DOE/EA-2272D

DRAFT Environmental Assessment

Southern Virginia Megasite at Berry Hill: Development of Lots 1 and 2 (3304 Berry Hill Road); Danville, Virginia

Microporous Assets – Project Stellar

Fed95, LLC

December 2024

U.S. Department of Energy

National Energy Technology Laboratory

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National Environmental Policy Act (NEPA) Compliance Cover Sheet

Proposed Project and DOE's Proposed Action:

The Proposed Action under review in this Environmental Assessment (EA) under NEPA involves the Department of Energy (DOE) providing cost-shared funding toward the Proposed Project, which consists of the construction and operation of a facility for Microporous, LLC (referred to as Microporous, a subsidiary of MP Assets Corporation). The Proposed Action applies to only Phase I of the overall development planned by Microporous at this location, although a total of four Phases are anticipated to be completed. The operations at the proposed Microporous facility include the development of a coated lithium-ion (Li-ion) battery separator plant at the property located at Lots 1 & 2 in Danville, VA (the Project Area) within the Southern Virigina Megasite (Megasite), also known as 3304 Berry Hill Road, for Li-ion batteries integral to electric vehicle (EV) supply chains. This project would secure 600 million m^2 per year of domestic separator manufacturing capacity, strengthening the United States market. Microporous would install twenty aqueous coating lines for both ceramic (alumina, boehmite) and polymer (PVdF, PMMA) coating, complete with slurry mixing and slitting equipment. Within the DOE grant's 3-year performance period, Microporous would expect to create approximately 282 permanent jobs based on a three-year performance period of Phase I, and would ensure that at least 85% of full-time employees are from local Disadvantaged Communities (DACs) by the completion of the project. To achieve its purpose, the plant would consist of manufacturing buildings, an administrative building, a utility building, and storage silos. It is Microporous' intent to proceed with the development and operation of applicable portions of Lots 1 and 2 if DOE funding is not provided. The Project Area is located at 3304 Berry Hill Road, Danville, Virginia (Pittsylvania County) and comprises approximately 212-acres. The Microporous development would occur entirely within Lots 1 and 2, located on the eastern edge of the Megasite.

The Megasite is 3,528-acres in total and is publicly owned, zoned for industrial use. Utilities including water, sanitary sewer, natural gas, fiber optic, and electricity, and Class 1 railway and Expressway (US 58/US 29) access have already been or are otherwise planned to be installed across the Megasite, including for applicable portions of LVeots 1 and 2. It is the goal of the Virginia Economic Development Partnership (VEDP) and Danville-Pittsylvania County that the Megasite would be fully utilized for industrial purposes.

DOE's Proposed Action is to provide $100 million in funding toward the total project costs of $525 million. Microporous' private cost share would be $425 million. Microporous has planned multiple phases of construction (Phases I - IV). However, DOE's Proposed Action is limited to providing funding for Phase I of Microporous' proposed project. Phases II – IV are not funded under DOE's Proposed Action and are still in unconfirmed conceptual stages. While Phases II – IV are not funded under DOE's Proposed Action, the potential impacts of all project phases (including Phases II – IV) are being evaluated in this EA to the extent possible and/or otherwise feasible.

This EA considers the Proposed Action (DOE providing cost-shared funding towards the construction and operation of portions of 3304 Berry Hill Road (Lots 1 & 2) by Microporous) and the No Action Alternative for the Project Area. Under the No Action Alternative, it is assumed that the development will not occur. However, as stated above, Microporous will proceed with the development and operation of the Project

Area in the absence of DOE funding. The No Action Alternative is analyzed in the EA to establish baseline conditions as required by Council on Environmental Quality (CEQ) regulations.

Type of Statement: Draft Environmental Assessment

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Abstract:

The Proposed Project would occur on Lots 1 and 2, south of McGuff Creek, of the Megasite in Danville, VA (Project Area), also known as 3304 Berry Hill Road, Danville. The Proposed Project includes the construction and operation of the Microporous facility which would consist of manufacturing buildings, an administrative building, a utility building, and storage silos. This project would secure 600 million m² per year of domestic separator manufacturing capacity, strengthening the United States market. Microporous would install twenty aqueous coating lines for both ceramic (alumina, boehmite) and polymer (PVdF, PMMA) coating, complete with slurry mixing and slitting equipment. Within the DOE's grant, Microporous would expect to create approximately 282 permeant jobs based on a three-year performance period of Phase I, and would ensure that at least 85% of full-time employees are from local Disadvantaged Communities (DACs) by the completion of the project. There is potential that the facility may be expanded in the future, and the facility's expansion/addition (Phases II through IV) will be analyzed in this EA to the extent feasible, including as part of the cumulative effects of DOE's Proposed Action. Construction and operation of the Microporous facility would be conducted in accordance with standard industry practices and applicable state and federal regulations, including local ordinances, as applicable.

Currently, no activities are conducted at 3304 Berry Hill Road, Danville, although it is the intent of VEDP and Danville-Pittsylvania County that the Megasite will be fully utilized for industrial purposes. As demonstrated in this EA, the Proposed Project has the potential for minor cumulative effects which require consideration related to the overall effect on the environmental conditions of the Megasite as a whole. Reasonable efforts have been made in this EA to anticipate potential contributions to site environmental or cultural conditions that may affect the campus in its entirety.

Public Participation:

The United States Department of Energy (DOE) National Energy Technology Laboratory (NETL) encourages public participation in the NEPA process. This Draft Environmental Assessment (EA) is being released for public review and comment. DOE NETL invites public participation through the solicitation of comments on the proposed construction and operation of the facility and the Draft EA detailing the results of the comprehensive evaluation of the action. The public is invited to provide oral, written, or e-mailed comments on this Draft EA to DOE by the close of the comment period on January 3rd, 2025. Copies of the Draft EA are also being distributed to federal and state agencies, and Tribal Nations that have jurisdictions or interests in the project area. All comments received by the close of the comment period will be considered in preparing a Final EA for Microporous' Proposed Project. Comments received after the end of the comment period will be addressed to the extent practicable. Comments should be marked "Microporous Draft EA Comments" and include name, address, and organization (if applicable). Individual names and addresses (including e-mail addresses) received as part of the public comment period normally are considered part of the public record. Persons wishing to withhold names, addresses, or other identifying information from the public record must state this request prominently at the beginning of their submitted comments. DOE will honor this request to the extent allowed by law. All submissions from organizations, businesses, and individuals identifying themselves as representatives or officials of organizations or businesses will be included in the public record and open to public inspection in their entirety. The Draft EA is available on the NETL website at https://netl.doe.gov/node/6939. A hard copy is also available at the Ruby B. Archie Public Library, located at 511 Patton Street, Danville, Virginia.

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LIST OF ACRONYMS/ABBREVIATIONS

amsl	Above Mean Sea Level
BCC	Birds of Conservation Concern
BIL	Bipartisan Infrastructure Law
bgs	Below Ground Surface
BMP	Best Management Practices
CAA	Clean Air Act
CBP	Community Benefits Plan
CEJST	Climate and Economic Justice Screening Tool
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Emergency Response Compensation and Liability Act
CFR	Code of Federal Regulations
CH_4	Methane
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CVSZ	Central Virginia Seismic Zone
CWA	Clean Water Act
DAC	Disadvantaged Communities
dB	Decibels
dB(A)	Decibels A
DOE	Department of Energy
EA	Environmental Assessment
ECOS	Environmental Conservation Online System
EH&S	Environmental Health and Safety
EA/CM	Emergency Action/Crisis Management
EO	Executive Order
EPA	Emergency Planning and Community Right-to-Know Act
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ETSC	Eastern Tennessee Seismic Zone
EV	Electric Vehicle
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FOA	Funding Opportunity Announcement
FONSI	Finding of No Significant Impact
FPPA	Farmland Protection Policy Act
ft	Feet or Foot

GCSZ	Giles County Seismic Zone
GHG	Greenhouse Gas
GSA	General Services Administration
GV	Gasoline-Fueled Vehicle
HAP	Hazardous air pollutants
hr	Hour
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
IPaC	Information for Planning and Consultation
IPCC	Intergovernmental Panel on Climate Change
IRA	Inflation Reduction Act
kV	Kilovolt
lbs	Pounds
m^2	Square Meters
m^3	cubic meters
mg	milligrams
mg/L	milligrams per liter
MGD	Million gallons per day
MMBTU	Million British Thermal Units
MMcf	Million cubic feet
MVA	Megavolt ampere
MW	Megawatt
MWh/yr	Megawatt hours per year
NAS	National Academy of Sciences
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NETL	National Energy Technology Laboratory
NOA	Notice of Availability
N_2O	Nitrous Oxide
NOx	Nitrogen Oxide
NO_2	Nitrogen Dioxide
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NSR	New Source Review
NWI	National Wetlands Inventory

ORD	Original Equipment Manufacturer
OMB	Office Management and Budget
ORD	Ordinance
OSHA	Occupational Safety and Health Administration
O_3	Ozone
PCB	polychlorinated biphenyls
pCi/L	Picocuries per liter
PM	Particulate Matter
POTW	Publicly Owned Treatment Work
PPE	Personal Protective Equipment
ppm	Parts per Million
PSIG	Pounds per Square Inch Gauge
PVdF	Polyvinylidene fluoride or polyvinylidene difluoride
PMMA	Polymethyl methacrylate
RCRA	Resource Recovery and Conservation Act
SC-GHG	Social Cost Estimating Tool
SDWA	Safe Drinking Water Act
sf	Square Feet
SF_6	Sulfur Hexafluoride
SHPO	State Historical Preservation Office
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SQG	Small Quantity Generator
SSA	Sole Source Aquifer
SWPPP	Stormwater Pollution Prevention Plan
TES	Threatened and Endangered Species
U.S.	United States
USDA	U.S. Department of Agriculture
USEPA	U.S. Environmental Protection Agency
USFAA	U.S. Federal Aviation Administration
USFWS	U.S. Fish & Wildlife Service
USGS	U.S. Geological Survey
USTA	Underground Storage Tank Act
VAC	Virginia Administrative Code
VEDP	Virginia Economic Development Partnership
VDEQ	Virginia Department of Environmental Quality
VDHR	Virginia Department of Historic Resources
VDOE-GMR	Virginia Department of Energy, General Mineral Resources

VDOLI	Virginia's Department of Labor and Industry
VDWR	Virginia Department of Wildlife Resources
VOC	Volatile Organic Compound
VOSH	Virginia Occupational Safety and Health Administration
VPDES	Virginia Pollutant Discharge Elimination System
VWP	Virginia Water Protection
WPCF	Water Pollution Control Facility
WSS	Web Soil Survey

1.0 INTRODUCTION

The United States Department of Energy (DOE) – National Energy Technology Laboratory (NETL) prepared this Draft Environmental Assessment (EA) to evaluate the potential environmental impacts associated with its Proposed Action of providing cost-shared funding for the construction and operation a facility for Microporous, LLC (referred to as Microporous, a subsidiary of MP Assets Corporation). The activities at the proposed Microporous facility include the construction and assembly of coated lithium-ion (Li-ion) battery separator plant at Lots 1 and 2 (south of McGuff Creek) of the Southern Virigina Megasite (Megasite) in Danville, VA (the Project Area) for Li-ion batteries integral to electric vehicle (EV) supply chains. To achieve its purpose, the plant would consist of manufacturing buildings, an administrative building, a utility building, and storage silos. It is Microporous' intent to proceed with the development and operation of Lots 1 and 2 in the absence of DOE funding. The project area is located at 3304 Berry Hill Road (also known as U.S. 311), Danville, Virginia (Pittsylvania County) and comprises approximately 212-acres. The Proposed Project would occur entirely within Lots 1 and 2 which is located on the eastern edge of the Megasite. This document has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended (42 United States Code [U.S.C.] 4321, et seq.), the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and the DOE NEPA implementing procedures (10 CFR Part 1021).

1.1 Purpose and Need for Agency Action

DOE's Proposed Action would provide cost-shared funding for the construction and operation of a facility for Microporous. The project was selected under the Funding Opportunity Announcement (FOA) "Bipartisan Infrastructure Law (BIL): Advanced Energy Manufacturing and Recycling Grant Program (Section 40209)." This project would support the broader government-wide approach to reinvigorating and reinvesting in the American industrial base; establishing secure, resilient domestic energy supply chains and revitalizing economies in energy communities to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis, empower, workers, and advance environmental justice. Microporous' project was selected due to its potential to create hundreds of permanent jobs (including 85% of those jobs going to employees located in disadvantaged communities) and its project plan to produce world-class separators for lithium-ion batteries and secure domestic manufacturing of a market currently dominated by China.

1.2 National Environmental Policy Act and Related Procedures

This EA is prepared in accordance with NEPA, as amended (42 U.S.C. 4321), the President's Council on Environmental Quality (CEQ) regulations for implementing NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and DOE's implementing procedures for compliance with NEPA (10 CFR 1021). This statute and the implementing regulations require that DOE, as a federal agency:

- Assess the environmental impacts of its proposed action;
- Identify any adverse environmental effects that cannot be avoided, should the proposed action be implemented;

- Propose mitigation measures for adverse environmental effects, if appropriate;
- Evaluate alternatives to the proposed action, including a no action alternative; and
- Describe the cumulative impacts of the Proposed Action together with other past, present, and reasonably foreseeable future actions.

These provisions must be addressed before a final decision is made to proceed with a proposed federal action that has the potential to cause impacts to the human environment, including providing federal funding to a project. This EA is intended to meet DOE's regulatory requirements under NEPA and provide DOE with the information needed to make an informed decision about providing financial assistance. In accordance with the above regulations, this EA allows for public input into the federal decision-making process; provides federal decision-makers with an understanding of potential environmental effects of their decisions before making these decisions; and documents the NEPA process.

1.3 Laws, Regulations, and Executive Orders

- Advancing Racial Equity and Support for Underserved Communities Through the Federal Government (Executive Order [EO] 13985)
- Bald and Golden Eagle Protection Act
- Clean Air Act (CAA)
- Clean Water Act (CWA)
- Comprehensive Environmental Response, Compensation, and Liability Act
- Endangered Species Act (ESA)
- Establishing a Federal Flood Risk Management Standard and a Process for Further Soliciting and Considering Stakeholder Input (EO 13690)
- Executive Order on America's Supply Chains (EO 14017)
- Federal Actions to Address Environmental Justice in Minority Population and Low-Income Populations (EO 12898)
- Floodplain Management (EO 11988)
- Migratory Bird Treaty Act
- Pollution Prevention Act of 1990
- Protection of Wetlands (EO 11990)
- Resource Conservation and Recovery Act
- Revitalizing Our Nation's Commitment to Environmental Justice for All (EO 14097)
- Tackling the Climate Crisis at Home and Abroad (EO 14008)
- The Noise Control Act of 1972, as amended.

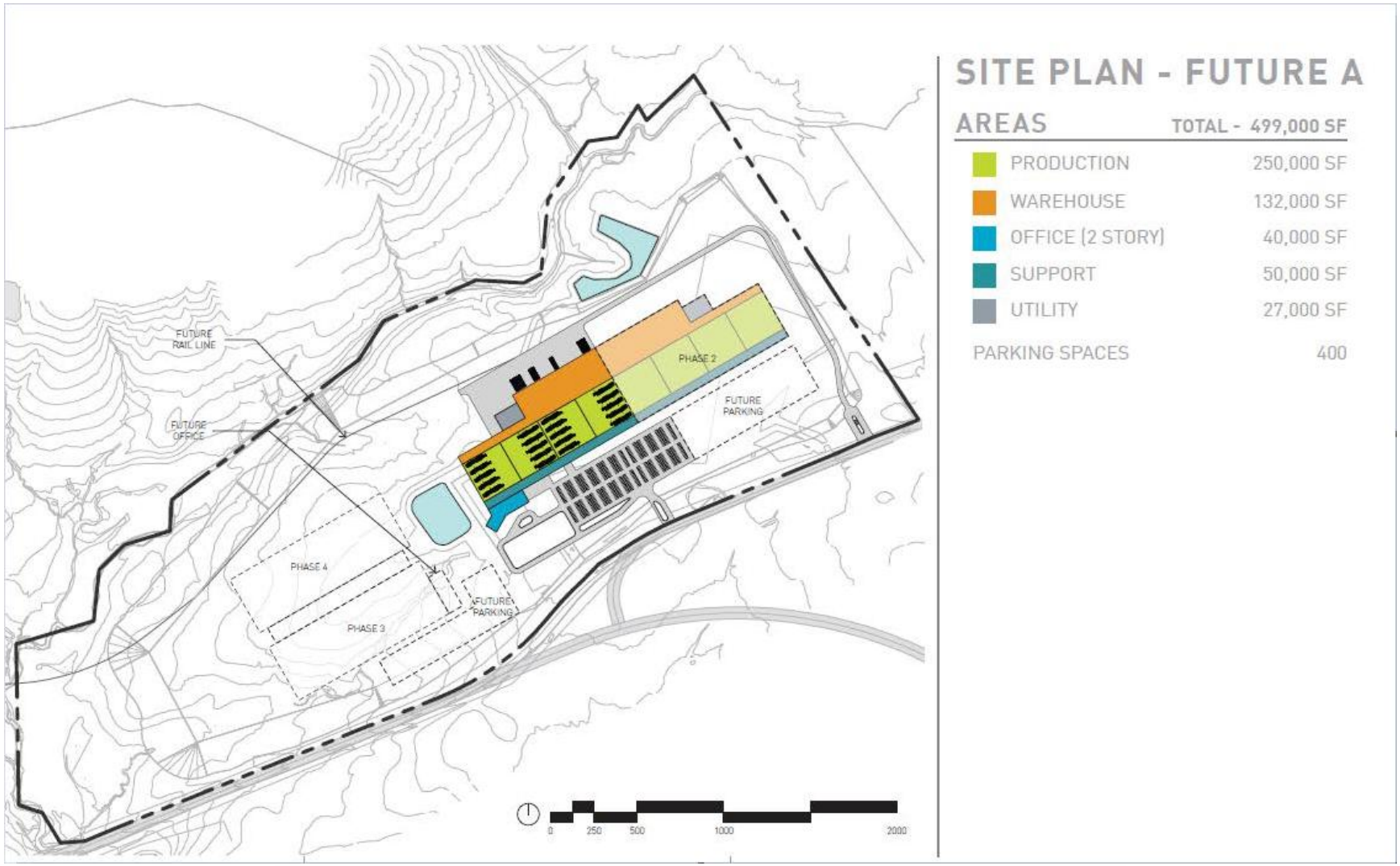
1.4 Location of the Proposed Project

The Project Area is generally located at Lots 1 and 2, south of McGuff Creek, of the Megasite at Berry Hill with the street address of 3304 Berry Hill (US-311), Danville, Pittsylvania County, Virginia (**Figure 1-1).** Two potential layouts of the Proposed Project (inclusive of Phases I – IV) are provided in **Figure 1.2**. Lots 1 and 2 comprises a total of 240-acres of the 3,528-total acres of the Megasite, although the

Proposed Project would utilize approximately 212-acres. The Proposed Project would occur entirely within Lots 1 and 2 on the eastern edge of the Megasite.

Figure 1-1: Proposed Project Location Map: Lots 1 and 2 at 3304 Berry Hill Road, Danville, Virginia

Notes: Images not scaled to size; images sourced from Google Earth Pro, November 2023; April 20


SITE PLAN - FUTURE A
AREAS
TOTAL - 499,000 SF
PRODUCTION 250,000 SF
WAREHOUSE 132,000 SF
OFFICE (2 STORY) 40,000 SF
SUPPORT 50,000 SF
UTILITY 27,000 SF
PARKING SPACES 400
FUTURE RAIL LINE
FUTURE OFFICE
PHASE 2
FUTURE PARKING
PHASE 4
PHASE 3
FUTURE PARKING
0
250
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1000
2000

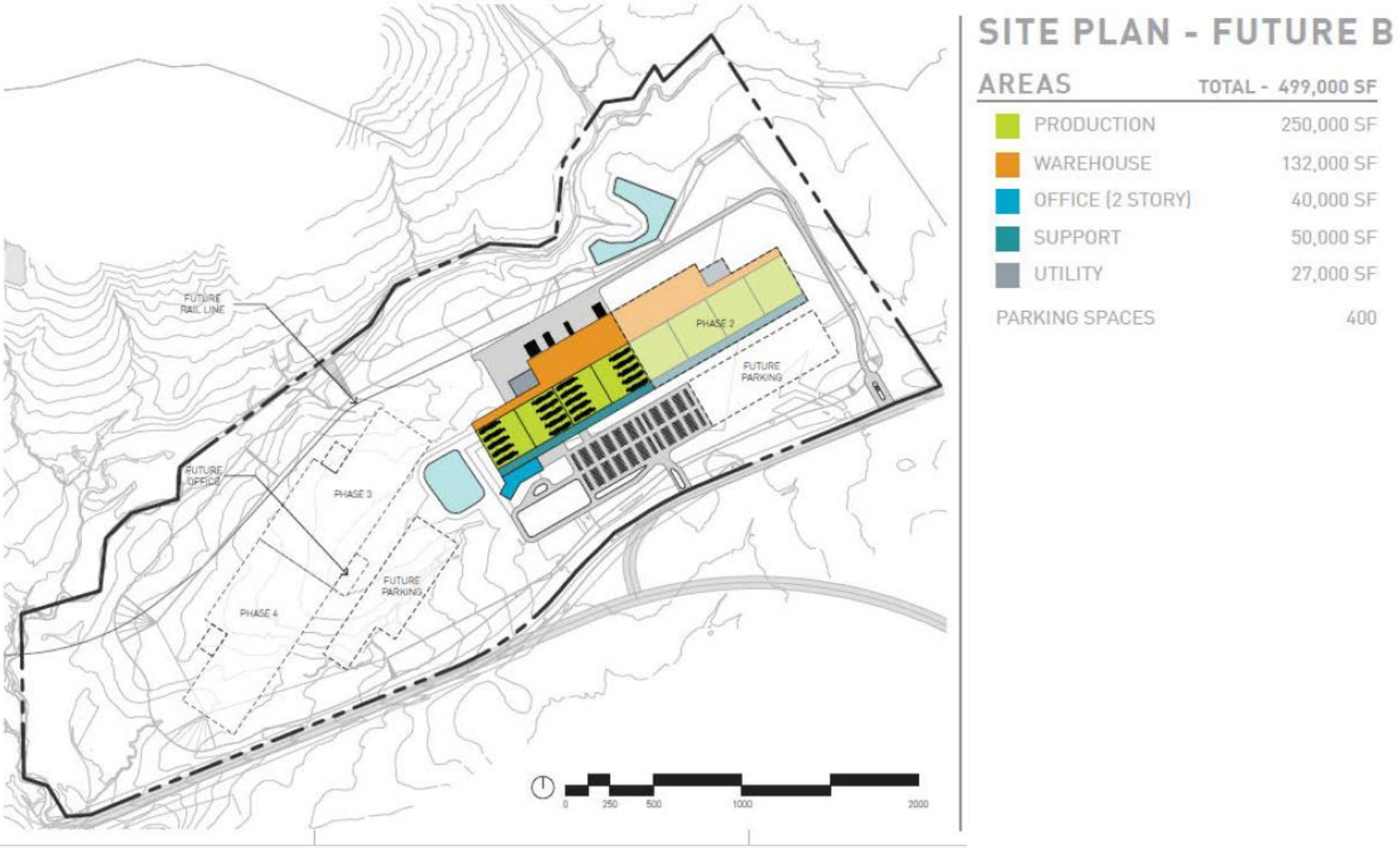

Figure 1-2: Proposed Project – Potential Site Layouts of Phases I – IV. "Future A" is the first image, and "Future B" is the second image

Notes: Images not scaled to size; images provided by BHDP+Microporous, Developed June 2024. Phases II through IV are shown on this site layout map as proposed locations.

1.5 Scope of the Environmental Assessment

Consistent with CEQ regulations, the scope of analysis presented in this EA is defined by the potential range of environmental impacts that may result from implementation of the Proposed Action (DOE partially funding the development and operation of applicable portions of Lots 1 and 2 of the Megasite at Berry Hill by Microporous). Lots 1 and 2 would be developed in four phases (Phase I through IV); however, Phase I will be the focus of this document, and will be funded from implementation of the Proposed Action. Phases II through IV will be analyzed in this EA to the extent feasible, including as part of the cumulative effects of DOE's Proposed Action. The proposed developments of Phase I, along with potential developments of Phases II – IV, are provided on **Figure 1-1**, shown above. This document is prepared such that it is focused on those resources that may be affected by implementation of the Proposed Action and Microporous' Proposed Project.

Resources that have a potential for impact were considered in detail to determine if implementing the Proposed Project would have a significant impact on environmental resources. Resources analyzed in detail include socioeconomics, environmental justice, noise, soils and geology, regulated waste (including solid and hazardous materials), hydrologic conditions and water quality, biological resources, cultural resources, utilities and energy use, transportation and traffic, air quality and greenhouse gasses, and public and occupational health and safety. The affected environment and potential environmental consequences relative to these resources are described in **Section 3.0**.

1.6 Coordination, Consultation, and Public Involvement

DOE consulted with the Virginia Department of Historic Resources (DHR), Delaware Nation of Oklahoma, Monacan Indian Nation, and U.S. Army Corps of Engineers regarding Microporous' Proposed Project prior to the publication of this Draft EA, and has also provided copies of this Draft EA to those agencies and tribal nations (along with state and local agencies identified in **Section 5.0)** as part of the 30-day public comment period for this Draft EA. NEPA requirements include the opportunity for public review of information outlining the project and potential impacts associated with proposed activities during the decision-making process and prior to implementation of the Proposed Action. Therefore, a Notice of Availability for this Draft EA was published in the Legal Notices sections of the Danville Register & Bee on December 3rd, December 5th, and December 7th, 2024 and the Chatham Star-Tribune on December 4th, 2024 to announce the beginning of the 30-day public comment period, which will occur from December 3rd, 2024 to January 3rd, 2025. This Draft EA is also posted on the NETL NEPA Environmental Assessments webpage (https://netl.doe.gov/node/6939) and DOE NEPA webpage (https://www.energy.gov/nepa/listings/latest-documents-and-notices) to solicit comments from the public regarding this Draft EA and Microporous' Proposed Project. All comments received will be considered and addressed in development of the Final EA for DOE's Proposed Action and Microporous' Proposed Project.

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2.0 PROPOSED ACTION AND ALTERNATIVES

This Section describes details of the Proposed Action and No Action Alternative considered to meet the project objectives, along with details of Microporous' Proposed Project. Relative impacts associated with each alternative have been considered and are provided in the sections below.

2.1 Introduction

The Southern Virginia Megasite at Berry Hill is a result of collaboration between multiple jurisdictions across state lines and is certified as a Tier 4-Infrastrucure Ready site by the VEDP[1]. Jurisdictions involved include the City of Danville and Pittsylvania County, and also has the involvement of the Southern Virginia Regional Alliance (SVRA). The Megasite has been divided up into 12 "lots" and is over 3,000-acres in size. Utilities including water, sanitary sewer, natural gas, fiber optic, and electricity, and Class 1 railway and Expressway access (US 58/US 29) have already been or are otherwise planned to be installed across the Megasite, including for Lots 1 and 2, regardless of the Proposed Action. It is the intent of VEDP and Danville-Pittsylvania County that the Megasite would be fully utilized for industrial purposes. The Proposed Action involves the partial funding of construction and operation of a facility for Microporous, LLC at Lots 1 and 2 of the Megasite (street/mailing address of 3304 Berry Hill Road). The activities at the proposed Microporous facility include the construction and assembly of coated lithium-ion (Li-ion) battery separator plant at the Project Area for Li-ion batteries integral to EV supply chains. This project would secure 600 million m^2 per year of domestic separator manufacturing capacity, strengthening the United States market. Microporous would install twenty aqueous coating lines for both ceramic (alumina, boehmite) and polymer (PVdF, PMMA) coating, complete with slurry mixing and slitting equipment. The Project Area is located at 3304 Berry Hill, Danville, Virginia (Pittsylvania County) and comprises a total of approximately 212-acres. The Proposed Project would occur entirely within Lots 1 and 2 (south of McGuff Creek), located on the eastern edge of the Megasite.

The option of no action is also considered in this EA in accordance with NEPA requirements. The Proposed Action and No Action Alternative are described in **Sections 2.2 and 2.3**, respectively.

2.2 Microporous' Proposed Project

Microporous' Proposed Project would consist of only Phase I of IV of Microporous Project Stellar (which includes Lots 1 and 2) at this time. There are a total of four Phases (Phase I through Phase IV) throughout Microporous Project Stellar, although Phases II – IV are in preliminary, unconfirmed stages. Phase II would consist of an eastern expansion of Phase I, and Phases III-IV would consist of western additions to Phase II. Phases II through IV will not be discussed in detail throughout this Draft Environmental Assessment, but will be analyzed in this EA to the extent feasible, including as part of the cumulative effects of DOE's Proposed Action. Refer to **Figure 1-1** for a site layout of Phases I - IV. DOE's Proposed Action would support the broader government-wide approach to reinvigorating and reinvesting in the American industrial base; establishing secure, resilient domestic energy supply chains' and revitalizing economies in energy

[1] https://www.dewberry.com/projects/southern-virginia-mega-site-at-berry-hill

communities to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis, empower workers, and advance environmental justice. Proceeding with DOE's Proposed Action and Microporus' Proposed Project would secure 600 million m² per year of domestic separator manufacturing capacity, strengthening the United States market. Microporous would install twenty aqueous coating lines for both ceramic (alumina, boehmite) and polymer (PVdF, PMMA) coating, complete with slurry mixing and slitting equipment. Microporous would provide 282 permanent jobs within the DOE grant's three-year performance period, and would support double-distressed coal and Justice40 communities by ensuring that at least 85% of full-time employees are from local DACs by the completion of the project. To achieve its purpose, the plant would consist of manufacturing buildings, an administrative building, a utility building, and storage silos. Note that a 70-acre graded pad has already been constructed at Lot 1 by the Megasite owners in anticipation of future industrial use.

2.3 Description of Alternatives

NEPA and the CEQ regulations require that reasonable alternatives for the Proposed Action be considered in the evaluation process. Per the requirements of 10 CFR Part 1021, selection standards are used to identify alternatives for meeting the purpose of and need for the Proposed Action, where "reasonable alternatives" are defined as those that could be implemented to meet that purpose and need. Because DOE's Proposed Action is limited to providing financial assistance in cost-sharing arrangements to projects submitted by applicants in response to a competitive funding opportunity, DOE's decision is limited to either accepting or rejecting a project as proposed by the applicant, including its proposed technology and selected sites. DOE's consideration of reasonable alternatives is therefore limited to the technically acceptable applications and a no-action alternative for each selected project. A No Action Alternative was considered, which is discussed in **Section 2.3.1**.

2.3.1 No Action Alternative

Under the Proposed Action, Lots 1 and 2 would continue to exist in its current condition without development and operations by Microporous. Additionally, it is the goal of the owners of the Megasite to fill these locations with industrial operations. However, in the No-Action Alternative scenario, as considered for the purpose of this EA, Lots 1 and 2 would remain undeveloped within the Megasite, and the current site conditions would remain as they are. The No-Action Alternative would not meet the purpose and need of the Proposed Action; however, it is analyzed in this EA to establish baseline conditions as required by CEQ regulations.

2.4 Summary of Environmental Consequences

Table 2-1 provides a summary of the environmental, cultural, and socioeconomic impacts of the No Action Alternative and the Proposed Action:

Table 2-1: Summary of Environmental Consequences

Impact Areas	Proposed Action		No Action Alternative	
	Construction	Operations	Construction	Operations
Land Use	Negligible	Negligible	Negligible	Negligible
Surface Water	Minor	Minor	Negligible	Negligible
Floodplains	Negligible	Negligible	Negligible	Negligible
Sole Source Aquifer	Negligible	Negligible	Negligible	Negligible
Socioeconomics	Minor (beneficial)	Minor (beneficial)	Negligible	Negligible
Environmental Justice	Minor (beneficial)	Minor (beneficial)	Negligible	Negligible
Transportation and Traffic	Negligible	Minor	Negligible	Negligible
GHG Emissions	Minor (beneficial)	Minor (beneficial)	Negligible	Negligible
Community Services	Negligible	Negligible	Negligible	Negligible
Parks and Recreation	Negligible	Negligible	Negligible	Negligible
Air Quality	Minor	Minor	Negligible	Negligible
Cultural Resources	Negligible (pending SHPO review)	Negligible	Negligible	Negligible
Wetlands	Negligible	Negligible	Negligible	Negligible
Vegetation and Wildlife	Minor	Negligible	Negligible	Negligible
Prime and Unique Farmland	Negligible	Negligible	Negligible	Negligible
Noise and Vibration	Minor	Minor	Negligible	Negligible
Geology, Topography, and Soils	Minor	Minor	Negligible	Negligible
Groundwater	Negligible	Negligible	Negligible	Negligible
Regulated Wastes (Solid and Hazardous Wastes)	Minor	Minor	Negligible	Negligible
Utilities and Energy Use	Minor	Minor	Negligible	Negligible
Public and Occupational Health and Safety	Minor	Minor	Negligible	Negligible

These areas are discussed in detail **in Sections 2.5 and 3.0** below.

2.5 Resource Areas Eliminated from Further Consideration

It has been determined that various resources would either not be affected or would sustain negligible impacts from the Proposed Project at the project area and therefore do not require further evaluation. These include land use, floodplains, sole source aquifer, airport clear zones, community services, parks and recreation, and prime and unique farmland. The basis for exclusion of each of these resource areas is briefly discussed in this section of the EA and will not be evaluated further within this document.

2.5.1 Land Use

The Project Area proposed on Lots 1 and 2 is within an area currently zoned for heavy industry/M-2 use. A proposed change in land use will not be necessary to perform the Proposed Project. The Megasite is suitable for original equipment manufacturer (OEM) manufacturing operations and other large advanced industrial tenants and is the result of a unique collaboration amongst multiple jurisdictions in both Virginia and North Carolina. This site is designated as a "Super Park" by Quest/McCallum Sweeney and certified under the VEDP Virginia Business Ready Sites Program. Quest has certified the Megasite at Berry Hill as a Certified Mega Site / Super Park. The site is also located in a Foreign Trade Zone, Enterprise Zone, Opportunity Zone, and is Business Ready Site Program Certified. The Proposed Project does not represent a significant change to local or regional land use and no change in land use or zoning would be necessary for implementation of the Proposed Action.

2.5.2 Floodplains

The Project Area includes an area within a Federal Emergency Management Agency (FEMA)-designated floodplain, as presented in **Appendix C**. The FEMA Flood Map Service Center database (FEMA, 2010) identifies the land surrounding McGuff Creek as a “Special Flood Hazard Area” on the Flood Insurance Rate Maps (FIRM) numbers 51143C0605E and 51143C0610E, effective September 29, 2010. The boundary of the Project Area is such that McGuff Creek itself is excluded, as described above. However, northwestern portions of the Project Area include the “Special Flood Hazard Area.” The Proposed Project does not include plans to develop within these flood areas. Therefore, it has been determined that a formal floodplain assessment as described in 10 CFR Part 1022 is not required for the Proposed Project and no further evaluation was completed in support of this EA.

2.5.3 Sole Source Aquifer

Based on a review of the United States Environmental Protection Agency (USEPA) Interactive Map of Sole Source Aquifers (SSA) (USEPA, 2024), the project area is not located within an SSA, as documented on **Figure 2-1**. The nearest SSA’s are approximately 200 miles to the east-northeast and 205 miles to the north-northeast of the project area. As there is no reasonable expectation of impact to an SSA from the Proposed Project, this resource is not analyzed further in this EA.

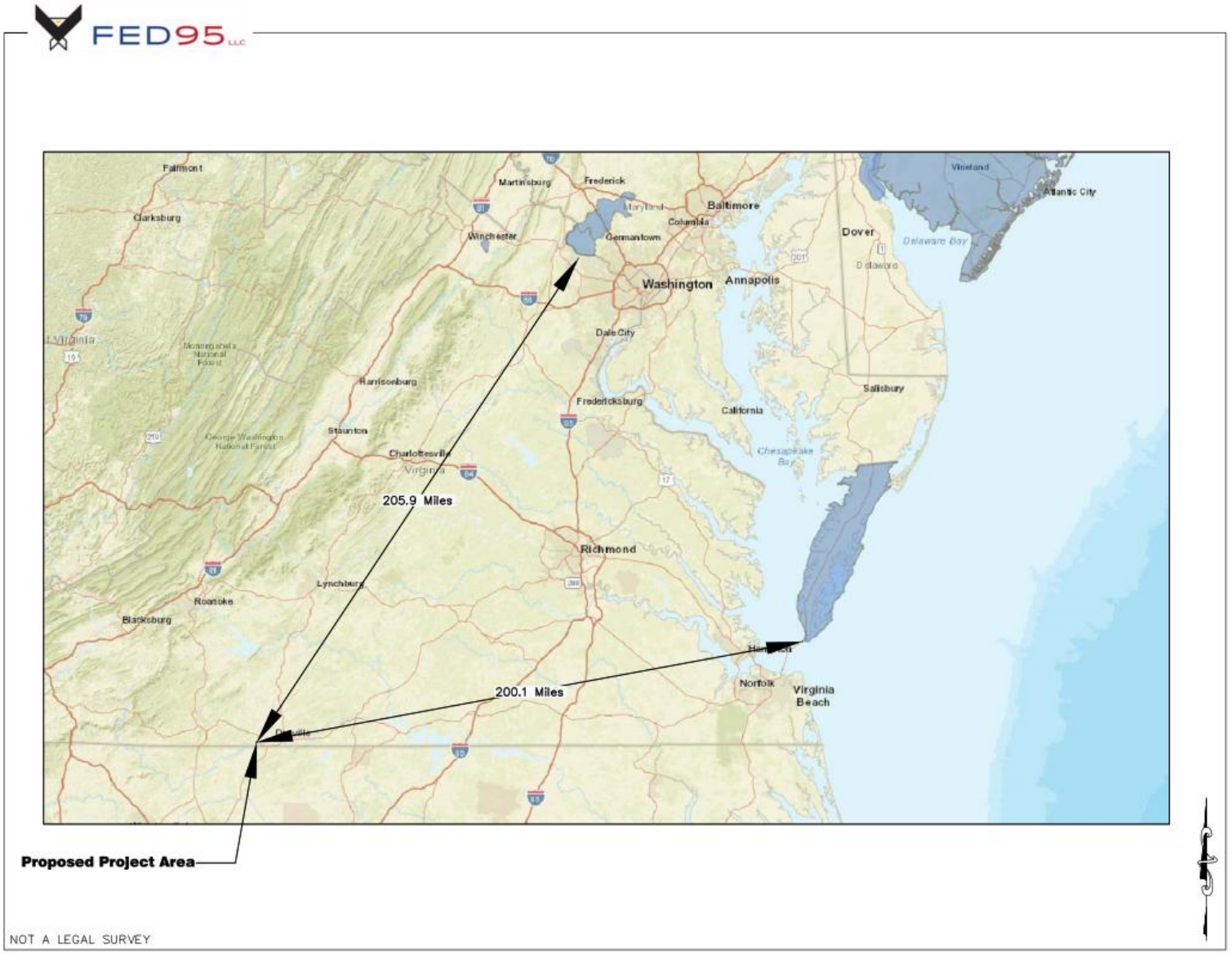

Figure 2-1 Sole Source Aquifer Map

Notes: Imaged sourced from EPA, Soil Source Aquifers (SSAs) for Drinking Water, National GIS SSAs, Interactive Map, retrieved May 7, 2024

2.5.4 Airport Clear Zones and Accident Potential Zones

An evaluation of civil and military airports in the region of the Project Area to determine compatibility with the Proposed Project was conducted. Based on a review of the United States Federal Aviation Administration (USFAA) Aeronautical Information Services Airport map layer (USFAA, 2016), the project area is not located within 2,500 feet of civilian airport or 15,000 feet (2.84 miles) of a military airport, as documented on **Figure 2-2** The nearest civilian airport is approximately seven miles to the south-southeast and the nearest military airport is approximately 180 miles to the northeast of the project area. Therefore, it has been determined that the Proposed Project is unlikely to impact Airport Clear Zones or Accident Potential Zones and is not analyzed further in this EA.

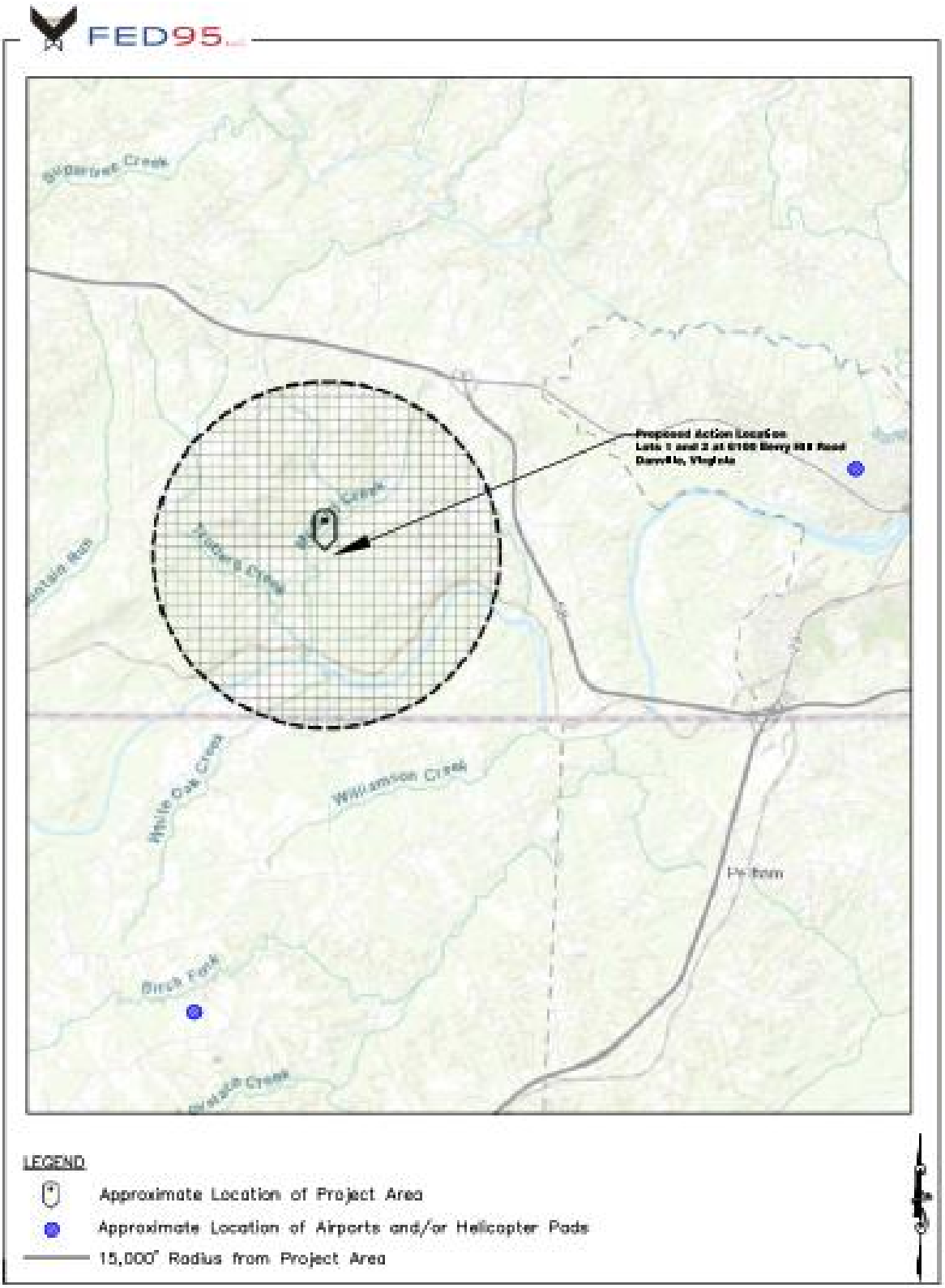

Figure 2-2 Airport Clear Zone Map

Notes: Image not scaled to size, sourced from: Federal Aviation Administration, Airports Summary, Retrieved May 17, 2024

2.5.5 Community Services

Community services pertinent to the proposed project include schools, police, fire, and emergency medical support, all of which are provided in Danville. Most of these services are located east of the Project Area, across U.S. Highway 58 (US-58). The nearest law enforcement headquarters is the Danville Police Department, located approximately 6.8 miles east of the Project Area. The closest fire station is Bachelors Hall Volunteer Fire Department, located approximately 1.6 miles northeast of the project area. A fire response team would also be present on-site at the Microporous Facility during operations. The nearest emergency medical service provider is Danville Lifesaving Crew, located approximately 10.8 miles east of the site. The nearest hospital with an emergency room is SOVA Health – Danville, located approximately 11.7 miles east of the project area. Several other medical clinics are located in the Danville area, east of the project area. Medical services would also be present on-site at the Microporous Facility during operations as either direct trained employees or contracted services.

