) completion of a final construction site inspection by the Trust and;
c) submission by 12/1/18 to and approval by the Trust of the **final report.** The **final report** on this project must include a complete accounting of expenditures and complete programmatic documentation as specified in report form instructions. The final report must include invoices, receipts, and an accounting of personnel costs, such as copies of timesheets (if applicable).

7) **Signed Grant Agreement, Status, and Final reports are required to be submitted by logging into the Chesapeake Bay Trust Online Grant System account accessed through the link https://www.GrantRequest.com/SID_1520** with the same username and password used when you applied. <u>Final and status report extension requests must be made via email to the appropriate program staff at the Trust prior to the report due date</u> and, depending on circumstances, may or may not be granted. In cases where the grantee fails to submit a status report or final report by the due date, the Trust reserves the right to terminate the Grant Agreement and require a refund of funds already transferred to the grantee. By signing this Grant Agreement, the grantee agrees to comply with the status report date, if applicable, and the final report date listed above and agrees to return funds if a complete report is not submitted by the deadline. Failure to submit report(s) by the deadline will affect eligibility for future awards.

8) **All public communications and promotion including press releases, print publications, signage, online messaging, etc. must acknowledge the Chesapeake Bay Trust and the Maryland Department of the Environment, and include the Trust's license plate logo and the MDE logo.** The Chesapeake Bay Trust license plate logo file is available online at www.cbtrust.org/logos.

9) The grantee will hold the Chesapeake Bay Trust harmless and indemnify from any claims or litigation arising out of the grantee's performance of the project and from and against such portion of any liability for injury or damage to person or property caused by the grantee's performance of the project.

The undersigned who is (are) fully authorized in the premises of the GreenTrust Alliance Inc. accepts, subject to the terms and conditions in the above Grant Agreement, the proposed grant of $885,230.

Please return signed copies of the full award letter, with each page initialed and full signatures on the last page, by uploading a scanned copy to your Chesapeake Bay Trust Online Grant System account accessed through the link https://www.GrantRequest.com/SID_1520 with the same username and password used when you applied. Please keep a copy for your records.

Signature of Executive Officer*	Title	Date
Signature of Project Leader*	Title	Date
Signature of Jana Davis, Ph.D.	Executive Director Chesapeake Bay Trust	6/15/2015 Date

Grant #: 13078 Grant Program: MDE-NonTidal Wetland

HELP THE TRUST TELL YOUR STORY

Congratulations on your recent grant approval! The Chesapeake Bay Trust is very excited to see your project come to life and would like to help publicize your great work. Now that you have your approval letter and your efforts can get underway, please help us learn more about your upcoming grant activity in three short ways:

**** EVENT DATE & TIME ****

**** PHOTO COLLECTION ****

**** BLOG WRITING ****

EVENTS: The Trust hosts an online calendar to help our grantees promote their upcoming events and volunteer needs. In order to know when projects take place, we encourage grantees to post events through the Trust's website: www.calendar.cbtrust.org. When applicable (and timing permits) Trust staff will try to attend particular events and we encourage you to keep in contact with staff on opportunities to volunteer, take pictures and promote activities to the local media.

(**Note:** We realize that certain projects do not have events associated with them but for those that do, please include them on the calendar. If your project is not open to the public, but it is appropriate for Trust staff to attend when available, please email Kristin Foringer at kforinger@cbtrust.org.)

PHOTOS: There is no better way to share your story than through pictures! We urge you to take photos during any grant event, and especially before and after photos of hands-on restoration projects. The Trust will publicize these through numerous formats and we encourage you to email them anytime to kforinger@cbtrust.org. If you want to see examples of previous Trust grant work, visit out Flickr page: (http://www.flickr.com/photos/cbtrust/)

BLOGS: Every grantee is invited to write a short blog on their Trust-funded grant project. The purpose of this post is to not only showcase great grant work, but also to help raise awareness about your organization or school and how your efforts are impacting the Chesapeake Bay. Not sure what to write about? Check out the Trust's online blog at www.cbtrust.org/blog for ideas.