The Project Area is located approximately 12 miles from the City of Danville. The City of Danville has two pre-schools, seven public elementary schools, three public middle schools, and three public high schools. The region also supports numerous private elementary and high schools. The closest early learning institution to the Project Area is Grove Park Pre-School located approximately 12.3 miles east of Lots 1 and 2. The City of Danville supports higher education opportunities at Danville Community College and at Averett University.

Construction crews, as well as full-time employees of Microporous, are expected to be drawn primarily from local and regional residents and not constitute a notable permanent migration of workers and their families to the region. The additional temporary construction staff and more permanent full-time operational staff are not anticipated to exert an undue burden on existing community services. In addition, road closures or other impacts that would restrict or impede the movement of emergency personnel or other traffic through the region are not anticipated as part of construction and operations activities associated with the Proposed Project (see **Section 3.10** for a discussion of transportation and traffic related impacts). In the event such restrictions would be temporarily necessary, steps will be taken to minimize the disruption to traffic.

Based on the current capacity of the City of Danville's community services as well as the intent to utilize local residents for jobs, the increased burden on existing police, fire, emergency medical, and other community services during construction and operations of the Proposed Project is expected to be negligible.

2.5.6 Parks and Recreation

The City of Danville maintains approximately eight city parks and five recreation facilities, the closest of which to the Project Area is H.B. Moorefield Park, located approximately 5.9 miles northeast of Lots 1 and 2. No public (local, state, federal) or private parks are present within five miles the Project Area. No scenic overlooks, trailheads, or recreations centers are present within five miles of the Project Area. A cemetery is located approximately 3.3 miles southwest of Lots 1 and 2, however, the Proposed Project unlikely to negatively affect cemetery operations or aesthetics. The nearest North Carolina state park is the Mayo River State Park, located approximately 22 miles southwest of the Project Area and the nearest Virginia state park is the Fairy Stone State Park, located approximately 32 miles to the northwest of the Project Area. There appears to be no National Parks within 35 miles of the Project Area. Due to the industrial zoning and

existing land use in the vicinity of the Megasite, including heavy industrial, recreational uses in proximity to the Project Area are limited and the development and operation of the Microporous battery plant on Lots 1 and 2 is not expected to alter any existing recreational uses of the immediate area. Therefore, the impact upon parks and recreation from the Proposed Project is anticipated to be negligible.

2.5.7 Prime and Unique Farmland

The United States Department of Agriculture (USDA) defines Prime and Unique Farmlands as land areas including those which have optimal physical and chemical characteristics for producing staple food crops, feed, forage, etc., or those which are uniquely capable of supporting growth of specialty crops such as citrus, olives, nuts, etc. The USDA further defines prime and unique farmlands as being available for these uses and excludes highly developed areas which are not reasonably available for farming. Land areas meeting these characteristics are regulated under the Farmland Protection Policy Act (FPPA), 1981.

Although portions of the Project Area are identified by USDA Natural Resource Conservation Service (NRCS) as "prime farmland" in its Soil Data Access table (USDA, n.d.b), the Project Area is not currently used for agricultural purposes, nor is it available for agricultural /farmland purposes as it is zoned industrial and has been included as part of the Megasite, intended by local government to be utilized for industrial purposes. Further, the area is not considered to be farmland of statewide importance, as defined by USDA due to its current and expected future use and level of development. No agricultural land would be lost or otherwise impacted by the Proposed Project or any of the alternatives considered at the project area. Further, no nearby and/or adjoining properties are utilized for agricultural/farmland purposes. As such, this factor is not considered further in this EA.

3.0 AFFECTED ENVIRONMENT AND CONSEQUENCES

Microporous Proposed Project located at Lots 1 and 2 of the Megasite at Berry Hill would be developed in four phases (Phases I through IV). Phase I (as shown on **Figure 1-1**) will be discussed throughout this Section, and Phases II through IV will be analyzed in this EA to the extent feasible, including as part of the cumulative effects of DOE's Proposed Action. Resources not previously evaluated and dismissed in **Section 2.5** have been reviewed in depth as they pertain to the Proposed Action and each of the previously described alternatives. The results of this evaluation and conclusions regarding potential impacts are provided in this Section.

3.1 Socioeconomics

3.1.1 Affected Environment

The Proposed Project that would occur within the boundaries of Lots 1 and 2 of the Southern Virginia Megasite is located in the City of Danville, Pittsylvania County, Virginia with a population of 41,837 residents (US Census Bureau, 2023). The Proposed Project is part of a concerted effort by local government to promote growth and industry in the area by the creation of the Megasite, located along U.S. Route 311, a designated industrial roadway with no weight restrictions, which has been recently improved to handle traffic from the site resulting from an anticipated 3,000 jobs per shift operation. Pittsylvania County is home to 59,571 residents, reflecting a -1.5% change in population since 2020 (US Census Bureau, 2023). The cost of living in the City of Danville, Virginia is 16.2% lower than the U.S. average, with a median household income of $41,484 (US Census Bureau, 2023). There is a 25.3% poverty rate in Danville, Virginia, compared to a 10.6% poverty rate for Virginia as a whole (US Census Bureau, 2023). The Danville Region has a civilian labor force of 47,535 with a participation rate of 56.4%. Of individuals aged 25 to 64 in the Danville Region, 18.7% have a bachelor's degree or higher which compares with 33.5% in the nation (Chmura Economics & Analytics, 2022). The unemployment rate for Danville, Virginia was 5.0% as of May 2022. The regional unemployment rate was higher than the national rate of 3.4%. The largest sector in Danville, Virginia is Health Care and Social Assistance, employing 5,356 workers. The next largest sectors in the region are Retail Trade (3,922 workers) and Manufacturing (3,830 workers) (Chmura Economics & Analytics, 2022). Pittsylvania County is home to seven industrial parks with potential to accommodate further growth and development.

3.1.2 Environmental Consequences: Socioeconomics

3.1.2.1 Proposed Project

3.1.2.1.1 Construction

During the Proposed Project's construction period, short-term construction workers will be employed. It is anticipated that these jobs will be filled by local and/or nearby residents, aiding the overall household incomes of local residents and providing reliable employment for the duration of the construction. This would benefit residents who may be currently unemployed or underemployed, residing and paying taxes in

Pittsylvania County or the surrounding area. Increased sales transactions for the purchase of materials and supplies would generate additional tax revenues for local and state governments, which would have a minor beneficial impact. Secondary jobs related to the increased economic activity stimulated by the Proposed Project may be created including additional retail services and business employment that may result from the Proposed Project through a multiplier effect, yielding additional sales and income tax revenues for local and state governments, also generating minor beneficial impact.

3.1.2.1.2 Operation of the Facility

Operations of the Proposed Project, along with the additional three phases (once completed), would introduce new, full-time jobs in a growing market sector and to engage under-employed Americans in the workforce (approximately 800 new permanent jobs within the first six years of operations and up to 2,015 permanent positions). It is anticipated that the number of jobs will increase as phases of the Proposed Project are completed and as the plant is able to expand. An influx of population is expected in the surrounding area of the Proposed Project, therefore the impact to housing demand and population from the Proposed Project is expected to be minor, although recent announcements have been made regarding the planned development of 1,800 housing units (1,500 townhomes and single-family homes, 300 apartments) which would significantly reduce the impact once complete (Thornton, 2024).

It is in agreement for the Proposed Project and a requirement of the DOE that a Community Benefits Plan (CBP) be developed as part of all BIL and Inflation Reduction Act (IRA) FOAs and loan applications. CBP's are based on a set of four core policy priorities, including engaging communities and labor, investing in America's workers through quality jobs, advancing diversity, equity, inclusion, and accessibility through recruitment and training; and implementing Justice40, which directs 40% of the overall benefits of certain Federal investments to flow to disadvantaged communities. The Proposed Project CBP will be implemented through existing and ongoing relationships with local and state governments and organizations, Microporous, LLC would work to optimize employment, training, outreach, and ancillary benefits to the community and surrounding areas.

3.1.3 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance. If the Proposed Action proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the Proposed Action would likely not proceed without DOE assistance. Under the No Action Alternative, socioeconomics for the area would remain unchanged from existing conditions.

3.2 Environmental Justice

The Federal government has initiated the Justice40 Initiative (as part of Executive Order 14008 - signed by President Biden in 2021) with the goal of allocating 40% of the overall benefits from certain Federal climate, clean energy, affordable housing, and other investments into disadvantaged communities that are

marginalized by pollution and underinvestment. This initiative functions in cooperation with Federal actions to address environmental justice in minority populations and low-income populations, as executed by President Clinton in 1994 (EO 12898). The purpose of this executive order included focus of federal attention on environmental and human health effects for low-income and minority populations in order to obtain environmental justice for these impacted communities. The Justice40 initiative looks to invest in climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, remediation and reduction of legacy pollution, and the development of critical clean water and wastewater infrastructure. The Office Management and Budget (OMB) released an Interim Implementation Guidance document for the Justice40 Initiative (M-21-28), guiding the DOE's work on Justice40 along with relevant statutory authorities. In addition, the DOE requires a CBP, as discussed in **Section 3.1.2.1.2**. Within the Office of Manufacturing and Energy Supply Chains, DOE identified the Advanced Energy Manufacturing and Recycling Grant Program as a Justice40 covered program (Section IIAii Clean Energy and Energy Efficiency within OMB M-21-28).

3.2.1 Affected Environment

DOE developed a DAC Reporter to define and identify disadvantaged communities for the purposes of Department programs. The DOE DAC score can be utilized to better understand the burdens experienced by census tracts identified in the CEJST tool (https://energyjustice.egs.anl.gov/). DOE calculates the DAC score by considering 36 indicator groups calculated by using a national percentile rank for each census tract, giving each of the 36 indicators equal wight. The scores range from 0 (least disadvantaged) to 36 (most disadvantaged). For the regional area where the Proposed Action would be located (CEJST/DAC TRACT 51143011100), DOE does not consider this area a disadvantaged community and it has received a DAC score of 16, with a national ranking of being in the 44th percentile for the 36 indicators and in the 65th percentile for Virginia State Nationwide, with low-income population, high unemployment, and various health risks.

However, to assist agencies with identifying disadvantaged communities, the CEQ developed the CEJST (CEQ 2022), which identifies census tracts as disadvantaged based on consideration of environmental and socioeconomic burdens. Based on the location of the Proposed Project Area (CEJST/DAC TRACT 51143011100), the region ***is*** identified as "Disadvantaged" by the CEJST tool, as the area is at or above the threshold for one or more environmental, climate, or other burdens, and above the threshold for associated socioeconomic burdens.

3.2.2 Environmental Consequences: Environmental Justice

3.2.2.1 Construction and Operation of the Facility

The proposed development and the intentions of Microporous in cooperation with the DOE will align with the goals established in the Justice40 initiative and align with the Executive orders 12898 and 14008. By introducing up to 2,015 high-paying, full-time employment opportunities (approximately 800 new permanent jobs within the first six years of operations and up to 2,015 permanent positions anticipated) to the region in addition to the short-term construction opportunities, the proposed development has the potential to alleviate several environmental and social burdens exhibited by the DACs. New technologies

proposed for these sites boast low operational emissions of potentially harmful pollutants and strong occupational health and safety standards. Overall, the Proposed Action is anticipated to have a net-positive (beneficial) impact on environmental justice by focusing economic development in locations that face significant legacy economic challenges and resulting social inequities. Microporous proposes introduction of new, full-time jobs in a growing market sector and to engage under-employed Americans in the workforce. During development of a CBP and through existing and ongoing relationships with local and state governments and organizations, Microporous would work to optimize employment, training, outreach, and ancillary benefits to the community and surrounding areas. This will ultimately reflect both short term and long-term benefits for the surrounding community.

3.2.3 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance. If the proposed development proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the proposed development, as funded by the Proposed Action, and the impacts of not proceeding with the project, for purposes of this environmental analysis, DOE assumes that the proposed development would likely not proceed without DOE assistance (the Proposed Action). Under the No Action Alternative, the environmental justice impacts and scoring for the area would remain unchanged from existing conditions.

3.3 Noise

3.3.1 Affected Environment

The Proposed Project is located in a Quest Site Solutions-certified (**Appendix C**) Megasite designated for industrial use, specifically the area of Lots 1 and 2. Existing noise and vibration sources within the site vicinity include local transportation on primary and secondary roads (such as the adjoining U.S. Route 311), and a Norfolk Southern rail line approximately one mile south of the Project Area. Additionally, it is anticipated by the local government that the Megasite will be utilized for industrial purposes (zoned heavy industrial/M-2), although the Megasite is currently graded/vacant, forested, or vegetated land. The nearest population (sensitive receptor) is rural (farm) residences, the closest of which is adjoining to the Proposed Project, approximately 0.10 miles east from the planned operational area of the Proposed Project. The nearest residential neighborhood to the Proposed Project is roughly 2 miles southwest of the Proposed Project. The Proposed Project is roughly five miles from the nearest school and about 1 mile from the nearest existing community structure (church). Other sensitive receptors, including parks, libraries, hospitals, and other care facilities, etc. do not occur within a mile or more radius to the Proposed Project. Population density is low in this rural area, with private residences scattered on large-acreage parcels surrounding the entire Megasite. Minor increase in noise and vibration is anticipated temporarily for construction and operations.

A railway is planned to extend from the western extent and continue easterly of the Proposed Project to accommodate for industrial operations occurring at the Megasite. The development and operation of the railway is anticipated to be completed regardless of the completion of the Proposed Action (development

and operation of the Microporous facility) at Lots 1 and 2. Refer to **Section 3.10** of this EA for additional discussion.

3.3.1.1 Construction

Construction noise would be anticipated as commensurate with comparable industrial development, and equivalent to other anticipated industrial construction on adjacent parcels within the Megasite. In addition, a new highway connector for U.S. Route 311 to US 58/US 29 was developed allowing for access to the Megasite, specifically leading to the southern extent of Lots 1 and 2. Ambient noise level would increase during construction activities but are anticipated to be short-term and intermittent. Construction noise associated with heavy machinery, building construction, site grading and leveling, installation of equipment can be anticipated during the construction phase of the Proposed Project. Studies of peak noise generated by heavy equipment and impact devices used in construction projects documented by the National Institute for Occupational Safety and Health (NIOSH) provide a range for sound levels associated with heavy construction equipment that ranges from 80 to 120 decibels A (dBA), and power tools commonly used during construction produce sound up to 115 dBA (Spencer, 2007). The City of Danville noise ordinance code (Ord. No. 2010-01.04, 1-5-10) prohibits construction noise between the hours of 10:00 p.m. and 6:00 a.m., except in the case of emergency under a permit granted by the city manager. Short-term and intermittent construction noise and vibration would generally be limited to the immediate vicinity of Lots 1 and 2. Construction during the prohibited time range is not currently anticipated and construction during general work hours (between 8:00 a.m. through 5:00 p.m.) can mitigate any potential concerns on the effect on the nearby properties. Construction of the Proposed Project is anticipated to last for approximately 12 months for building installation, and 24 months for equipment installation. During both construction and operations, use of existing Environmental Health and Safety (EH&S) protocols as applicable (e.g. training, industry best practices, and personal protective equipment (PPE)) would mitigate noise impacts to personnel within the site, and for private residences in the larger area.

3.3.1.2 Operation of the Facility

The Proposed Project would result in a minor, long-term increase in noise as an average increase in ambient noise is expected for industrial activities, increase in traffic to and from the site, and overall increase in noise in commensurate with comparable industrial development, and with other planned industrial construction on adjacent parcels within the Megasite. Primary noise sources during operations are anticipated from industrial activities within enclosed facility structures, and from truck and employee-vehicle traffic accessing Lots 1 and 2, and a possible incremental increase in rail traffic when the railway is constructed associated with material delivery and product shipment. Heating, ventilation, and air conditioning would be installed externally on facility structures, with small contributions to low-decibel ambient noise. Due to the expected hiring of approximately 800 new employees at the Proposed Project within the first six years of operation, there is expected to be a proportional increase in commuter vehicle noise on Berry Hill Road and the new connector road.

3.3.2 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE

decides not to provide financial assistance. If the proposed development proceeds without DOE's financial assistance (the Proposed Action), the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the proposed development and the impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the proposed development would likely not proceed without DOE assistance. Under the No Action Alternative, noise for the area would remain unchanged from existing conditions.

3.4 Geologic and Soil Conditions

The Proposed Project will have a minor impact on the geology, topography, and soils, including soil distribution and erosion. Several factors for consideration and management during the proposed Project Area construction will include soil loss/distribution, erosion, grading, and dewatering (if groundwater is encountered). Microporous plans to utilize best management practices that will be implemented during construction and operations to effectively prevent effects to soil and geologic resources. Such management practices that will be implemented (if applicable) include: storm water training for onsite personnel, use of erosion control blankets for exposed soil, avoidance of excessive soil stockpiling (wind and rain, potential migration factor), sediment settling basin as part of the stormwater and erosion runoff control program, use of temporary water or dust palliatives on soils to prevent exposure to erosive elements, proper use of temporary or permanent landscaping to hold soils in place, and mechanics to prevent unwanted soil movement. Proposed construction on the Proposed Project is limited to surface and near-surface activities, which is not anticipated to affect the deeper geologic strata (Refer to **Section 3.4.1.2 and Section 3.4.1.3** for further information regarding regional geology and soil activities). Seismic activity in this region is negligible and would be adequately addressed through compliance with local building codes (refer to **Section 3.4.1.4** for further information regarding seismic activity).

3.4.1 Affected Environment

3.4.1.1 Topography

The proposed Project Area as shown on the Virginia Department of Energy, General Mineral Resources (VDOE-GMR) Online Mapping, United States Geological Survey (USGS) 7.5-Minute Topographic Map of the Danville, Virginia Quadrangle (**Figure 3-1**) presents various elevations, ranging approximately between 600-650 feet (ft) above mean sea level (amsl) (VDOE-GMR, n.d) with a down gradient slope towards the northern adjacent McGuff Creek.

Figure 3-1: Topographic Map

Notes: Image not sized to scale, sourced from: Virginia Department of Energy, Geology Mineral Resources Online Mapping, Geology of Whitmell and Brosville Quadrangles, Scale, 1:24,000 (1980).

3.4.1.2 Regional Geology

Regional geologic features of the Proposed Project, as shown on the Geologic Map of Viriginia Portion of the Danville 30x60 Minute Quadrangle, compiled by William S. Henika (2002) identified the Project Area to be situated on quaternary-aged terrace deposits soils or alluvial soils, underlain by the Triassic age, Danville Basin Chatham Group. The Danville Basin Chatham Group is divided into two groups:

- Newark Supergroup – Sandstone, undifferentiated (VDOE-GRM, n.d, Henika, 2002).
- Newark Supergroup – Sandstone, siltstone, and shale, interbedded (VDOE-GRM, n.d, Henika, 2002).

A Mesozoic rock, igneous dike with a vertical (north/south) direction is identified on Lot 1 on the Geologic Map of Viriginia Portion of the Danville 30x60 Minute Quadrangle. No karst geology (e.g. sinkholes, caves, sinking streams) were identified on the Proposed Project (VDOE-GRM, n.d, Henika, 2002). In addition, no karst geology was observed during the F&R Phase II (F&2, 2011, refer to **Section 3.4.1.3.1** for further information regarding the geotechnical study). The location of the Proposed Project, as well as the geologic descriptions are presented on **Figure 3-2**.

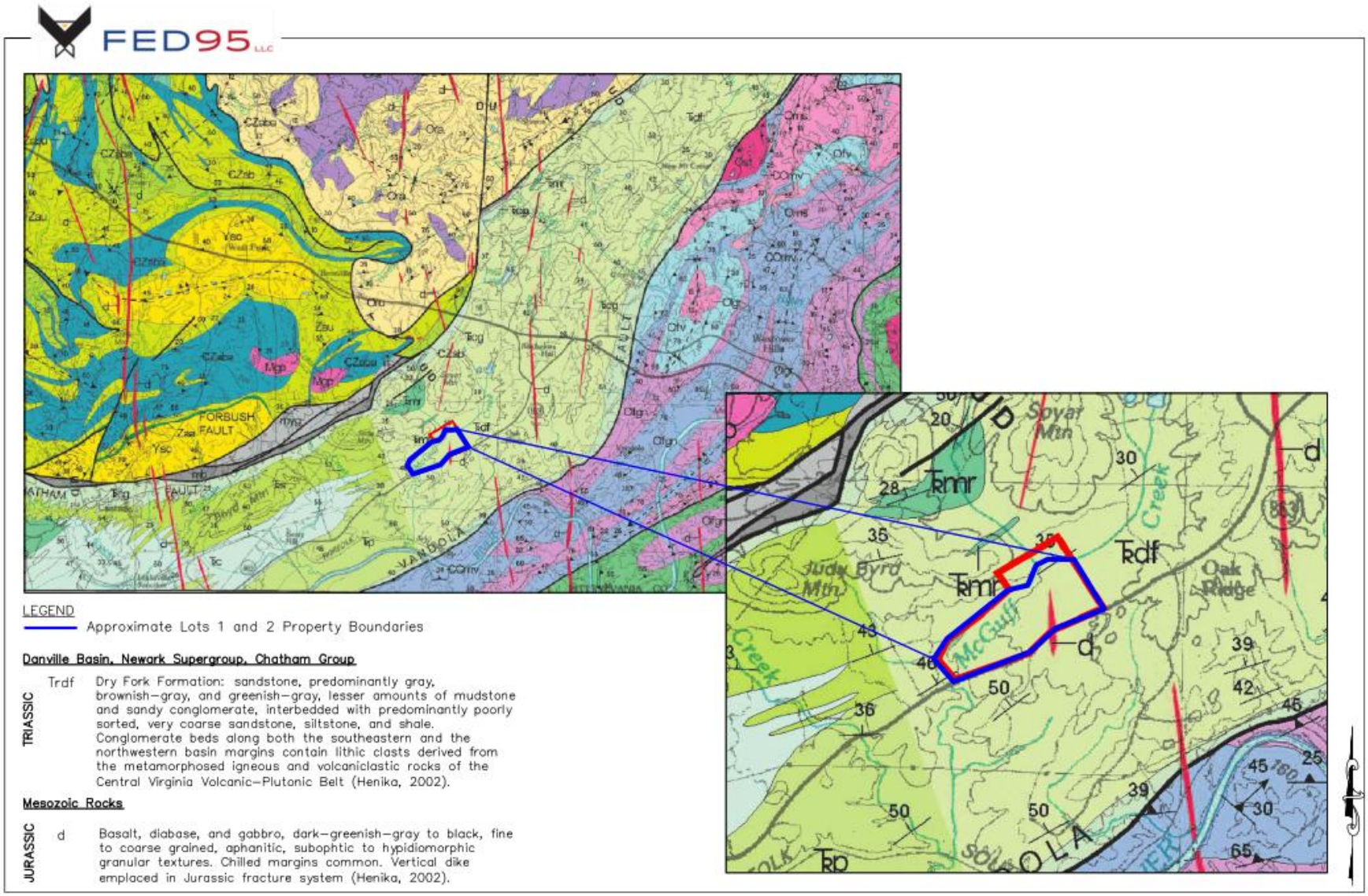

Figure 3-2: Geologic Map

Notes: Image not sized to scale, soured from Geologic Map of the Virginia Portion of the Danville 30x60 Minute Quadrangle, William S. Henika, 2002

3.4.1.3 Soils

The USDA Web Soil Survey (WSS) indicates the surficial soils at the Proposed Project consist of sandy loam and silt loam. Further details of the surficial soils, including slope class, and estimated disturbance are summarized in **Table 3-1** below. The USDA Soil Survey Manual (SSM) soil descriptions are presented on **Figure 3-3**.

Table 3-1: USDA Soil Units

Soil Unit Name	Slope Class (%)	Surface Disturbance on proposed Project Area (Acres)	Location on proposed Project Area
Codorus-Comus complex	0 to 2%, frequently flooded	34	Along the northern property boundary of Lots 1 and 2
Clover fine sandy loam	2 to 7%, 7 to 15%	12.2	Northeastern-eastern portion of Lot 1
Sheva fine sandy loam	2 to 7%	27.7	Southeastern portion of Lot 1
Stoneville silt loam	2 to 7%, 7 to 15%	143.4	Central portion of Lots 1 and 2

USDA, Soil survey area: Pittsylvania Couty and the City of Danville, Virginia (September 5, 2023)
Sloping Class (%): USDA, Soil Survey Manual, Agriculture Handbook No.18, Table 2-3, Issued March 2017, Minor Amendments February 2018
Nearly Level: 0-3%
Gently Sloping: 1-8%
Strongly Sloping: 4-16%

The Proposed Project is situated with a variety of elevation changes between a nearly level grade to strongly sloped throughout the area. The sloping degree can be interpreted as slight to moderate potential for erosion of natural soils at the Proposed Project. Based on the USDA soil mapping, a higher sloping percentage is likely to be encountered on Lot 1. However, it is Microporous' understanding the construction will include graded leveling for building construction.

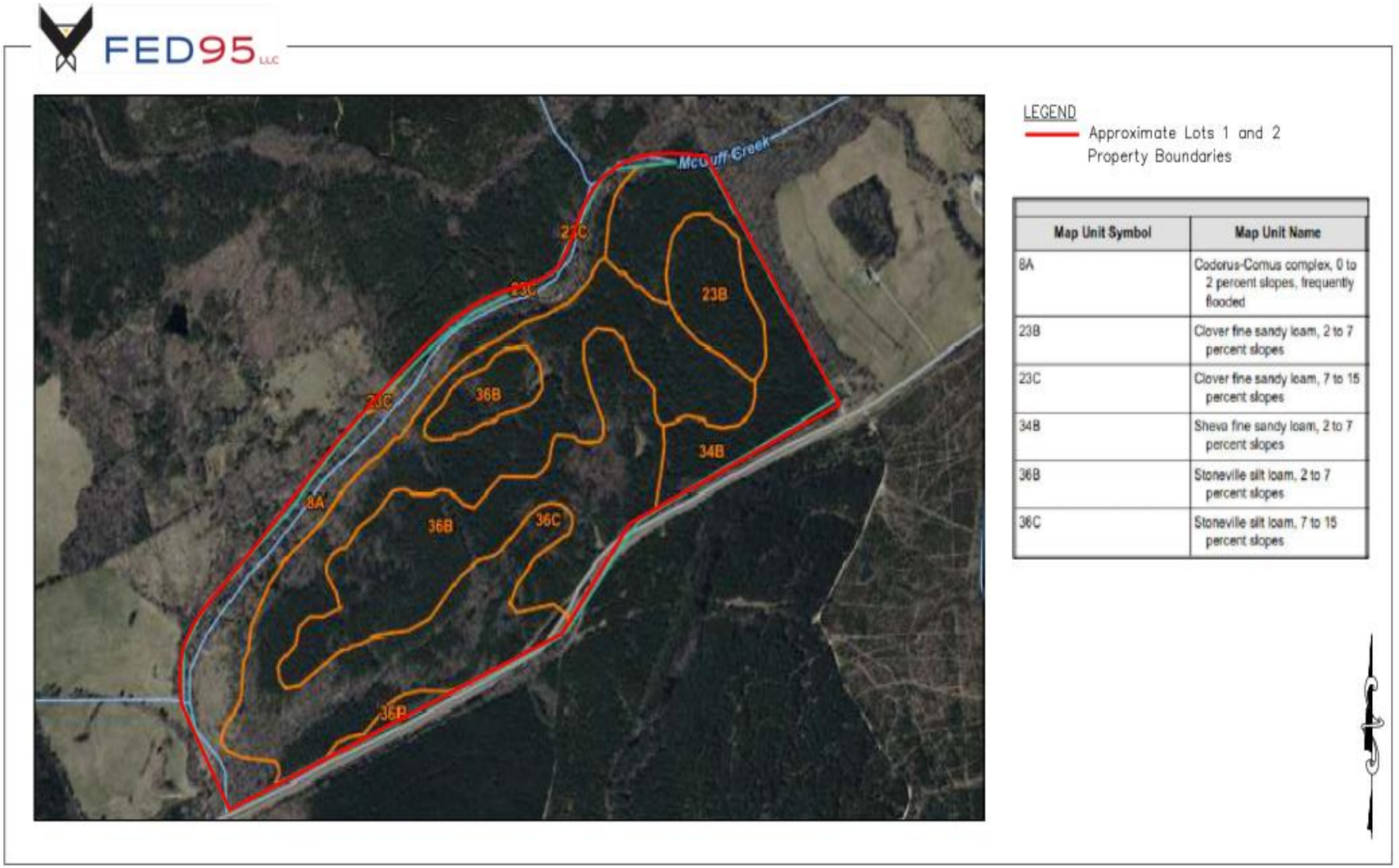

Figure 3-3: Soils Map

Notes: USDA Natural Resources Conservation Service Web Soil Survey, Mapped at 1:24,000, 2024

3.4.1.3.1 Geotechnical Investigative Activities

A Subsurface Exploration and Geotechnical Study – Berry Hill Road Mega-Park (Phase II) was prepared by Froehling & Robertson, Inc. (F&R) for Dewberry & Davis, Inc. on July 29, 2011. F&R conducted 58 boreholes to evaluate the subsurface soil at the Megasite. Of these boreholes conducted, five were completed on the Project Area. The five boreholes (B-39 to B-43) on May 24-26, 2011 on the proposed Project Area were drilled to a depth between 11.2 to 35.0 feet below ground surface (bgs) (F&R, 2011). General soils encountered include: sandy clay, silt, silty sand, and trace gravel. F&R did not report contact with bedrock for the boreholes conducted within the Proposed Project. Based on the regional geology of the proposed Project Area, no karstic features, sinkholes, geomorphology, or caves were observed or identified on the proposed Project Area (F&R, 2011).

The purpose of this study is to present the subsurface analysis results to best describe existing (as of 2011) Proposed Project conditions and recommendation. A copy of the Report can be provided upon request, with approval from Dewberry & Davis, Inc.

The following simplified findings and/or recommendations for Proposed Project include:

- Two of the soil boreholes (B-40 and B-42) encountered refusal materials above the expected preliminary planned finish grades. Based on the final planned grade for the structure, subcontractors (construction, builders) should expect difficult excavation conditions in various areas (F&R, 2011).
- The proposed development for an allowable design bearing pressure in the range of 2,000 to 3,000 pounds per square foot (psf) should be suitable for footing bearings on approved soil material (F&R, 2011).
- The study finds that the on-site soils will have a moderate shrink-swell potential; however, it is not recommended to modify designs to accommodate potential shrink-swell potential (F&R, 2011).
- Subsurface water was encountered in B-40 during the study. It is likely perched water may be encountered during excavation activities and the contractor should be prepared to dewater. Fluctuations in subsurface water levels and soil moisture can be anticipated with changes in precipitation, runoff, and season (F&R, 2011).

Further findings and/or recommendations for specific items, such as: structural fill, slope stability, frost depth, seismic site (also provided in **Section 3.3.4 below**), and foundation design can be found in Section 4.0 of the 2011 F&R Phase II.

3.4.1.4 Seismic Activity

Geologic faults are identified as a fracture in a zone between rock formations that allow geologic formations to move against one another. Such movement can result in seismic activity, including earthquakes. Virginia's seismic activities are concentrated in three primary areas: central Virginia seismic zone (CVSZ), Giles County seismic zone (GCSZ), and the Eastern Tennessee seismic zone (ETSC) (VDOE-GMR, Earthquakes, n.d.; Bollinger 1989). Virginia's earthquake activities generally, with a few exceptions, have been low to moderate-magnitude and have low occurrence but persistent (VDOE-GMR, Earthquakes, n.d.;

Bollinger 1978). The largest earthquake recorded in Virginia was recorded at 5.8 magnitude, with the epicenter (located within the fault zone (Shores fault zone, Chopawamsic fault, lakeside fault, and Spotsylvania fault)) determined in central Virginia, located near the town of Mineral, in Lousia County on August 23, 2011 (located approximately 130 miles Northeast from the Project Area). Based on a review of the VDOE-GMR earthquake hazards and the Virginia Minerals, Seismic Hazard in Virginia, G.A. Bollinger (1978), Virginia is situated on a passive margin, where earthquakes will occur at depths between three to 15 miles bgs and may be unable to specify the quake to a specific fault (VDOE-GMR, Earthquakes, n.d.; Bollinger, 1978).

Based on the geologic mapping provided by VDOE-GMR and Geologic Map of Viriginia Portion of the Danville 30x60 Minute Quadrangle (Henika, 2002), no faults or indication of a tectonic plate were identified on the Project Site, as well as the Project Area. In addition, the Project Area, is not located within VA's primary seismic zones. According to Federal Emergency Management Agency (FEMA), Earthquake Epicenters 1774 to the Present Map, Version: March 2017 (FEMA, 2017), one earthquake was identified in Danville with a magnitude between 3.01-4.00; however, the date of this earthquake was not provided. **Figure 3-4** present seismic activity within the Danville region between 2004 to 2024. According to VA Tech University Seismological Observatory (VA-TSO, image from Earthquaketrack.com) mapping area of magnitude 4+ earthquakes affecting Virginia over the last 30 years, no seismic activity was present within the Danville region.

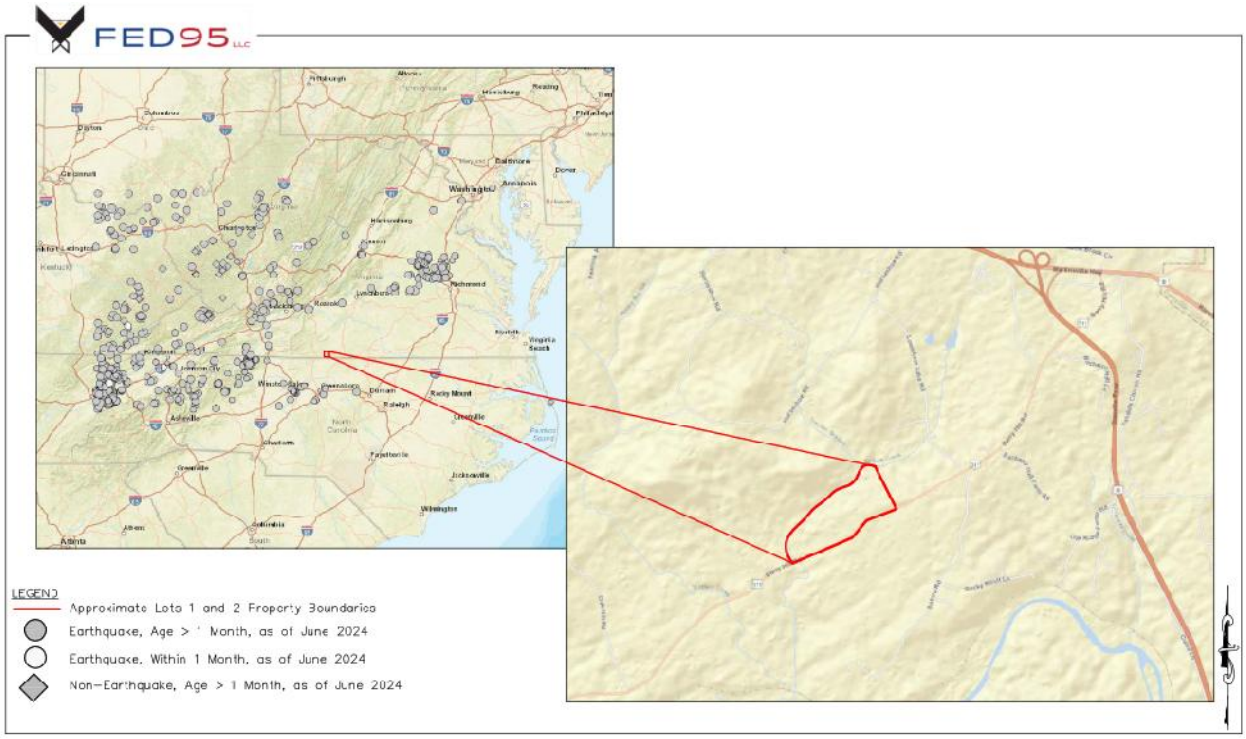

Figure 3-4: Seismic Activity 2004-2024
Notes: Not sized to scale. Imaged soured from USGS, Earthquakes - Online Web Viewer, 2004-2024

The FEMA Earthquake Hazards Map shows the Danville region to be located within the seismic design category (SDC) "A" and is described as a *very small probability of experiencing damaging earthquake*

effects (FEMA, 2020). The probability of minor-damage ground shaking, as shown in the 2018 figure, the probability is less than 1%. **Figure 3-5** presents FEMA's earthquake hazard map of the Eastern United States.

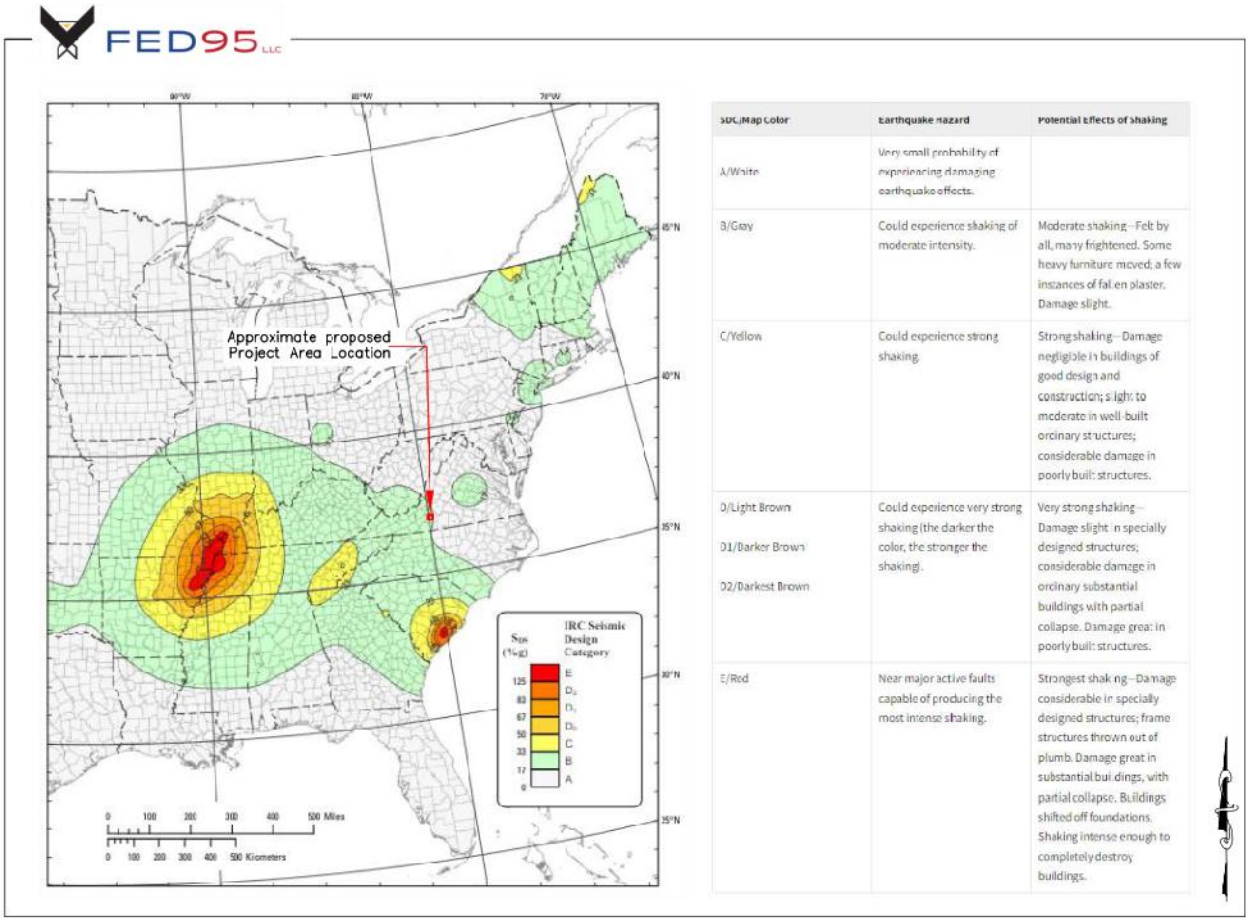

Figure 3-5: Earthquake Hazards Map
Notes: Not sized to scale. Imaged soured from FEMA, Risk Management, Earthquake Hazards Map, 2020

The 2024 USGS National Seismic Hazard Maps (Peterson et al., 2014) shows the Danville regions to be in a low seismic hazard.

3.4.2 Environmental Consequences

3.4.2.1 Construction and Operations

The Proposed Project impacts to geology, soils, and topography are anticipated to be direct, long term, and minor. Construction will include excavation, dredging, surficial grading, soil movement, and/or topsoil loss throughout the Project Area to accommodate facility buildings, future additions, parking lots, and retention pond construction. Facility construction will include drilling into a stable soil unit with reinforced caissons to support structure foundations. The lack of karstic conditions within the Proposed Project for proposed construction and operations are not anticipated to cause adverse geological impacts. Based on the precautions and best management practices adhered to during construction, soil erosion it anticipated to be

minimal. Planed levelling and grading activities would redistribute soils to accommodate planned development of the Proposed Project.

Microporous has indicated the Proposed Project will involve the clearing and/or excavating up to 120-acres (55-acres is already cleared, graded, and pad [concrete] ready). The filling of waters of the U.S. is not currently planned and are not anticipated to occur for any future development. The U.S Army Corps of Engineers has previously indicated that an on-site jurisdictional determination found both jurisdictional and non-jurisdictional features within the Southern Virginia Megasite (**Appendix B**). If filling of waters of the United States is found to be required as part of the Proposed Project, Microporous would require a Department of the Army Permit and authorization by state and local authorities prior to initiation of those activities. DOE has submitted a consultation letter to the Norfolk District of the U.S. Army Corps of Engineers regarding DOE's Proposed Action and Microporous' Proposed Project (**Appendix B**), and has also provided a copy of this Draft EA to the Norfolk District for review and comment.

3.4.2.2 Cumulative Impacts

Although additional tenants are planned for the Megasite at Berry Hill, which may also disturb soils during construction and operations, all such activities would be subject to similar regulatory requirements under the Virginia Pollutant Discharge Elimination System (VPDES) program minimizing the movement of soils to stormwater. In addition, geological and topographic conditions described for the Proposed Project are consistent with those across the Megasite and are not anticipated to be impacted by construction or operations of industrial facilities in the area. Therefore, despite plans for additional industrial development in the vicinity of the Proposed Project, no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse impacts to geology, topography, and soils.

3.4.2.3 Proposed Migration Measures

Potential for future impacts to soils and underlying geology would be mitigated throughout the life of the Proposed Action through the implementation of spill prevention and emergency response procedures, and a facility monitoring and inspection program. Microporous anticipates completing a permit for Stormwater Discharges associated with construction activities, but prior to operation, Microporous anticipates filing a Notice of Intent for authorization under the VPDES Permit for Stormwater Discharges associated with Industrial Activities (refer to **Section 3.6.2** for further information regarding stormwater permits). This required permit prohibits unauthorized discharges to surface water during operations and incorporates the requirements of a facility-specific Stormwater Pollution Prevention Plan (SWPPP) and erosion control measures, as well as other sitewide best management practices (BMPs).

3.4.3 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance. If the Proposed Project (development of the site) proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the

impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the proposed development would likely not proceed without DOE assistance. Under the No Action Alternative, the geologic and soil conditions for the area would remain unchanged from existing conditions. If the DOE would not fund the Proposed Project, and the Microporous initiative would not go forward at the Megasite, no additional research would occur at this location, the Project Area would remain undeveloped; therefore, no new impact to geologic and soil conditions would occur.

3.5 Non-Hazardous and/or Hazardous Materials and Waste

The Proposed Project is located within the Megasite (Lots 1 & 2 south of McGuff Creek). There is no known prior hazardous waste or non-agricultural or residential solid waste generation at the Proposed Project. In addition, no asbestos, lead, or polychlorinated biphenyl (PCB)-containing materials will be utilized for construction materials. There is also no USEPA identification number currently associated with the Proposed Project. There are no Superfund sites within at least a 1-mile radius from the proposed area (**Figure 3-6**) (USEPA, 2024). The Proposed Project on Lots 1 and 2 has been identified as agricultural with no known historical releases in soil or groundwater contamination, and no known current sources of emission or effluents. No evidence of contamination has been reported from either of the Phase I Environmental Site Assessment surveys (Dewberry, 2019).

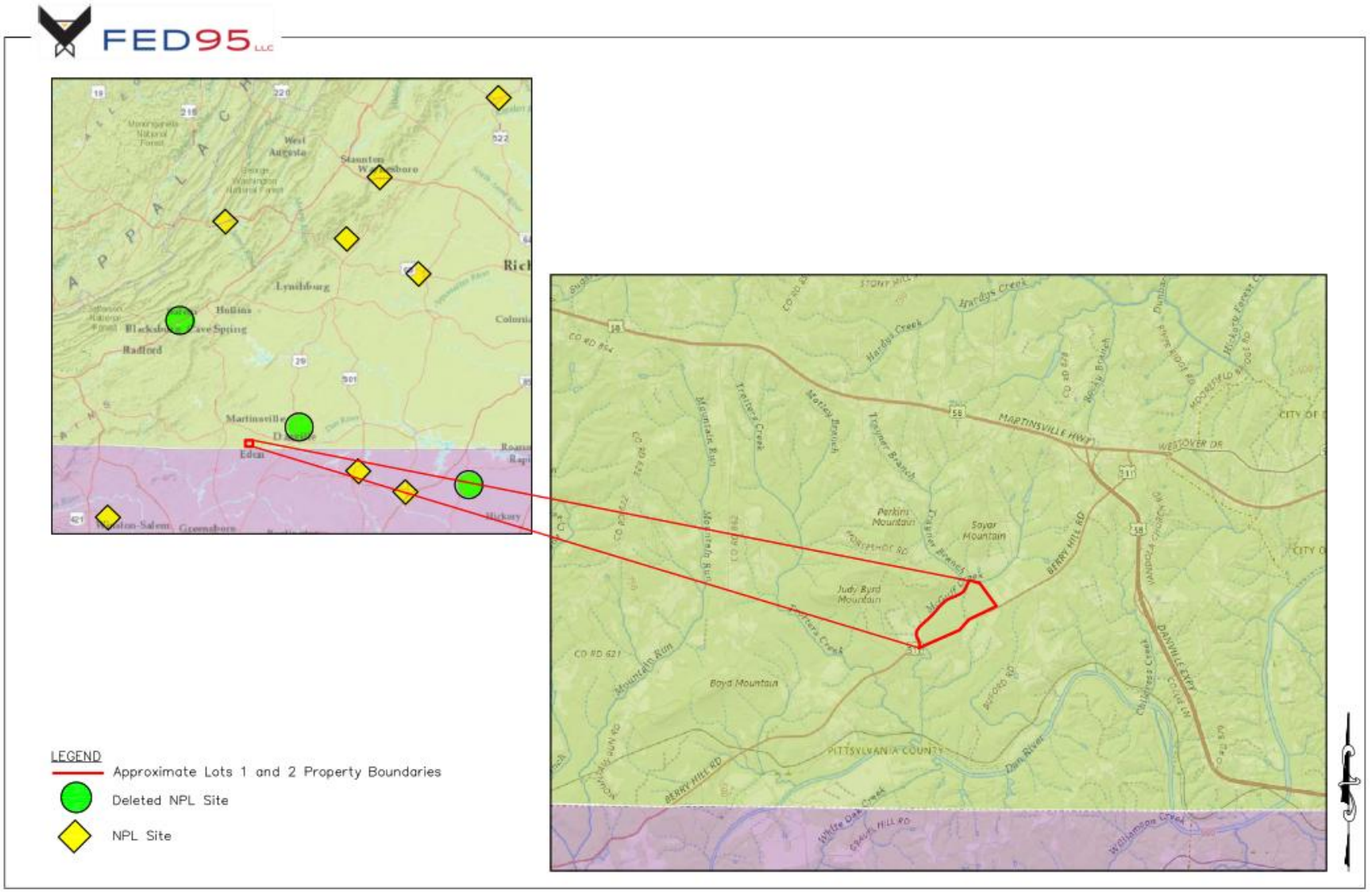

Figure 3-6: Superfund Sites within the Southern Virginia Area

Notes: Not sized to scale. Imaged soured from FEMA Superfund National Priorities List (NPL), EPA Region 3, ESRI, USGS, NOAA, 2023

3.5.1 Permits

The Proposed Project is not classified as a hazardous waste generator, as no operations involving hazardous materials or waste generation have previously occurred in this location. However, it is anticipated that Microporous will be registered with the Virginia Department of Environmental Quality (VDEQ) and follow the 9VAC20-60 and CFR § 262.11 guidelines. Microporous LLC headquarters (596 Industrial Park Road, Piney Flats, TN) is an existing facility with appropriate permits currently in effect, suitable to cover planned Project Stellar activities at this location. For the Southern VA Megasite, the Proposed Project currently has no permits in effect for planned development and operations. Microporous has indicated the following permits are anticipated to be required for their proposed Facility:

- Federal Permits: The following permits/approvals may be necessary for compliance with relevant federal requirements for proposed construction and operations
  - Federal approvals (U.S. Army Corps of Engineers authorization for placement of fill in waters at the U.S. (refer to **Section 3.6** regarding hydrologic conditions and water quality) under Section 404 of the CWA, USEPA permit under RCRA for applicable hazardous waste containment and disposal during operations
  - USEPA permit under Title V of the CAA (refer to **Section 3.11** regarding air Quality and emissions). The Title V of the CAA approval would be co-administered with VDEQ). This would not be required until Phases III and IV of the Proposed Project.
- Virginia State Permits:
  - VDEQ Water Protection Section 401 of CWA (refer to **Section 3.6** for further information), VDEQ-VPDES permit for construction activities and industrial operations, under the CWA National Pollutant Distance Elimination System (NPDES) program.
  - VDEQ Title V Permit under the Minor New Source Review (NSR) permitting program (refer to **Section 3.11** for further information)
- City permits: local approval of building permits from Pittsylvania County Community Development Department.

Other permits required include a Zoning Permit for Use, Erosion and Sediment Control Permit, Virginia Stormwater Management Permit (reviewed and approved by the City of Danville), Site Plan Approval for Zoning Ordinance, a Virginia Department of Transportation Land Use Permit (for ingress/egress to the property), and a Building Permit.

3.5.2 Non-Hazardous and/or Hazardous Generation and Waste

Microporous has indicated the following regulated chemicals and estimated quantities that are expected during annual operations, as shown on **Table 3-2** below.

Table 3-2: Anticipated Chemical Production at the Proposed Project

Chemical Inventory		CAS Number	USEPA-CERCLA or OSHA* Hazardous List?	Estimated Production Quantity Used
Ceramics Powders (combined Boehmite + Alumina)	Boehmite	1318-23-6	Not listed	9,425 US Tons/year
	Alumina (aluminum oxide)	1344-28-1	Powder form is not listed. Fibrous form is listed in the USEPA CERCLA consolidated list of chemicals	
Polyvinylidene Fluoride (PVdF)		24937-79-9	Not listed	2,480 US Tons/year
Polymethyl methacrylate (PMMA) powder		9011-14-7	Not listed	Not specified
Porous polyolefin base film		83136-87-2	Not listed	600 MM sqm/year
Estimated annual production quantity at the proposed facility				After Phase 1 is fully operation, ~600 million sqm/year

**OSHA: Occupational Safety and Health Administration*
Chemical and estimated quantities are as provided by a representative of Microporous (2024)
OHSA, Appendix A to §1910.19 – List of Highly Hazardous Chemicals, Toxics, and Reactives (1992, updated 2019)
USEPA, CERCLA Hazardous Substances List (40 CFR 116.4, USEPA 550-B-24-001), (1978, updated 2024)

Microporous has stated the operations resulting from the Proposed Project will generate non-hazardous waste including recycling/trash and solid ceramic/polymer filter cake from slurry preparation for coating process. Wastewater will be treated off-site by the Publicly Owned Treatment work (POTW). Non-hazardous waste generated as a direct result of manufacturing processes would be recycled to the extent possible by on-site recycling equipment and re-incorporated into the manufacturing process. Non-hazardous waste that cannot be recycled will be disposed of in accordance with Federal, State, and local environmental regulations, including RCRA.

If hazardous waste transportation and disposal is required, this will be completed by licensed and permitted contractors in accordance with Federal, State, and local environmental regulations. Microporous anticipates its operations will involve storing, using, handling, and otherwise processing hazardous materials, including granular or powder polymers and ceramics, binder, additives, industrial polyolefins, and industrial solvents. All such handling will occur in-production scale equipment by properly trained individuals and as allowed under applicable permits, once granted to Microporous. Microporous has prepared, developed, and will have dedicated proper hazardous chemical/material handling, engineering controls, waste management, and disposal practices to minimize/eliminate risk to the public and environment (refer to **Section 3.9** for further information regarding EH&S).

3.5.3 Environmental Consequences: Hazardous Materials and Hazardous Waste

3.5.3.1 Construction

The construction phase of the Proposed Project is expected to generate negligible to minor, direct, and temporary impacts from regulated waste. Solid waste and sanitary waste generated during construction activities would be limited to common construction-related waste streams. It is Microporous' responsibility to follow applicable state permits to discharge any construction-related waste stream. In-state or out-of-state landfills or recycling facilities would have the capability and capacity to accept these waste (if documented and approved), and therefore, there would be no impact associated with the disposal of these

materials. In addition, the Facility would implement BMPs to minimize the quantity of non-hazardous solid waste generated, as appropriate, during construction and to ensure proper handling of materials.

3.5.3.2 Operation of the Facility

Operations of the facility under the Proposed Project are expected to incur minor, direct, long-term impacts from regulated wastes. There would be certain non-hazardous waste production generated during facility operations including municipal solid waste as well as any applicable chemicals used. No underground storage tanks are included in the Proposed Project. Materials would be stored in the appropriate containers designed for spill containment in accordance with BMPs and any applicable regulatory requirements. Materials would be received via truck to facilitate more controlled and consistent unloading. While there is the potential that materials could be received via rail in the future, such development would not occur until later phases of this development (starting in Phase II).

It is anticipated that the Proposed Project may produce some amount of non-hazardous waste (see **Table 3-2** above for estimated annual production rates). Major waste stream estimates for the anticipated operations of Phase I completion are as followed on **Table 3-3**:

Table 3-3: Estimated Waste Streams at the Proposed Project (Full Capacity)

Production Area/Process	Description	Classification	Estimated Waste Stream
Slurry Preparation	Solid filter cake	Non-hazardous	115 mT/yr
Slurry Preparation	Liquid filtrate	Non-hazardous	45,600 gals/yr
Coating/Slitting	Coated PE separator	Non-hazardous	886 mT/yr
Total site	General trash	Non-hazardous	625 mT/yr

Note: This table will only include the estimated waste streams for the completion of Phase I. Phases II through IV waste streams are notincluded in this table.

The quantity of the non-hazardous waste generated at the facility would determine the facility's generator status and which Federal and State regulations related to waste generation, management, and disposal would be applicable. The initial operations as a result of the Proposed Project would have a negligible impact on the overall quantity of hazardous waste generated and the amount of waste that would require offsite treatment and disposal.

Microporous intends to recycle or reuse byproducts and non-hazardous waste to the maximum extent possible, minimizing the amount of waste that would be disposed off-site. As a result, the operations as a result of the Proposed Project would have minor impact on the overall quantity of solid waste generated at the Proposed Project, which would be disposed of at a licensed landfill off-site.

3.5.3.3 Cumulative Impacts

No additional tenants, apart from Microporous, are planned for the Proposed Project area. The type and extent of impacts from regulated wastes from the other lots within the Megasite are not reasonably foreseeable due to the unknown nature of any use of other lots by the theoretical occupants and does not affect the current use of the Proposed Project. However, it is expected that any additional tenants within the Megasite would follow all applicable federal, state, and local permitting related to waste management, which would mitigate against potential significant and cumulative impacts.

3.5.3.4 Proposed Mitigation Measures

During constructions, standard BMPs and preventive measures such as machining fencing around construction areas, establishing designated materials containment and storage areas, and controlling the flow of construction equipment and personnel through the Proposed Project, would minimize the potential for a release of hazardous materials to occur. If a release occurs, immediate action would be taken place to contain, remediate, and dispose of any contaminated materials in accordance with Federal, State, and local regulations and site-specific spill plans.

For the operational phase, arrangements are not yet made for the off-site transport and treatment, or disposal, of wastes generated during operations; however, the facility plans to reuse materials to the extent possible and would dispose of other materials offsite in accordance with applicable regulations.

3.5.4 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance (the Proposed Action). If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the Proposed Action would likely not proceed without DOE assistance. Under the No Action Alternative, non-hazardous and/or hazardous waste for the area would remain unchanged from existing conditions. If the DOE would not fund the Proposed Project, and the Microporous initiative would not go forward at the Virginia Site, no additional research would occur at this location, the Microporous site would remain undeveloped; therefore, no use of hazardous materials or byproducts will be produced. Ongoing construction activities by the local governmental authority (i.e., tree removal and/or installation of a pad on select portions) in the Proposed Project could present the potential use of hazardous materials and/or waste, although those would be temporary due to the short-term nature of the activities completed.

3.6 Hydrologic Conditions and Water Quality

3.6.1 Groundwater

Groundwater is not directly utilized for potable or non-potable purposes at the Megasite in general; drinking water is supplied by the municipal water system (see **Section 3.9** for details) Groundwater is also not directly withdrawn from the Proposed Project, nor does wastewater discharge to groundwater occur. No SWPPP, NPDES, Water Pollution Control Facility (WPCF) and/or other water related permits have been issued for Lots 1 and 2. Microporous intends to apply for any necessary permits related to discharging wastewater to the municipal system. Potential permits include a Virginia Water Protection Permit and/or a Virginia Pollutant Discharge Elimination System Permit.

The upper aquifer in the majority of area of Lots 1 and 2 is known to be present at depths greater than 6.5 feet bgs, with the exception of along the northeastern property boundary, which is at depths of up to three feet, and the area of McGuff Creek which is at depths of up to 1.5 feet bgs as reported by the Natural Resources Conservation Service (NRCS) (USDA, n.d.a) (**Figure 3-7**).

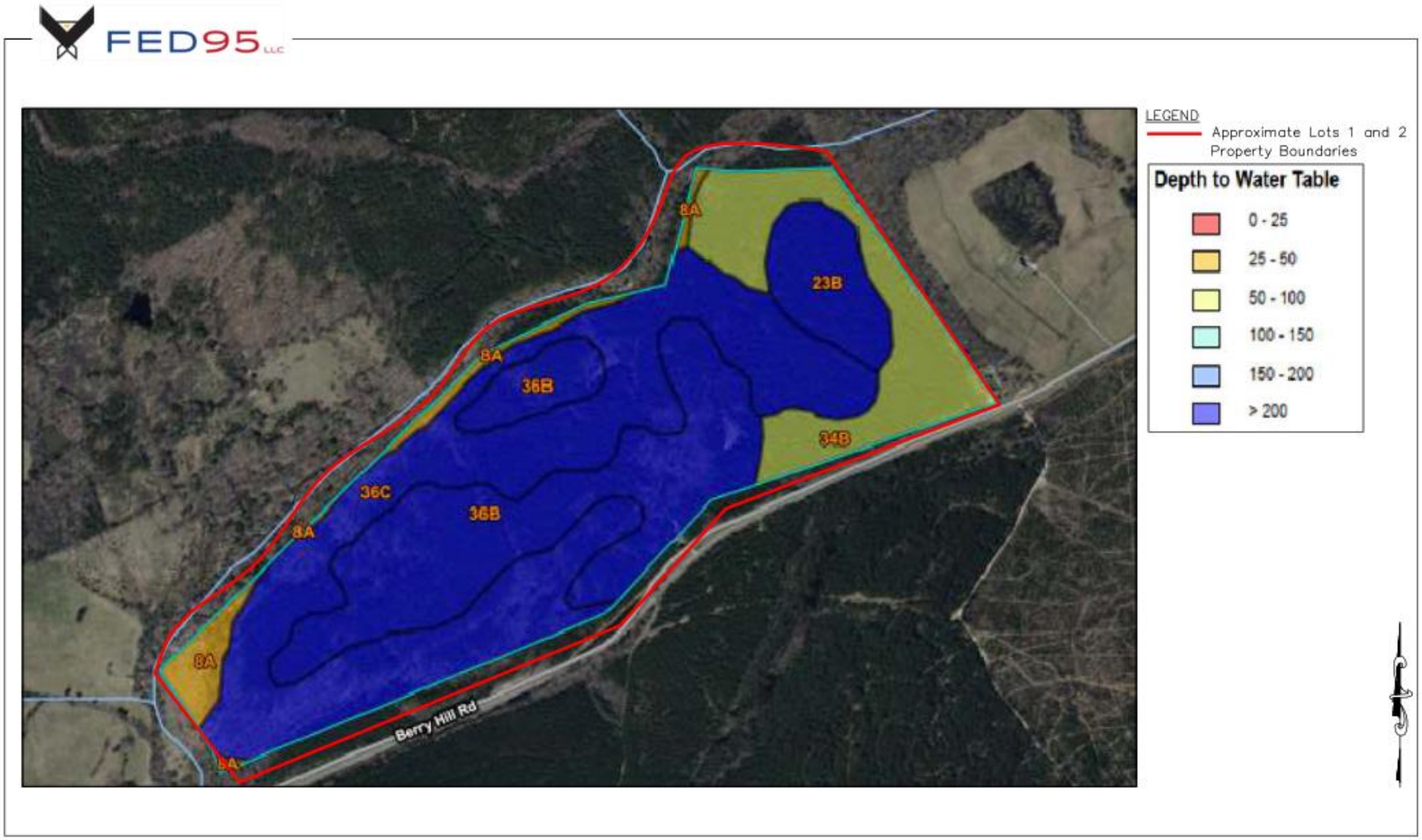

Figure 3-7: Depth to Groundwater

Notes: Not sized to scale Imaged soured from USDA Natural Resources Conservation Service Web Soil Survey, Mapped at 1:24,000, 2023, retrieved June 5, 2024

3.6.2 Surface Water

The Proposed Project (Lots 1 and 2, south of McGuff Creek) is within the drainage basin of the Dan River, specifically the Trotters Creek-Dan River watershed (identification number HUC 030101030903 by the USGS). The nearest significant surface water body is the Dan River, located approximately 1.55 miles south of Lots 1 and 2. McGuff Creek and Trayner Branch are adjoining north of the Proposed Project, and an unnamed tributary is located along the northern and western site boundaries which ultimately discharges to the Dan River. In addition, a 0.18-acre freshwater forested/shrub wetland is identified on the southern portion of the Proposed Project, which is identified to contain the seasonal presence of surface water during the early growing season (discussed further in **Section 3.6.3** below). **Figure 3-8** displays areas of surface water within the area of Lots 1 and 2. The McGuff Creek, Trayner Branch, and the unnamed tributary are listed as having an unknown condition under Section 303(d) of the CWA. Lots 1 and 2 are provided water by an existing municipal water line located along the southern Proposed Project boundary, along Berry Hill Road, and an existing sanitary sewer line is located along the southwestern portion of Lots 1 and 2. No current utilization of surface water nor discharges of any processed or sanitary wastewaters to surface waters are made at the Proposed Project, as the Proposed Project is currently approximately 55-acres of cleared, graded and pad ready area and the remaining acreage is forested area. A retention pond is anticipated to be installed within the Proposed Project based on the most recent Project Stellar building plans (provided by Microporous in 2024), and proper permitting will be acquired as necessary from applicable governing entities. Microporous anticipates the need to obtain and confirm to the necessary permitting as required.

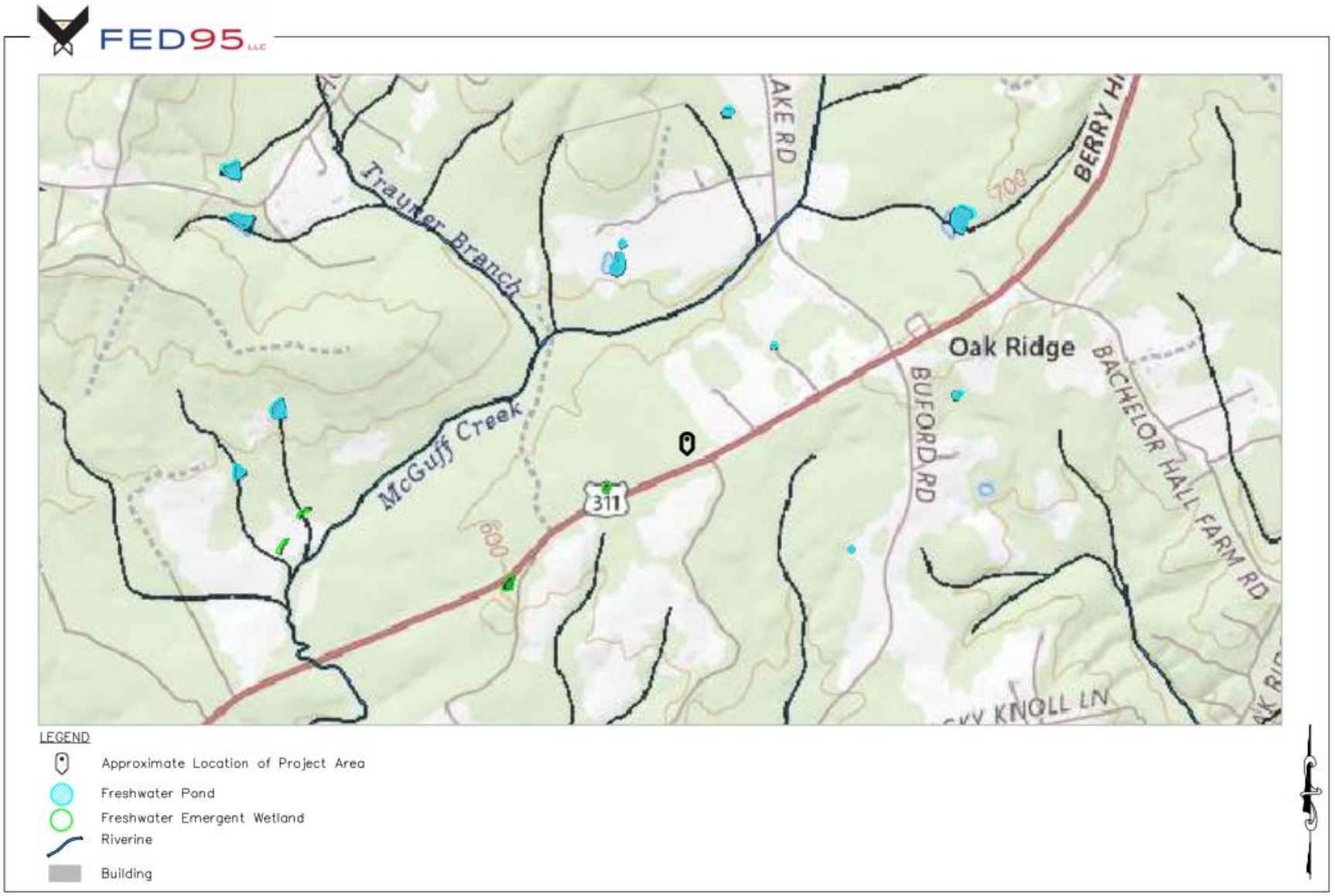

Figure 3-8: Surface Water Map

Notes: Imaged soured from U.S. Fish and Wildlife Service, National Wetlands Inventory (NWI), NWI Mapper, retrieved May 29, 2024

3.6.3 Wetlands

The United States Fish and Wildlife Service (USFWS) NWI mapping system (USFWS, 2023) (**Figure 3-9**) indicates that no federally-regulated wetlands are present within the Proposed Project Area or adjacent areas. Two state-level wetland areas (Freshwater Forested/Shrub Wetland, PF01C) were identified to be present on the southern portion of Lot 1 and on the southern adjacent Berry Hill Road, based on review of the Virginia Department of Conservation and Recreation (VDCR), Virginia Wetlands Catalog: An Inventory of Wetlands and Potential Wetlands with Prioritization Summaries for Conservation and Restoration Purposes by Parcel, Subwatershed, and Wetland Boundaries. (Weber, 2014) (**Figure 3-9**). The wetland located on the southern property boundary of the Lot 1 location is approximately 0.18-acre. The wetland located adjacent to the southern property boundary of Lot 1 is approximately 0.34-acre. The USFWS Freshwater Forested/Shrub wetland description is provided below **Figure 3-9.**

The presence of hydric soils is one of the elements utilized to identify potential wetlands. When poorly drained soils such as Clover fine sandy loam, Sheva sandy loam, and Stoneville silt loam are wet for an extended period of time, they are considered hydric soils and are considered to be a factor in evaluating the presence of wetlands (see **Section 3.4.1.3** for further information regarding the soils at the proposed Project Area). Clover, Sheva sandy loam, and Stoneville silt loam are present on the Proposed Project (USDA, 2023), and have been assigned a USDA National Resources Conservation Service, State Soil Data Access Hydric reading of 2 (NRCS, n.d.). NRCS hydric rating 2 is defined as:

> *Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:*

Based on the range of characteristics for the soil series, will at least in part meet one or more field indicators of Hydric Soils in the United States, or show evidence that the soil meets the definition of a hydric soil. On-site observations on May 24 through July 11, 2011, during a Geotechnical Study conducted by Froehling & Robertson, Inc. (F&R, 2011) confirmed that wetlands are not a potential concern on the project site (Refer to **Section 3.4.1.3.1** above for further details of this study)

Figure 3-9: National Wetland Inventory Map

Notes: Not sized to scale, Imaged soured from U.S. Fish and Wildlife Service (1982), National Wetlands Inventory (NWI), NWI Mapper, ESRI, photo interpreted using 1:58,000 scale., retrieved May 29, 2024

System Palustrine (P): The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt (USFWS, 2023).

Class Forested (FO): Characterized by woody vegetation that is 6 m tall or taller (USFWS, 2023).

Subclass Broad-Leaved Deciduous (1): Woody angiosperms (trees or shrubs) with relatively wide, flat leaves that are shed during the cold or dry season; e.g., black ash (Fraxinus nigra) (USFWS, 2023).

Water Regime Seasonally Flooded (C): Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface (USFWS, 2023).

3.6.4 Environmental Consequences: Water Resources

3.6.4.1 Ground Water

3.6.4.1.1 Construction

There is no current or anticipated direct use of groundwater at the Megasite, including the vicinity of Lots 1 and 2. Based on the availability of municipal water utilities, and as the Proposed Project would likely not encounter groundwater during construction activities, it is unlikely that the Proposed Project would have a negative impact on the groundwater in the area of Lots 1 and 2.

3.6.4.1.2 Operation of the Facility

There is no current or anticipated direct use of groundwater at the Megasite, including the vicinity of Lots 1 and 2. Based on the availability of municipal water utilities, and as the Proposed Project would likely not encounter groundwater during construction activities, it is unlikely that the Proposed Project would have a negative impact on the groundwater in the area of Lots 1 and 2.

3.6.4.2 Surface Water

3.6.4.2.1 Construction

Construction of the Proposed Project will have minor temporary indirect impacts from runoff to surface waters. A review of current permits for the Project Area indicated record of three permits in the NPDES system database in relation to the Project Area that are listed as Non-Major: General Permits for construction of storm water utilities (identifier: VAR10P821, VAR10R052, and VAR10T687). Compliance tracking for the permits indicates no violations identified in relation to the permits.

Sources of inputs for the Proposed Project include precipitation and runoff from the constructed building into storm water utilities that are managed by the City of Danville, Sanitation Division. Stormwater runoff from the Proposed Project is ultimately discharged to the City of Danville municipal stormwater drainage system. Current development plans for the Proposed Project avoid incursion into jurisdictional freshwater aquatic/wetland resources which have been identified within the area of Lots 1 and 2. If development plans are revised to include placement of fill in a wetland or other aquatic resource, avoidance and minimization measures would be defined in conjunction with application for appropriate permits and approvals under Section 404 and 401 of the CWA, and applicable state statutes. Construction and operations of Microporous facilities will include up to 120-acres of impervious surface, which could potentially impact stormwater runoff at the site, and may require a stormwater management structure(s) such as stormwater retention pond(s) and/or drainage culverts. Potential stormwater discharges would be managed according to requirements of authorizations provided through the Commonwealth of Virginia, specifically under Virginia DEQ VPDES (Virginia Pollutant Discharge Elimination System) permits for industrial construction and operations under the CWA NPDES program, and through a Virginia Water Protection (VWP) Permit from the Virginia DEQ under Section 401 of the CWA. As the activities being performed at the Proposed Project for Phase I of development do not appear to include impacts to surface waters, such

as land clearing, dredging, filling, excavating, draining, or ditching in open water or streams, a VWP Permit as issued by the VDEQ does not appear to be required for operations conducted at the site at this time. However, it is anticipated that Phase II of the Microporous Project Stellar will include the addition of a retention pond, and permitting will be assessed and conformed to as required by the appropriate governing entities.

3.6.4.2.2 Operation of the Facility

During operations, discharges of process water to the local POTW would be managed according to requirements of authorizations obtained from the Commonwealth of Virginia. Discharge of treated water to the local POTWs would be modest due to anticipated emphasis on internal water recycling processes within Microporous facilities. The existing POTW provider has indicated their established treatment works will be able to handle water and wastewater needs produced during operations for the Proposed Project within existing capacity. The Proposed Project is anticipated to generate non-hazardous waste (per 40 C.F.R. §261.2) including garbage/trash and sludge from slurry preparation for coating processes. Wastewater will be treated off site via the POTW, and therefore any sludge resultant from the Proposed Project would be treated off site as well. Non-hazardous waste generated as a direct result of manufacturing processes will be recycled to the extent possible by on-site recycling equipment and re-incorporated into the manufacturing process. Non-hazardous wastes which cannot be recycled would be disposed of in accordance with Federal, State, and local environmental regulations including RCRA and in accordance with CWA permits or authorizations that may be required.

3.6.5 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance (the Proposed Action), the potential surface water impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance. Under the No Action Alternative, surface water would remain unchanged from existing conditions.

3.7 Biological Resources

3.7.1 Vegetation

The Proposed Project consists of gravel and areas of concrete, however the exterior boundaries of Lots 1 and 2 consists of heavy vegetation and forested areas. The Proposed Project is identified as being located within an area of shrub/scrub, pasture, hay, or forested area, as identified on the USGS National Land Cover Database (USGS, 2019) obtained via NEPAssist (https://www.epa.gov/nepa/nepassist) and covered by Evergreen, mixed, and deciduous forested area. The surrounding properties to the north and east appear to be a mixture of residential, agricultural, and vacant, forested or vegetated land. The anticipated use for the westerly and southerly adjoining lots are included as part of the Megasite at Berry Hill and will be utilized for industrial use. The adjoining properties are currently zoned heavy industrial/M-2. To date, 55-acres have

been cleared and developed on Lots 1 and 2 by the local municipal government to prepare for industrial developments; however, a total area of planned development will eventually amount to 212-acres of cleared and developed area on Lots 1 and 2. If Phases II through IV proceed, those project plans would comply with federal, state, tribal, and local requirements for tree and vegetation clearance.

In a general classification, Virginia is in the temperate deciduous forest biome, consisting of three major forest biomes: eastern deciduous forest, southeastern mixed/evergreen forest, and a smaller portion of eastern mixed forest. Original vegetation of the Triassic Basin has been mapped as Oak-Hickory-Pine forest, dominated by various hickories, shortleaf pine (*Pinus echinata*), loblolly pine (*Pinus taeda*), white oak (*Quercus alba*), and post oak (Quercus stellata). There is significant agriculture in the area, including production of corn, tobacco, cotton, soybeans, small grains, and truck crops. Many tree species are found on abandoned fields, and consist of an early-successional stage of shortleaf pine, loblolly pine, Virginia pine (*Pinus virginiana*), and a variety of hardwoods (Woods, Omerink, & Brown, 1999).

3.7.2 Threatened and Endangered Species (TES)

The Proposed Project is located in the Triassic Basins Ecoregion as defined by the USEPA as a Level IV ecoregion in USEPA Region 3. Information regarding the potential state or federally listed threatened, endangered, or candidate species within the vicinity of the Proposed Project was obtained from the USFWS (**Figure 3-10**) and the VDWR (**Figure 3-11**). **Table 3-4** summarizes the information regarding status and habitat requirements for federal and state listed species. These are species that have the potential to be present within the Proposed Project and therefore are evaluated further in this EA. No listed endangered or threatened species have been observed or documented on Lots 1 and 2, and nowhere on the Proposed Project encompasses any designated critical habitat for a listed species. A report generated from query of the USFWS IPaC tool identified theoretical potential for three threatened, endangered, or candidate species and nine migratory bird species to exist within or in proximity to the Proposed Project (**Appendix B**). In particular, the USFWS IPaC tool identified a Proposed Endangered species (the Tricolored bat) that could be impacted by the Proposed Project, and utilizing a USFWS Determination Key (Dkey) found that the Proposed Project "may effect" this species. However, the Southern Virginia Megasite does not contain critical habitat for this species, and a bat survey has been commissioned for the overall Southern Virginia Megasite to ascertain if the tricolored bat is present on the Southern Virginia Megasite. The findings of this survey are not yet available, but will be addressed in the Final EA. It is expected that if the tricolored bat is identified in the Proposed Project area, mitigation measures (particularly restricting tree cutting to times of year when this species will not be present) would be followed. The Final EA will discuss the probability of presence and any required mitigation measures. As part of a Quest Site Solutions Certification Report (Certification Report) commissioned prior to the development of the overall Southern Virginia Megasite in June 2021, the Northern Long-eared Bat (NLEB) was identified as a threatened species. However, this species was not identified in a recent (November 2024) USFWS IPaC Official Species List. The Certification Report noted that there are no known maternity roost trees or hibernaculum within close proximity to the Southern Virginia Megasite. DOE also completed a review of the Northern Long-Eared Bat Regulatory Buffer Interactive Tool (https://dwr.virginia.gov/wildlife/bats/northern-long-eared-bat-application/) in November 2024 and found that the overall Southern Virginia Megasite contained no NLEB hibernacula, roots, or mist-net and auditory captures.

Multiple surveys have been conducted on an area nearby west of the Proposed Project between 2010 and 2015, less than a mile from Lots 1 and 2, with the most recent study conducted in 2015, totaling 340 acres of surveyed land. The 2015 survey conducted was for potential populations of *Echinacea laevigata* (Smooth Coneflower), *Isotria medeoloides* (Small Whorled Pogonia) and *Nestronia umbellula* (Indian Olive) at the above referenced site. The survey for Indian Olive, a protected plant, was conducted under the recommendation of the consulted surveyors. Due to their rarity and loss of potential habitat from development, *Echinacea laevigata* and *Isotria medeoloides* have been listed by the USFWS as Endangered and Threatened, respectively. These plants have also received formal recognition as Threatened and Endangered, respectively, by the Virginia Department of Agriculture & Consumer Services under the Commonwealth of Virginia's Endangered Plant & Insect Act. Prior surveys conducted in 2010 and 2011 were conducted during the growing seasons for the population of the above listed flora. Search efforts identified no individuals of any of the three target plant species within the investigated area in 2010, 2011, or 2015, and the site has been labeled as having a low potential for their occurrence.

A survey of freshwater mussel fauna in Trotters Creek and unnamed tributaries of the Dan River was conducted in 2015 nearby west of the Proposed Project to determine potential impact to the freshwater mussel habitat during development of the entire Megasite. The area was surveyed for the presence of the James spinymussel (*Pleurobema collina*) and potential habitat, which has been identified as a federally and state endangered species and has the potential to be located within the area of the Proposed Project. The surveyed area did not account for potential freshwater mussels in McGuff Creek or Trayners Branch, which are located adjoining north of Lots 1 and 2. However, of the entirety of the survey which consisted of approximately 3.1 effort hours of observed area (less than 1 mile west of the Proposed Project), no mussel species, family Unionidae were observed during the survey. The only bivalve observed was the Asian clam (*Corbicula fluminea*), which was found in Trotters Creek. No other mollusks or snails were observed, and water conditions were reported to be clear and shallow, which would have provided fair conditions to find mussels. In addition, previous surveys performed in 2010 and 2011 across the entirety of Trotters creek produced no evidence of freshwater mussels. In addition, no areas of potential habitat were observed, as concluded by the survey.

The Monarch Butterfly is considered a candidate species and has not, to date, been formally listed or proposed for listing under the Endangered Species Act (ESA) (Endangered Species Act, 1973). The Monarch Butterfly does not have a designated critical habitat, and there are no unique features/vegetation associated with the Proposed Project hat preferentially support Monarch habitat. It is therefore unlikely that the Proposed Project would have a negative effect on this species.

Additionally, the USFWS identifies several eagles and other migratory birds on its Birds of Conservation Concern (BCC) list which are considered as part of this evaluation. All applicable species are identified in **Table 3-4** below.

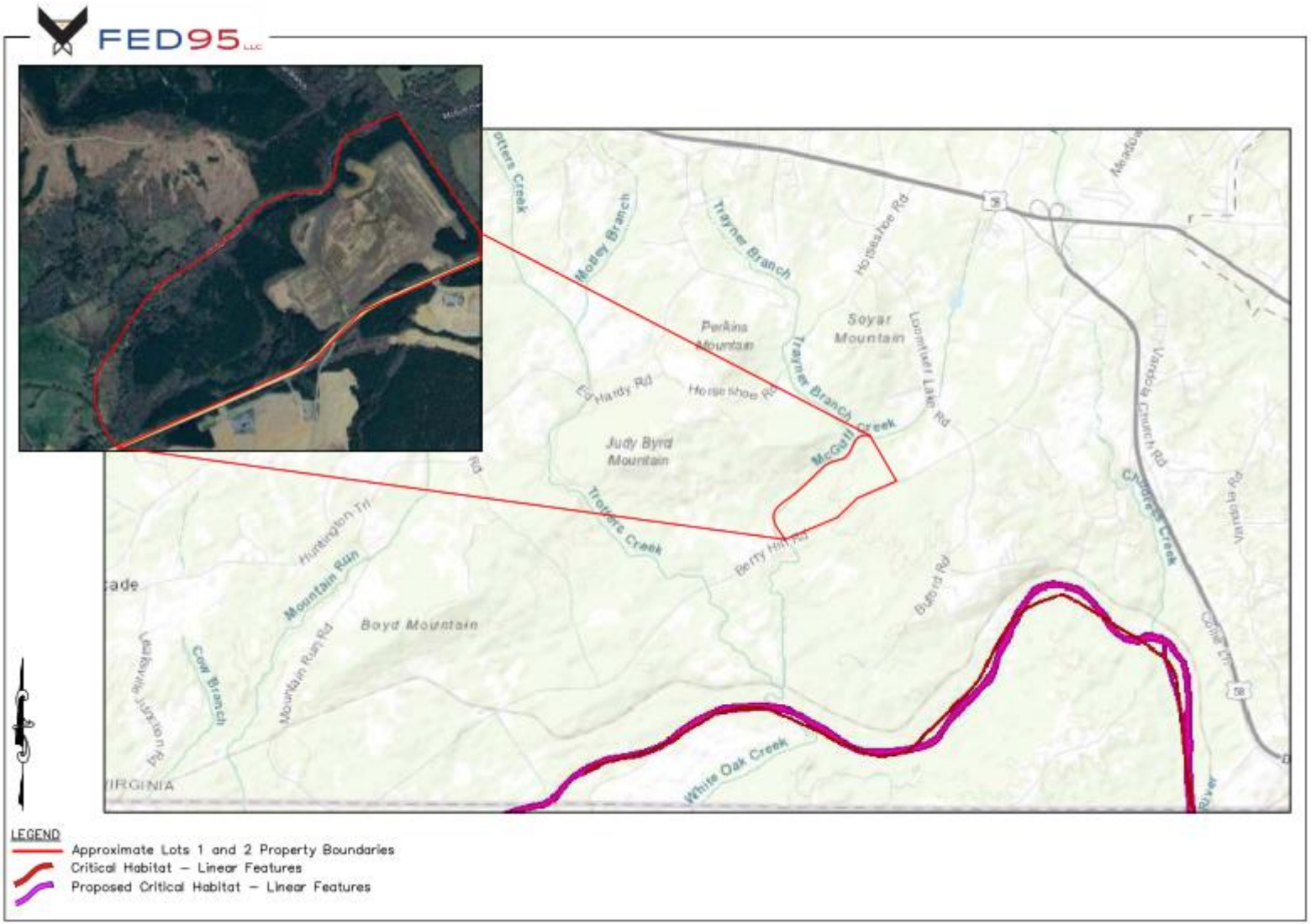

Figure 3-10: U.S. Fish and Wildlife Service Critical Habitat Map

Notes: Image not sized to scale. Imaged soured from US Fish and Wildlife Service Critical Habitat, Online View, State of North Carolina, DOT, VITA, Esri, HERE, Garmin, INCREMENT P, USGS, METI/NASA, NGA, EPA, USDA. Accessed May 9, 2024

No conservation of a crtical habitat for threatened and endangered species is identified on Lots 1 &2.

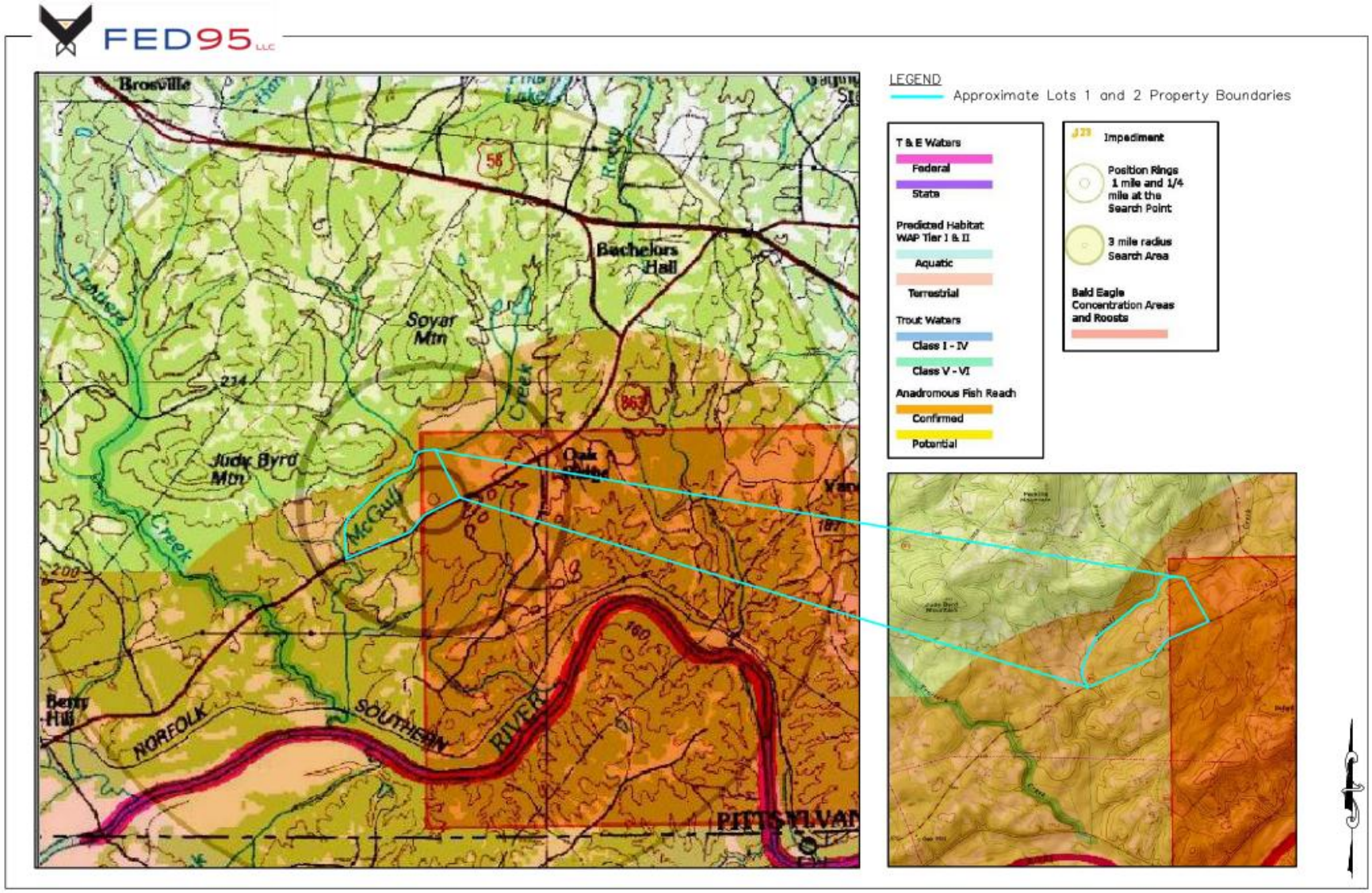

Figure 3-11: Virginia Department of Fish and Wildlife Habitat

Note: Image not sized to scale. Image sourced from: VDWR Habitat Mapper. ©Commonwealth of Virginia Department of Game and Inland Fisheries, June 2024

Table 3-5 summarizes the list of species identified as a potential concern by the USFW and VDWR based on habitat characteristics and the likelihood of the species occurring within the Proposed Project.