Blog Criteria:

1. Between 3-4 paragraphs in length
2. Describe the nature of your grant project
3. Highlight the project before, during or after and its overall impact
4. Include pictures (when applicable) and a personal connection (when possible)

QUESTIONS?
CONTACT GRANTADMIN@CBTRUST.ORG OR CALL THE TRUST 410-974-2941.
CONGRATULATIONS AND WE LOOK FORWARD TO A GREAT PROJECT!

Stantec Consulting Services Inc.
6110 Frost Place
Laurel MD 20707
Tel: (301) 982-2800

July 24, 2015
File: 113075

Attention: Ms. Beth Cole
Maryland Historical Trust
100 Community Place
Crownsville, MD 21032

Reference: ***Phase I Archaeological Survey for a Stream and Wetland Restoration Project at the Henry A. Wallace Beltsville Agricultural Research Center in Prince George's County, Maryland***

Dear Ms. Cole,

BMT Designers and Planners has requested that Stantec Consulting Services Inc. provide your office with a copy of the report referenced above for your review and comment. The report details the results of the Phase I archaeological investigations at the proposed location of stream and wetland restoration within the North Farm of the Beltsville Agricultural Research Center in Prince George's County. No archaeological sites were located as a result of this survey. BMT Designers and Planners would appreciate any comments on the enclosed draft report within 30 days of receipt.

If you have any questions or comments, please do not hesitate to contact me at 301-982-2866 or paul.kreisa@stantec.com.

Regards,

Paul P. Kreisa, PhD, RPA
Mid-Atlantic Water & Environment
Senior Archaeologist
Stantec Consulting Services Inc.

c. Claudette Joyner, USDA ARS
Dana Jackson, USDA ARS
Patrick Phillips, BMT Designers & Planners, Inc.
Brett Berkley, GreenVest, LLC

kp document10

5.1 Survey Results

The project area consisted of a generally flat Spray Irrigation Field that was divided by a system of drainage ditches and berms (Figures 13 and 14). The STP excavations were divided into three survey tracts: the wetland restoration area of 2.94 acres, the stream restoration corridor comprising approximately 1,483 linear feet, and the 15-acre SIF adjacent fields that in the future that could be included in wetland restoration efforts.