Table 3-4: Identified Federal and State Threatened and Endangered Species

Scientific Name	Common Name	Federal/ State Status	Habitat	Habitat Present
*Crotalus horridus**	Timber Rattlesnake	Collection Concern	Mountainous or hilly forests, hardwood or pine forests, swamps and river floodplains, lowland cane thickets, and agricultural fields	Potentially
*Danaus Plexippus***	Monarch Butterfly	Candidate (federal-level only)	Areas with presence of milkweed (*Asclepias* spp.) plants (fields, gardens, wetland areas, etc.)	Potentially
*Fusconaia masoni**	Atlantic Pigtoe	Federal Threatened, State Threatened	Coarse sand and gravel, and rarely in silt and detritus. Small creeks to larger rivers with excellent water quality, where flows were sufficient to maintain clean, silt-free substrates.	No
*Lampropeltis elapsoides**	Scarlet Kingsnake	Collection Concern	Wet pinelands and mesic hammocks, and/or drier habitats under rocks, logs, and debris.	Potentially
*Lanius ludovicianus**	Loggerhead Shrike	State Threatened	Open country with short vegetation and well-spaced shrubs or low trees, particularly those with spines or thorns.	Potentially
*Lanius ludovicianus migrans**	Migrant Loggerhead Shrike	State Threatened	Open country with short vegetation and well-spaced shrubs or low trees, particularly those with spines or thorns.	Potentially
*Lasmigona subviridis***, *	Green Floater	Proposed Threatened (Federal Protected, State Threatened)	Small streams and large rivers in the eastern United States.	No
*Myotis lucifugus**	Little Brown Bat	State Endangered	Roost in caves and mines in the winter, can be found in trees, artificial structures, bat houses, under rocks and in piles of wood in the summer. Foraging habitat requirements are generalized, occurring primarily over streams and other bodies of water, along the margins of lakes and streams or in woodlands near water.	No

Scientific Name	Common Name	Federal/ State Status	Habitat	Habitat Present
*Myotis septentrionalis**	Northern Long-eared Bat	Federal Endangered, State Threatened	Overwinters in caves or mines and spends the remainder of the year in forested habitats.	Potentially
*Noturus gilberti**	Orangefin Madtom	State Threatened	Upper Roanoke River (including the Dan River) drainage in Virginia and North Carolina.	No
*Pleurobema collina**	James Spinymussel	Federal Endangered, State Threatened	Found in the James River basin in Virginia and West Virginia and in the Upper Dan sub-basin of the Roanoke River basin in Virginia and North Carolina.	No
*Paravitrea hera**	Spirit Supercoil	State Endangered	Steep forested slopes and in ravines, often among woody debris, rocks, or deeper leaf litter.	Potentially
*Percina rex**	Roanoke Logperch	Federal Endangered, State Endangered	Found in larger streams in the upper Roanoke, Smith, Pigg, Otter, Nottoway river systems, and Goose Creek in Virginia and in the Dan, Mayo, Smith river systems and Big Beaver Island Creek in North Carolina. Large sized warm clear streams and riffles, runs and pools with sand, gravel or boulder.	No
*Perimyotis subflavus***	Tricolored Bat	Proposed Endangered (Federal Protected, State Endangered)	Overwinters in caves and abandoned mines. Also found in road-associated culverts. Forested habitats, including roosting in trees. May also be found in Spanish moss, pine trees, and occasionally human structures.	Potentially

*The Virginia Fish and Wildlife Search Report compiled on 6/6/2024 requires a minimum 3-mile search radius from the Proposed Project.

**Included as part of the results from the IPaC list (USFW, 2024) for Lots 1 and 2.

Table 3-5 summarizes the list of migratory bird and eagle species identified as a potential concern by the USFWS based on habitat characteristics and the likelihood of the species occurring within the Proposed Project.

Table 3-5: Identified Eagles and Migratory Birds

Scientific Name	Common Name	Federal/State Status	Habitat	Habitat Present
Haliaeetus leucoephalus	Bald Eagle	Not a BCC; protected under Eagle Act. Delisted due to recovery	Forested areas adjacent to large bodies of water.	No
Chaetura pelagica	Chimney Swift	BCC	Originally nested in natural sites such as caves and hollow trees of old-growth forests, Chimney Swifts now nest primarily in chimneys and other artificial sites with vertical surfaces and low light	No
Antrostomus vociferus	Eastern Whip-poor-will	BCC	Eastern forests with open understories. They can be found in both purely deciduous and mixed deciduous-pine forests, often in areas with sandy soil	Potentially
Grasshopper Sparrow Ammodramus savannarum perpallidus	Grasshopper Sparrow	BCC	Grasslands, prairies, hayfields, and open pastures with little to no scrub cover and often with some bare ground.	No
Setophaga discolor	Prairie Warbler	BCC	Shrubby habitats with open canopies, ranging from pine forests, scrub oak barrens, regenerating forests, and borders of forest and prairie.	Potentially
Protonotaria citrea	Prothonotary Warbler	BCC	Flooded bottomland forests, wooded swamps, and forests near lakes and streams. They tend to avoid forest patches smaller than about 250 acres or forest borders less than 100 feet wide.	Potentially
Melanerpes erythrocephalus	Red-headed Woodpecker	BCC	Deciduous woodlands with oak or beech, groves of dead or dying trees, river bottoms, burned areas, recent clearings, beaver swamps, orchards, parks, farmland, grasslands with scattered trees, forest edges, and roadsides.	Potentially
Euphagus carolinus	Rusty Blackbird	BCC	Flooded woods, swamps, marshes and the edges of ponds.	Potentially
Hylocichla mustelina	Wood Thrush	BCC	Mature deciduous and mixed forests in eastern North America, most commonly those with American beech, sweet gum, red maple, black gum, eastern hemlock, flowering dogwood, American hornbeam, oaks, or pines.	Potentially

There are elements for potentially suitable habitats for several species listed in **Table 3-4 and Table 3-5** (trees, deciduous forests, recent clearings, streams, etc.). Additional discussion is provided below in **Section 3.7.3**.

3.7.3 Critical and Sensitive Habitats

Critical habitat is defined in the ESA and includes "the specific areas within the geographical area currently occupied by a species, at the time it is listed in accordance with Section 4 of the Act, on which are found those physical or biological features (I) essential to the conservation of the species, and (II) which may require special management considerations or protection, and (ii) specific areas outside the geographical area occupied by a species at the time it is listed upon a determination by the Secretary that such areas are essential for the conservation of the species." No designated Critical Habitats meeting the ESA definition are located within the project area. The USFWS Critical Habitat and Endangered Species interactive Environmental Conservation Online System (ECOS) (ECOS, n.d.) was used to develop a species list for the project area. The resulting report generated by the USFWS system reports that no critical habitats are identified within the Proposed Project (**Figure 3-10**). Additionally, no state-level critical habitats were identified to be present in the project area based on a review of the Virgina DWR/ Virginia Fish and Wildlife Service Mapping system (VaFWIS Search Report, 2024) (**Figure 3-11**).

Based on recent developments of the Megasite (including the Proposed Project site) and surveys conducted within close proximity to the Proposed Project, presence of minimal natural habitat, and resulting low potential for wildlife use, the impacts on general biological resources (i.e., wildlife and vegetation), including potential impacts on threatened or endangered species and migratory birds as a result of the Proposed Project, DOE has determined that the Proposed Project would have no effect (or would be unlikely to have effect), on critical habitat. DOE has submitted a copy of this Draft EA (along with documentation related to the Virginia Ecological Services Field Office online review process) for review and comment on this determination to the USFWS – Virginia Ecological Services Office.

3.7.4 Environmental Consequences: Biological Resources

Potential impacts to Biological Resources including vegetation, threatened and endangered species, and sensitive habitats are described below.

3.7.4.1 Construction

Impacts to listed endangered or threatened species or designated critical habitat from the Proposed Project are anticipated to be negligible. Phase I of Project Stellar would be constructed on the west half of Lot 1. Future expansion (Phase II) would occur on the eastern half of Lot 1, and the next expansion phases (Phase III and IV) would be constructed on Lot 2. Lot 1 is currently cleared and graded, and Lot 2 is currently forested. It is anticipated that forested and vegetated land will be cleared and developed as part of the Proposed Project. Trees within and/or immediately adjacent to the project area would be removed or otherwise potentially impacted (i.e., trimmed or unintentionally damaged) during proposed development activities. However, reasonable precautions will be taken to protect against potential adverse impacts to established trees. Grading and permanent removal of vegetation during construction will cause localized removal of topsoil and permanent minor adverse impacts to vegetation. Potential staging areas for construction equipment and materials will utilize existing cleared areas, minimizing adverse impacts to vegetation. In addition, no threatened or endangered plant species have been encountered in surveys conducted within the vicinity of the Proposed Project.

Based on surveys previously conducted for the Proposed Project, it is not reasonably expected that any of the protected species identified using USFWS and VDWR have established populations within or near the Proposed Project. The Phase I development will occur on the area already cleared and partially developed (as of August 2024), it is unlikely that established populations will be affected by further development of the cleared portion. The USFWS species list states that the Proposed Project "location does not overlap the [final] critical habitat" for species with a designated critical habitat, reaffirming that there is no critical habitat at risk from implementation of the Proposed Project. Based on review of USFWS IPaC Tool, databases described above, and prior surveys of the Southern Virginia Megasite, DOE has determined that the Proposed Action and DOE's Proposed Project will have No Effect on the Green Floater, Not Likely to Adversely Affect the Monarch Butterfly, and May Effect the Tricolored bat – with confirmation pending that this species is not likely to be in the Proposed Project Area (and proposed mitigation measures if so). The Proposed Project would also have No Effect on critical habitats. DOE has provided a copy of this Draft EA (and documentation following the Virginia Ecological Services Field Office online review process) for comments on this determination.

3.7.4.2 Operation of the Facility

Because the immediate area of the Proposed Project will be developed and spaced away from forested area or potential habitat areas for wildlife, facility operations are not anticipated to create any additional impacts to vegetation or wildlife.

3.7.5 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance (the Proposed Action). If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance. Under the No Action Alternative, no changes or impacts would be expected to vegetation, mature trees, critical habitats, or other biological resources within the vicinity of the Proposed Project.

3.8 Cultural Resources

3.8.1 Prehistoric and Historic Archaeological Resources

3.8.1.1 Affected Area

The Proposed Project is situated within the cultural area of two federally recognized tribes, the Delaware Nation - Oklahoma and the Monacan Indian Nation, though no known sites of tribal interest are within proximity to the Megasite Project Stellar or within the vicinity to Lots 1 and 2.

3.8.1.2 Archeological Survey

An archeological survey on historic features was previously conducted by WSP USA Inc. (WSP) in 2020 for portions of the Megasite (specifically, Lots 1-5, 8, and 9) based on a scope developed through their prior discussions with the DHR during non-federal development of the Megasite as a whole ("National Register Survey and Evaluations of Archaeological Sites and Evaluations of Architectural Resources in Lots 1,2,3,4,5,8, and 9"). The work conducted included providing information for eligibility for the NRHP for all previously recorded cultural resources identified within portions of the Megasite. Portions of the survey conducted on Lots 1 and 2 encompass the area of potential effect from Microporous' Proposed Project. The land where the Proposed Project would occur is prior industrial tobacco farmland, and/or forest vegetation regenerated from former agricultural land.

The archaeological evaluations and survey completed by WSP in 2020 was designed to collect information to address DHR comments relative to 26 previously identified archaeological resources and their eligibility for the NRHP located throughout the Megasite. These investigations were performed pursuant to the National Historic Preservation Act of 1966 (as amended in 1980), the Archaeological and Historical Preservation Act of 1974, Executive Order 11593, and Title 36 of the Code of Federal Regulations, Parts 60-66 and 800 (as appropriate). For the purpose of this EA and the Proposed Project (which concerns Lots 1 and 2), architectural resources identified on Lots 5/6 and 8/9 will not be discussed or reviewed. Based on the survey performed for Lots 1 and 2, six archeological resources including lithic/artifact scatter/prehistoric isolated finds were identified on Lots 1 and 2. WSP recommended that these six sites were not eligible for the NRHP.

WSP submitted this survey and their recommendations to the DHR, and per a letter from the Virginia DHR dated December 2020, DHR noted that two sites are multicomponent sites consisting of low density prehistoric lithic scatters and evidence of 19th to mid-20th century occupation. Three sites consist of structural remnants and historic artifact assemblages dating from the 19th to mid-20th century. These sites likely represent sharecropper, tenant occupations, and/or agricultural support structures. Based on the submitted information, DHR concurred that four of the sites are not eligible for listing in the NRHP. The DHR recommended that two sites be considered potentially eligible for listing the NRHP and additional archaeological testing should be conducted to determine the eligibility of the sites. Prior to grading the 55-acre pad at the Proposed Project, an additional survey ("Phase II Investigation…") was conducted. WSP recommended that based on the results of this survey, these two sites were not eligible for the NRHP. Ground disturbance and earthmoving subsequently began at the Megasite. In June 2024, DOE initiated formal consultation with the DHR and provided the results of the Phase II survey and WSP's recommendations. DOE also submitted a copy of this Draft EA to the DHR for review and comment on the eligibility of these two sites for the NHRP. DOE will incorporate comments received from the DHR in the Final EA for Microporous' Proposed Project.

3.8.1.3 Traditional Cultural Resources

DOE is consulting with the Virginia DHR, Delaware Nation of Oklahoma and the Monacan Indian Nation regarding the Proposed Project per the developed consultation letters (included in **Appendix B** of this EA).

3.8.2 Environmental Consequences: Cultural Resources

3.8.2.1 Construction and Operations

DOE is consulting with the DHR during the development of the EA and has initiated tribal consultation with the Delaware Nation and the Monacan Indian Nation. Responses from these tribal nations, if received, will be included in **Appendix B**. Microporous has also developed a Plan for Unanticipated Archaeological Discoveries that outlines procedures to follow in the event of unanticipated discovery of cultural or historic resources during the course of project construction and operations. The outcome of consultation, in combination with requirements to follow procedures outlined in the Plan for Unanticipated Archaeological Discoveries, will avoid and/or minimize potential impacts to tribal cultural resources. Desktop query of the National Register of Historic Places has found no listed sites, and no prehistoric archaeological sites identified on the Proposed Project. Regardless, Microporous will adhere to the Plan for Unanticipated Archaeological Discoveries to address historic/prehistoric cultural resource discovery during the Proposed Project construction and operations phase.

3.8.3 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding, and DOE recognizes that this project therefore may continue if the Proposed Action does not occur. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance. Under the No Action Alternative, no changes or impacts would be expected to non-eligible and potentially eligible sites for the NRHP defined within the area of the Proposed Project.

3.9 Utilities and Energy Use

3.9.1 Environmental Consequences: Utilities and Energy Use

The Megasite has been developed by the local government to include water, wastewater treatment, natural gas, electricity, and fiber optic utility availability to Lots 1 and 2. Potable water is available through the City of Danville, which is partially subcontracted to the City of Eden, North Carolina, approximately 14 miles to the southwest of the Proposed Project. Wastewater treatment is available through the City of Danville. Natural gas transmission is provided by Transco, and distribution is provided by the Southwestern Virginia Gas Company (Quest Site Solutions, 2021). Electricity is available through American Electric Power (Southern Virginia Megasite at Berry Hill, n.d.). Internet services are available through fiberoptic cable owned by the Mid-Atlantic Broadband Community Corporation (Quest Site Solutions, 2021). Note

that construction plans include a retention basin and therefore Microporous does not intend to connect to a municipal storm sewer system.

Danville Utilities owns and operates the Danville Water Treatment Plant (Danville Utilities, 2020) and purchases additional capacity from the City of Eden Department of Public Works (Quest Site Solutions, 2021), which operates the Robert A. Harris Water Filtration Plant, approximately 11 miles to the southwest of the Proposed Project, in the City of Eden, North Carolina (Eden North Carolina, n.d.). The combined total output capacity of these treatment plants is 38.6 million gallons per day (MGD) of potable water; the combined allocated output capacity of the treatment plants to the Megasite is 7 MGD of potable water. The source of water for the Danville Water Treatment Plant and the Robert A. Harris Water Filtration Plant is the Dan River (Danville Utilities, 2020; Eden North Carolina, n.d.). The existing waterline servicing the area of Lots 1 and 2 is 16 inches in diameter and runs along the southern boundary of the lots, along Berry Hill Road (U.S. Route 311) (Southern Virginia Megasite at Berry Hill, n.d.).

The City of Danville purchases the entirety of the wastewater capacity provided to the Megasite from the City of Eden, NC, which processes the wastewater at the Mebane Bridge Wastewater Treatment Plant (Eden North Carolina, n.d.). The total capacity of this treatment plant is 13.5 MGD; the allocated capacity of this treatment plant to the Megasite is 3 MGD (Quest Site Solutions, 2021). The existing sewer line servicing the area is 20 inches in diameter and ends near the southwestern extent of Lots 1 and 2 (Southern Virginia Megasite at Berry Hill, n.d.).

The Southwestern Virginia Gas Company owns 4-inch and 8-inch distribution lines that service the Megasite that operate at 450 Pounds per Square Inch Gauge (PSIG). These distribution lines connect through a gas gate in the northwestern portion of the Megasite to transmission lines owned by Transco. These transmission lines are 30 and 42 inches and operate at 680 PSIG and are located along the northwest boundary of the Megasite. The capacity of these lines is over 50 million cubic feet (MMcf) of natural gas per month (Quest Site Solutions, 2021).

American Electric Power owns a 138 kilovolts (kV) electric transmission line and associated sub-station with a 30-megavolt ampere (MVA) transformer in the northwestern portion of the Megasite. The capacity of this line is over 100 megawatts (MW) of electric power (Southern Virginia Megasite at Berry Hill, n.d.).

3.9.1.1 Construction

Construction of the Proposed Project will have short-term, negligible impacts on utilities, specifically electricity, water, gas, and sanitary sewer. During the construction period the proposed Project will rely on portable generators, water tanks, and portable bathrooms to accommodate increases in the demand for water, electricity, and sewer from workers and equipment at the Proposed Project site. Once grading is completed, contractors will build out applicable utility lines to the new structures. New permanent utility connections will be installed during the construction period, but not be relied on for services in new buildings until those buildings are fully operational and occupiable.

3.9.1.2 Operations

Proposed Project operations will have minor direct impacts on local utilities and energy use, as the industrial processes involved will increase the demand for electricity, water, and gas at the Proposed Project, and increase the amount of wastewater generated on the site.

The Proposed Project is anticipated to increase demand for potable water by approximately 41,000 gallons per day, a quantity that will be allocated from the Danville Water Treatment Plant and the Robert A. Harris Water Filtration Plant as described in **Section 3.9.1** above. This quantity represents less than one percent of the potable water available from these sources to the Proposed Project and the increased demand from the Proposed Project will not have an adverse impact on availability for other users. Additionally, Microporous plans to incorporate water recycling into the facility to increase water use efficiency during operations, thereby minimizing the quantity of water required from municipal sources. A service connection to the main water pipeline, available along Berry Hill Road, will be constructed to service Microporous operations.

The wastewater produced by the Proposed Project would be treated by the plants described in **Section 3.9.1** above; these wastewater treatment providers have indicated their established treatment performs effectively and will be able to process and treat Microporous' wastewater discharge within existing capacity and the increased demand from the Proposed Project will not have an adverse impact on availability for other users. Additionally, Microporous plans to incorporate water recycling into the facility to increase water use efficiency during operations, thereby minimizing the quantity of water required from municipal sources. A service connection to the present main sanitary sewer line located on the southwestern extent of Lots 1 and 2 will be constructed to service Microporous operations.

The steam boilers for the site will utilize a maximum of 75 million cubic feet (MMcf) of natural gas per month during the completion of Phase I, as described in **Section 3.9.1** above. According to the 2021 *Southern Virginia Megasite Certification Report*, the minimum stated capacity of the natural gas line available for connection to the site is less than the maximum operational requirements of the Microporous facility. However, because the stated capacity is a minimum, it is assumed that the gas lines capacity is in actuality greater than Microporous' operational needs. A service line connection to the main natural gas line is available to the west of Lots 1 and 2 and will be constructed to service Microporous operations.

The maximum electrical demand for the Proposed Project following the Phase I completion is estimated to operate at 300,000 Megawatt hours per year (MWh/yr). The capacity of the American Electric Power line is over 100 MW of electricity. An overhead power line will be constructed to provide a service connection between the main 138 kV power line located west of Lots 1 and 2.

3.9.2 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance. The utility demand would remain unchanged under the No Action Alternative.

3.10 Transportation and Traffic

3.10.1 Affected Environment

The primary access to Lots 1 and 2 is from Berry Hill Road (U.S. Route 311), on the southern boundary of the Proposed Project site. U.S. Route 311 was expanded in 2024 from a two-lane undivided road to a four-lane divided road and a new connector road was constructed in 2024 from the existing interchange of Oak Ridge Farms Road (Route 1260) and the Danville Expressway (U.S. Route 58) west to tie in with U.S. Route 311 to accommodate the anticipated increase in traffic from operations at the Megasite.

U.S. Route 311 connects to U.S. Route 58 Expressway, located approximately two miles to the east of the Proposed Project site. U.S. Route 58 Expressway intersects with U.S. Highway 29 within the City of Danville, approximately seven miles from the Proposed Project site. A Norfolk Southern rail line is located within the Megasite, approximately 1 mile to the south of Lots 1 and 2. Additions to the rail system within the Megasite are anticipated to be completed regardless of the Proposed Action. Danville Regional Airport is located approximately 13 miles to the east of the Proposed Project. The Proposed Project is currently vacant and does not generate any existing vehicle traffic.

3.10.2 Environmental Consequences: Transportation and Traffic

3.10.2.1 Construction

Short term impacts to traffic and transportation are expected to be negligible during the construction phase of the Proposed Project. Construction of the facility is anticipated to take place over four phases, although Phases II – IV are in unconfirmed, conceptual stages. Phase I will include the construction of production, warehouse, office, support, and utility buildings, installation of equipment and storage silos, and extension of utilities to service newly constructed buildings. Phase I and Phase II of building construction is anticipated to last 12 months each, creating jobs that will be generated along with a corresponding increase in traffic to the area. The roads most impacted would include U.S. Route 311 and the Danville Expressway.

3.10.2.2 Operation

The Proposed Project will generate a minor long-term increase to traffic and transportation from anticipated daily semi-truck and personal-vehicle traffic into and out of the industrial park. Microporous expects all raw materials and finished goods to be transported by truck in Phase I, and all raw materials (except for base film) and finished goods by truck through Phase II. Phase I operations are expected to require 2,560 semi-truck trips per year for the importing of raw materials and outgoing shipments of finished goods. The rail spur will be connected to an existing rail line and will be used for incoming deliveries of imported base film during Phase II, eventually reducing the number of additional semi-truck trips needed to operate the facility. At full site capacity when Phase II is complete, 2.64 billion square meters of base film will be carried by rail in 2,934 containers per year. The rail spur will be designed to support rail deliveries efficiently and minimize traffic disruptions at the adjacent automobile rail crossing on Berry Hill Road (U.S. Route 311). Trucks will use the established road network to access the industrial parkas these roadways are designed to accommodate industrial semi-truck traffic. Once Phases I through IV are

completed and in operation, the facility will add approximately 800 employees with an expected corresponding daily number of personal vehicles at the site each day (see **Section 3.2.1** Socioeconomics). The facility's site design will include adequate and sufficient parking, loading, and maneuver space to accommodate all incoming vehicles and semi-trucks.

3.10.3 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance. If the Proposed Project (development of the Microporous site) proceeds without DOE's financial assistance, the potential impacts to traffic would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would not proceed without DOE assistance. Transportation and traffic would remain unchanged under the No Action Alternative.

3.11 Air Quality and Emissions

3.11.1 National Ambient Air Quality Standards

As a part of the Clean Air Act (42 U.S.C. §7401, et seq, CAA), the National Ambient Air Quality Standards (NAAQS) have been established as a means of assessing and controlling Hazardous Air Pollutants (HAP) emissions across the country. Each state is required to prepare a State Implementation Plan (SIP) intended to focus on state-specific industries and sources of emissions. The CAA requires the USEPA to set NAAQS for pollutants considered harmful to public health and the environment. The USEPA has established NAAQS for six (6) principal pollutants, which are called "criteria pollutants": ozone (O3), carbon monoxide (CO), nitrogen dioxide (NO2), particulate matter (PM), sulfur dioxide (SO2), and lead (Pb) **(Table 3-6).**

Pittsylvania County, Virginia has been classified as meeting attainment requirements since 1992 based on data published by the USEPA Greenbook (USEPA, 2024) for CO, particulate matter less than 10 microns (PM10), PM less than 2.5 microns (PM2.5), NO2, SO2, O3, and criteria pollutants designated under USEPA NAAQS.

Table 3-6: USEPA National Ambient Air Quality Standards

Pollutant	Primary/ Secondary	Averaging Time	Level	Form
Carbon Monoxide	primary	8 hours	9 ppm	Not to be exceeded more than once per year
		1 hour	35 ppm	
Lead	primary and secondary	Rolling 3 month average	0.15 $\mu g/m^3$ (1)	Not to be exceeded
Nitrogen Dioxide	primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years

Pollutant		Primary/ Secondary	Averaging Time	Level	Form
Nitrogen Dioxide		primary and secondary	1 year	53 ppb (2)	Annual Mean
Ozone		primary and secondary	8 hours	0.070 ppm (3)	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Pollution	$PM_{2.5}$	primary	1 year	9.0 µg/m^3	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide		primary	1 hour	75 ppb (4)	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

Source: https://www.epa.gov/criteria-air-pollutants/naaqs-table

(1) In areas designated nonattainment for the Pb standards prior to the promulgation of the current (2008) standards, and for which implementation plans to attain or maintain the current (2008) standards have not been submitted and approved, the previous standards (1.5 µg/m3 as a calendar quarter average) also remain in effect.
(2) The level of the annual NO_2 standard is 0.053 ppm. It is shown here in terms of ppb for the purposes of clearer comparison to the 1-hour standard level.
(3) Final rule signed October 1, 2015, and effective December 28, 2015. The previous (2008) O_3 standards are not revoked and remain in effect for designated areas. Additionally, some areas may have certain continuing implementation obligations under the prior revoked 1-hour (1979) and 8-hour (1997) O_3 standards.
(4) The previous SO_2 standards (0.14 ppm 24-hour and 0.03 ppm annual) will additionally remain in effect in certain areas: (1) any area for which it is not yet 1 year since the effective date of designation under the current (2010) standards, and (2)any area for which an implementation plan providing for attainment of the current (2010) standard has not been submitted and approved and which is designated nonattainment under the previous SO_2 standards or is not meeting the requirements of a SIP call under the previous SO_2 standards (40 CFR 50.4(3)). A SIP call is an USEPA action requiring a state to resubmit all or part of its SIP to demonstrate attainment of the required NAAQS.

3.11.2 Existing Air Quality Standards

Air emissions from mobile and stationary sources are regulated on a federal level by the CAA. The CAA establishes standards and control requirements for facilities meeting the definition of a Major Source and those classified as Area Sources. A Major Source includes any facility with operations emission sources that emit HAPs totaling at least 10 tons of any single HAP or 25 tons of any combination of HAPS annually. Implementation of Air Quality regulations in Virginia is a shared responsibility between the USEPA and VDEQ. The Proposed Project will be subject to conditions within USEPA Title V Operating Permits co-administered with VDEQ (VDEQ; Megasite), which will provide monitoring and reporting on air emissions to maintain regulatory compliance. Facilities meeting the definition of a major source, or an area source are required to obtain a Title V air quality permit in accordance with 9VAC5-80-60 unless otherwise exempted.

Virginia DEQ also requires permitting for minor sources not otherwise required to obtain a Title V permit under the Minor New Source Review (NSR) permit program. The minor NSR permit program applies to the construction of any new stationary source or any project (which includes any addition or replacement of an emissions unit, any modification to an emissions unit or any combination of these changes) that will emit regulated air pollutants above the exemption thresholds listed in 9VAC5-80-1105 C or D of state regulations or that will require a permit via 9VAC5-80-1105 E or F. If a permit is required, it must be obtained before any activity on the project can begin. Minor NSR permits are for facilities that emit less than 100 tons per year of any criteria pollutant (PM, PM_{10}, $PM_{2.5}$, CO, nitrous oxide [NOX], SO_2, and Volatile Organic Compounds [VOC]) and for facilities that emit toxic pollutants more than state toxic exemption levels. The criteria pollutant exemption levels are as follows **(Table 3-7):**

Table 3-7: Criteria Pollutant Exemption Levels

Pollutant	New Stationary (Tons/Yr)	Projects (Tons/Yr)
PM	25	15
PM_{10}	15	10
$PM_{2.5}$	10	6
CO	100	100
NO_X	40	10
SO_2	40	10
VOC	25	10

Source: https://www.deq.virginia.gov/permits/air

Other permitting guided by the VDEQ include facilities that do not meet the exemption levels and specifications should be reviewed upon obtaining an emissions figure for the Proposed Project, discussed below.

3.11.3 Affected Environment

The Proposed Project is located west of the City of Danville, Pittsylvania County, Virginia in an area currently zoned for industrial use to the west and south; agricultural and residential land to the north and east. The Proposed Project is located within the eastern portion of the Megasite, located approximately 10 miles from the community of Danville, Virginia. The nearest population (sensitive receptor) are rural (farm) residences, the closest of which is adjoining to the Proposed Project (approximately 0.10 miles east). The nearest residential neighborhood to the Proposed Project is approximately two miles southwest. The Proposed Project is approximately five miles from the nearest school and about 1 mile from the nearest existing community structure (church). Other sensitive receptors, including parks, libraries, hospitals, and other care facilities, etc. are not present within a mile or more radius to the Proposed Project.

3.11.4 Environmental Consequences: Air Quality

3.11.4.1 Construction

Construction of the Proposed Project Phase I is expected to be developed over 120 acres of the total property area of 212 acres (approximate acres of Phases II through IV development). An area on the Proposed Project has cleared 55 acres, and has been graded, and ready for structure and/or pavement development. Minor, temporary, intermittent air emissions are anticipated during Proposed Project construction which could present a short-term, minor adverse impact on air quality. Air emissions of CO, NOX, SO_2, PM_{10}, $PM_{2.5}$ and VOC associated with construction equipment and/or vehicles are anticipated during active use of heavy machinery, site grading and leveling, installation of equipment. Construction material (i.e. mason supplies) deliveries via roadways can be anticipated during the construction of the Proposed Project - Phase I. As such, in addition to tailpipe emissions, surface soil disturbances during excavation and grading could result in generation of fugitive dust. Fugitive dust could potentially affect both public health and the environment. The severity of its effects on health depends on the size and composition of the particulate matter. Typical effects are persistent coughs, respiratory distress, eye irritation, asthma, etc. Use of EH&S protocols as applicable (e.g. training, industry best practices, and PPE) would mitigate any potential health impacts to personnel within the Proposed Project, and for private residences in the larger area. Because the Proposed Project will include components that continues in Phases II through IV, it is not feasible to accurately estimate air emissions that may result from Proposed Project Phase I construction, though construction emissions would be temporary (i.e. only during development or the area or renovations) in nature.

3.11.4.2 Operation

The Proposed Project may require an USEPA permit under Title V of the CAA co-administered with VDEQ, which will provide monitoring and reporting on air emissions to maintain regulatory compliance. The Proposed Project operations do not currently have any modeled air quality data available; however, based upon existing Microporous facilities with similar operations, the Proposed Project anticipates a closed-loop processes with limited air emissions, primarily associated with natural gas combustion for boiler operations. New technologies proposed for the Proposed Project boast low operational emissions of potentially harmful pollutants. The Proposed Project's operational impacts to air quality are expected to be minor, direct, and long term. Activities deemed 'significant' for air quality regulatory purposes include wet-processing, and raw material and product handling during the Li-ion production process.

3.11.5 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance (the Proposed Action), the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance. Under the No Action

Alternative, conditions related to air quality would remain unchanged from existing conditions in reference to the Proposed Project.

3.12 Greenhouse Gasses

Greenhouse gases (GHGs) are of concern for climate change, and include water vapor, carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), and several hydro and per-chlorofluorocarbons.

The CEQ issued interim guidance on January 9, 2023, relevant to the consideration of GHGs and climate change effects of proposed action under NEP (CEQ, 2023). The guidance advises federal agencies to consider "(1) the potential effects of a proposed action on climate change, including by assessing both GHG emissions and reduction from the proposed action; and (2) the effects of climate change on a proposed action and its environmental impacts."

3.12.1 Affected Environment

Rising global temperatures are associated with weather and climate shifts driving environmental and human impacts across a range of spatiotemporal scales and intensities (Intergovernmental Panel on Climate Change [IPCC], 2013). The Mid-Atlantic Regional Integrated Sciences and Assessments Community Climate Outlooks resource highlight climate change and it associated impacts for communities across the Mid-Atlantic Region, including possible increased frequency and severity of weather and climate related hazards, specifically heat waves, heavy rainfall, and shifting seasons for Danville, Virginia. These hazards are expected to negatively impact agriculture, human health, and water source cleanliness. This is consistent with anticipated GHG-driven climate change impacts as outlined by the IPCC, though the type, frequency, and intensity of those impacts are not forecast for the county or region specifically by the IPCC.

3.12.2 Environmental Consequences: Greenhouse Gasses

3.12.2.1 Construction

Construction of the Proposed Project will result in temporary GHG emissions from sources including vehicle transportation of equipment and materials, use of construction machinery, and concrete curers. Use of electricity during construction may indirectly increase GHG emissions depending on electric generation sources/methods employed by local utilities serving the Proposed Project. Current online resources allow for very general estimates for order of magnitude of GHG emissions for construction projects, based on input of known project parameters. The site http://buildcarbonneutral.org provides these rough estimates using the following basic input parameters: area of disturbance planned, primary structural material to be used, region within the US, prior land use, and current vegetation type (or unvegetated). Estimates are given as net embodied carbon from construction activities, where "embodied carbon" includes emissions from raw material extraction, transportation of materials, materials waster, building operations and maintenance, and the emissions a building continues to produce after it is no longer in use. It does not account for GHGs other than embodied carbon. However, other GHG emissions as a result of construction are expected to be negligible in comparison to CO_2 emissions. Build Carbon Neutral estimates that construction would

produce net emissions of 28,248 metric tons of embodied carbon per year. Because the input parameters for Phase I and Phase II of the Proposed Project are identical, this estimate is applicable to both phases.

3.12.2.2 Operation

Facility operations will include the use of natural gas steam boilers. Two steam boilers will be operational during Phase I (totaling 540,000 million British thermal units (mmBtu). After Phase II becomes operational, these values would be expected to increase to 960,000 mmBtu/yr. Natural gas contains methane, a minimal amount of which can escape into the atmosphere as fugitive emissions. Combustion of natural gas produces CO_2 and other GHGs. Estimated maximum GHG emissions from natural gas are itemized in **Table 3-10** (GHG Calculation Tables are contained in **Appendix C**).

The Proposed Project plans to purchase up to 157,000MWh/yr of electricity for facility operations during Phase I, with an increase to 302,000 MWh/year after Phase II becomes operational. The quantity of emissions that are associated with the purchased electricity will vary on a year-to-year basis, depending on electric generation sources and methods employed by local utilities serving the Proposed Project site. Estimates of emissions of GHG per MWh for Virginia are from the USEPA eGRID 2022 data (EPA 2024). Maximum GHG emissions from estimated electricity use per year for Proposed Project Phase I operations are outlined below in **Table 3-8** below.

Table 3-8: Estimated Annual GHG Emissions

Source	Base Value		Metric Tons CO_2	Metric Tons CH_4	Metric Tons N_2O
Phase I					
Steam Boilers	540,000	mmBtu/yr	28,652	0.54	0.054
Electricity Use	157,000	MWh/yr	41,869	4	1
Total			**70,521**	**4**	**1**
Phase II					
Steam Boilers	960,000	mmBtu/yr	50,938	0.96	0.096
Electricity Use	302,000	MWh/yr	80,537	7	1
Total			**131,475**	**8**	**1**

3.12.2.3 Social Cost of Carbon

DOE's Social Cost Estimating Tool (SC-GHG) was used to estimate the social cost of CO_2, CH_4, and N_2O associated with the Proposed Project. The SC-GHG was designed to help agencies understand the social costs and benefits associated with various decisions. The SC-GHG assigns a monetary value to the net harm to society associated with adding small amounts of GHG to the atmosphere in a given year. The SC-GHG is intended to include "the value of all climate change impacts, including (but not limited to) changes in net agricultural productivity, human health effects, property damage from increased flood risk natural disasters, disruption of energy systems, risk of conflict, environmental migration, and the value of ecosystem services." (Interagency Working Group on Social Cost of Greenhouse Gases 2021).

Conservatively high emission estimates for CO_2, CH_4, and N_2O were calculated based on estimated electricity use and natural gas emissions. Emission factor sources included 40 CFR Part 98, Tables C-1 and C-2 and USEPA eGRID data (EPA 2022).

Table 3-9 shows the calculated social cost of carbon for production during Phase I and Phase II of the Proposed Project. **Table 3-9** also factors in 28,248 metric tons of CO_2 associated with construction of the Microporous facility (see **Section 3.12.2.1**) in 2025 and 2031 for Phase I and Phase II, respectively. Construction of the buildings associated with Phase I and Phase II will last for approximately 12 months prior to each phase being initiated, equipment installation will last for approximately 24 months, and an increase in the Li-ion separator manufacturing capacity of the facility would increase for an additional 24 months. This increase in capacity is included in calculations resulting in the values shown in **Table 3-9** during 2026-2029 and 2031-2034. Detailed breakdowns of the figures noted in **Table 3-9** are included in **Appendix C**.

Table 3-9: Social Cost of Carbon – Microporous Construction and Operations

Present Value (in 2024) of Estimated Social Cost for all emissions during Phase I and Phase II (millions, 2020$)			
	Discount Rate		
	2.5%	2.0%	1.5%
SC-CO2	-$2,783.31	-$4,581.61	-$7,896.36
SC-CH4	-$0.53	-$0.68	-$0.92
SC-N2O	-$5.51	-$8.45	-$13.55
Total	**-$2,789.35**	**-$4,590.74**	**-$7,910.83**

In terms of operational outputs, Microporous estimates that production levels for the Proposed Project would be sufficient to produce Li-ion battery separators for approximately up to 1.3 million EVs per year for Phase I and II of production, increasing during the first four years of operation to full capacity. Microporous' operational output is expected to double following the completion of Phase II in 2034, which is not included in these calculations. The GHG reduction associated with driving EVs instead of gasoline fueled vehicles (GVs) was calculated using emission factors and fuel efficiency data from USEPA 40 CFR Part 98 Tables C-1 and C-2, average electric vehicle energy use per mile (USEPA), and average miles per year per driver (US Department of Transportation Federal Highway Administration) (**Table 3-10**). These savings would offset the GHG emissions from Microporous' facility construction and operation by the end of the first year of operations. The GHG emission estimates used to calculate the reductions shown in **Table 3-10** include miles driven and do not include GHG produced during the manufacture or maintenance of EVs or GVs. The calculations also assume that Microporous will manufacture the maximum square meters of separator production capacity, that the manufactured separator will result in the maximum number of lithium-ion batteries produced, that each of these batteries will be used in an electric vehicle, and that each electric vehicle produced will replace a gasoline vehicle that would otherwise be used at the same mileage as the electric vehicle. It does not account for any future changes in vehicle efficiency or sources of electric power. A stop date of 2034, the end of Phase II, was assumed, as production dates for Phase III and Phase IV are not yet available. Detailed breakdowns of the figures and additional assumptions noted in **Table 3-10** are included in **Appendix C**.

3.12.2.4 Proposed Mitigation Measures

Market displacement of gasoline and diesel-powered vehicles through Li-ion battery production support at the Microporous Plant within the Southern VA Megasite at Berry Hill for U.S. EV manufacture is expected to realize GHG emissions reductions greater than GHG emissions from plant operations. Therefore, the impact to GHG emissions from this Proposed Project is a net reduction in GHGs, and no further mitigation measures are proposed.

3.12.3 No Action Alternative

Microporous has indicated that it is their intent to proceed with the development and the operation of the facility in the absence of DOE funding and DOE recognizes that this project therefore may continue if DOE decides not to provide financial assistance. If the Proposed Project proceeds without DOE's financial assistance, the potential impacts to greenhouse gasses would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the Proposed Project for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance (the Proposed Action). Greenhouse gasses would remain unchanged under the No Action Alternative.

3.13 Public and Occupational Health and Safety

The Microporous Safety Program prescribes policies and procedures to protect personnel and the public from potential risks associated with normal activities conducted on the Proposed Project on Lots 1 and 2. Microporous Safety Program will include requirements established by the Virginia Occupational Safety and Health Administration[2] (VOSH) and Virginia's Department of Labor and Industry (VDOLI) in accordance with the following Virginia Administrative Code (VAC):

- Labor and Employment Law: 16VAC15, Chapter 11, 21, 30, 40, and 50
- Virginia Occupational Safety and Health: 16VAC25, Chapters 11, 60, 70, 75, 80, 85, 90, 100, 120,
- Voluntary Protection Program: 16VAC25, Chapter 200
- Boiler and Pressure Vesel Regulations: 16VAC25-50-10

3.13.1 Radon

Radon is a naturally occurring odorless and colorless radioactive gas produced by decomposition of uranium in certain geologic formations and has been associated with health and safety concerns including lung cancer as reported by the National Academy of Sciences (NAS, 1999). Where present, radon may become concentrated in enclosed spaces such as basements and other poorly ventilated areas of buildings.

USEPA established a recommended action level for radon of 4 picocuries per liter (pCi/L) in indoor air for residences with radon levels above this concentration considered as a health risk to occupants. USEPA has

[2] OHSA Virginia State Plan Timeline:
Initial approved on September 28, 1976 (41 FR 42658)
State Plan Certification: August 21, 1984 (49 FR 33122 and 33126)
18(e) Final Approval: November 30, 1988 (53 FR 48258), amended on June 9, 2000 (65 FR 36630), and June 29, 2006 (71 FR 36991)

designated Pittsylvania County, Virgina being within Radon Zone 1 (EPA, 1993), which has predicted indoor radon screening levels of greater than 4 pCi/L (**Figure 3-13**). Based on the potential high levels of radon reasonably expected in the Proposed Project, radon could potentially have an adverse effect on the buildings proposed in the Proposed Project.