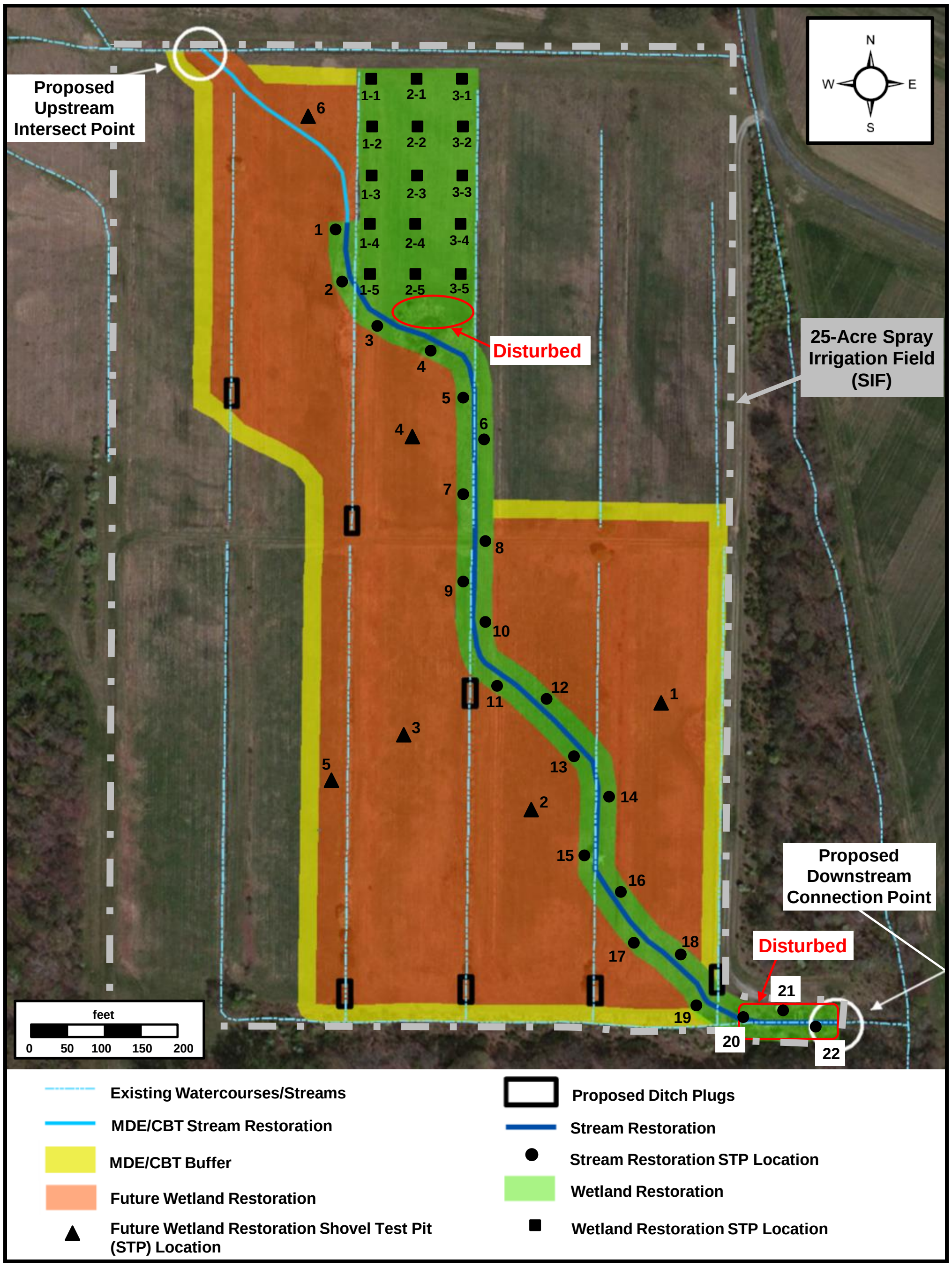

Figure 14. Location of wetland and stream restoration area STPs.

July 21, 2015

Attention: Claudette Joyner, Realty Specialist
Real Property Section
USDA, Agricultural Research Service
Henry A. Wallace Beltsville Agricultural Research Center
10300 Baltimore Avenue, Building 003, Room 308 BARC-West
Beltsville, Maryland 20705

Dear Ms. Joyner,

Reference: Phase I Archaeological Survey for a Stream and Wetland Restoration Project at the Henry A. Wallace Beltsville Agricultural Research Center (BARC)

During June and July 2015 Stantec Consulting Services Inc. (Stantec) conducted background research and field investigations covering a 15± acre area of the Spray Irrigation Field (SIF) stream and wetland restoration site located within the North Farm portion of the U.S. Department of Agriculture's Henry A. Wallace Beltsville Agricultural Research Center (BARC) in Prince George's County, Maryland. BMT Designers and Planners, part of the GreenVest team, is undertaking this stream and wetland restoration project in the North Farm portion of this federally owned facility. The archaeological Phase I survey was conducted in consultation with the Maryland Historical Trust (MHT) to determine whether archaeological resources were present within the proposed project footprint. The scope of this Phase I survey was approved by MHT in advance of conducting said work. This study was conducted in compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA). The investigations were also conducted in accordance with the Secretary of the Interior's *Standards and Guidelines for Archeological and Historic Preservation* (Federal Register 1983) and the *Standards and Guidelines for Archeological Investigations in Maryland* (Shaffer and Cole 1994). This letter provides a summary of those investigations for the purposes of documenting the scope of work and findings for USDA ARS staff.