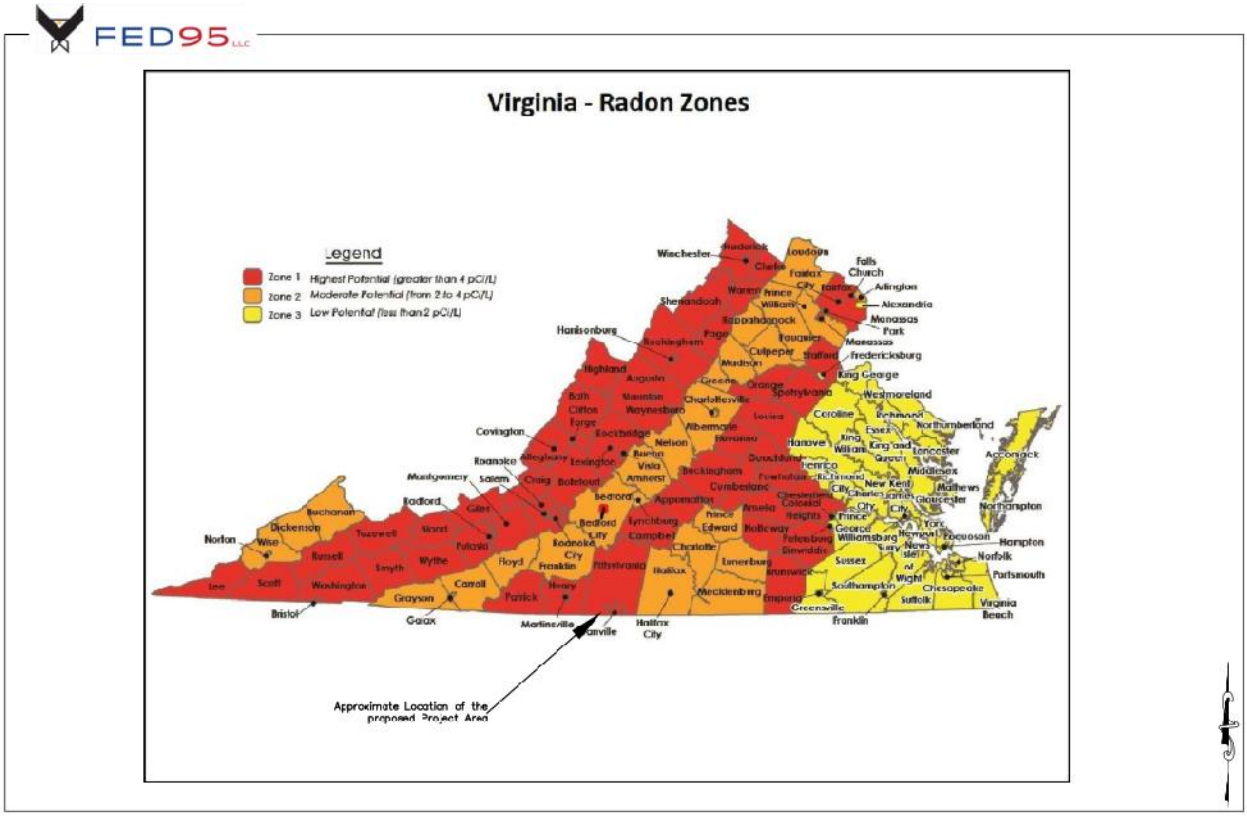

Figure 3-12: Radon Map

Notes: Not sized to scale. Imaged soured Virginia Department of Health, EPA Radon Risk Map for Virginia, 1993.

3.13.2 Affected Area

No other risks to public or occupation health and safety from the existing Proposed Project have been identified. The proposed Project Area on Lots 1 and 2 has been identified as agricultural land with no known historical releases in soil or groundwater contamination, and no known current sources of emission or effluents. No evidence of contamination or hazards potentially affecting public and occupational health were reported from the Phase I Environmental Site Assessment survey (Dewberry, 2019).

3.13.3 Environmental Consequences

3.13.3.1 Construction and Operation

Risk to public and occupational health and safety from the Proposed Project construction and operations are expected to be minor, direct and indirect, and long-term. Numerous regulatory permitting requirements and planned mitigations governing Proposed Project construction and operations address factors relevant

to public and occupational health and safety. These include noise (**Section 3.3**), regulated waste (solid and hazardous waste) (**Section 3.5**), hydrologic conditions and water quality (**Section 3.6**), transportation and traffic (**Section 3.10**), and air quality and emissions (**Section 3.11**), greenhouse gases (**Section 3.12),** Existing corporate policies of Microporous or future updates thereof, further address relevant health and safety risk factors and will be followed throughout construction and operations. These mitigation measures are summarized below under **Section 3.13.3.2.4**.

Proposed Project operations will process certain hazardous materials on a regular basis including ceramic powder (combined boehmite and alumina), PVdF, and polymethyl methacrylate (PMMA) powder (**Table 3-2 of Section 3.5.2**). To reduce logistic risk and ensure safety, these materials would be received via truck within the facility area allowing for strictly controlled and consistent management. Prior to startup, Microporous will prepare an Emergency Action/Crisis Management (EA/CM) Plan that will address unanticipated events (e.g., natural disaster, terrorism, accidents, spills) and provide procedures for the protection of the site's personnel, environment, and infrastructure. Microporous would build on EA/CM Plans from their other facilities with similar operations. Microporous is prepared and dedicated to proper hazardous chemical/material handling, engineering controls, waste management, and disposal practices to minimize/eliminate risk to the public or employees. Hazardous materials will be managed in accordance with Federal, State, and local environmental regulations. To mitigate potential hazards and existing EH&S, corporate [Microporous, LLC Headquarters] policies and procedures would be specially adapted and refined for the proposed Facility prior to initiation of operations. Some items that are included but are not limited to are:

- Employee training
- Appropriate PPE
- Engineering controls
- Real-time monitoring
- Reporting along with internal EH&S assessment for compliance with applicable health and safety regulations

In additions, site preparations and construction activities will be consistent with industry-standard EH7S best practices in the U.S. and will comply with applicable laws and regulations governing public and occupation health and safety.

Microporous will require all employees to participate in the Company's established health, safety, and security training, which includes specialized training for individuals handling hazardous materials and waste. Microporous would maintain a visible emergency contact list and close coordination with local first responders (e.g., fire department and law enforcement). Microporous will maintain compliance with local, state, and federal regulatory requirements including the Emergency Planning and Community Right-to-Know Act (EPCRA), Tier II reporting, and RCRA (if applicable).

3.13.3.2 Accidents and Intentional Destructive Acts

Prior to the start of Phase I facility operations (including Phases II through IV), Microporous will initiate security procedures to protect the site's personnel, environment, and infrastructure from reasonably

foreseeable accidental and intentional destructive acts, which may be possible but are considered very unlikely to occur. Procedures would focus on both prevention and emergency response, and will be predicated on environmental, health, and safety protocols established in their other manufacturing and research and development facilities. Procedures and protocols would also include those discussed in above applicable **Sections 3.3. 3.5. 3.6. 3.10, and 3.11**, as part of operations and regulatory compliance. The Proposed Project will be surrounded by a perimeter security fence and monitored by dedicated 24-hour security staff and trained facility first responders. In addition, the facility would have closed-circuit cameras in each building with focus on critical ingress and egress routes. Security badges will regulate access to facility buildings. Facility management will work in full and immediate cooperation with emergency responders and managers from outside the facility as appropriate. The nearest Fire Department (FD) is the Bachelor Hall FD, which is located 1.6 miles from the Proposed Project. The nearest hospitals are located 8 miles (SOVA Health Danville), and 10 miles (UNC Rockingham).

3.13.3.2.1 Cumulative Impacts

Although additional industrial tenants are planned for the Megasite, which may also contribute to public and occupational health and safety risk, all future tenants will be subject to similar regulatory requirements as described in the resource sections listed above. Conditions described and planned for the Proposed Project are consistent with those across the Megasite and are not anticipated to be impacted by construction or operations of other industrial facilities in the area. Therefore, despite plans for additional industrial development in the vicinity of the Proposed Project no reasonably foreseeable actions have been identified that would interact with the Proposed Project to generate cumulative adverse public and occupational health and safety impacts.

3.13.3.2.2 Proposed Mitigation Measures

Risk mitigation for handling hazardous materials will be established through defined operational procedures (e.g., Hazardous Communication, PPE, chemical management) including, maintenance of equipment in compliance with federal, state, and local occupational health and safety requirements, environmental regulations, and manufacturer recommendations. Spill detection equipment would be installed for appropriate containers with secondar containment, as necessary Further Proposed Project mitigations covered under Microporous guidance include but are not limited to chemical handling procedures; waste management and handling procedures; and specific health and safety policies including proper employee training, equipment commissioning, regular maintenance, and engineering controls.

Site-specific process risk assessments will be completed to identify potential hazards by type (i.e., material handling or worker safety program) not present at an existing Microporous facility. If new hazards are identified additional policies would be implemented to directly address potential hazards, and in compliance with local, state, and federal regulations.

3.13.4 No Action Alternative

Microporous has indicated that it is their intent to proceed in the absence of DOE funding. DOE recognizes that this development might continue if DOE decides not to provide financial assistance. If the Proposed

Project proceeds without DOE's financial assistance, the potential impacts would be essentially identical to those under DOE's action alternative. To allow a comparison between potential impacts of the Proposed Action and the impacts of not proceeding with the Proposed Project, for purposes of this environmental analysis, DOE assumes that the Proposed Project would likely not proceed without DOE assistance

4.0 CUMULATIVE ENVIRONMENTAL EFFECTS

Activities at the Proposed Project Area (Lots 1 and 2) will ultimately represent a small proportion of the anticipated industrial operations to occur at the entire Southern Virginia Megasite, however, the Proposed Action and its alternatives may have the potential for incremental effects which may impact environmental conditions or regulatory obligations for Microporous, LLC and the Proposed Project Area. Reasonable efforts have been made in this EA to anticipate possible contributions to site environmental or cultural conditions that may affect the Proposed Project Area as a whole. Cumulative impacts may be direct or indirect and result from the "incremental impact of actions when added to other past, present, and reasonably foreseeable future actions regardless of what agency undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (CEQ, 1997).

4.1 Compatibility of Proposed Action with Federal, State, Regional, and Local Objectives

NEPA and CEQ regulations were developed to balance the need for actions proposed by federal agencies with the objective of protecting existing environmental and cultural resources. As described in the above sections, minor short-term negative impacts may be associated with the Proposed Action as well as positive long-term outcomes with respect to socioeconomic, environmental justice, and greenhouse gases at the Project Area and immediate vicinity.

4.2 Cumulative Environmental Consequences

The following analysis considers how the impacts of the actions identified in the above sections might affect, or be affected by, other ongoing and/or proposed activities at Microporous, Lots 1 and 2. The analysis considers whether incremental effects contributed by the Proposed Action, or its alternatives, would be reasonably expected to result in potentially significant impacts not previously identified

Table 4-1: Cumulative Effects

Resource	Proposed Project and Action	No Action Alternative
Socioeconomics	Construction and operations of the Proposed Project, combined with past, present, and future planned development within the Megasite would have a minor, beneficial impact on socioeconomic conditions in the area through increased tax revenues for state and local government due to increased sales transactions for the purchase of materials and supplies, and through the introduction of new full-time jobs. Microporous plans to hire employees for 800 permanent positions within the first six years of operations, and up to 2,015 permanent positions over the life of their proposed facility, which would contribute to additional beneficial socioeconomic impacts.	No cumulative effects are expected under the No Action Alternative.
Environmental Justice	Construction and operations of the Proposed Project, combined with past, present, and future planned development within the Megasite would have a minor (beneficial) impact on environmental justice by focusing economic development in locations that face significant legacy economic challenges and resulting social inequities. As stated about in the "Socioeconomics" section, Microporous plans to hire employees for 800 permanent positions within the first six years of operations, and up to 2,015 permanent positions over the life of their proposed facility (Phases I – Phase IV). 85% of these positions filled by employees would be from local DACs by the completion of the project.	No cumulative effects are expected under the No Action Alternative.
Noise	The Proposed Project would result in a minor, long-term increase in noise as an average increase in ambient noise is expected for industrial activities, increase in traffic to and from the site, and overall increase in noise in commensurate with comparable industrial development, and with other planned industrial construction on adjacent parcels within the Southern Virginia Megasite.	No cumulative effects are expected under the No Action Alternative.
Soils	The Proposed Project would result in minor, adverse cumulative effects to soils are anticipated under the Proposed Action. Soil impacts are limited to localized temporary disturbances which will be mitigated by required sedimentation and erosion control measures under the Proposed Action. These localized and temporary disturbances would occur if Microporous' facility would be expanded as part of Phases II – IV, but would be within the current development of the Southern Virginia Megasite.	No cumulative effects are anticipated under the No Action Alternative.
Geology	No Cumulative effects are anticipated related to regional or local geology under any of the alternative actions. No proposed activity to disturb the bedrock or other geologic features are anticipated in any of the alternative actions. Potential impact from a significant earthquake is possible; however, the likelihood of an earthquake based on several research (refer to **Section 3.4.1.4**) and recent data, is unlikely for a high magnitude (greater than 5) earthquake, but not impossible. These conditions would remain the same if Microporous would be expanded as part of Phases II – IV.	No cumulative effects are anticipated under the No Action Alternative.
Hazardous Materials	Microporous would be required to evaluate the generator classification to determine if site-wide hazardous waste generation exceeds criteria for small quantity generator (SQG) status during operation activities. Depending on the operation activities, it is determined to be in compliance with applicable State and Federal regulations to be approved for the correct generator status and requirements. Based on the given hazardous materials used on the site by Microporous, it is unlikely any non-disclosed or new chemicals will be used at the Facility and would significantly increase the estimated usage or increate the amount of hazardous waste. The cumulative effects on hazardous materials/regulated wastes are anticipated to be minor.	No cumulative effects are expected under the No Action Alternative.

Resource	Proposed Project and Action	No Action Alternative
Water Resources	No adverse cumulative impacts to water resources are anticipated under any of the alternatives considered. Two wetlands are present along and/or adjacent to the southern property boundary of the proposed Project Area. None of the scenarios involve groundwater use or discharge to groundwater. Localized surface water run-off will not affect site-wide water management. Potential stormwater discharges would be managed according to requirements of authorizations provided through the Commonwealth of Virginia, specifically under Virginia DEQ VPDES (Virginia Pollutant Discharge Elimination System) permits for industrial construction and operations under the CWA NPDES program, and through a Virginia Water Protection Permit from the Virginia DEQ under Section 401 of the CWA.	No cumulative effects are anticipated under the No Action Alternative.
Biological Resources	No adverse cumulative impacts to biological resources are anticipated under any of the considered alternatives. No critical habitats, sensitive habitats, and/or wetland habitats are present at the Project Area. Due to the recently developed nature of the project area, along with a lack of preferred and/or required habitat type, no threatened, endangered, or otherwise identified species of concern are likely to be present or otherwise negatively impacted by construct. Therefore, no significant incremental or cumulative impacts on biological resources are anticipated.	No cumulative effects are anticipated under the No Action Alternative.
Cultural Resources	No adverse cumulative impacts to cultural resources (pending SHPO review during the construction phase) are anticipated under any of the considered alternatives. On-going, direct with the tribal nations has occurred during the NEPA and/or other federal permitting processes. Microporous has also developed a Plan for Unanticipated Archaeological Discoveries that outlines procedures to follow in the event of unanticipated discovery of cultural or historic resources during the course of project construction and operations. Desktop query of the National Register of Historic Places has found no listed sites, and no prehistoric archaeological sites have been identified within Megasite Lots 1 and 2.	No cumulative effects are expected under the No Action Alternative.
Utilities and Energy Use	Construction and operations of the Proposed Project, combined with past, present, and future planned development within the Southern Virginia Megasite would increase localized traffic volume along Berry Hill Road and within the Route 58 West corridor between Pembroke and Hopkinsville, during construction. In addition, the Proposed Project would likely increase regional rail traffic through transport of additional raw materials and finished products during operations. Combined, these would add incrementally to local and regional cumulative traffic and transportation impacts. However, the recent expansion of U.S. Route 311 and added connector road between the Megasite and the Danville Expressway was designed to accommodate these anticipated traffic and transportation impacts.	No cumulative effects are anticipated under the No Action Alternative.
Transportation and Traffic	Construction and operations of the proposed project, combined with past, present, and future planned development within the Megasite would increase localized traffic volume along Berry Hill Road and within the Route 58 West corridor between Pembroke and Hopkinsville as a result of construction, shipping of materials and products, and employee commuting. In addition, the Proposed Action would likely increase regional rail traffic through transport of additional raw materials and finished products during operations. Combined, these would add incrementally to local and regional cumulative traffic and transportation impacts. However, the recent expansion of U.S. Route 311 and added connector road between the Megasite and the Danville Expressway to accommodate these anticipated traffic and transportation impacts	No cumulative effects are anticipated under the No Action Alternative.

Resource	Proposed Project and Action	No Action Alternative
Air Quality	Air Quality under the Proposed Project may require an USEPA permit under Title V of the CAA co-administered with Virginia DEQ. The Proposed Project operations do not currently have any modeled air quality data available; however, the Proposed Project anticipates closed-loop processes with limited air emissions. The Proposed Project's operational impacts to air quality are expected to be minor, direct, and long term.	No cumulative effects are anticipated under the No Action Alternative.
Greenhouse Gasses	The Proposed Project would support a minor beneficial, long-term impact to reduce GHG emissions and climate change through its contributions to decarbonizing U.S. transportation, which would significantly outweigh its GHG emissions. During Phase 1 of operations, the Proposed Project is expected to directly contribute to a reduction in carbon dioxide emissions totaling over 1 million metric tons. The potential benefits associated with reducing CO2 and other GHG emissions would support a reduction in GHG concentrations and reduce associated climate change impacts (e.g., increases in atmospheric temperature, changes in precipitation, increases in the frequency and intensity of extreme weather events, rising sea levels, etc.).	No cumulative effects are anticipated under the No Action Alternative.
Public and Occupational Health and Safety	Minor cumulative effects are anticipated based on the Proposed Project. It is Microporous responsibility to ensure the Health and Safety Plan is in effect during construction and operation activities and any personnel to enter the proposed Project Area will abide to the requirements.	No cumulative effects are anticipated under the No Action Alternative.

5.0 CONSULTATION AND COORDINATION

5.1 Consultation

DOE coordinated with the following agencies, tribal nations, and stakeholders through consultation letters and/or notification of the availability of this Draft EA.

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APPENDIX A

ENVIRONMENTAL SYNOPSIS

ENVIRONMENTAL SYNOPSIS
Bipartisan Infrastructure Law (BIL) Advanced Energy Manufacturing and Recycling Grant Program (Section 40209)

DE-FOA-002907

September 2024

National Energy Technology Laboratory
U.S. Department of Energy
Pittsburgh, PA
Morgantown, WV
Albany, OR

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CONTENTS

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INTRODUCTION

The U.S. Department of Energy (DOE) prepared this Environmental Synopsis pursuant to its responsibilities under Section 216 of the DOE National Environmental Policy Act (NEPA) Implementing Procedures set forth in 10 Code of Federal Regulations (CFR) Part 1021. A number of applications were received under DE-FOA-0002907, and a smaller subset of those technically acceptable applications was presented for detailed consideration of environmental factors. This synopsis summarizes the consideration given to environmental factors for those applications, and documents that the relevant environmental consequences of reasonable alternatives were evaluated under the Office of Manufacturing and Energy Supply Chains (MESC), who issued the Funding Opportunity Announcement (FOA) DE-FOA-0002907 Bipartisan Infrastructure Law (BIL) Advanced Energy Manufacturing and Recycling Grant Program. Projects awarded under FOA-0002907 are to be funded, in whole or in part, with funds appropriated by the Infrastructure Investment and Jobs Act[1] (more commonly known as the BIL). The BIL is a once-in-a-generation investment in infrastructure that will grow a more sustainable, resilient, and equitable economy through enhancing U.S. competitiveness in the world, creating good jobs and ensuring stronger access to economic benefits for disadvantaged communities. The BIL appropriates more than $62 billion to DOE[2] to deliver a more equitable clean energy future for the American people by investing in American manufacturing and workers; expanding access to energy efficiency and clean energy for families, communities, and businesses; delivering reliable, clean, and affordable power to more Americans; and building the technologies of tomorrow through clean energy demonstrations.

The BIL will invest more than $750 million in advanced energy manufacturing and recycling over the five-year period encompassing fiscal years (FYs) 2022 through 2026. This includes the support of projects by small- and medium-sized manufacturing firms (SMMs) to establish new or re-equip or expand existing industrial facilities in eligible energy communities to produce or recycle advanced energy. The activities to be funded under the FOA support BIL Section 40209 and the broader, government-wide approach to reinvigorating and reinvesting in the American industrial base; establish secure, resilient domestic energy supply chains; and revitalize economies in energy communities to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis, empower workers, and advance environmental justice.

DOE initially selected numerous projects under two topic areas of interest (AOIs) and provided cost-shared funding for project definition activities; all the projects are subject to the completion of project-specific NEPA reviews. DE-FOA-0002907 supports new, re-equipped and expanded industrial domestic facilities in eligible energy communities to produce or recycle advanced energy property. As required by Section 216, this synopsis does not contain business-sensitive, confidential, trade secret or other information that statues or regulations would prohibit DOE from

1. Infrastructure Investment and Jobs Act, Public Law 117-58 (November 15, 2021).

2. U.S. Department of Energy. November 2021. “DOE Fact Sheet: The Bipartisan Infrastructure Deal Will Deliver For American Workers, Families and Usher in the Clean Energy Future.” https://www.energy.gov/articles/doe-fact-sheet-bipartisan-infrastructure-deal-will-deliver-american-workers-families-and-0.

disclosing. It also does not contain data or other information that may reveal the identity of the offerors.[3]

BACKGROUND

The projects that will result from this FOA are cost-shared collaborations between the government and industry to increase investment in projects for the production or recycling of advanced energy property. In contrast to other federally funded activities, these projects are not federal projects; instead, they are private projects seeking federal financial assistance. Under the FOA, industry proposes projects that meet their needs and those of their customers while furthering the national goals and objectives of DOE. The successful development of advanced energy manufacturing and recycling facilities is a key objective of the nation's effort to help mitigate the effects of climate change, gain energy independence and bolster the domestic supply chain.

Awardees under this FOA will receive assistance using funds appropriated by the Infrastructure Investment and Jobs Act, Public Law 117-58 (November 15, 2021), also known as the BIL. The activities to be funded under this FOA support BIL Section 40209 and the broader, government-wide approach to reinvigorating and reinvesting in the American industrial base; establish secure, resilient domestic energy supply chains; and revitalize economies in energy communities to maximize the benefits of the clean energy transition as the nation works to curb the climate crisis, empower workers, and advance environmental justice.

The applications reviewed under this FOA were selected for negotiations in November 2023. Two topic AOIs were included in the FOA, each outlining their own specific project objectives. The two AOIs were separated according to the BIL sections 40209(a)(6)(A) and 40209(a)(6)(B):

Topic Areas	Title
Advanced Energy Manufacturing and Recycling Program Grants Pursuant to Section 40209(a)(6)(A)	
1	Building New Advanced Energy Manufacturing or Recycling Facilities
Advanced Energy Manufacturing and Recycling Program Grants Pursuant to Section 40209(a)(6)(B)	
2	Re-Equipping or Expanding Existing Advanced Energy Manufacturing or Recycling Facilities

3. All information provided by the applicant must to the greatest extent possible exclude Personally Identifiable Information (PII). The term "PII" refers to information that can be used to distinguish or trace an individual's identity alone (e.g., their name, social security number, biometric records), or when combined with other personal or identifying information that is linked or linkable to a specific individual, such as date and place of birth, mother's maiden name, or race.

AOI 1 was directed at projects that involve the construction of new facilities. AOI 2 was directed at projects that expand or re-equip existing facilities. Both AOIs had the same criteria, and each application was evaluated against the criteria as outlined below:

A. Technical Review Criteria AOIs 1 and 2:

Criterion 1: Technical Merit, Project Management, and Impact (25%)

Criterion 2: Financial and Market Viability (25%)

Criterion 3: Project Workplan (15%)

Criterion 4: Management Team and Project Partners (15%)

Criterion 5: Community Benefits Plan: Job Quality and Equity (20%)

These criteria represented the total evaluation scoring. However, the selection official also considered program policy factors in making final selections.

The evaluation process consists of multiple phases; each includes an initial eligibility review and a thorough technical review. Rigorous technical reviews of eligible submissions were conducted by reviewers that are experts in the subject matter of the FOA. Ultimately, the selection official considered the recommendations of the reviewers, along with other considerations such as program policy factors, in determining which applications to select.

Applications that were determined to be eligible were evaluated in accordance with this FOA, by the standards set forth in EERE's Notice of Objective Merit Review Procedure (76 Fed. Reg. 17846, March 31, 2011) and the guidance provided in the "DOE Merit Review Guide for Financial Assistance," effective September 2020, which is available at: https://www.energy.gov/management/articles/merit-review-guide-financial-assistance-and-unsolicited-proposals-current

As a federal agency, DOE must comply with NEPA (42 U.S.C. §§ 4321 *et seq.)* by considering potential environmental issues associated with its actions prior to deciding whether to undertake these actions. The environmental review of applications received in response to DE-FOA-0002907 was conducted pursuant to Council on Environmental Quality Regulations (40 CFR Parts 1500–1508) and DOE's NEPA Implementing Procedures (10 CFR Part 1021), which provide directions specific to NEPA in the context of procurement and financial assistance actions.

PURPOSE AND NEED

The Biden administration has laid out a bold agenda to upgrade and modernize infrastructure, address the climate crisis, and build a clean and equitable energy economy that achieves a carbon pollution-free electricity by 2035, and puts the United States on a path to achieve net-zero emissions economy-wide by no later than 2050 to the benefit of all Americans. DOE is committed to pushing the frontiers of science and engineering; catalyzing clean energy jobs through research, development, demonstration, and deployment (RDD&D); and advancing environmental justice and inclusion of underserved and disadvantaged communities.

Advanced energy manufacturing and recycling is critical to addressing clean energy supply chain vulnerabilities by supporting key materials and components for energy storage for grid and transportation uses, wind energy, and energy efficient solutions for buildings.

President Biden's Executive Order on America's Supply Chains directed the U.S. government to undertake a comprehensive review of critical U.S. supply chains to identify risks, address vulnerabilities and develop a strategy to promote resilience. In response, DOE published "America's Strategy to Secure Supply Chain for a Robust Clean Energy Transition," the first comprehensive U.S. government plan to build an energy sector industrial base. The report is supported by deep-dive supply chain assessments, highlighting key risks and opportunities across the supply chains for carbon capture materials, electric grid, energy storage, fuel cells and electrolyzers, hydropower, neodymium magnets, nuclear energy, platinum group metals, semiconductors, solar photovoltaics, and wind. The report described actions to address vulnerabilities in the advanced energy supply chain. In addition, the administration issued determinations under the Defense Production Act,[4] citing the critical need to strengthen domestic production capacity of large-capacity batteries, to increase domestic mining and processing of critical materials for the large-capacity battery supply chain[5] and to accelerate progress in establishing secure domestic supply chains for: (1) solar panel parts like photovoltaic modules and module components; (2) critical power grid infrastructure like transformers; (3) heat pumps; (4) building insulation; and (5) equipment for making and using clean-electricity-generated fuels, including electrolyzers, fuel cells and related platinum group metals.[6] These determinations further signal the need to bolster these clean energy supply chains in order to strengthen national and climate security in the United States while also reducing energy costs for American families.

As part of the whole-of-government approach to advance equity across the federal government, and in alignment with BIL Section 40209, this FOA and any related activities sought to encourage meaningful engagement and participation of underserved communities and underrepresented groups, including consultation with tribal nations. Consistent with Executive Order 14008, this FOA is designed to ensure that 40% of the benefits of the overall investments provided through the FOA will be delivered to disadvantaged communities in accordance with the Justice40 Initiative.

[4] 50 U.S.C. § 4533.

[5] See Memorandum on Presidential Determination Pursuant to Section 303 of the Defense Production Act of 1950, as amended (March 31, 2022).

[6] See Memorandum on Presidential Determination Pursuant to Section 303 of the Defense Production Act of 1950, as amended, on Solar Photovoltaic Modules and Module Components (June 6, 2022); Memorandum on Presidential Determination Pursuant to Section 303 of the Defense Production Act of 1950, as amended, on Transformers and Electric Power Grid Components (June 6, 2022); Memorandum on Presidential Determination Pursuant to Section 303 of the Defense Production Act of 1950, as amended, on Electric Heat Pumps (June 6, 2022); Memorandum on Presidential Determination Pursuant to Section 303 of the Defense Production Act of 1950, as amended, on Insulation (June 6, 2022); Memorandum on Presidential Determination Pursuant to Section 303 of the Defense Production Act of 1950, as amended, on Electrolyzers, Fuel Cells, and Platinum Group Metals (June 6, 2022).

The overall scope in DE-FOA-0002907 included the construction of new advanced energy manufacturing or recycling facilities, or re-equipping or expanding existing facilities to manufacture or recycle advanced energy property. FOA-0002907 seeks the establishment of new — or the re-equipment or expanding of existing — industrial facilities in eligible energy communities to produce or recycle advanced energy property, as per Section 40209.

Pursuant to BIL Section 40209, DOE took into consideration whether projects selected under the FOA provide workforce opportunities in low- and moderate-income communities; encourage partnership with universities and laboratories to spur innovation and drive down costs; partner with tribal nations; and consider greenhouse gas (GHG) emissions reductions and energy efficient advanced energy processing opportunities. Similarly, pursuant to BIL Section 40209, DOE strongly considered projects that will: provide higher net impact in avoiding or reducing anthropogenic emissions of GHGs; result in a higher level of domestic job creation (both direct and indirect) during the lifetime of the project; and result in a higher level of job creation in the vicinity of the project, particularly with respect to low-income communities and dislocated workers who were previously employed in manufacturing, coal power plants, or coal mining and have higher potential for technological innovation and commercial deployment.

DOE intends to further this purpose and satisfy this need by providing financial assistance under cost-sharing arrangements, as specified in this FOA, for projects selected.

ALTERNATIVES

DOE received numerous applications in two AOIs: AOI 1 under Advanced Energy Manufacturing and Recycling Grants pursuant to Section 40209(a)(6)(A) and AOI 2 under Advanced Energy Manufacturing and Recycling Grants pursuant to Section 40209(a)(6)(B):

Detailed requirements for each AOI are listed in the FOA. Applications were accepted and reviewed, and initial selections were made; all the projects are subject to the completion of project specific NEPA reviews. The AOIs and the number of applications received are listed in the table below:

AOI	AOI Title
1	Building New Facilities
2	Re-Equipping or Expanding Existing Facilities

ENVIRONMENTAL REVIEW

DOE assembled environmental review teams to assess all applications that met the mandatory requirements. The review teams considered 18 resource areas that could potentially be impacted by the technologies and sites proposed for each application provided for review. These resource areas consisted of:

- Aesthetics and Visual Resources
- Air Quality
- Community Services
- Cultural Resources
- Environmental Justice
- Geology, Soils, and Topography
- Greenhouse Gasses
- Land Use
- Noise and Vibration
- Public and Occupational Health and Safety
- Regulated Wastes (Solid and Hazardous Wastes)
- Socioeconomics
- Soils
- Surface Water and Groundwater
- Transportation and Traffic
- Utilities and Energy Use
- Vegetation and Wildlife
- Wetlands and Floodplains

The review teams were composed of environmental professionals having expertise in the resource areas considered by DOE. The review teams considered the information provided as part of each application, which included narrative text, worksheets, and the environmental-focused documentation for the sites proposed by the applicant. In addition, reviewers independently verified the information provided to the extent practicable using available sources commonly consulted in the preparation of NEPA documents and conducted preliminary analyses to identify the potential range of impacts that would be associated with each application. Reviewers identified both direct and indirect potential impacts to the resource areas mentioned above, as well as short-term impacts that might occur during construction and start-up, and long-term impacts that might occur over the expected operational life of the proposed project and beyond. The reviewers also considered any mitigation measures proposed by the applicant and any reasonably available mitigation measures that may not have been proposed.

Reviewers assessed the potential for environmental issues and impacts using the following characterizations:

- **Beneficial** — Expected to have a net beneficial effect on the resource in comparison to baseline conditions.
- **None (negligible)** — Immeasurable or negligible in consequence (not expected to change baseline conditions).
- **Low** — Measurable or noticeable but of minimal consequence (barely discernable change in baseline conditions).
- **Moderate** — Adverse and considerable in consequence but moderate and not expected to reach a level of significance (discernable, but not drastic, alteration of baseline conditions).
- **High** — Adverse and potentially significant in severity (anticipated substantial changes or effects on baseline conditions that might not be mitigable).

Applications in Response to the FOA

Based on the technologies and sites proposed, the applications reviewed were preliminarily evaluated and reviewed by the NETL NEPA Division. In some cases, site selections for some projects had not been finalized. Therefore, the summary in the below section is based on the information that was available. The following impacts by resource area were considered in the candidates for award:

Aesthetics and Visual Resources — Low impact would be expected as applications proposing new construction would primarily be conducted on existing industrial sites or areas zoned for industry, and in numerous cases, work would be limited to refurbishing existing facilities with no or minimal groundbreaking required. One project would involve new construction of an advanced materials production facility, though no aesthetic impacts are expected.

Air Quality — Moderate impact would be expected as many facilities would have air controls and permitting in place, and new facilities will be putting controls in place as required by any obtained air permits. Environmental permits will be obtained for all projects as emissions from power generation or other processes are expected. One project noted that the locations of their project are currently designated as "in attainment, unclassifiable" for carbon monoxide (CO), particulate matter less than 10 microns (PM10), PM less than 2.5 microns (PM2.5), nitrogen dioxide (NO2), sulfur dioxide (SO2), ozone (O3), and criteria pollutants designated under U.S. Environmental Protection Agency (EPA) National Ambient Air Quality Standards (NAAQA). Closed-loop processes with limited air emissions would be implemented and the project would be subject to conditions with EPA Title V Operating Permits. Other impacts may be expected from transportation-related emissions or fugitive dust from construction activities.

Vegetation and Wildlife — Low impact would be expected for a project application that requires new construction of industrial facilities, as construction would occur in a previously disturbed areas currently being zoned and developed for industrial use, while other projects will have no new facility construction and will take place in existing buildings. Projects will be assessed for agricultural or natural habitat concerns, if any identified, and consultation initiated with the U.S. Fish and Wildlife Service, if appropriate.

Greenhouse Gasses — Net beneficial long-term impacts would likely occur for all projects as advanced energy projects are critical to decarbonizing the economy through grid modernization, establishing secure domestic supply chains for solar panels, critical grid infrastructure, heat pumps, building insulation and clean-electricity generating equipment, as noted in the FOA. Greenhouse gas emissions from the projects would be minimal compared to these downstream decarbonization efforts.

Community Services — Low impacts would be expected for the projects. Generally, projects anticipating a larger temporary workforce during construction would be expected to place a higher demand on community services — particularly in smaller, more rural communities where currently existing community services are more limited. Operation of new facilities may place additional demand on community services in response to any accidents or emergencies during operations, but it is expected these would be mitigated through each applicant following established environmental safety and health plans and best practices.

Cultural Resources — There is negligible to low impact expected for all applications evaluated. A project requiring construction and earthmoving would require consultation Section 106 of the National Historic Preservation Act (NHPA) for compliance purposes.

Environmental Justice — The environmental justice impacts should be beneficial for the projects. Through the administration's Justice40 Initiative, 40% of the overall benefits of this FOA should flow to disadvantaged communities, as listed in the Justice40 guidance document and the FOA.[7] Environmental justice benefits will be considered for all projects under the Juctice40 initiative. Under Justice40, the benefits include, but are not limited to, measurable direct or indirect investments or positive project outcomes that achieve or contribute to the following in disadvantaged communities: (1) a decrease in energy burden; (2) a decrease in environmental exposure and burdens; (3) an increase in access to low-cost capital; (4) an increase in job creation, the clean energy job pipeline and job training for individuals; (5) increases in clean energy enterprise creation and contracting (e.g., minority-owned or diverse business enterprises); (6) increases in energy democracy, including community ownership; (7) an increase in parity in clean energy technology access and adoption; and (8) an increase in energy resilience. Environmental and human health of the disadvantaged communities will be considered under Executive Order 12898 — Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, as required for projects.

Wetlands and Floodplains — Wetlands and floodplains impacts would be low. None of the applications noted specific wetlands concerns, but if any of those plans were to change, avoidance and minimization measures would be defined in conjunction with application for applicable permits and approvals (including approvals from the U.S Army Corps of Engineers). The extent and conditions of the wetlands on the one project site will be addressed during formal NEPA process and subsequent construction and/or operations as required. One application was located within the 100-year floodplain, but the applicant has provided details of extensive resiliency and mitigation measures planned for the project site. This application would also involve interior renovation of an existing structure, so no construction-related impacts to the floodplain would be expected.

Geology, Soils, and Topography — Impacts to geology, soils, and topography would be negligible to low for all projects. The majority of applications would not involve new construction, so impacts to geology, soils, and topography would be negligible for those. An application involving new construction would be subject to construction and stormwater management permitting and guidelines, which would likely avoid any significant impacts related to construction activities. Construction activities could result in a potential for soil erosion, but appropriate mitigation would be implemented as necessary, such as run-off control and silt fences. The remaining projects have

[7] The Justice40 initiative, created by Executive Order 14008, establishes a goal that 40% of the overall benefits of certain federal investments flow to disadvantaged communities. The Justice40 Interim Guidance provides a broad definition of disadvantaged communities (Page 2): https://www.whitehouse.gov/wp-content/uploads/2021/07/M-21-28.pdf. DOE, the Office of Management and Budget (OMB), and/or the Federal Council for Environmental Quality (CEQ) may issue additional and subsequent guidance regarding the designation of disadvantaged communities and recognized benefits under the Justice40 Initiative.

existing facilities that will be repurposed for advanced energy purposes and do not expect soil impacts.

Surface Water and Ground Water — Ground water impacts for the projects would be low. None of the applications reviewed cited a groundwater concern. Ground water impact from metals/chemicals or wastes could be of note for the projects, though containment measures would be in place as required for permitting. Stormwater runoff will be managed in accordance with all relevant requirements, if required by projects. Surface water impacts would be low to moderate. Battery separator manufacturing and clean energy recycling facilities would potentially have water influent and wastewater effluent requirements to minimize the impacts with municipalities treating water. Disposal of discharges would be carried out in compliance of all applicable laws and regulations. Controls could be used on hazardous liquids, if any, to minimize impacts.

Public and Occupational Health and Safety — Impacts will be low to moderate, but impacts would be mitigated as all projects have environmental, health and safety policies and procedures. Low to moderate impacts may also be considered during both construction and operations of the proposed facilities. The level of risk is generally related to the size and complexity of the planned construction. Of note would be any concerns for handling of chemicals and metals, including minimizing exposure and prevention of spills. Safe operating practices would be implemented for all projects, as will compliance with federal, state, and local regulations and standards.

Land Use — Impacts to land use would be negligible-to-low for all applications reviewed. The majority of applications would not require new construction with no change in land use, and an application with new construction would occur in an area in the process of being developed for industrial use.

Noise and Vibration — Noise impacts would be low to moderate. One application specifically cited noise impact. During the project construction phases, noise levels will increase, but would be temporary and would end after construction. All project facilities conducting manufacturing and/or recycling may have noise, but much will occur in closed buildings. Any projects near neighboring buildings may have noise impacts to consider for those near the site if outdoor noise continues past construction phases.

Socioeconomics — Beneficial impacts would be expected for all projects. All projects would provide some additional employment during construction and operations, with most opportunities occurring within the local area disadvantaged communities. Tax revenue generation and direct and indirect spending in the local economy is expected for the projects.

Surface Water — Impacts would be low to moderate. Battery separator manufacturing and clean energy recycling facilities would potentially have water influent and wastewater effluent requirements to minimize the impacts with municipalities treating water. Disposal of discharges would be carried out in compliance of all applicable laws and regulations. Stormwater controls could be used during construction of one project that includes construction of a new facility. Controls could be used on hazardous liquids, if any, to minimize impacts.

Transportation and Traffic — Low to moderate impacts are expected. Two projects indicated there would be changes to local traffic patterns, citing minimal increases causing minor impacts. Transportation of construction workforce to the site would be temporary. New parking lots will be considered for one project, as needed. Recycling and manufacturing facilities would also require trucking or railcar transport of materials and wastes in and out of the facility.

Utilities and Energy Use — Low to moderate impacts would be expected. Projects would either utilize existing utility infrastructure, or would require minor modifications or additions to existing utility infrastructure. Facilities developed may have need for water, electricity, steam, wastewater, industrial gases and/or natural gas or other for the processes and facilities, or in a single case, new utility infrastructure would be required for a new industrial facility.

Regulated Wastes (Solid and Hazardous Wastes) — Impacts would be low to moderate. Projects will obtain permits related to hazardous waste management if the project involves handling, storage, or disposal of hazardous materials or substances. The nature of the manufacturing and/or recycling for clean energy components will require diligence in hazardous/nonhazardous waste management practices and applicable permitting. Transportation of waste to landfills will be considered, if applicable to the projects.

CONCLUSION

The applications received in response to the FOA provided DOE with reasonable alternatives for accomplishing its purpose and need to satisfy the responsibility imposed on it to carry out a program to strengthen clean energy supply chains and accelerate domestic clean energy manufacturing. An environmental review was part of the evaluation process for a select number of technically acceptable applications. DOE prepared a critique containing information from this environmental review. That critique, summarized here, contains summaries and project-specific environmental information. DOE determined that selecting numerous applications in response to the FOA would meet DOE's purpose and need.

APPENDIX B

CONSULTATION LETTERS AND RESPONSES

July 3, 2024

Diane Shields
Tribal Chief
Monacan Indian Nation
111 Highview Drive
Madison Heights, VA 24572

Subject: Tribal consultation and Section 106 compliance for the Microporous Assets Corporation - Project Stellar at the Southern Virginia Megasite

Dear Chief Shields,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Microporous Assets Corporation (Microporous) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Advanced Energy Manufacturing and Recycling Grant Program (Section 40209)," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

The proposed project would involve the construction of a coated lithium-ion (Li-ion) battery separator plant on Lots 1 and 2 of the Southern Virginia Megasite near Danville, VA for lithium-ion batteries integral to electric vehicle supply chains. The total project footprint encompassing Lots 1 and 2 is approximately 212 acres. This project would secure 600 million m2 per year of domestic separator manufacturing capacity, strengthening the United States market. Microporous would install twenty aqueous coating lines for both ceramic (alumina, boehmite) and polymer (PVdF) coating, complete with slurry mixing and slitting equipment. The plan would consist of manufacturing buildings, an administrative building, a utility building, and storage silos. Microporous would provide 282 permanent jobs within the DOE grant's three-year performance period and would ensure that at least 85% of full-time employees are from local Disadvantaged Communities by the completion of the project.

The location for the proposed project is within Lot 1 and Lot 2 of the Southern Virginia Megasite, located at 6100 Berry Hill Road, City of Danville, Pittsylvania County, Virginia (Attachments 1 and 2). The construction of the Li-ion battery separator plant would be conducted in accordance with applicable federal, state, and local ordinances, as necessary. There are multiple stages of construction planned, with Phase I and II occurring on Lot 1 and including the construction of a manufacturing and administration building within a currently graded area. Phase III and IV would take place on Lot 2 and include an would additional manufacturing building(s) in an area that is currently forested. Attachment 1 is a conceptual layout which would construct a base separator film plant to produce onsite (vs. purchasing) the base film required for the separator coating lines in Phases I and II. Attachment 2 is a conceptual layout of adding additional separator coating lines requiring additional purchased

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base film. Phase II, Phase III, and Phase IV are not funded under the current proposed award (DOE's Proposed Action) and are still in unconfirmed conceptual stages. Phase I plans are in darker green color, while Phase II is in light green color and Phases III– IV plans are bordered with dashed lines. All Phases are labeled accordingly. Different possible layouts for Phase II – IV are noted with Attachments 1 and 2.

I have provided attachments that contain additional details pertaining to the proposed project, including project site plans and cultural resource survey reports encompassing the proposed project area. In particular, a "National Register Survey and Evaluations of Archaeological Sites and Evaluations of Architectural Resources in Lots 1, 2, 3, 4, 5, 8, and 9" report (Attachment 4) was completed in November 2020 by WSP USA, Inc. (WSP) that documented archaeological fieldwork and architectural research completed from May – July 2020 encompassing the above-noted lots of the Southern Virginia Megasite (including Lots 1 and 2, the site of the Microporous project). This report was submitted to the Virginia Department of Historic Resources (DHR). The Virginia DHR subsequently recommended in a letter dated from December 30, 2020 that two archaeological sites identified within Lots 1 and 2 (44PY0394 and 44PY0398) were potentially eligible for listing in the National Register of Historic Places (NRHP) and recommended avoidance or additional archaeological testing to determine eligibility for the NRHP (Attachment 5). WSP completed a Phase II investigation of sites 44PY0394 and 44PY0398 in August 2021 and documented the investigation in the "Phase II Investigation of Sites 44PY0394 and 44PY0398" report (Attachment 6) and subsequently formed an opinion that sites 44PY0394 and 44PY0398 are not eligible for listing in the NRHP. If your review of these materials concludes that no historic nor cultural properties would be affected by the proposed project, a written acknowledgment of that conclusion would be appreciated. DOE is also consulting with the VA DHR regarding this proposed project.

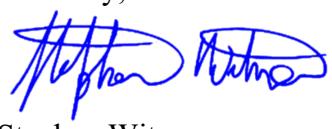
Based on the scope of the proposed Microporous project, DOE plans to prepare an Environmental Assessment (EA) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. While Phase II, Phase III, and Phase IV are not part of DOE's Proposed Action, the potential impacts of Phases II, III, and IV are being reasonably evaluated in the EA as part of the Cumulative Effects of the Proposed Action. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, the Monacan Indian Nation will be provided electronic and hard copies where you may provide additional comments.

If you have any questions, comments, or concerns regarding this project, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

Sincerely,



Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Microporous Project Site Plan – Future A.pdf
2. Microporous Project Site Plan – Future B.pdf
3. Southern Virginia Megasite Utilities and Infrastructure Map.pdf
4. WSP Evaluation of Sites in Lots 1, 2, 3, 4, 5, 8, 9_11-25-2020.pdf
5. VA DHR Response Letter to WSP Survey_12-30-2020.pdf
6. Phase II Investigation of Sites 44PY0394 and 44PY0398_06-13-2022.pdf

July 3, 2024

Katelyn Lucas
Tribal Historic Preservation Officer
Delaware Nation, Oklahoma
P.O. Box 825
Anadarko, OK 73005

Subject: Tribal consultation and Section 106 compliance for the Microporous Assets Corporation - Project Stellar at the Southern Virginia Megasite

Dear Ms. Lucas,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Microporous Assets Corporation (Microporous) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Advanced Energy Manufacturing and Recycling Grant Program (Section 40209)," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

The proposed project would involve the construction of a coated lithium-ion (Li-ion) battery separator plant on Lots 1 and 2 of the Southern Virginia Megasite near Danville, VA for lithium-ion batteries integral to electric vehicle supply chains. The total project footprint encompassing Lots 1 and 2 is approximately 212 acres. This project would secure 600 million m2 per year of domestic separator manufacturing capacity, strengthening the United States market. Microporous would install twenty aqueous coating lines for both ceramic (alumina, boehmite) and polymer (PVdF) coating, complete with slurry mixing and slitting equipment. The plan would consist of manufacturing buildings, an administrative building, a utility building, and storage silos. Microporous would provide 282 permanent jobs within the DOE grant's three-year performance period and would ensure that at least 85% of full-time employees are from local Disadvantaged Communities by the completion of the project.

The location for the proposed project is within Lot 1 and Lot 2 of the Southern Virginia Megasite, located at 6100 Berry Hill Road, City of Danville, Pittsylvania County, Virginia (Attachments 1 and 2). The construction of the Li-ion battery separator plant would be conducted in accordance with applicable federal, state, and local ordinances, as necessary. There are multiple stages of construction planned, with Phase I and II occurring on Lot 1 and including the construction of a manufacturing and administration building within a currently graded area. Phase III and IV would take place on Lot 2 and include an would additional manufacturing building(s) in an area that is currently forested. Attachment 1 is a conceptual layout which would construct a base separator film plant to produce onsite (vs. purchasing) the base film required for the separator coating lines in Phases I and II. Attachment 2 is a conceptual layout of adding additional separator coating lines requiring additional purchased

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

base film. Phase II, Phase III, and Phase IV are not funded under the current proposed award (DOE's Proposed Action) and are still in unconfirmed conceptual stages. Phase I plans are in darker green color, while Phase II is in light green color and Phases III– IV plans are bordered with dashed lines. All Phases are labeled accordingly. Different possible layouts for Phase II – IV are noted with Attachments 1 and 2.

I have provided attachments that contain additional details pertaining to the proposed project, including project site plans and cultural resource survey reports encompassing the proposed project area. In particular, a "National Register Survey and Evaluations of Archaeological Sites and Evaluations of Architectural Resources in Lots 1, 2, 3, 4, 5, 8, and 9" report (Attachment 4) was completed in November 2020 by WSP USA, Inc. (WSP) that documented archaeological fieldwork and architectural research completed from May – July 2020 encompassing the above-noted lots of the Southern Virginia Megasite (including Lots 1 and 2, the site of the Microporous project). This report was submitted to the Virginia Department of Historic Resources (DHR). The Virginia DHR subsequently recommended in a letter dated from December 30, 2020 that two archaeological sites identified within Lots 1 and 2 (44PY0394 and 44PY0398) were potentially eligible for listing in the National Register of Historic Places (NRHP) and recommended avoidance or additional archaeological testing to determine eligibility for the NRHP (Attachment 5). WSP completed a Phase II investigation of sites 44PY0394 and 44PY0398 in August 2021 and documented the investigation in the "Phase II Investigation of Sites 44PY0394 and 44PY0398" report (Attachment 6) and subsequently formed an opinion that sites 44PY0394 and 44PY0398 are not eligible for listing in the NRHP. If your review of these materials concludes that no historic or cultural properties are present in the project area and that neither historic nor cultural properties would be affected by the proposed project, a written acknowledgment of that conclusion would be appreciated. DOE is also consulting with the VA DHR regarding this proposed project.

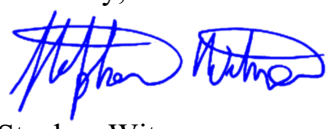
Based on the scope of the proposed Microporous project, DOE plans to prepare an Environmental Assessment (EA) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. While Phase II, Phase III, and Phase IV are not part of DOE's Proposed Action, the potential impacts of Phases II, III, and IV are being reasonably evaluated in the EA as part of the Cumulative Effects of the Proposed Action. Information that you provide will be incorporated and appropriately addressed in the EA. Moreover, when the Draft EA is circulated for public comment, the Delaware Nation will be provided electronic and hard copies where you may provide additional comments.

If you have any questions, comments, or concerns regarding this project, please contact me at the following address, phone, or email below:

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Thank you for your attention to this request, and I look forward to working with your Tribal Nation.

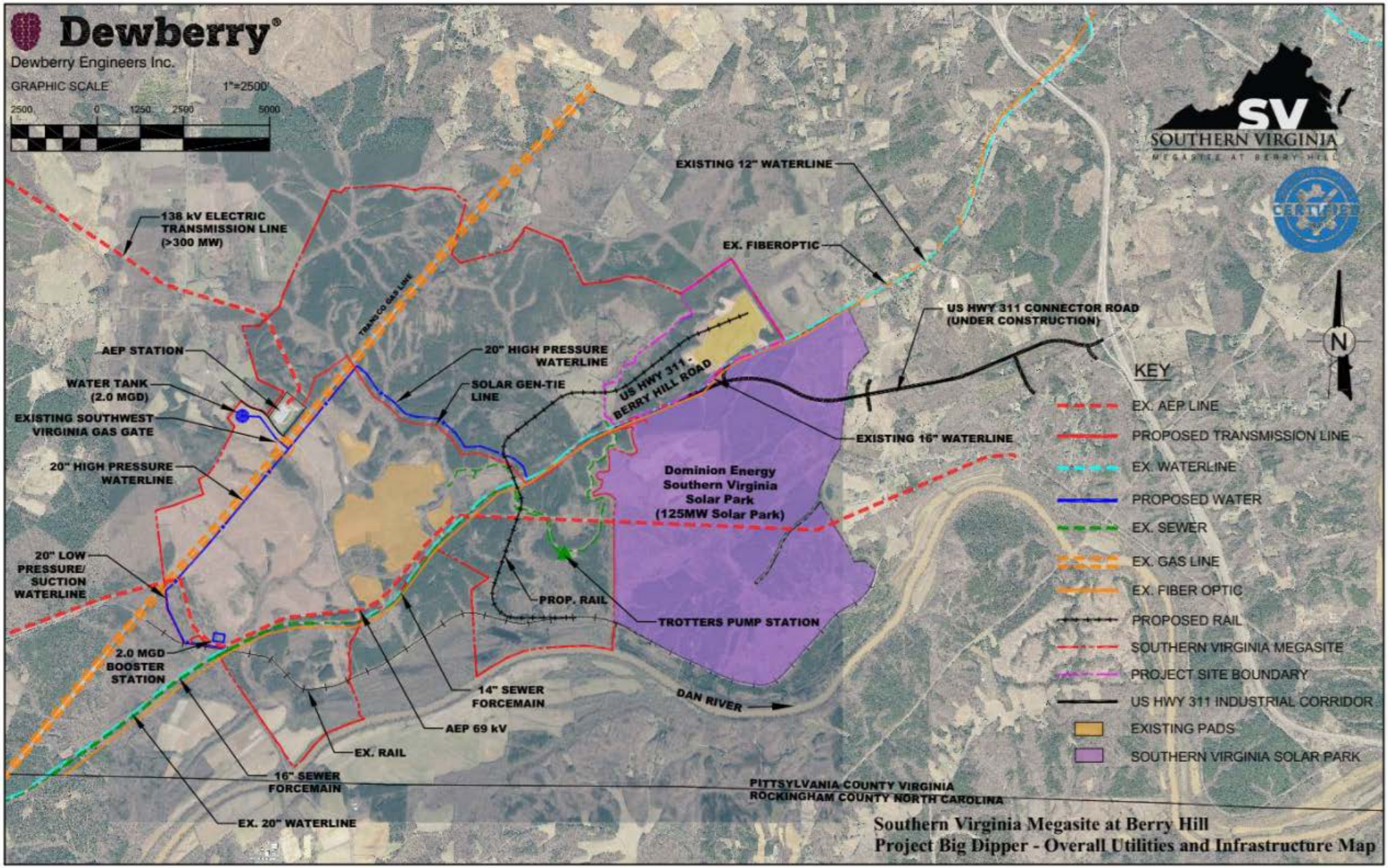
Sincerely,

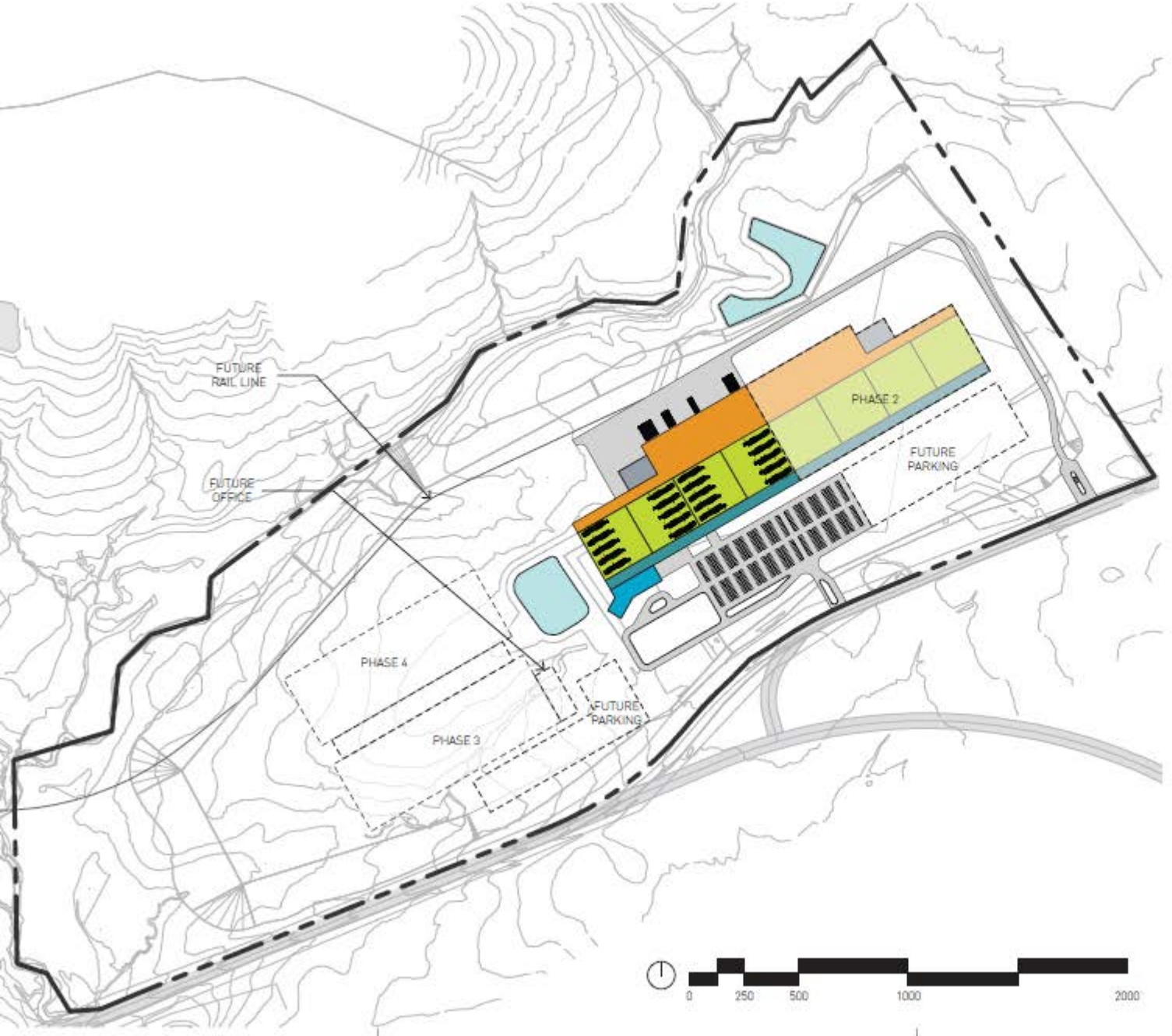


Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Microporous Project Site Plan – Future A.pdf
2. Microporous Project Site Plan – Future B.pdf
3. Southern Virginia Megasite Utilities and Infrastructure Map.pdf
4. WSP Evaluation of Sites in Lots 1, 2, 3, 4, 5, 8, 9_11-25-2020
5. VA DHR Response Letter to WSP Survey_12-30-2020
6. Phase II Investigation of Sites 44PY0394 and 44PY0398_06-13-2022.pdf


Dewberry
Dewberry Engineers Inc.
GRAPHIC SCALE
1"=2500'
2500 0 1250 2500 5000
SV
SOUTHERN VIRGINIA
MEGASITE AT BERRY HILL
CERTIFIED
N
EXISTING 12" WATERLINE
138 kV ELECTRIC TRANSMISSION LINE (>300 MW)
EX. FIBEROPTIC
US HWY 311 CONNECTOR ROAD (UNDER CONSTRUCTION)
TRANSCO GAS LINE
AEP STATION
20" HIGH PRESSURE WATERLINE
WATER TANK (2.0 MGD)
SOLAR GEN-TIE LINE
US HWY 311 - BERRY HILL ROAD
EXISTING SOUTHWEST VIRGINIA GAS GATE
EXISTING 16" WATERLINE
20" HIGH PRESSURE WATERLINE
Dominion Energy Southern Virginia Solar Park (125MW Solar Park)
20" LOW PRESSURE/ SUCTION WATERLINE
PROP. RAIL
TROTTERS PUMP STATION
2.0 MGD BOOSTER STATION
14" SEWER FORCEMAIN
DAN RIVER
AEP 69 kV
EX. RAIL
16" SEWER FORCEMAIN
PITTSYLVANIA COUNTY VIRGINIA
ROCKINGHAM COUNTY NORTH CAROLINA
EX. 20" WATERLINE
KEY
EX. AEP LINE
PROPOSED TRANSMISSION LINE
EX. WATERLINE
PROPOSED WATER
EX. SEWER
EX. GAS LINE
EX. FIBER OPTIC
PROPOSED RAIL
SOUTHERN VIRGINIA MEGASITE
PROJECT SITE BOUNDARY
US HWY 311 INDUSTRIAL CORRIDOR
EXISTING PADS
SOUTHERN VIRGINIA SOLAR PARK
Southern Virginia Megasite at Berry Hill
Project Big Dipper - Overall Utilities and Infrastructure Map



SITE PLAN - FUTURE A

AREAS

TOTAL - 499,000 SF

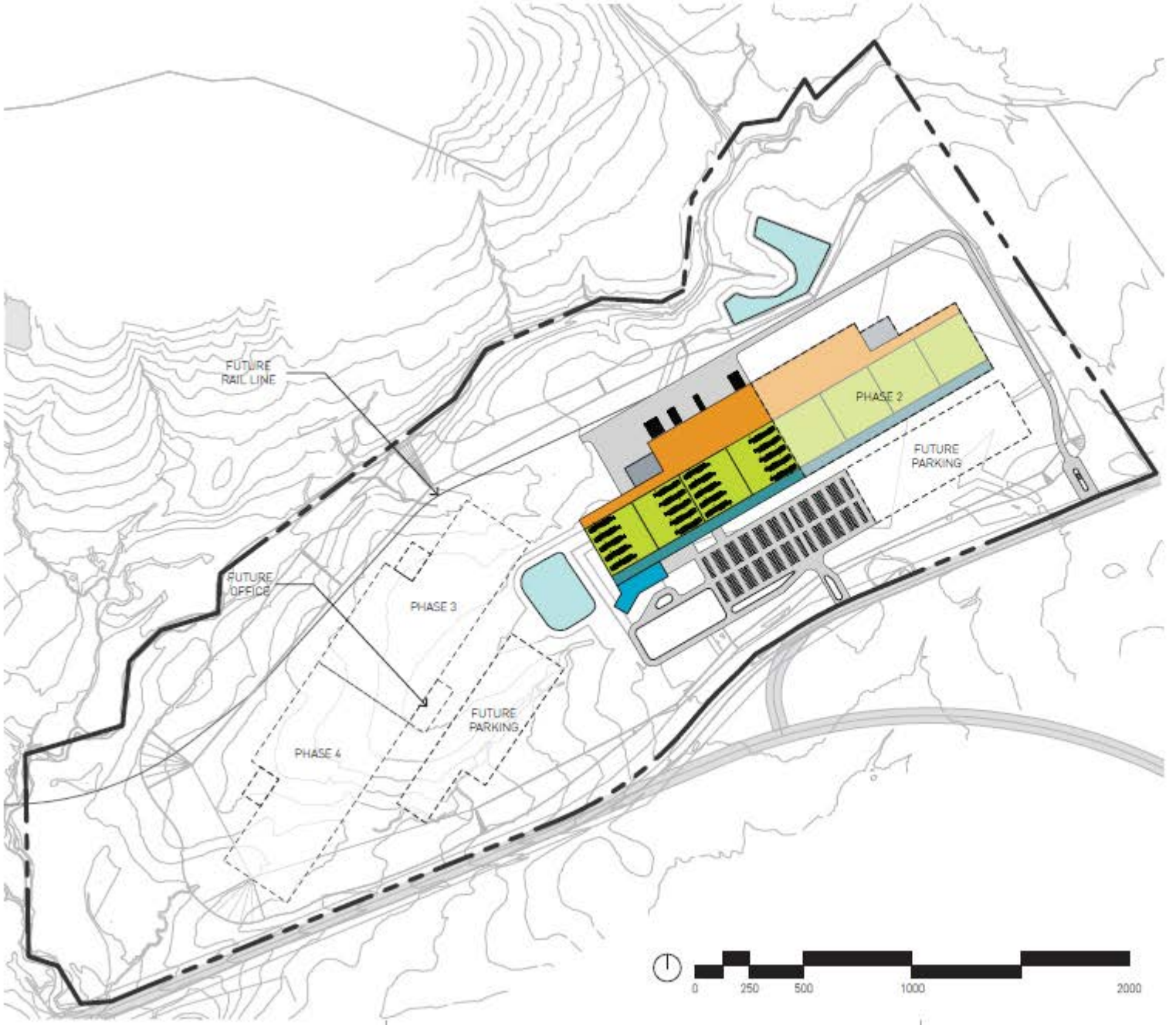
PRODUCTION	250,000 SF
WAREHOUSE	132,000 SF
OFFICE (2 STORY)	40,000 SF
SUPPORT	50,000 SF
UTILITY	27,000 SF
PARKING SPACES	400

PROS

- Office facing main access road.
- Minimized sitework for Phases 1 and 2.
- Short travel distance from warehouse to coating modules.
- Central water feature and green space for entire campus
- Minimized sitework for all phases and retain existing retention pond.
- Central warehouse between phases 1 and 2.
- Building shape should not require fire walls.

CONS

- Phases 3 and 4 are not directly connected to Phases 1 and 2.
- Utilities not centralized in Phase 1 and 2.
- If Phases 3 and 4 are coating lines it will necessitate expansion of the building pad.
- Longer travel distance between Phase 2 and central office building.



SITE PLAN - FUTURE B

AREAS

TOTAL - 499,000 SF

PRODUCTION	250,000 SF
WAREHOUSE	132,000 SF
OFFICE (2 STORY)	40,000 SF
SUPPORT	50,000 SF
UTILITY	27,000 SF
PARKING SPACES	400

PROS

- Office facing main access road.
- Minimized sitework for Phases 1 and 2.
- Short travel distance from warehouse to coating modules.
- Central water feature and green space for entire campus
- Minimized sitework for all phases and retain existing retention pond.
- Central warehouse between phases 1 and 2.
- Building shape should not require fire walls.

CONS

- Phases 3 and 4 are not directly connected to Phases 1 and 2.
- Utilities not centralized in Phase 1 and 2.
- If Phases 3 and 4 are coating lines it will necessitate expansion of the building pad.
- Longer travel distance between Phase 2 and central office building.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694

In Reply Refer To: 11/04/2024 19:41:05 UTC
Project Code: 2024-0131963
Project Name: Project Stellar

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*). Any activity proposed on National Wildlife Refuge lands must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

https://www.fws.gov/sites/default/files/documents/endangered-species-consultation-handbook.pdf

Migratory Birds: In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts, see https://www.fws.gov/program/migratory-bird-permit/what-we-do.

The MBTA has no provision for allowing take of migratory birds that may be unintentionally killed or injured by otherwise lawful activities. It is the responsibility of the project proponent to comply with these Acts by identifying potential impacts to migratory birds and eagles within applicable NEPA documents (when there is a federal nexus) or a Bird/Eagle Conservation Plan (when there is no federal nexus). Proponents should implement conservation measures to avoid or minimize the production of project-related stressors or minimize the exposure of birds and their resources to the project-related stressors. For more information on avian stressors and recommended conservation measures, see https://www.fws.gov/library/collections/threats-birds.

In addition to MBTA and BGEPA, Executive Order 13186: *Responsibilities of Federal Agencies to Protect Migratory Birds*, obligates all Federal agencies that engage in or authorize activities that might affect migratory birds, to minimize those effects and encourage conservation measures that will improve bird populations. Executive Order 13186 provides for the protection of both migratory birds and migratory bird habitat. For information regarding the implementation of Executive Order 13186, please visit https://www.fws.gov/partner/council-conservation-migratory-birds.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Project Code in the header of this

letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Bald & Golden Eagles
- Migratory Birds

OFFICIAL SPECIES LIST

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
(804) 693-6694

PROJECT SUMMARY

Project Code: 2024-0131963
Project Name: Project Stellar
Project Type: Federal Grant / Loan Related
Project Description: The proposed project would involve the construction of a coated lithium-ion (Li-ion) battery separator plant on Lots 1 and 2 of the Southern Virginia Megasite near Danville, VA for lithium-ion batteries integral to electric vehicle supply chains. The total project footprint encompassing Lots 1 and 2 is approximately 212 acres. This project would secure 600 million m2 per year of domestic separator manufacturing capacity, strengthening the United States market. Microporous would install twenty aqueous coating lines for both ceramic (alumina, boehmite) and polymer (PVdF) coating, complete with slurry mixing and slitting equipment. The plan would consist of manufacturing buildings, an administrative building, a utility building, and storage silos.

Project Location:

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.566958299999996,-79.58139969235967,14z

Counties: Pittsylvania County, Virginia

ENDANGERED SPECIES ACT SPECIES

There is a total of 3 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

MAMMALS

NAME	STATUS
Tricolored Bat *Perimyotis subflavus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/10515	Proposed Endangered

CLAMS

NAME	STATUS
Green Floater *Lasmigona subviridis* There is **proposed** critical habitat for this species. Your location does not overlap the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7541	Proposed Threatened

INSECTS

NAME	STATUS
Monarch Butterfly *Danaus plexippus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/9743	Candidate

CRITICAL HABITATS

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

YOU ARE STILL REQUIRED TO DETERMINE IF YOUR PROJECT(S) MAY HAVE EFFECTS ON ALL ABOVE LISTED SPECIES.

USFWS NATIONAL WILDLIFE REFUGE LANDS AND FISH HATCHERIES

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

BALD & GOLDEN EAGLES

Bald and golden eagles are protected under the Bald and Golden Eagle Protection Act[1] and the Migratory Bird Treaty Act[2].

Any person or organization who plans or conducts activities that may result in impacts to bald or golden eagles, or their habitats[3], should follow appropriate regulations and consider

implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Bald and Golden Eagle Protection Act of 1940.
2. The Migratory Birds Treaty Act of 1918.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

There are likely bald eagles present in your project area. For additional information on bald eagles, refer to Bald Eagle Nesting and Sensitivity to Human Activity

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

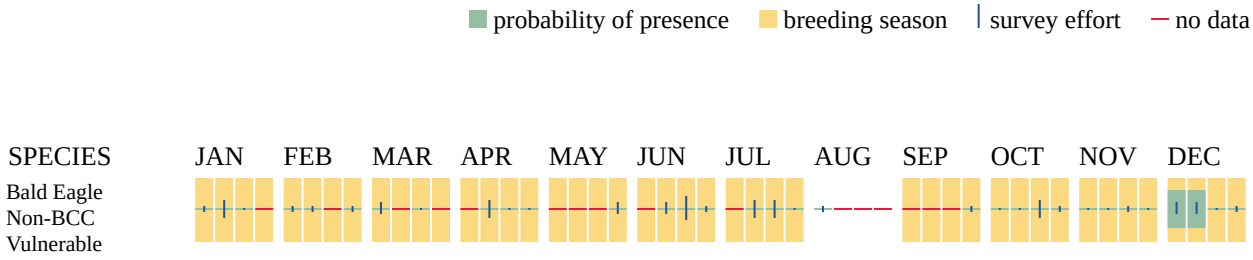
Probability of Presence (▪)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (▪)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

MIGRATORY BIRDS

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any person or organization who plans or conducts activities that may result in impacts to migratory birds, eagles, and their habitats[3] should follow appropriate regulations and consider implementing appropriate conservation measures, as described in the links below. Specifically, please review the "Supplemental Information on Migratory Birds and Eagles".

---

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

For guidance on when to schedule activities or implement avoidance and minimization measures to reduce impacts to migratory birds on your list, see the PROBABILITY OF PRESENCE SUMMARY below to see when these birds are most likely to be present and breeding in your project area.

NAME	BREEDING SEASON
Bald Eagle *Haliaeetus leucocephalus* This is not a Bird of Conservation Concern (BCC) in this area, but warrants attention because of the Eagle Act or for potential susceptibilities in offshore areas from certain types of development or activities. https://ecos.fws.gov/ecp/species/1626	Breeds Sep 1 to Jul 31
Chimney Swift *Chaetura pelagica* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9406	Breeds Mar 15 to Aug 25
Eastern Whip-poor-will *Antrostomus vociferus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/10678	Breeds May 1 to Aug 20
Grasshopper Sparrow *Ammodramus savannarum perpallidus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/8329	Breeds Jun 1 to Aug 20
Prairie Warbler *Setophaga discolor* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9513	Breeds May 1 to Jul 31
Prothonotary Warbler *Protonotaria citrea* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9439	Breeds Apr 1 to Jul 31
Red-headed Woodpecker *Melanerpes erythrocephalus* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9398	Breeds May 10 to Sep 10
Rusty Blackbird *Euphagus carolinus* This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA https://ecos.fws.gov/ecp/species/9478	Breeds elsewhere
Wood Thrush *Hylocichla mustelina* This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9431	Breeds May 10 to Aug 31

PROBABILITY OF PRESENCE SUMMARY

The graphs below provide our best understanding of when birds of concern are most likely to be present in your project area. This information can be used to tailor and schedule your project activities to avoid or minimize impacts to birds. Please make sure you read "Supplemental

Information on Migratory Birds and Eagles", specifically the FAQ section titled "Proper Interpretation and Use of Your Migratory Bird Report" before using or attempting to interpret this report.

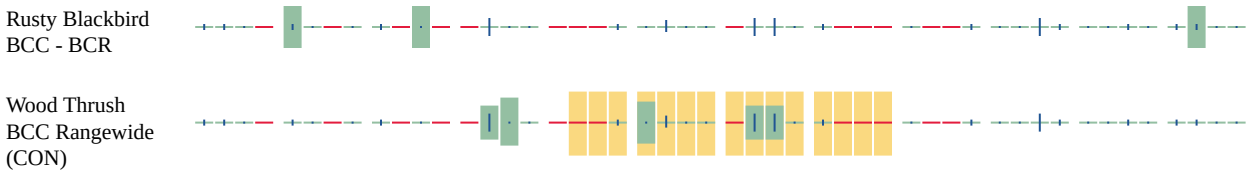
Probability of Presence (■)

Green bars; the bird's relative probability of presence in the 10km grid cell(s) your project overlaps during that week of the year.

Breeding Season (■)
Yellow bars; liberal estimate of the timeframe inside which the bird breeds across its entire range.

Survey Effort (|)
Vertical black lines; the number of surveys performed for that species in the 10km grid cell(s) your project area overlaps.

No Data (–)
A week is marked as having no data if there were no survey events for that week.



Additional information can be found using the following links:

- Eagle Management https://www.fws.gov/program/eagle-management
- Measures for avoiding and minimizing impacts to birds https://www.fws.gov/library/collections/avoiding-and-minimizing-incidental-take-migratory-birds
- Nationwide conservation measures for birds https://www.fws.gov/sites/default/files/documents/nationwide-standard-conservation-measures.pdf
- Supplemental Information for Migratory Birds and Eagles in IPaC https://www.fws.gov/media/supplemental-information-migratory-birds-and-bald-and-golden-eagles-may-occur-project-action

IPAC USER CONTACT INFORMATION

Agency: Department of Energy
Name: Stephen Witmer
Address: 626 Cochran Mill Road
Address Line 2: Mailstop 921-227
City: Pittsburgh
State: PA
Zip: 15236
Email stephen.witmer@netl.doe.gov
Phone: 4123867589

You have indicated that your project falls under or receives funding through the following special project authorities:

- BIPARTISAN INFRASTRUCTURE LAW (BIL) (OTHER)

Endangered Species Act (ESA) Section 7 Determination Table

Project Name: Project Stellar

Date: 11/12/2024

Consultation Code: 2024-0131963

Species / Resource Name *Insert name of species or resource as listed on Official Species List.*	**Habitat/Species Presence in Action Area** *Indicate if suitable habitat and species are present in the Action Area (see examples in Step 5).*	**Sources of Info** *Explain what info suitable habitat/species presence is based on.*	**ESA Section 7 Determination** *Using reasoning and decision tables in Step 5, select determination for each species (e.g. no effect, not likely to adversely affect, or likely to adversely affect).*	**Project Elements that Support Determination** *Explain which project elements may impact the habitat or individuals of each species and any Avoidance and Minimization Measures being implemented.*
Perimyotis subflavus (Tricolored bat)	No critical habitat has been designated for this species, but suitable habitat present.	VAFO CH Map Tool, IPaC Official Species list (2024), Determination Key.	*May affect*	The Tricolored Bat overwinters in caves and abandoned mines. Also found in road-associated culverts. Forested habitats, including roosting in trees. May also be found in Spanish moss, pine trees, and occasionally human structures. The Tricolored Bat does not have a designated critical habitat. However, forested habitats on Lot 2 may provide suitable habitat for the Tricolored Bat. As of this submission, results from a survey commissioned over the Southern Virginia Megasite to ascertain the presence of the Tricolored Bat are not yet final. It is expected that if the species could be present (particularly on Lot 2), proposed tree removal would be timed so as to not impact Tricolored Bat populations.

Lasmigona subviridis (Green Floater)	Critical habitat not present, and no suitable habitat present.	VAFO CH Map Tool, IPaC Official Species list (2024), Quest Site Solutions Certification Report (2021), conclusions drawn from "Survey for Freshwater Mussel Fauna in Trotters Creek and unnamed Tributaries of the Dan River, Berry Hill Commerce Centre, Pittsylvania County, Virginia" (2015).	*No effect*	Per the conclusions of the "Survey for Freshwater Mussel Fauna" survey previously referenced, "No species of freshwater mussels were found at any examined site. The sites to be affected on the two unnamed tributaries of the Dan River are overtly inappropriate for freshwater mussels of interest, being seasonal streams. Trotters Creek was found to contain an exotic species, the Asian clam, while the habitats that might be expected to possibly support James spinymussel where badly impacted by siltation with much habitat otherwise inappropriate for that species. From consideration of general biological features and stream habitats, no listed species of freshwater mussel including James spinymussel, or other Atlantic slope species potentially occurring in the Roanoke basin is expected to occur in the survey area or be affected by the proposed Commerce Centre development."
Danaus plexippus (Monarch Butterfly)	No critical habitat has been designated for this species, and no suitable habitat present	VAFO CH Map Tool, IPaC Official Species list (2024)	*Not likely to adversely affect*	The Monarch Butterfly is considered a candidate and has not, to date, been formally listed or proposed for listing under the Endangered Species Act (ESA) (Endangered Species Act, 1973). The Monarch Butterfly does not have a designated critical habitat,

				and there are no unique features/vegetation associated with the Proposed Project that preferentially support Monarch habitat.

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, VA 23061-4410
Phone: (804) 693-6694

In Reply Refer To: 11/07/2024 19:34:09 UTC
Project code: 2024-0131963
Project Name: Project Stellar

Federal Nexus: yes
Federal Action Agency (if applicable): Department of Energy

Subject: Technical assistance for 'Project Stellar'

Dear Stephen Witmer:

This letter records your determination using the Information for Planning and Consultation (IPaC) system provided to the U.S. Fish and Wildlife Service (Service) on November 07, 2024, for 'Project Stellar' (here forward, Project). This project has been assigned Project Code 2024-0131963 and all future correspondence should clearly reference this number. **Please carefully review this letter. Your Endangered Species Act (Act) requirements are not complete.**

Ensuring Accurate Determinations When Using IPaC

The Service developed the IPaC system and associated species' determination keys in accordance with the Endangered Species Act of 1973 (ESA; 87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) and based on a standing analysis. All information submitted by the Project proponent into IPaC must accurately represent the full scope and details of the Project. **Failure to accurately represent or implement the Project as detailed in IPaC or the Northern Long-eared Bat and Tricolored Bat Range-wide Determination Key (Dkey), invalidates this letter.**

Determination for the Northern Long-Eared Bat and Tricolored Bat

Based on your IPaC submission and a standing analysis completed by the Service, you determined the proposed Project will have the following effect determinations:

Species	Listing Status	Determination
Tricolored Bat (*Perimyotis subflavus*)	Proposed Endangered	May affect

Other Species and Critical Habitat that May be Present in the Action Area

The IPaC-assisted determination key for the northern long-eared bat and tricolored bat does not apply to the following ESA-protected species and/or critical habitat that also may occur in your Action area:

- Green Floater *Lasmigona subviridis* Proposed Threatened
- Monarch Butterfly *Danaus plexippus* Candidate

You may coordinate with our Office to determine whether the Action may cause prohibited take of the species listed above.

Conclusion

Consultation with the Service is not complete. Further consultation or coordination with the Service is necessary for those species or designated critical habitats with a determination of "May Affect." A "May Affect" determination in this key indicates that the project, as entered, is not consistent with the questions in the key. Not all projects that reach a "May Affect" determination are anticipated to result in adverse impacts to listed species. These projects may result in a "No Effect", "May Affect, Not Likely to Adversely Affect", or "May Affect, Likely to Adversely Affect" determination depending on the details of the project. Please contact our Virginia Ecological Services Field Office to discuss methods to avoid or minimize potential adverse effects to those species or designated critical habitats

Action Description
You provided to IPaC the following name and description for the subject Action.

1. Name

Project Stellar

2. Description

The following description was provided for the project 'Project Stellar':

> The proposed project would involve the construction of a coated lithium-ion (Li-ion) battery separator plant on Lots 1 and 2 of the Southern Virginia Megasite near Danville, VA for lithium-ion batteries integral to electric vehicle supply chains. The total project footprint encompassing Lots 1 and 2 is approximately 212 acres. This project would secure 600 million m2 per year of domestic separator manufacturing capacity, strengthening the United States market. Microporous would install twenty aqueous coating lines for both ceramic (alumina, boehmite) and polymer (PVdF) coating, complete with slurry mixing and slitting equipment. The plan would consist of manufacturing buildings, an administrative building, a utility building, and storage silos.

The approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@36.566958299999996,-79.58139969235967,14z

DETERMINATION KEY RESULT

Based on the answers provided, the proposed Action is consistent with a determination of “may affect” for a least one species covered by this determination key.

QUALIFICATION INTERVIEW

1. Does the proposed project include, or is it reasonably certain to cause, intentional take of listed bats or any other listed species?

   Note: Intentional take is defined as take that is the intended result of a project. Intentional take could refer to research, direct species management, surveys, and/or studies that include intentional handling/encountering, harassment, collection, or capturing of any individual of a federally listed threatened, endangered or proposed species?

   No

2. Is the action area wholly within Zone 2 of the year-round active area for northern long-eared bat and/or tricolored bat?

   Automatically answered
   No

3. Does the action area intersect Zone 1 of the year-round active area for northern long-eared bat and/or tricolored bat?

   Automatically answered
   No

4. Does any component of the action involve leasing, construction or operation of wind turbines? Answer 'yes' if the activities considered are conducted with the intention of gathering survey information to inform the leasing, construction, or operation of wind turbines.

   Note: For federal actions, answer ‘yes’ if the construction or operation of wind power facilities is either (1) part of the federal action or (2) would not occur but for a federal agency action (federal permit, funding, etc.).

   No

5. Is the proposed action authorized, permitted, licensed, funded, or being carried out by a Federal agency in whole or in part?

   Yes

6. Is the Federal Highway Administration (FHWA), Federal Railroad Administration (FRA), or Federal Transit Administration (FTA) funding or authorizing the proposed action, in whole or in part?

   No

7. Are you an employee of the federal action agency or have you been officially designated in writing by the agency as its designated non-federal representative for the purposes of Endangered Species Act Section 7 informal consultation per 50 CFR § 402.08?

   Note: This key may be used for federal actions and for non-federal actions to facilitate section 7 consultation and to help determine whether an incidental take permit may be needed, respectively. This question is for information purposes only.

   Yes

8. Is the lead federal action agency the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC)? Is the Environmental Protection Agency (EPA) or Federal Communications Commission (FCC) funding or authorizing the proposed action, in whole or in part?

   No

9. Is the lead federal action agency the Federal Energy Regulatory Commission (FERC)?

   No

10. [Semantic] Is the action area located within 0.5 miles of a known bat hibernaculum?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

11. Does the action area contain any winter roosts or caves (or associated sinkholes, fissures, or other karst features), mines, rocky outcroppings, or tunnels that could provide habitat for hibernating bats?

    No

12. Will the action cause effects to a bridge?

    Note: Covered bridges should be considered as bridges in this question.

    No

13. Will the action result in effects to a culvert or tunnel at any time of year?

    No

14. Are trees present within 1000 feet of the action area?

    Note: If there are trees within the action area that are of a sufficient size to be potential roosts for bats answer "Yes". If unsure, additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    Yes

15. Does the action include the intentional exclusion of bats from a building or structure?

    Note: Exclusion is conducted to deny bats' entry or reentry into a building. To be effective and to avoid harming bats, it should be done according to established standards. If your action includes bat exclusion and you are unsure whether northern long-eared bats or tricolored bats are present, answer "Yes." Answer "No" if there are no signs of bat use in the building/structure. If unsure, contact your local Ecological Services Field Office to help assess whether northern long-eared bats or tricolored bats may be present. Contact a Nuisance Wildlife Control Operator (NWCO) for help in how to exclude bats from a structure safely without causing harm to the bats (to find a NWCO certified in bat standards, search the Internet using the search term "National Wildlife Control Operators Association bats"). Also see the White-Nose Syndrome Response Team's guide for bat control in structures.

    No

16. Does the action involve removal, modification, or maintenance of a human-made structure (barn, house, or other building) **known or suspected to contain roosting bats?**

    No

17. Will the action cause construction of one or more new roads open to the public?

    For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.).

    No

18. Will the action include or cause any construction or other activity that is reasonably certain to increase average daily traffic permanently or temporarily on one or more existing roads?

    Note: For federal actions, answer 'yes' when the construction or operation of these facilities is either (1) part of the federal action or (2) would not occur but for an action taken by a federal agency (federal permit, funding, etc.). .

    Yes

19. Will the increased vehicle traffic occur on any road that lies between any two areas of contiguous forest that are each greater than or equal to 10 acres in extent and are separated by less than 1,000 feet? Bats may cross a road by flying between forest patches that are up to 1,000 feet apart.

    Note: "Contiguous forest" of 10 acres or more may includes areas where multiple forest patches are separated by less than 1,000 feet of non-forested area if the forested patches, added together, comprise at least 10 acres.

    No

20. Will the proposed Action involve the creation of a new water-borne contaminant source (e.g., leachate pond, pits containing chemicals that are not NSF/ANSI 60 compliant)?

    Note: For information regarding NSF/ANSI 60 please visit https://www.nsf.org/knowledge-library/nsf-ansi-standard-60-drinking-water-treatment-chemicals-health-effects

    No

21. Will the proposed action involve the creation of a new point source discharge from a facility other than a water treatment plant or storm water system?

    No

22. Will the action include drilling or blasting?

    Yes

23. Will the drilling or blasting produce noise or vibrations above existing background levels that will affect suitable summer habitat for northern long-eared bats and/or tricolored bats?

    Note: Additional information defining suitable suitable summer habitat for the northern long-eared bat and/or tricolored bat, can be found in Appendix A in the USFWS' Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines

    No

24. Will the action involve military training (e.g., smoke operations, obscurant operations, exploding munitions, artillery fire, range use, helicopter or fixed wing aircraft use)?

    No

25. Will the proposed action involve the use of herbicides or other pesticides other than herbicides (e.g., fungicides, insecticides, or rodenticides)?

    No

26. Will the action include or cause activities that are reasonably certain to cause chronic or intense nighttime noise (above current levels of ambient noise in the area) in suitable summer habitat for the northern long-eared bat or tricolored bat during the active season?

    Chronic noise is noise that is continuous or occurs repeatedly again and again for a long time. Sources of chronic or intense noise that could cause adverse effects to bats may include, but are not limited to: road traffic; trains; aircraft; industrial activities; gas compressor stations; loud music; crowds; oil and gas extraction; construction; and mining.