The background research completed for the North Farm and entire 25± acre Spray Irrigation Field site indicated that Native American archaeological sites are common in the floodplain and terraces associated with Little Paint Branch, which lies approximately 400 m to the east of the proposed project. The North Farm wetland and stream restoration area historically consisted of a similar landform, perhaps suggesting a high potential for Native American sites. However, research including "as-built" site plans provided by USDA ARS also indicates that

Reference: Phase I Archaeological Survey for a Stream and Wetland Restoration Project at the Henry A. Wallace Beltsville Agricultural Research Center (BARC)

the area was historically within a wetland that was extensively graded, substantially decreasing the potential for the presence of intact Native American resources.

The field investigations conducted were more intensively focused on the 2.94-acre wetland restoration area and the 1,483-linear-foot stream restoration corridor that is the limit of disturbance for the first phase of stream and wetland restoration at the Spray Irrigation Field. The field investigation consisted of the excavation of STPs at 20-m intervals with all soils removed screened through ¼-inch mesh hardware cloth. The total number of STPs and their locations were approved by MHT prior to implementing the field investigation. A total of thirty-seven (37) STPs were excavated within the area of the first phase of stream and wetland restoration project. Fifteen (15) STPs were excavated within the Phase I portion of the wetland restoration area. Based on comparisons to soils described for the project area, the STP profiles appear to consist of modern alluvial or effluent spray deposited horizons, or both, over Bt horizon soils. The original A horizon, E horizon, and upper portion of the B horizon was absent and was removed during the 1970s land leveling. Twenty-two (22) STPs were excavated along the proposed stream restoration corridor spanning from the northwestern to the southeastern corners of the Spray Irrigation Field. These STPs exhibited a similar profile as the northern portion of the wetland restoration area with no A, E, or upper B horizon present. Finally, based on the results of these 37 STPs, Stantec excavated six (6) judgmentally placed STPs within the Spray Irrigation Field in adjacent areas that are the subject of subsequent phases of the stream and wetland restoration project. These STPs exhibited a similar profile as the first phase stream and wetland restoration area with a modern A horizon overlying Bt horizon deposits. These results are consistent with soil boring logs and profiles developed by GreenVest and BMT for the entire 15± acre area of the SIF which will be subject to restoration activities. The original A horizon, E horizon, and upper portion of the B horizon was also absent in these adjacent areas and was removed during the 1970s land leveling to create the SIF. No artifacts or other archaeological resources were identified in any of the survey areas. These data along with stratigraphic data collected by BMT and GreenVest further support Stantec's findings and conclusion that no further action is needed to identify or characterize the potential to uncover cultural resources on the SIF.

Based on the level of historic disturbance, existing sub-surface stratigraphy combined with the results of the Phase IB survey, no archaeological resources are present in the in the 15 acre area of the Spray Irrigation Field tested. The absence of archaeological resources is most likely due to prior impacts (soil removal) and/or because the area is within, and not adjacent to, an historical wetland which typically are not consistent with Native American site locations. As such, Stantec concluded that no additional archaeological investigations within

Reference: Phase I Archaeological Survey for a Stream and Wetland Restoration Project at the Henry A. Wallace Beltsville Agricultural Research Center (BARC)

the project area were needed and recommends no additional archaeological investigations within the 15± acre area of the SIF subject to future stream and wetland restoration activities.

Based on the findings of the archaeological investigation, Stantec expects that the wetlands and stream restoration project at the BARC North Farm Spray Irrigation Field will receive concurrence from MHT that the undertaking will have no adverse effects on cultural resources.

Regards,

Paul P. Kreisa
Stantec Consulting Services, Inc.
Senior Archaeologist
Phone: 301-982-2866
paul.kreisa@stantec.com

c. Mr. Patrick Phillips, BMT Designers & Planners, Inc.
Mr. Brett Berkley, GreenVest, LLC
Mr. Dana Jackson, USDA ARS

Spray Irrigation Field Wetlands Project Update

Photograph 1 – Before: Current Spray Irrigation Field

Photograph 2 – “After Rendering”: Image of similar stream connection and wetland creation.