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    No

27. Does the action include, or is it reasonably certain to cause, the use of permanent or temporary artificial lighting within 1000 feet of suitable northern long-eared bat or tricolored bat roosting habitat?

    Note: Additional information defining suitable summer habitat for the northern long-eared bat and tricolored bat can be found in Appendix A of the USFWS' Range-wide Indiana Bat and Northern long-eared bat Survey Guidelines at: https://www.fws.gov/media/range-wide-indiana-bat-and-northern-long-eared-bat-survey-guidelines.

    No

28. Will the action include tree cutting or other means of knocking down or bringing down trees, tree topping, or tree trimming?

    Yes

29. Will the proposed action occur exclusively in an already established and currently maintained utility right-of-way?

    No

30. Does the action include emergency cutting or trimming of hazard trees in order to remove an imminent threat to human safety or property? See hazard tree note at the bottom of the key for text that will be added to response letters

    Note: A "hazard tree" is a tree that is an immediate threat to lives, public health and safety, or improved property.

    No

31. Does the project intersect with the 0- 9.9% forest density category?

    Automatically answered
    No

32. Does the project intersect with the 10.0- 19.9% forest density category map?

    Automatically answered
    No

33. Does the project intersect with the 20.0- 29.9% forest density category map?

    Automatically answered
    No

34. Does the project intersect with the 30.0- 100% forest density category map?

    Automatically answered
    Yes

35. Will the action cause trees to be cut, knocked down, or otherwise brought down across an area greater than 100 acres in total extent?

    No

36. Will the proposed action result in the use of prescribed fire?

    Note: If the prescribed fire action includes other activities than application of fire (e.g., tree cutting, fire line preparation) please consider impacts from those activities within the previous representative questions in the key. This set of questions only considers impacts from flame and smoke.

    No

37. Does the action area intersect the tricolored bat species list area?

    Automatically answered
    Yes

38. [Semantic] Is the action area located within 0.25 miles of a culvert that is known to be occupied by northern long-eared or tricolored bats?

    Note: The map queried for this question contains proprietary information and cannot be displayed. If you need additional information, please contact your State wildlife agency.

    Automatically answered
    No

39. Has a presence/probable absence bat survey targeting the tricolored bat and following the Service's Range-wide Indiana Bat and Northern Long-Eared Bat Survey Guidelines been conducted within the project area?

    No

40. Is suitable summer habitat for the tricolored bat present within 1000 feet of project activities?
    (If unsure, answer ""Yes."")

    Note: If there are trees within the action area that may provide potential roosts for tricolored bats (e.g., clusters of leaves in live and dead deciduous trees, Spanish moss (Tillandsia usneoides), clusters of dead pine needles of large live pines) answer ""Yes."" For a complete definition of suitable summer habitat for the tricolored bat, please see Appendix A in the Service's Range-wide Indiana Bat and Northern long-eared Bat Survey Guidelines.

    Yes

41. Do you have any documents that you want to include with this submission?

    No

PROJECT QUESTIONNAIRE

Enter the extent of the action area (in acres) from which trees will be removed - round up to the nearest tenth of an acre. For this question, include the entire area where tree removal will take place, even if some live or dead trees will be left standing.

67

IPAC USER CONTACT INFORMATION

Agency:	Department of Energy
Name:	Stephen Witmer
Address:	626 Cochran Mill Road
Address Line 2:	Mailstop 921-227
City:	Pittsburgh
State:	PA
Zip:	15236
Email	stephen.witmer@netl.doe.gov
Phone:	4123867589

You have indicated that your project falls under or receives funding through the following special project authorities:

- BIPARTISAN INFRASTRUCTURE LAW (BIL) (OTHER)

November 12, 2024

U.S. Fish and Wildlife Service
Virginia Ecological Services Field Office
6669 Short Lane
Gloucester, Virginia 23061-4410

Subject: Review Request Letter: Project Stellar at the Southern Virginia Megasite

Dear Virginia Ecological Services Field Office,

The U.S. Department of Energy (DOE) is proposing to provide a financial assistance grant (DOE's Proposed Action) to Microporous Assets Corporation (Microporous) as part of the funding opportunity announcement titled "Bipartisan Infrastructure Law (BIL) Advanced Energy Manufacturing and Recycling Grant Program (Section 40209)," with funds appropriated by the Infrastructure Investment and Jobs Act, also more commonly known as the Bipartisan Infrastructure Law.

The location for the Proposed Project is within Lot 1 and Lot 2 of the Southern Virginia Megasite, located at 6100 Berry Hill Road, City of Danville, Pittsylvania County, Virginia (Attachments 1 and 2). The Southern Virginia Megasite is 3,528-acres in total and is publicly owned and zoned for industrial use. The Southern Virginia Megasite is currently being developed for industrial use, which has included site preparation, clearing, and development of select lots. Utilities including water, sanitary sewer, natural gas, fiber optic, and electricity, and Class 1 railway and Expressway (US 58/US 29) access have already been or are otherwise planned to be installed across the Megasite, including for applicable portions of Lots 1 and 2. Current development plans for the Proposed Project avoid incursion into jurisdictional freshwater aquatic/wetland resources which have been identified within the area of Lots 1 and 2. Trees within and/or immediately adjacent to the project area will be removed or otherwise potentially impacted (i.e., trimmed or unintentionally damaged) during proposed development activities.

Microporous has planned multiple stages of construction, with Phase I and II occurring on Lot 1 in the short-term and including the construction of a manufacturing and administration building within a currently graded area. Phase III and IV would take place on Lot 2 and would include additional manufacturing building(s) in an area that is currently forested. Attachment 1 is a conceptual layout which would construct a base separator film plant to produce onsite (vs. purchasing) the base film required for the separator coating lines in Phases I and II. Attachment 2 is a conceptual layout of adding additional separator coating lines requiring additional purchased base film. Phase II, Phase III, and Phase IV are not funded under the current proposed award (DOE's Proposed Action) and are still in unconfirmed conceptual stages. Phase I plans are in

626 Cochran Mill Road, Pittsburgh, PA 15236
stephen.witmer@netl.doe.gov Phone (412) 386-7589 www.netl.doe.gov

darker green color, while Phase II is in light green color and Phases III– IV plans are bordered with dashed lines. All Phases are labeled accordingly. Different possible layouts for Phase II – IV are noted with Attachments 1 and 2.

Multiple surveys have been conducted on an area nearby west of the Proposed Project between 2010 and 2015, less than a mile from Lots 1 and 2, with the most recent study conducted in 2015, totaling 340 acres of surveyed land. The 2015 survey conducted (Attachment 8) was for potential populations of Echinacea laevigata (Smooth Coneflower), Isotria medeoloides (Small Whorled Pogonia) and Nestronia umbellula (Indian Olive) at the above referenced site. The survey for Indian Olive, a protected plant, was conducted under the recommendation of the consulted surveyors. Due to their rarity and loss of potential habitat from development, Echinacea laevigata and Isotria medeoloides have been listed by the USFWS as Endangered and Threatened, respectively. Prior surveys conducted in 2010 and 2011 were conducted during the growing seasons for the population of the above listed flora. Search efforts identified no individuals of any of the three target plant species within the investigated area in 2010, 2011, or 2015, and the site has been labeled as having a low potential for their occurrence. A survey of freshwater mussel fauna in Trotters Creek and unnamed tributaries of the Dan River was conducted in 2015 (Attachment 7) nearby west of the Proposed Project to determine potential impact to the freshwater mussel habitat during development of the entire Megasite. The area was surveyed for the presence of the James spinymussel (Pleurobema collina) and potential habitat, which has been identified as a federally and state endangered species and has the potential to be within the area of the Proposed Project. The surveyed area did not account for potential freshwater mussels in McGuff Creek or Trayners Branch, which are located adjoining north of Lots 1 and 2. However, of the entirety of the survey which consisted of approximately 3.1 effort hours of observed area (less than 1 mile west of the Proposed Project), no mussel species, family Unionidae were observed during the survey. The only bivalve observed was the Asian clam (Corbicula fluminea), which was found in Trotters Creek. No other mollusks or snails were observed, and water conditions were reported to be clear and shallow, which would have provided fair conditions to find mussels. In addition, previous surveys performed in 2010 and 2011 across the entirety of Trotters creek produced no evidence of freshwater mussels. In addition, no areas of potential habitat were observed, as concluded by the survey.

Information regarding the potential state or federally listed threatened, endangered, or candidate species within the vicinity of the Proposed Project area was obtained from the USFWS website's Information, Planning, and Conservation (IPaC) Tool Official Species List (Attachment 3). DOE also completed the online project review steps outlined on the Virginia Ecological Services Field Office website based on the identification of three species from the USFWS Official Species List and has provided a Determination Table as part of this submission (Attachment 4). The Tricolored Bat, Green Floater, and Monarch Butterfly were identified on the Official Species List. No critical habitats were identified within (or adjacent to) the Proposed Project boundaries. As part of a Quest Site Solutions Certification Report and Quest Site Solutions Certification Letter (Attachment Six) commissioned prior to the development of the overall Southern Virginia Megasite in

June 2021, the Northern Long-eared Bat (NLEB) was identified as a threatened species. However, this species was not identified in the most-recent USFWS IPaC Official Species List used as the basis for DOE's analysis. The Certification Report noted that there are no known maternity roost trees or hibernaculum within close proximity to the Southern Virginia Megasite. DOE also completed a review of the Northern Long-Eared Bat Regulatory Buffer Interactive Tool in November 2024 and found that the overall Southern Virginia Megasite contained no NLEB hibernacula, roots, or mist-net and auditory captures.

DOE's determination is that the Proposed Project would have No Effect on the Green Floater, Not Likely to Adversely Affect the Monarch Butterfly, and May Effect the Tricolored Bat. The Proposed Project would also have No Effect on critical habitats. The "May Affect" determination for the Tricolored Bat was also supported by use of a Determination Key on the IPaC website (Attachment 5). It is DOE's understanding that a survey to determine the presence of the Tricolored Bat within the entirety of the Southern Virginia Megasite has been completed, with findings to be finalized in the near-term. If the presence of this species is confirmed, Microporous and developers of the Southern Virginia Megasite would ensure that tree clearing would be timed to avoid adverse impacts to the Tricolored Bat.

Based on the scope of the proposed Microporous project, DOE plans to prepare an Environmental Assessment (EA) in accordance with requirements of the National Environmental Policy Act to analyze, document, and disseminate information on the potential environmental and cultural consequences of the project. While Phase II, Phase III, and Phase IV are not part of DOE's Proposed Action, the potential impacts of Phases II, III, and IV are being reasonably evaluated in the EA. The Virginia Ecological Services Field Office will be provided a copy of this Draft EA as part of the 30-day public comment and review period. Any information you provide regarding DOE's Determination of Effect noted above, along with pending results of the bat survey within the Southern Virginia Megasite will be accounted for as part of the Final EA for DOE's Proposed Action and Microporous' Proposed Project.

Please contact Stephen Witmer using the contact information below if you have questions, comments, or would like additional information regarding DOE's Determination of Effect.

U.S. Department of Energy
National Energy Technology Laboratory
626 Cochran Mill Road
M/S 921-227
Pittsburgh, PA 15236
Telephone: 412-386-7589
Email: stephen.witmer@netl.doe.gov

Sincerely,

Stephen Witmer

Stephen Witmer
NEPA Compliance Officer

Attachments:

1. Microporous Project Site Plan – Future A.pdf
2. Microporous Project Site Plan – Future B.pdf
3. IPaC Official Species List_Microporous.pdf
4. Virginia Ecological Services Field Office Determination Table.pdf
5. Determination Key_Tricolored Bat.pdf
6. Quest Site Solutions Certification Letter.pdf
7. Freshwater Mussel Survey – SVMS.pdf
8. Smooth Coneflower-Small Whorled Pogonia-Indian Olive Survey.pdf

APPENDIX C

RELEVANT TECHNICAL STUDIES AND BACKGROUND MATERIALS

United States Environmental Protection Agency
Social Cost of Greenhouse Gases Application Workbook

Emission Changes			
	Emissions Changes (metric tons)		
Year	CO2	CH4	N2O
2020			
2021			
2022			
2023			
2024			
2025	28,248		
2026	28,248		
2027	(402,707)	(4)	(2)
2028	(1,749,061)	(23)	(12)
2029	(3,408,357)	(29)	(14)
2030	(3,408,357)	(51)	(23)
2031	(3,408,357)	(51)	(23)
2032	(3,408,357)	(51)	(23)
2033	(3,408,357)	(51)	(23)
2034	(3,408,357)	(51)	(23)
2035			
2036			
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2080			
Total	**(22,545,414)**	**(312)**	**(144)**

Constant discounting

Number of years (N)	10		
Discount Rate	2.5%	2.0%	1.5%

Present and Annualized Values of CO2 Emission Changes (millions, 2020$)			
GHG	**CO2**	**CO2**	**CO2**
Discount Rate	**2.5%**	**2.0%**	**1.5%**
Present Value in 2024 (2020$)	-$2,783.31	-$4,581.61	-$7,896.36
Annualized Value (10 Years, 2020$)	-$318.02	-$510.06	-$856.24

Present and Annualized Values of CH4 Emission Changes (millions, 2020$)			
GHG	**CH4**	**CH4**	**CH4**
Discount Rate	**2.5%**	**2.0%**	**1.5%**
Present Value in 2024 (2020$)	-$0.53	-$0.68	-$0.92
Annualized Value (10 Years, 2020$)	-$0.06	-$0.08	-$0.10

Present and Annualized Values of N2O Emission Changes (millions, 2020$)			
GHG	**N2O**	**N2O**	**N2O**
Discount Rate	**2.5%**	**2.0%**	**1.5%**
Present Value in 2024 (2020$)	-$5.51	-$8.45	-$13.55
Annualized Value (10 Years, 2020$)	-$0.63	-$0.94	-$1.47

Total Present and Annualized Values of all GHG Emission Changes (CO2, CH4, and N2O) (millions, 2020$)			
GHG	**Total**	**Total**	**Total**
Discount Rate	**2.5%**	**2.0%**	**1.5%**
Present Value in 2024 (2020$)	**-$2,789.35**	**-$4,590.75**	**-$7,910.83**
Annualized Value (10 Years, 2020$)	**-$318.71**	**-$511.07**	**-$857.80**

United States Environmental Protection Agency
Social Cost of Greenhouse Gases Application Workbook

	Discounted, Monetized Value of Emission Changes, discounted to 2024 (millions, 2020$) - Constant Discounting								
	Discounted, Monetized Value of CO2 Emissions Changes (millions, 2020$)			Discounted, Monetized Value of CH4 Emissions Changes (millions, 2020$)			Discounted, Monetized Value of N2O Emissions Changes (millions, 2020$)		
	Discounted Back to 2024			Discounted Back to 2024			Discounted Back to 2024		
	CO2	CO2	CO2	CH4	CH4	CH4	N2O	N2O	N2O
Year	2.5%	2.0%	1.5%	2.5%	2.0%	1.5%	2.5%	2.0%	1.5%
2020									
2021									
2022									
2023									
2024									
2025	$3.58	$5.87	$10.02						
2026	$3.58	$5.84	$10.01						
2027	-$50.86	-$83.11	-$142.49	-$0.01	-$0.01	-$0.01	-$0.09	-$0.14	-$0.23
2028	-$220.25	-$360.34	-$617.98	-$0.04	-$0.05	-$0.07	-$0.46	-$0.70	-$1.12
2029	-$424.76	-$697.67	-$1,202.26	-$0.05	-$0.06	-$0.08	-$0.56	-$0.85	-$1.36
2030	-$423.22	-$696.10	-$1,196.96	-$0.08	-$0.11	-$0.15	-$0.89	-$1.36	-$2.17
2031	-$421.50	-$694.32	-$1,194.63	-$0.09	-$0.11	-$0.15	-$0.88	-$1.35	-$2.17
2032	-$419.61	-$689.43	-$1,192.10	-$0.09	-$0.11	-$0.15	-$0.88	-$1.35	-$2.17
2033	-$417.56	-$687.32	-$1,186.41	-$0.09	-$0.11	-$0.15	-$0.88	-$1.35	-$2.17
2034	-$412.70	-$685.03	-$1,183.56	-$0.09	-$0.12	-$0.16	-$0.87	-$1.35	-$2.17
2035									
2036									
2037									
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2075									
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2080									
Totals	**-$2,783.31**	**-$4,581.61**	**-$7,896.36**	**-$0.53**	**-$0.68**	**-$0.92**	**-$5.51**	**-$8.45**	**-$13.55**

Electric Vehicle Emissions Reductions Calculations Table

Base Information			Electric Vehicles Produced					Gasoline Vehicles Replaced					Difference		
Year	Microporous Lithium-ion Battery Separator Production Capacity (MM m^2)	Number Vehicles per year	kWh used per car per year[1]	Total MWh per yr by car	CO2 emissions (tpy)[2]	N2O emissions (tpy)[2]	CH4 emissions (tpy)[2]	Gallons of gasoline used per car per year[3]	Total gallons/ year	CO2 emissions (tpy)[4]	N2O emissions (tpy)[4]	CH4 emissions (tpy)[4]	CO2 emissions (tpy)	N2O emissions (tpy)	CH4 emissions (tpy)
Formula	million (MM) meters squared (m^2) of separator production capacity	1,099 EVs enabled per 1 MM m^2 of separator produced	(miles per year per driver) / (average miles per kWh)	(Vehicles) * (electricity use) *0.001 [conversion from kwh to MWh]	(Total MWh/yr) * (823.1 [eGRID US CO2 emissions lbs per MWh]) * 0.000454 [conversion from lbs to metric tons]	(Total MWh/yr) * (0.009 [eGRID US N2O emissions lbs per MWh]) * 0.000454 [conversion from lbs to metric tons]	(Total MWh/yr) * (0.066 [eGRID US CH4 emissions lbs per MWh]) * 0.000454 [conversion from lbs to metric tons]	(miles per year per driver) / (average mpg)	(Vehicles) * (Fuel use)	((total gallons per year) * (0.125 [conversion from gallons to mmBtu]) * (70.22)[40 CFR Part 98 table C-1 emissions factor for automotive gasoline] * (1.00E-03)[conversion from kg to metric tons]	((total gallons per year) * (0.125 [conversion from gallons to mmBtu]) * (0.0006) [40 CFR Part 98 table C-2 emissions factor for gasoline] * (1.00E-03)[conversion from kg to metric tons)	((total gallons per year) * (0.125 [conversion from gallons to mmBtu]) * (0.003) [40 CFR Part 98 table C-2 emissions factor for gasoline] * (1.00E-03)[conversion from kg to metric tons)	(electric vehicle emissions) - (gasoline vehicle emissions)	(electric vehicle emissions) - (gasoline vehicle emissions)	(electric vehicle emissions) - (gasoline vehicle emissions)
2027	170	186,830	4991	932420	348,434	4	28	518	96,828,240	849,910	7	36	-501,476	-3	-8
2028	637.5	700,613	4991	3496575	1,306,626	14	105	518	363,105,901	3,187,162	27	136	-1,880,536	-13	-31
2029	765	840,735	4991	4195890	1,567,951	17	126	518	435,727,082	3,824,594	33	163	-2,256,643	-16	-38
2030	1,200	1,318,800	4991	6581789	2,459,532	27	197	518	683,493,462	5,999,364	51	256	-3,539,832	-24	-59
2031	1,200	1,318,800	4991	6581789	2,459,532	27	197	518	683,493,462	5,999,364	51	256	-3,539,832	-24	-59
2032	1,200	1,318,800	4991	6581789	2,459,532	27	197	518	683,493,462	5,999,364	51	256	-3,539,832	-24	-59
2033	1,200	1,318,800	4991	6581789	2,459,532	27	197	518	683,493,462	5,999,364	51	256	-3,539,832	-24	-59
2034	1,200	1,318,800	4991	6581789	2,459,532	27	197	518	683,493,462	5,999,364	51	256	-3,539,832	-24	-59

[1]Calculated using USEPA value for average kWh per mile for electric vehicles (https://www.epa.gov/greenvehicles/comparison-your-car-vs-electric-vehicle) and USDOT value for average miles per year per driver (https://www.fhwa.dot.gov/ohim/onh00/bar8.htm)
[2]Calculated using USEPA eGRID subregion emission rates (https://www.epa.gov/egrid/summary-data)
[3]Calculated using USEPA value for average fuel economy for 2024 car models (https://www.epa.gov/system/files/documents/2023-12/420s23002.pdf) and USDOT value for average miles per year per driver (https://www.fhwa.dot.gov/ohim/onh00/bar8.htm)
[4]Calculated using 40 CFR Part 98 Tables C-1 and C-2 emissions factors

Estimated Emissions Per Phase of Operations

Estimated Emissions for Phase I of Operations				
Source	**Base Value**	**Metric Tons CO_2**	**Metric Tons CH_4**	**Metric Tons N_2O**
Steam Boilers	540,000 mmBtu/yr	28652	0.54	0.054
Electricity Use	157,000 MWh/yr	41869	4	1
Total		**70521**	**4**	**1**

Estimated Emissions for Phase 2 of Operations				
Source	**Base Value**	**Metric Tons CO_2**	**Metric Tons CH_4**	**Metric Tons N_2O**
Steam Boilers	960,000 mmBtu/yr	50938	0.96	0.096
Electricity Use	302,000 MWh/yr	80537	7	1
Total		**131475**	**8**	**1**

FROEHLING & ROBERTSON

Engineering Stability Since 1881

22 March 2021

Mr. Brian Bradner, P.E.
Dewberry Engineers, Inc.
551 Piney Forest Road
Danville, Virginia 24540

RE: Southern Virginia Megasite

Dear Mr. Bradner:

We have reviewed our previous reporting for the Berry Hill Phase II project entitled: *Report of Subsurface Exploration and Geotechnical Engineering Evaluation Berry Hill Road Mega-Park (Phase ll) Pittsylvania County, Virginia, F&R Project No. 62N0066, dated 29 July 2011*. With respect to the referenced report, the Megasite is comprised of Lots 4, 5, 8 and 9 which as explored by Boring numbers B-53 through B-69 and B-79 through B-95 in the 2011 report. Based on our review of this data, it is our opinion that the residual (native) soil profile strength characteristics for this area are more favorable than what is generally typical for the Piedmont physiographic province of the southeastern United States.

We note that not only was our firm involved with the above listed geotechnical exploration performed in 2011, we also performed a Berry Hill Phase I exploration in 2010 as well as providing fulltime Construction Materials Testing services to observe mass grading operations for the existing graded pad areas across the Megasite. Based on previous inquiry and review, we note that expansive clay, sinkholes, or high ground water are not issues for this site. In consideration of past inquiries, our work at the site, and our general experience in the region, we believe that heavy industrial design bearing pressures of at least 3,500 psf can be met at the site.

Once definitive information with respect to structure types, locations, loading and elevations are determined for each specific project within the Megasite, additional subsurface information will be required to provide final geotechnical design parameters and recommendations.

Please contact us if you have any questions regarding this letter or if we may be of further service.

Sincerely,

Andrew R. Frank, P.E.
Regional Senior Geotechnical Engineer

Gary A. Bruce, P.E.
Regional Vice President

F:\Branch62\Geotechnical Dept\62 Geo Reports\62N\62N0066 Berry Hill Mega-Park Phase II ADDM LTR 032221\62N0066 Megasite Letter.docx

CERTIFICATION LETTER

June 22, 2021

Linda Green
Executive Director
Southern Virginia Regional Alliance
P.O. Box 3300
Danville, VA 24543-3300

Dear Ms. Green:

The Southern Virginia Megasite at Berry Hill, located in Pittsylvania County, Virginia, has completed Quest Site Solutions' (Quest), formerly McCallum Sweeney Consulting, Mega Site Certification Program. Quest has conducted a thorough analysis of the property and based on the information provided by the Danville-Pittsylvania County Regional Industrial Facility Authority, Dewberry, and our evaluation of the property, we are certifying the **Southern Virginia Megasite at Berry Hill** as a **Mega Site / Super Park**.

Quest has certified the Southern Virginia Megasite at Berry Hill as meeting the following criteria for Mega Site / Super Park certification:

- The property must be available for sale or lease (with a documented price and terms) to prospective industrial investors for a minimum of three years.
- The property must be at least 1,500 total acres with at least one 800-acre contiguous, developable parcel that would be acceptable for a single industrial user (Mega Site). The remainder of the property acreage (Super Park) must be at least 60% developable.
- The property's developable acreage must be located outside of the 100-year flood zone or be able to be filled within 180 days.
- The property must be free of recognized environmental concerns or have recognized environmental concerns remediated and/or resolved prior to certification.
- The property's developable acreage must be free of wetlands or be able to be mitigated within 180 days.
- The property's developable acreage must be free of federal threatened and endangered species or be able to be mitigated within 180 days.
- The property's developable acreage must be free of areas of archaeological or historical significance or be able to be mitigated within 180 days.
- The property's developable acreage must have soils compatible with industrial development.
- The property must be zoned appropriately or be able to be rezoned for industrial use within 90 days (if applicable). The surrounding properties must also be compatible with industrial uses.

CERTIFICATION LETTER

- The property must be within five miles of an interstate or four-lane limited-access divided highway. The property must be directly served or be able to be served within 12 months by a road that is compatible with standards for tractor-trailer access (80,000 pounds / 20,000 pounds per axle).

- The property must be served or be able to be served within 12 months by rail.

- The property must be served or be able to be served by industrial quality power that can meet a minimum of 30 MW demand. The first 15 MW must be able to be provided to the property within 12 months with an additional 15 MW to follow in the next 12 months. The property must also be served or be able to be served within 12 months by redundant electric service, preferably with feeds from two substations.

- The property must be served or be able to be served within 12 months by natural gas. Natural gas service must provide at least 50,000 mcf per month.

- The property must be served or be able to be served within 12 months by water infrastructure and a water system with a minimum excess capacity of 1,200,000 gallons per day.

- The property must be served or be able to be served within 12 months by wastewater infrastructure and a wastewater treatment plant with a minimum excess capacity of 1,000,000 gallons per day.

- The property must be served or be able to be served within 12 months by fiber telecommunications infrastructure.

The details on how the property meets each of these criteria is included in the following sections of this report.

This certification will expire on **June 22, 2026.** Upon certification expiration, the property will need to submit for recertification.

We congratulate the team at the Danville-Pittsylvania County Regional Industrial Facility Authority for their hard work and on achieving certification. If there are any questions regarding our analysis, please contact me.

Sincerely,

Lindsey M. Cannon

Lindsey M. Cannon
Director

NOTES TO USERS

p is for use in administering the National Flood Insurance Program. It t necessarily identify all areas subject to flooding, particularly from local sources of small size. The **community map repository** should be d for possible updated or additional flood hazard information.

n more detailed information in areas where **Base Flood Elevations** and/or **floodways** have been determined, users are encouraged to consult d Profiles and Floodway Data and/or Summary of Stillwater Elevations ontained within the Flood Insurance Study (FIS) report that accompanies M. Users should be aware that BFEs shown on the FIRM represent whole-foot elevations. These BFEs are intended for flood insurance urposes only and should not be used as the sole source of flood n information. Accordingly, flood elevation data presented in the FIS should be utilized in conjunction with the FIRM for purposes of tion and/or floodplain management.

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areas not in Special Flood Hazard Areas may be protected by **flood structures**. Refer to Section 2.4 "Flood Protection Measures" of the surance Study report for information on flood control structures for this on.

jection used in the preparation of this map was Virginia State Plane South he **horizontal datum** was NAD 83, GRS80 spheroid. Differences in spheroid, projection or State Plane zones used in the production of FIRMs ent jurisdictions may result in slight positional differences in map features jurisdiction boundaries. These differences do not affect the accuracy of this

evations on this map are referenced to the North American Vertical Datum . These flood elevations must be compared to structure and ground s referenced to the same **vertical datum**. For information regarding ion between the National Geodetic Vertical Datum of 1929 and the merican Vertical Datum of 1988, visit the National Geodetic Survey at http://www.ngs.noaa.gov or contact the National Geodetic Survey at wing address:

ormation Services
4NGS12
Geodetic Survey
#9202
ad-West Highway
ring, Maryland 20910-3282
3-3242

n current elevation, description, and/or location information for **bench** shown on this map, please contact the Information Services Branch National Geodetic Survey at **(301) 713-3242**, or visit its website at w.ngs.noaa.gov.

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the **FEMA Map Service Center** at 1-800-358-9616 for information on products associated with this FIRM. Available products may include y issued Letters of Map Change, a Flood Insurance Study report, and/or rsions of this map. The FEMA Map Service Center may also be reached 1-800-358-9620 and its website at http://www.msc.fema.gov.

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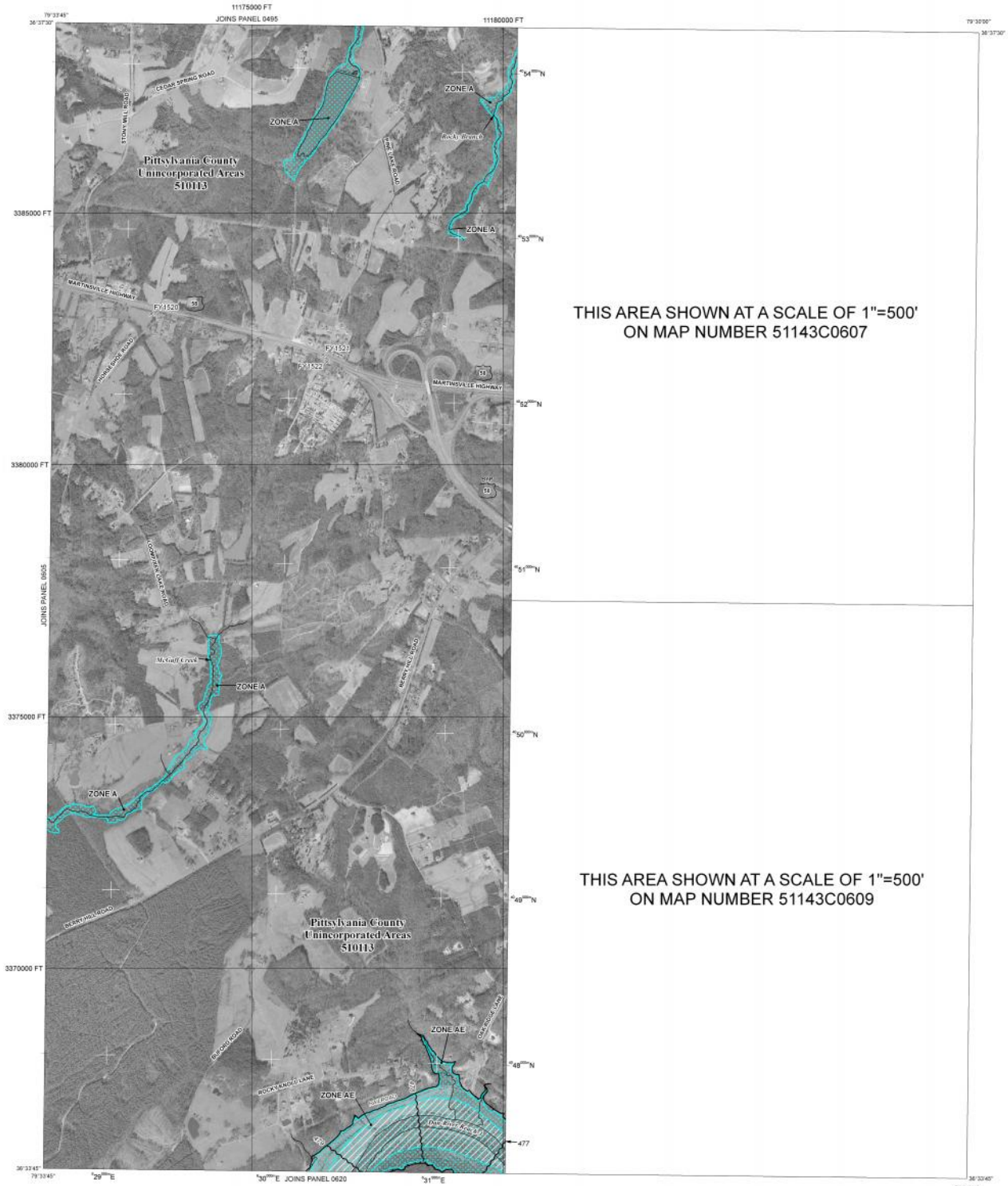

LEGEND

SPECIAL FLOOD HAZARD AREAS SUBJECT TO INUND
BY THE 1% ANNUAL CHANCE FLOOD

The 1% annual flood (100-year flood), also known as the base flood, is the flood that h chance of being equalled or exceeded in any given year. The Special Flood Hazard A area subject to flooding by the 1% annual chance flood. Areas of Special Flood Haza Zones A, AE, AH, AO, AR, A99, V, and VE. The Base Flood Elevation is the wate elevation of the 1% annual chance flood.

ZONE A	No Base Flood Elevations determined.
ZONE AE	Base Flood Elevations determined.
ZONE AH	Flood depths of 1 to 3 feet (usually areas of ponding); Ba Elevations determined.
ZONE AO	Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); depths determined. For areas of alluvial fan flooding, veloc determined.
ZONE AR	Special Flood Hazard Area formerly protected from the 1% annu flood by a flood control system that was subsequently decertified. indicates that the former flood control system is being restored t protection from the 1% annual chance or greater flood.
ZONE A99	Area to be protected from 1% annual chance flood by a Fede protection system under construction; no Base Flood E determined.
ZONE V	Coastal flood zone with velocity hazard (wave action); no Ba Elevations determined.
ZONE VE	Coastal flood zone with velocity hazard (wave action); Ba Elevations determined.

FLOODWAY AREAS IN ZONE AE

The floodway is the channel of a stream plus any adjacent floodplain areas that must be of encroachment so that the 1% annual chance flood can be carried without substantial in flood heights.

OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance f average depths of less than 1 foot or with drainage areas l 1 square mile; and areas protected by levees from 1% annual char

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain
ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Are

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zo boundary dividing Special Flood Hazard Areas of diffe Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North Ame Datum of 1983 (NAD 83), Western Hemisphere
- 4276000 FT N — 1000-meter Universal Transverse Mercator grid values, z
- 600000 FT — 5000-foot grid values: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conform projection
- DX5510 x — Bench mark (see explanation in Notes to Users section FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 29, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Commu Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insu agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0610E

FIRM
FLOOD INSURANCE RATE

PITTSYLVANIA COUNTY, VIRGINIA
AND INCORPORATED AREAS

PANEL 610 OF 690
(SEE MAP INDEX FOR FIRM PANEL LA

CONTAINS

COMMUNITY	NUMBER	PANEL
PITTSYLVANIA COUNTY	510113	0610

Notice to User: The **Map Number** shown below used when placing map orders; the **Communit** shown above should be used on insurance applica subject community.

MAP NU
51143C

EFFECTIVE
SEPTEMBER 29

Federal Emergency Management

NOTES TO USERS

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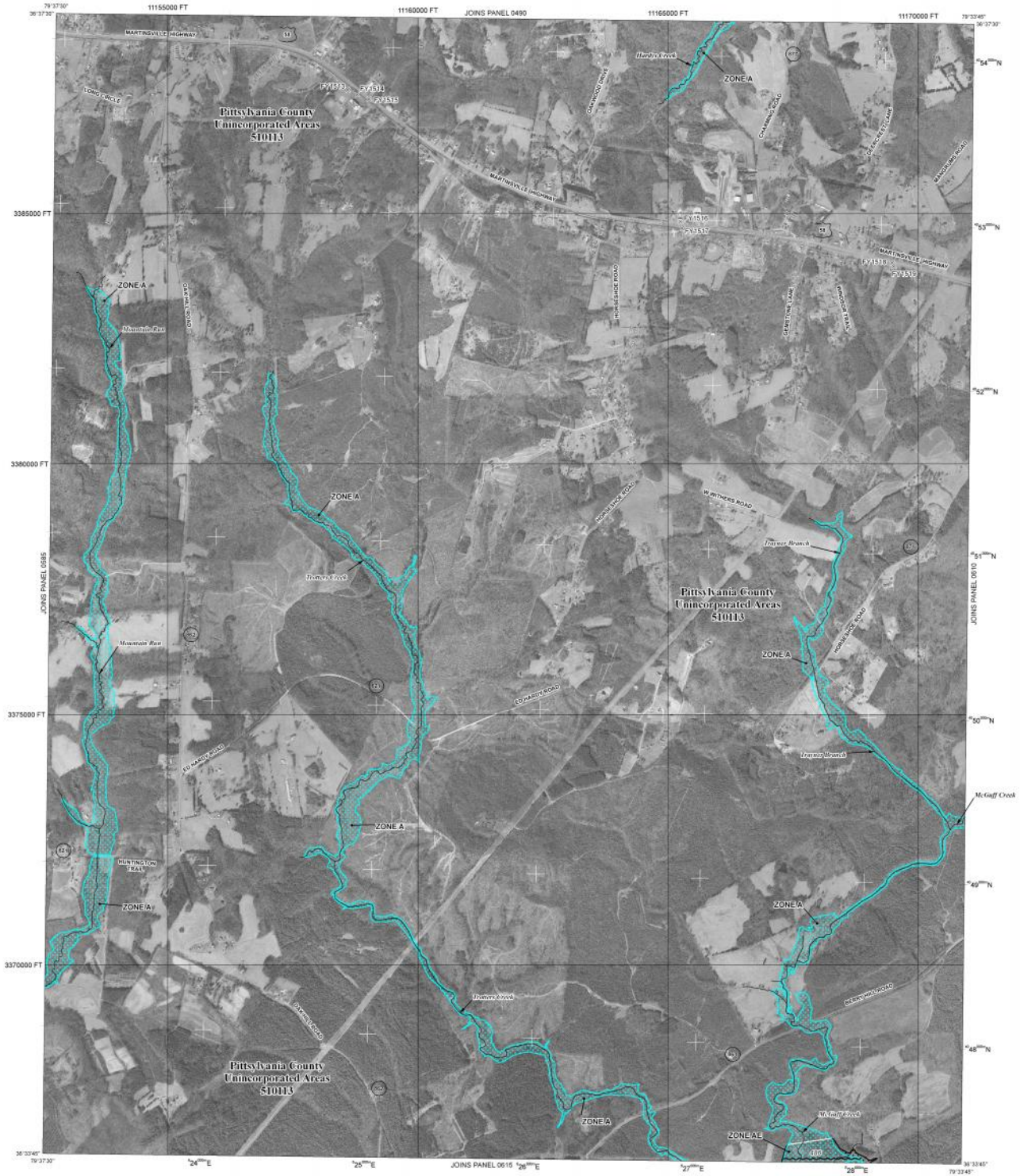

LEGEND

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OTHER FLOOD AREAS

ZONE X — Areas of 0.2% annual chance flood; areas of 1% annual chance f average depths of less than 1 foot or with drainage areas l 1 square mile; and areas protected by levees from 1% annual char

OTHER AREAS

ZONE X — Areas determined to be outside the 0.2% annual chance floodplain

ZONE D — Areas in which flood hazards are undetermined, but possible.

COASTAL BARRIER RESOURCES SYSTEM (CBRS) AREAS

OTHERWISE PROTECTED AREAS (OPAs)

CBRS areas and OPAs are normally located within or adjacent to Special Flood Hazard Are

- 1% annual chance floodplain boundary
- 0.2% annual chance floodplain boundary
- Floodway boundary
- Zone D boundary
- CBRS and OPA boundary
- Boundary dividing Special Flood Hazard Area Zo boundary dividing Special Flood Hazard Areas of diffe Flood Elevations, flood depths or flood velocities.
- Limit of Moderate Wave Action
- 513 — Base Flood Elevation line and value; elevation in feet*
- (EL 987) — Base Flood Elevation value where uniform within zone; in feet*

* Referenced to the North American Vertical Datum of 1988

- Cross section line
- Transect line
- 87°07'45", 32°22'30" — Geographic coordinates referenced to the North Ame Datum of 1983 (NAD 83), Western Hemisphere
- 4276000mN — 1000-meter Universal Transverse Mercator grid values, z
- 600000 FT — 5000-foot grid values: Virginia State Plane coordinate system, South zone (FIPSZONE 4502), Lambert Conform projection
- DX5510 × — Bench mark (see explanation in Notes to Users section FIRM panel)
- M1.5 — River Mile

MAP REPOSITORY
Refer to listing of Map Repositories on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP
September 29, 2010

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

For community map revision history prior to countywide mapping, refer to the Commu Map History table located in the Flood Insurance Study report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insu agent or call the National Flood Insurance Program at 1-800-638-6620.

MAP SCALE 1" = 1000'
500 0 1000 2000 FEET
300 0 300 600 METERS

NFIP
NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0605E

FIRM
FLOOD INSURANCE RATE

PITTSYLVANIA COUNT
VIRGINIA
AND INCORPORATED AREAS

PANEL 605 OF 690
(SEE MAP INDEX FOR FIRM PANEL LA

CONTAINS

COMMUNITY	NUMBER	PANEL
PITTSYLVANIA COUNTY	510113	0605

Notice to User: The **Map Number** shown below used when placing map orders; the **Communit** shown above should be used on insurance applicat subject community.

MAP NU
51143C

EFFECTIVE
SEPTEMBER 29

Federal Emergency Management

Phase II Investigation of Sites 44PY0394 and 44PY0398

Southern Virginia Megasite at Berry Hill
Pittsylvania County, Virginia

DHR File No.: 2012.0023

THIS REPORT CONTAINS CONFIDENTIAL INFORMATION
NOT FOR PUBLIC DISTRIBUTION

Prepared for:

Dewberry

Dewberry
551 Piney Forest Road
Danville, Virginia 24540

Prepared by:

WSP USA Inc.
1100 Boulders Parkway
Richmond, Virginia 23225

June 13, 2022

Phase II Investigation of Sites 44PY0394 and 44PY0398

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Pittsylvania County, Virginia

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Prepared for:

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Prepared by:

Erin Cagney and John Bedell

WSP USA Inc.
1100 Boulders Parkway
Richmond, Virginia 23225

June 13, 2022

ABSTRACT

On behalf of Dewberry, WSP USA Inc. (WSP) conducted a Phase II investigation of Sites 44PY0394 and 44PY0398 on Lots 1 and 2 of the proposed Southern Virginia Megasite at Berry Hill (Southern Virginia Megasite, formerly referred to as the Berry Hill Complex), Pittsylvania County, Virginia (DHR No. 2012-0023). Lots 1 and 2 are part of the larger megasite being developed, which had previously been subjected to Phase I investigations, by both Browning & Associates, Ltd. in 2011 and WSP in 2020. Sites 44PY0394 and 44PY0398 were identified in the BAL survey and then resurveyed by WSP. Both sites were described as domestic single-dwelling sites dating to the late nineteenth to early twentieth centuries. WSP recommended the sites as not eligible for listing in the National Register of Historic Places (NRHP); however, in a letter on December 30, 2020, the Virginia Department of Historic Resources (DHR) found Sites 44PY0394 and 44PY0398 potentially eligible for listing in the NRHP and requested avoidance or additional testing.

Dewberry began to plan grading of Lots 1 and 2 of the megasite (DHR File No. 2012-0023) in June 2021, affecting Sites 44PY0394 and 44PY0398 and prompting the need for the Phase II investigation to determine the sites' eligibility status. WSP conducted the Phase II archaeological investigation from August 3 to 6, 2021. Fieldwork consisted of surface inspection, the excavation of six 1x1-meter (3.3x3.3-foot) test units and four judgmentally placed shovel tests, and photo documentation of disturbance at the sites.

WSP excavated two test units at Site 44PY0394 and four test units and four judgmental shovel tests at Site 44PY0398. A high level of disturbance was noted at both sites, and this was mapped and recorded via photo documentation. No subsurface architectural features were noted, but an apparent trash midden was found at Site 44PY398.

The artifact assemblage from both sites reflected the findings from the Phase I investigation in 2020, with broadly diagnostic ceramics and glass dating to the nineteenth and twentieth centuries. WSP did not find that the Phase II investigation offered any significant new information on either site, and believes it unlikely that further investigations would yield any more information. The unstratified archaeological deposits were shallow and showed some level of disturbance, with modern artifacts mixed in with older material. The surrounding areas had been heavily disturbed by logging activity.

The Phase I and II investigations have recovered as much information as is likely to be gained from these sites. Because of their diminished integrity and lack of information potential, WSP finds that Sites 44PY0394 and 44PY0398 are not eligible Criterion D. As the ethnicity of the residents cannot be established, and the chronology of the sites is so poor, they cannot be related to a broad theme that might make them eligible under Criterion A. Criteria B and C do not apply. It is WSP's opinion that Sites 44PY0394 and 44PY0398 are not eligible for listing in the NRHP.

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I. INTRODUCTION

On behalf of Dewberry, WSP USA Inc. (WSP) conducted a Phase II investigation of Sites 44PY0394 and 44PY0398 on Lots 1 and 2 of the proposed Southern Virginia Megasite at Berry Hill (Southern Virginia Megasite, formerly referred to as the Berry Hill Complex), Pittsylvania County, Virginia (DHR No. 2012-0023) (Figure 1).

The Southern Virginia Megasite is planned as a location for large industries that will serve as a major source of employment in Southside Virginia and will help transform the regional economy. Danville and Pittsylvania County are working jointly to develop the complex through the Danville-Pittsylvania Regional Industrial Facility (RIFA). Through RIFA, Danville and Pittsylvania County seek to establish a complex that will accommodate industries requiring a large footprint and provide access to rail, highway transportation, and utilities. It is located in southwestern Pittsylvania County, just west of the City of Danville along U.S. Route 311/SR 770 (Berry Hill Road), approximately 6.4 kilometers (4 miles) southwest of the intersection of U.S. Routes 58 and 311.

Lots 1 and 2 are located on the northeastern end of the Megasite and comprise a total of 97.85 hectares (241.79 acres). The lots are bounded by Berry Hill Road on the south, Lot 3 on the north and west, and arbitrary property lines on the north and east. McGuff Creek runs along the northern portions of these lots. Sites 44PY0394 and 44PY0398 were previously determined to be domestic single-dwelling sites dating to the late nineteenth to early twentieth centuries.

Over the years, the Southern Virginia Megasite has been the subject of multiple cultural resource investigations. Most recently, WSP (2020a) carried out Phase I resurvey of 15 archaeological sites first recorded during Phase I survey by Browning & Associates, Ltd. (BAL) (2011). Sites 44PY0394 and 44PT0398 were among the Phase I sites located on Lots 1 and 2 (Figure 2). WSP recommended both sites as not eligible for listing in the National Register of Historic Places (NRHP); however, the Virginia Department of Historic Resources (DHR) did not concur and listed both sites as potentially eligible in a letter dated December 30, 2020, thereby requiring either avoidance or further investigation of the two sites. In June 2021 Dewberry began planning to grade Lots 1 and 2 of the megasite (DHR File No. 2012-0023), prompting the Phase II investigation to determine the eligibility status of Sites 44PY0394 and 44PY0398 (Figure 3).

WSP's Phase I archaeological survey was conducted from May 25 to July 17, 2020. Fieldwork consisted of the excavation of shovel tests at both 15-meter (49-foot) and 7.5-meter (25-foot) intervals, and 1x1-meter (3.3x3.3-foot) test units. The Phase II archaeological investigation was conducted from August 3 to August 6, 2021. Fieldwork consisted of surface inspection, the excavation of six 1x1-meter (3.3x3.3-foot) test units and four judgmentally placed shovel tests, and photo documentation of disturbance at the sites.

These investigations were performed pursuant to the National Historic Preservation Act of 1966 (as amended in 1980), the Archaeological and Historical Preservation Act of 1974, Executive Order 11593, and Title 36 of the Code of Federal Regulations, Parts 60-66 and 800 (as appropriate). The field investigations and technical report are consistent with the Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation (*Federal Register*, Part IV, 48:190:44716-44742) (United States Department of the Interior 1983) as well as the *Guidelines for Conducting Cultural Resource Survey in Virginia* (DHR 2017). All cultural materials collected and curated, along with all records of this contract, will be cared for in accordance with the requirements set forth in 36 CFR Part 79. The Project Archaeologist, Architectural Historian/Historian, and Project Manager performing the cultural resource investigation meet or exceed the qualifications described in the Secretary of the Interior's Professional Qualifications Standards (*Federal Register*, Part IV, 48:44738-44739) (United States Department of the Interior 1983).

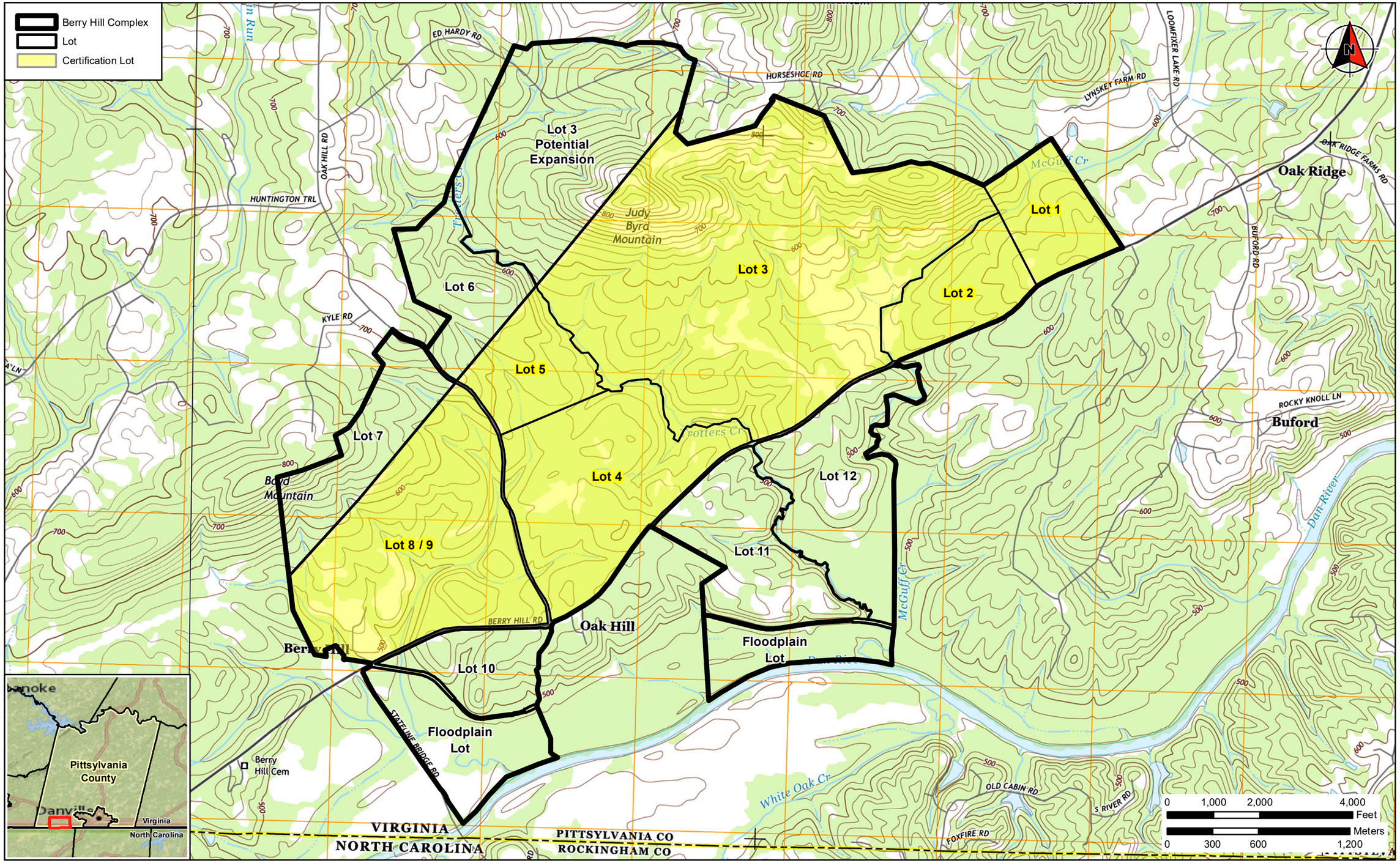

FIGURE 1: Map of Southern Virginia Megasite Showing All Lots (USGS Brosville 2013a, Northeast Eden 2013b)

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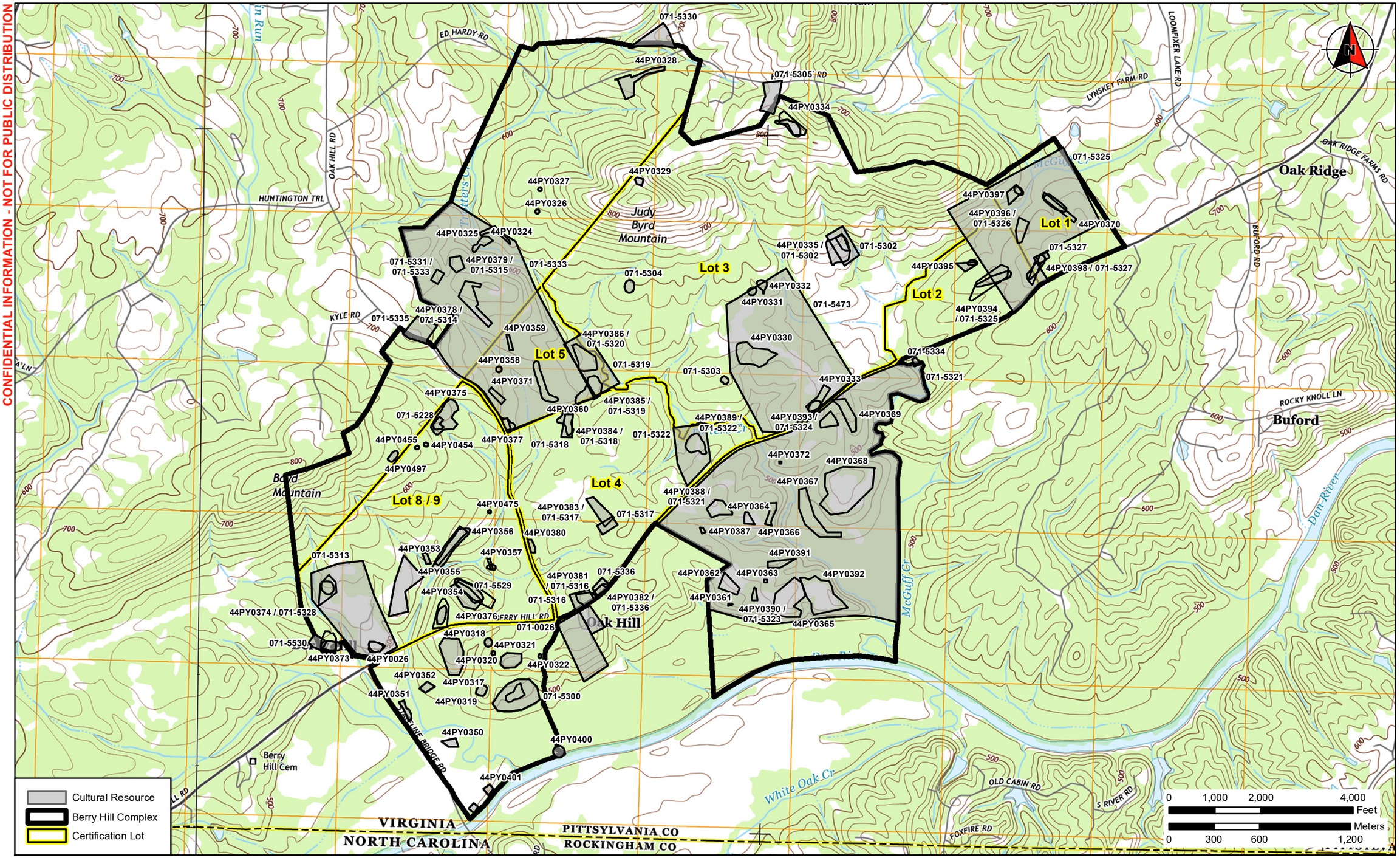

FIGURE 2: Map of Southern Virginia Megasite Showing Previously Recorded Cultural Resources (USGS Brosville 2013a, Northeast Eden 2013b)

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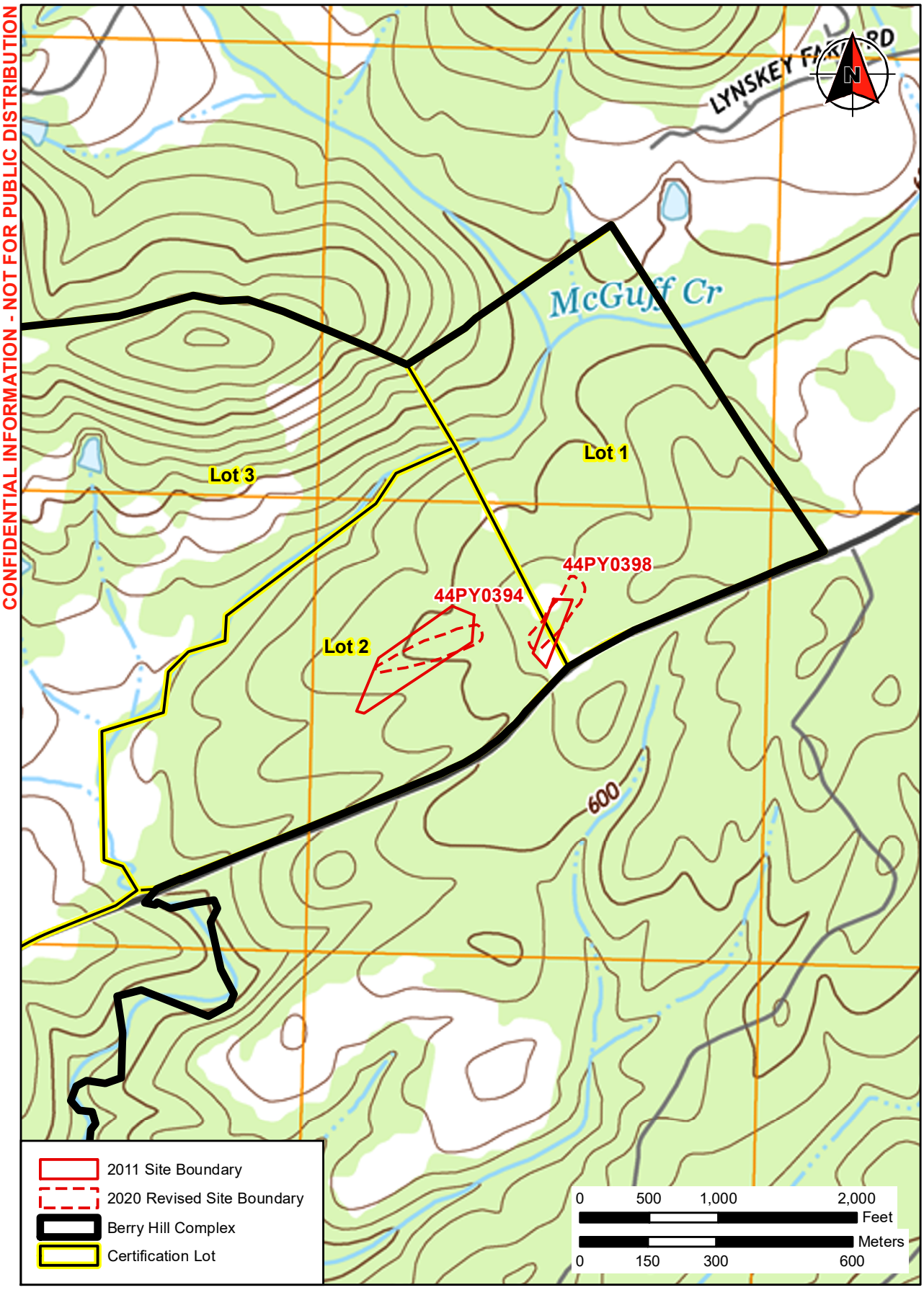

FIGURE 3: Map of Southern Virginia Megasite Lot 1 Showing Sites 44PY0394 and 44PY0398 (USGS Brosville 2013a)

The report is organized into nine chapters: Chapter I, Introduction; Chapter II, Environmental Context; Chapter III, Previous Investigations; Chapter IV, Cultural Context; Chapter V, Field Methods and Techniques; Chapter VI, Results of the Archaeological Evaluations; Chapter VII, Archaeological Evaluation; Chapter VIII, Summary and Recommendations; and Chapter IX, References Cited and Bibliography. Appendix A provides the methods of artifact analysis and cataloging and the artifact inventory.

The WSP archaeological crew consisted of field archaeologists Olivia Larson, Regina Light, Meredith McCulley, and Crew Chief Jaquelene Poveromo under the direction of Principal Investigator Erin Cagney (Registered Professional Archaeologist [RPA] 17555). Artifacts were analyzed under the direction of Archaeologist Kathryn Wilkins (RPA 28576913). Senior Archaeologist John Bedell, PhD (RPA 39384252) served as Project Manager. Jacqueline Horsford, GISP, prepared the GIS data and graphics, and Anne Moiseev edited the report.

II. ENVIRONMENTAL CONTEXT

The Southern Virginia Megasite and the sites under investigation lie in the southern portion of the Piedmont physiographic province, a vast peneplain of metamorphosed Paleozoic and Precambrian rock that extends from New York to central Alabama. In Virginia the Piedmont is approximately 64 kilometers (40 miles) wide in the northern part of the state and more than 161 kilometers (100 miles) wide at the North Carolina border. Relief is highest in the western portion of the Piedmont, at an elevation of around 305 meters (1,000 feet) above mean sea level (amsl), and, for the most part, descends gradually to the eastern boundary. The eastern boundary, at approximately 91 meters (300 feet) amsl, is defined by an unconformity with younger sedimentary rocks deposited on the Piedmont peneplain. These sedimentary rocks derive from repeated advances and retreats of the Atlantic Ocean during the Cretaceous period. The eastern boundary is known as the Fall Line owing to the number of waterfalls and rapids formed as rivers and streams pass from the hard bedrock of the Piedmont to the less resistant sedimentary rocks that underlie the Coastal Plain.

The Piedmont consists of a well-eroded surface characterized by a rolling landscape; however, isolated mountains and steep-sided streams present exceptions to the smooth topography of the region (Dietrich 1990:104). Sites identified at the Berry Hill area are most commonly located on the summits or upper shoulders of hillslopes, and elevations therefore typically range from 140 to 183 meters (478 to 600 feet) amsl, although one site (44PY0329) is located near the summit of Judy Byrd Mountain at 274 meters (899 feet) amsl. The lots that comprise the proposed commercial complex are characterized by an agrarian landscape of former pasture and agricultural fields now largely covered in successional growth or tall grasses, and wooded areas consisting of young to mature pine or mixed-growth forests.

The underlying bedrock of the Piedmont consists primarily of Precambrian and Paleozoic metamorphic and igneous rocks. Large areas of the province, however, are underlain by sedimentary rocks and occasional basaltic sills and dikes of Triassic age (Dietrich 1990:105). Important raw materials used by prehistoric groups within the Piedmont province include quartz, quartzite, hornfels, jasper, and soapstone (steatite).

The sites under investigation are located in the Roanoke River watershed and the Dan River drainage basin. Trotter's Creek, Trayner Branch, and McGuff Creek are the principal streams in the vicinity of the sites, with multiple unnamed or intermittent tributary streams feeding into them throughout the parcel. The soil on both sites is described as Stoneville silt loam, 2 to 7 percent slopes. This is a deep, moderately well-drained to well-drained soil typically found on the summits and shoulders of hills.

Native vegetation in the region in prehistoric and early historic times would have consisted of a mixed upland hardwood forest that included oak, chestnut, and hickory. Formerly, such forests would have provided plant resources, particularly mast, that were attractive to both animal and human populations. Present vegetation in the vicinity of the sites consists of successional-growth plants in former agricultural fields, or mixed-growth, deciduous, or pine forest with a light to moderate understory. Original faunal species in this region that would have been sought by prehistoric and early historic populations include white-tailed deer, bear, squirrel, raccoon, mink, turkey, grouse, and migratory waterfowl.

III. PREVIOUS INVESTIGATIONS

A. INVESTIGATIONS

A Phase I cultural resource survey of the entire Southern Virginia Megasite (then known as a "Mega-Park") parcel) was conducted by BAL in 2011. The BAL (2011) cultural resource survey identified 71 new archaeological sites, 31 new architectural resources, and one previously documented building (see Figure 2). Of the 31 new architectural resources, four are the sites of historic-period cemeteries.

BAL's testing methodologies consisted of historical map projection, pedestrian reconnaissance, and field inspections, supplemented by shovel tests excavated at 15-meter intervals or judgmentally and/or pedestrian surface survey of disked agricultural fields at some sites. BAL typically noted the sites at which they conducted ground surface survey or subsurface testing in the report site descriptions or the site forms; however, the 2011 report lacks detailed site plan maps that show the number and extent of shovel tests, the number and location of positive shovel tests, or the extent and density of surface artifact scatters. The BAL (2011) report included plan maps of structure building sets that were submitted as architectural resources, but no plan maps were provided for archaeological sites with foundations or collapsed structures.

TRC Environmental Corporation (TRC) conducted a Phase I cultural resource survey of the MVP Southgate Pipeline project in 2018 (Blood et al. 2019; Karpynec et al. 2019). The route of that project extends through Pittsylvania County, and the proposed pipeline corridor extends along the northwestern boundary of Lots 3, 5, and 8/9. That archaeological survey resulted in the identification of two new sites (44PY0454 and 44PY0455) within Lots 8/9 of the Southern Virginia Megasite as well as the resurvey of portions of four sites: Sites 44PY0329 (not relocated), 44PY0375, 44PY0358, and 44PY0359. Within the Southern Virginia Megasite, architectural historians from TRC identified eight architectural resources that were within the MVP project area of potential effect (APE). These resources were not assessed until 2019, when TRC conducted an addendum survey that included 071-5228, 071-5303, 071-5304, 071-5313, 071-5318, 071-5319, 071-5333, and 071-5530 (Millis et al. 2019). Two of these resources (071-5313 and 071-5333) were determined not eligible by WSP during the 2020 Phase I investigation. In 2019 TRC also conducted Phase II evaluations of three archaeological sites identified during the Phase I archaeological survey of the MVP Southgate pipeline (Karpynec 2019).

The Louis Berger Group (Louis Berger) conducted three separate studies at Berry Hill. The first was an evaluation of 10 sites in Lots 4 and 5 (Tippett et al. 2015). In a separate study, archaeological evaluations were conducted at four sites in Lots 8 and 9: Sites 44PY0373, 44PT0374, 44PY0375, and 44PY0376 (Fiedel and Merritt 2016), and in Lot 3 at Sites 44PY0331 and 44PY0332 (Jones et al. 2017). Louis Berger also conducted archaeological evaluations at 12 sites in Lots 1-5 that are not the focus of the current investigation.

WSP reinvestigated 26 of the sites identified by BAL at the Megasite in Lots 1-5, 8, and 9 in 2020, as the DHR determined that these sites required further assessment to determine their eligibility status because the previous field investigations were insufficient or the sites were potentially eligible. WSP found that all 26 sites were not eligible (WSP 2020a). In a December 30, 2020 letter, the DHR concurred with WSP's ineligibility recommendation for 13 of the 26 sites (44PY0026, 44PY0329, 44PY0353, 44PY0354, 44PY0355, 44PY0356, 44PY0357, 44PY0370, 44Y0380, 44PY0395, 44PY0396, and 44PY0397). They also concurred that the two architectural resources, 071-5313 and 071-5333, were ineligible (DHR 2020); however, the DHR felt that 10 of the sites (44PY0331, 44PY0332, 44PY0382, 44PY0386, 44PY0373, 44PY0374, 44PY0375, 44PY0376, 44PY0454, and 44PY0455) may be eligible as an archeological district defined by a rare collection of post-emancipation African American domestic/agricultural tenant farmer sites. The DHR also requested further testing or avoidance of four sites (44PY0394, 44PY0398, 44PY0333, and 44PY0334) to determine their eligibility for the NRHP alone, and listed them as potentially eligible.

The archaeological testing and evaluations conducted by TRC and Louis Berger generally consisted of grid shovel testing at 15-meter intervals, with radials placed around positive shovel tests at 7.5-meter intervals as needed to delineate site boundaries or artifact concentrations. TRC did not go past the gas pipeline project APE when determining site boundaries. Both TRC and Louis Berger excavated 1x1-meter test units during archaeological evaluations, placing the test units with respect to artifact clusters or concentrations, surface features, building foundations, or other areas of interest. The field methodology surveys and evaluations conducted by TRC and Louis Berger followed the DHR's current guidelines (2017), with shovel tests excavated at least 10 centimeters into sterile subsoil, and test units excavated in 10-centimeter levels within natural strata into sterile subsoil. All excavated soil was screened through 0.25-inch hardware mesh.

B. RECORDED ARCHAEOLOGICAL SITES

To date, approximately 74 archeological sites have been recorded at the Southern Virginia Megasite (Table 1). Of these, 42 yielded precontact artifacts, although this includes historic sites that produced only one or two precontact objects. No large, artifact-rich precontact sites were identified. Diagnostic artifacts were found dating to the Early, Middle and Late Archaic periods and the Middle and Late Woodland. These data show that the Berry Hill landscape was used occasionally by small groups of people across the precontact period.

Historic remains were found at 50 sites. The vast majority of these were farmstead or agricultural complexes from the later nineteenth and twentieth centuries, when Berry Hill was farmed by sharecroppers and tenants. Building remains have been identified at 44 sites. In some cases the remains consisted of foundations, but in others the remains of collapsed log or frame structures were also identified. On several sites, agricultural outbuildings built after the domestic site was abandoned were still standing. Artifact recovery at these sites has generally been poor. Small numbers of artifacts are found, almost always broken into small pieces. All the material has been found in shallow, near-surface deposits; no sealed, datable contexts have been identified at any of these sites. The artifacts are mostly of a few common types, notably cut and wire nails, window glass, colorless and aqua bottle glass, and whiteware or ironstone ceramics.

TABLE 1: LIST OF ARCHAEOLOGICAL SITES IN THE PROJECT VICINITY

SITE NOS.	DESCRIPTION	DATE	REFERENCE
44PY0026	Lithic Scatter	Middle Archaic; Woodland	Fiedel et al. 2020
44PY0317	Lithic Scatter and Farmstead	Indeterminate; 19th-20th Century	BAL 2011
44PY0318	Farmstead	Indeterminate	BAL 2011
44PY0319	Farmstead	Indeterminate	BAL 2011
44PY0320	Lithic Scatter and Farmstead	Indeterminate; 19th-20th Century	BAL 2011
44PY0321	Lithic Scatter	Indeterminate	BAL 2011
44PY0322	Lithic Scatter	Indeterminate	BAL 2011
44PY0324 (Perkins Mill)	Gristmill	18th-19th Century	BAL 2011
44PY0325	Miller's House	18th-19th Century	BAL 2011
44PY0326	Farmstead	19th-20th Century	BAL 2011
44PY0327	Farmstead	19th-20th Century	BAL 2011
44PY0328 (Adams House and Cemetery)	Farm and Cemetery	19th-20th Century	BAL 2011
44PY0329 (Mountain House)	Single Dwelling	19th-20th Century	Fiedel et al. 2020
44PY330	Farmstead	19th-20th Century	
44PY0331 (Hairston Building Set 8)	Single Dwelling	19th-20th Century	Fiedel et al. 2020

SITE NOS.	DESCRIPTION	DATE	REFERENCE
44PY0332 (Hairston Building Set 9	Single Dwelling	19th-20th Century	Fiedel et al. 2020
44PY0333 (Hairston Building Set 10)	Farmstead	19th-20th Century	Fiedel et al. 2020
44PY0334 (Ridge House)	Single Dwelling	19th-20th Century	Fiedel et al. 2020
44PY0335 (Chadwell Cantor Tenant House)	Lithic Scatter and Farmstead	20th Century	BAL 2011
44PY0350	Lithic Scatter	Late Woodland	BAL 2011
44PY0351	Lithic Scatter	Indeterminate	BAL 2011
44PY0352	Lithic Scatter	Indeterminate	BAL 2011
44PY0353	Lithic and Artifact Scatter	19th-20th Century; Indeterminate	Fiedel et al. 2020
44PY0354	Lithic Scatter	Indeterminate	Fiedel et al. 2020
44PY0355	Lithic Scatter	Indeterminate	Fiedel et al. 2020
44PY0356	Lithic Scatter	Middle Archaic; Woodland	Fiedel et al. 2020
44PY0357	Lithic Scatter	Middle Archaic	Fiedel et al. 2020
44PY0358	Lithic and Artifact Scatter	Indeterminate; 19th-20th Century	Tippett et al. 2015
44PY0359	Lithic Scatter	Indeterminate	Tippett et al. 2015
44PY0360	Lithic Scatter	Late Archaic	Tippett et al. 2015
44PY0361	Lithic Scatter	Indeterminate	BAL 2011
44PY0362	Lithic Scatter	Indeterminate	BAL 2011
44PY0363	Lithic Scatter	Indeterminate	BAL 2011
44PY0364	Lithic and Artifact Scatter	Indeterminate; 18th-19th Century	BAL 2011
44PY0365	Lithic Scatter	Early Archaic	BAL 2011
44PY0366	Lithic Scatter	Middle Archaic	BAL 2011
44PY0367	Lithic Scatter	Indeterminate	BAL 2011
44PY0368	Lithic Scatter	Late Archaic	BAL 2011
44PY0369	Lithic and Artifact Scatter	Indeterminate	Cagney et al. 2021
44PY0370	Lithic scatter	Indeterminate	Fiedel et al. 2020
44PY0371	Lithic scatter	Indeterminate	Tippett et al. 2015
44PY0372	Artifact Scatter	19th-20th Century	
44PY0373	Lithic and Artifact scatter	19th-20th Century	Fiedel & Merritt 2016
44PY0374	Single Dwelling	19th-20th Century	Fiedel et al. 2020
44PY0375	Farmstead	19th-20th Century	Fiedel et al. 2020
44PY0376	Lithic Scatter and Farmstead	20th Century	Fiedel et al. 2020
44PY0377	Single Structure	20th Century	Tippett et al. 2015
44PY0378	Farmstead	19th-20th Century	Cagney et al. 2021
44PY0379	Artifact Scatter	19th-20th Century	BAL 2011
44PY0380	Agricultural Building	19th-20th Century	Fiedel et al. 2020
44PY0381	Farmstead	19th-20th Century	Tippett et al. 2015
44PY0382	Farmstead	19th-20th Century	Fiedel et al. 2020
44PY0383	Farmstead	19th-20th Century	Tippett et al. 2015
44PY0384	Artifact Scatter	19th-20th Century	BAL 2011
44PY0385	Farmstead	19th-20th Century	Tippett et al. 2015
44PY0386	Farmstead	19th-20th Century	Fiedel et al. 2020
44PY0387	Artifact Scatter	19th-20th Century	BAL 2011

SITE NOS.	DESCRIPTION	DATE	REFERENCE
44PY0388	Lithic Scatter	Indeterminate	BAL 2011
44PY0389	Farmstead	19th-20th Century	Tippett et al. 2015
44PY0390	Lithic and Artifact Scatter	Indeterminate; 19th-20th Century	BAL 2011
44PY0391	Lithic and Artifact Scatter	Indeterminate; 19th-20th Century	BAL 2011
44PY0392	Lithic and Artifact Scatter	Indeterminate; 19th-20th Century	BAL 2011
44PY0393	Agricultural Outbuildings	19th-20th Century	Cagney et al. 2021
44PY0394	Single Dwelling	19th-20th Century	Fiedel et al. 2020
44PY0395	Lithic Scatter Agricultural Outbuildings	Indeterminate; 19th-20th Century	Fiedel et al. 2020
44PY0396	Agricultural Outbuildings	19th-20th Century	Fiedel et al. 2020
44PY0397	Lithic Scatter/ Single Dwelling	Indeterminate; 19th-20th Century	Fiedel et al. 2020
44PY0398	Single Dwelling	19th-20th Century	Fiedel et al. 2020
44PY0399	Ford	19th-20th Century	BAL 2011
44PY0400	Lithic Scatter	Indeterminate	BAL 2011
44PY0401	Lithic Scatter	Indeterminate	BAL 2011
44PY0454	Agricultural Outbuilding	Indeterminate	Fiedel et al. 2020
44PY0455	Agricultural Outbuilding	20th Century	Fiedel et al. 2020
44PY0558	Agricultural Outbuilding	19th-20th Century	Cagney et al. 2021

VCRIS

IV. CULTURAL CONTEXT

A. PREHISTORY

The prehistoric cultural sequence for the Piedmont of south-central Virginia (Albemarle Sound Drainage) generally conforms to that defined for the Middle Atlantic region as a whole, although there were some divergent local developments in later prehistory. Given the area's drainage by the upper reaches of rivers that flow on southward through the North Carolina Piedmont, strong ties to the cultures of that region would be anticipated and are evident, particularly in the Late Woodland period. Thus, most relevant information comes from archaeological research undertaken to the south, particularly the work done in advance of flooding of dammed reservoirs on the Roanoke (Coe 1964; Miller 1962; Prezzano 2014; South 1959, 2005). Surface collections and test excavations along Leesville Lake have also been informative about the prehistory of Pittsylvania County (Blanton et al. 1996; Boyd 1997; Childress and Vogt 1994). The cultural sequence for the region has been conventionally divided into seven periods: Paleoindian (11,000 to 9500 cal BC), Early Archaic (9500 to 7500 cal BC), Middle Archaic (7500 to 3800 cal BC), Late Archaic (3800 to 2200 cal BC), Terminal Archaic or Transitional (2200 to 1450 cal BC), Early Woodland (1450 to 600 cal BC), Middle Woodland (500 cal BC to cal AD 1000), and Late Woodland (cal AD 1000 to 1600)[1]. This chronology is based on a surprisingly small corpus of radiocarbon dates, many of which are very imprecise. The divisions between periods are, to some extent, arbitrary and subject to future revisions.

1. Paleoindian Period (11,000 to 9500 cal BC)

The earliest convincingly attested occupants of the Middle Atlantic region were Paleoindian hunters, who entered the region around 11,000 cal BC. The Paleoindians arrived at a time of abrupt climate changes at the end of the Wisconsin glacial, as spruce-dominated boreal vegetation was replaced by northward expansion of deciduous forest, and large mammals migrated to new ranges or were driven to extinction. The diagnostic early Paleoindian artifact is the basally fluted, lanceolate Clovis point; typically associated tools include scrapers and gravers for working hides and bones. Stylistic variations in fluted points suggest gradual change and regional differentiation over time, from an original ubiquitous Clovis or Early Paleoindian type, through the Mid-Paleoindian Quad, Cumberland, and Debert types, to the Late Paleoindian Dalton and Hardaway types.

Population density must have been very low, perhaps amounting to only 250 to 500 people in the entire present state of Virginia (Turner 1989:84). Fewer than 50 Paleoindian sites have been identified in Virginia out of a total of roughly 14,000 known prehistoric sites of all periods. Known Paleoindian sites cluster markedly in the southeastern portion of the state, where the northern edge of the oak-hickory forest was located at the end of the Pleistocene. The same area contained good sources of jasper, chalcedony, and chert—the preferred high-quality stones used for the manufacture of Paleoindian tools. Only 10 Paleoindian sites are recorded in DHR files for the Piedmont and Coastal Plain provinces, all of them south of the James River (Turner 1989:78, 80).

William Childress's collection from the shores of Leesville Lake includes a few fluted points. Louis Berger's 2008 excavations on the lake shores at Site 44PY0007 (LaBudde et al. 2009) recovered a basal fragment of a fluted point preform, made of brown jasper. Miller (1962) illustrated Hardaway points from sites in Mecklenburg County now inundated by the John H. Kerr Reservoir: Site 44MC0072a (plate 6l) and Site 44MC0075 (plate 43n). Wells (2002:272) reported no fluted or Hardaway points collected from sites

[1] Regarding dates: the term "rcbp" refers to uncalibrated radiocarbon years before present ("present" by accepted convention is AD 1950); "cal AD" and "cal BC" denote calibrated calendar ages according to standard western usage. DHR (2017) defines the prehistoric periods as Early Archaic (8000 to 6500 BC), Middle Archaic (6500 to 3000 BC), Late Archaic (3000 to 1200 BC), Early Woodland (1200 BC to AD 300), Middle Woodland (AD 300 to 1000), and Late Woodland (AD 1000 to 1600).

along the Kerr Reservoir. An unfluted lanceolate point resembling Late Paleoindian western Plano types was found at Site 44PY0154 on Leesville Lake. Charcoal collected nearby yielded a radiocarbon date of 10,150±70 rcbp (Beta-93017) (Childress 1993; Childress and Blanton 1997; Childress and Vogt 1994).

2. Early Archaic Period (9500 to 7500 cal BC)

After 9500 cal BC (the end of the Younger Dryas cold period and onset of the Holocene, marked by an abrupt warming), the regional population seems to have rebounded rapidly. A marked stylistic change is evident in the projectile points of the early Archaic (9500 to 8000 cal BC); they begin to be notched near the base, either in the sides or the corners, instead of basally thinned. Corner-notched Palmer points, relatively common in Virginia (Turner 1989:79), date to ca. 9500 to 9000 cal BC. Corner-notched Charleston, Kirk, and Amos types date to about 9000 to 8000 cal BC. Although high-quality lithic materials were preferred for points and other tools, Early Archaic groups also began to exploit local stone, such as quartz, quartzite, and rhyolite.

Miller's (1962) photographs of artifacts from the Kerr Reservoir sites include several probable Palmer or Kirk corner-notched points. Childress's surface collection of 44 points from Site 44PY0007 at Leesville Lake includes 13 Kirk Corner-Notched and 14 Kirk Stemmed points (Blanton et al. 1996:56). Louis Berger's 2008 Phase II deep testing of this site recovered a chert Kirk Corner-Notched point (LaBudde et al. 2009). Childress has also collected many Palmer/Kirk corner-notched points from the surface of Site 44PY0152 (Blanton et al. 1996:39, figure 18). By 2009 Childress had collected some 70 Palmer/Kirk points from Site 44PY0152 (Johnson 2009).

Closer to the current project area, Browning (2013) found a Palmer point during shovel testing of Site 44PY0339 on the Coleman Tract (Fearn Plantation) southeast of Danville.

3. Middle Archaic Period (7500 to 3800 cal BC)

The Middle Archaic cultural period roughly corresponds to the Hypsithermal, a climatic episode marked by rising temperatures, generally decreasing precipitation (with regional exceptions linked to the shifting locations of air masses), and the development of more seasonally variable climate. An oak-hemlock-hickory forest dominated the region, and deer became the dominant large mammal. The growing human population changed its subsistence-settlement patterns. Sites are larger and more numerous, and a more diverse toolkit implies a broader range of subsistence activities than in the Early Archaic. During the Middle Archaic period, locations were used that had previously been ignored, such as upland swamps and interior ridgetops (Gardner 1987); however, base camps were still located primarily in the floodplains of major drainages. The appearance of new tool types specifically designed for woodworking, seed grinding, and nut cracking (e.g., axes and adzes, mauls, grinding slabs, and nutting stones) and the location of sites in previously unused areas indicate an increasing reliance on plants for food and construction materials. A noteworthy technological change is the shift from the carefully made and curated unifacial scrapers of the Early Archaic to the expedient tools found in Middle Archaic and later assemblages (Cable 1996; Gardner 1989).

Bifurcate-base point types (LeCroy, St. Albans, Kanawha), Kirk Stemmed, and Kirk Serrated points also date to the Middle Archaic; they may have been knives used by the same people who employed bifurcates as dart tips. The Bifurcate and Kirk Stemmed types date from 8000 to 7000 cal BC (Broyles 1971). Diagnostic projectile point types of the later portion of the Middle Archaic period include Stanly (7000 to 6000 cal BC), Morrow Mountain (6000 to 5000 cal BC), and Guilford (5000 to 3800 cal BC). All of these temporal spans are based on very small suites of associated radiocarbon dates.

Both bifurcates and Kirk Stemmed or Serrated points have been collected from the shoreline of Leesville Lake. In Childress's collection from Site 44PY0007, the most frequent type is Kirk Stemmed, which accounts for 31.8 percent (n=14) of the total (Blanton et al. 1996:56). Although no points of this type were

recovered during Louis Berger's 2008 excavation at Site 44PY0007 (LaBudde et al. 2009), a radiocarbon date of 8220±50 rcbp (Beta-256901) (ca. 7200 cal BC) was obtained on wood charcoal from Levels 9-10, which would be appropriate for a Kirk Stemmed occupation. This date falls midway between the two dates obtained by the William and Mary Center for Archaeological Research (WMCAR) for Site 44PY0152, on the same landform: 7760±170 rcbp (ca. 6600 cal BC) and 8810±130 rcbp (ca. 8000 cal BC) (Blanton et al. 1996).

Until recently, there was only one reported radiocarbon date for Guilford points: 5350±60 rcbp (ca. 4200 cal BC), from Site 38CT58 in South Carolina (Gunn and Foss 1992). Another date loosely associated with Guilford points was obtained recently from Zone 7 of Site 38FA608, a stratified site in South Carolina: 5170±30 rcbp (Beta-475888) (ca. 3950 cal BC) (White 2020). Browning (2013) found a Guilford point at Site 44PY0339 on the Coleman Tract. During a subsequent excavation project on the Coleman Tract (focused on removal of the Fearn Cemetery), Louis Berger archaeologists fortuitously encountered a cache of 52 lanceolate rhyolite and metasiltstone bifaces. These are probably Guilford preforms. A Guilford point and an Orient Fishtail point (Terminal Archaic) were also found on the surface elsewhere on that property (Fiedel and Jones 2014).

DHR files record 18 Middle Archaic sites in Pittsylvania County. This relatively high number probably results from frequent surface finds of Morrow Mountain points, which are also very common in the adjacent North Carolina Piedmont.

4. Late Archaic Period (3800 to 2200 cal BC)

During the Late Archaic period groups that manufactured small, stemmed Halifax points in the North Carolina and Virginia Piedmont maintained a "sylvan" adaptation (Mouer 1991) to the eastern deciduous forest, focusing on nut-bearing trees. Deer and turkey probably provided most of the meat in their diet. Piedmont Archaic sites in Albemarle County are strongly associated with soils that are best suited to support nut-bearing hardwood trees (Mouer 1991). In Powhatan, Goochland, and Cumberland counties, Middle and Late Archaic sites cluster on the upper and middle terraces of the James River, and Terminal Archaic and Woodland sites (after 2200 cal BC) are generally found on the floodplain (Mouer 1991:5). The earlier sites are situated mainly at spring heads on the upper terraces, and on gentle south- and east-facing slopes on lower terraces. White oaks dominate the present-day forested areas on such slopes.

Halifax points, mostly made of quartz, are ubiquitous in the region, but almost all come from surface collections or excavated sites lacking clear stratigraphic separation of multiple temporal components. In fact, the chronology of this type is based mainly on relative stratigraphic position at a few sites in the Carolinas and Virginia, supplemented by only two imprecise radiocarbon dates with large standard errors: 5050±400 rcbp (4800 to 2800 cal BC) from the Slade Site in southeastern Virginia (Egloff and McAvoy 1990) and 5440±350 rcbp (5300 to 3500 cal BC) from the Gaston Site in North Carolina (Coe 1964). Halifax points predominated in the lithic assemblage at two sites along Chopawamsic Creek on Marine Corps Base Quantico that also included points of later and earlier types. The radiocarbon dates from charcoal found amidst associated concentrations of fire-cracked rock ranged from 4770 to 5020 rcbp or around 3550 to 3850 cal BC, which is probably the age of the Halifax occupation (Bedell et al. 2014).

The apparently sudden appearance and expansion of the Halifax complex are coeval with several converging vectors of environmental change. Most importantly, successive droughts hit the Middle Atlantic and Northeast, triggering a hemlock decline at 4000 cal BC, then a collapse at 3600 cal BC. The combination of drought and dead hemlocks set the stage for more frequent wildfires. A newly arrived and/or increasing human population may have been partly responsible for setting these fires, whether to drive game or to manage the forest. Drought and hemlock disappearance probably were conducive to rapid expansion of hickories, which were immediately used intensively by the Halifax people.

A temporal gap in the Virginia cultural sequence between the Halifax complex and Terminal Archaic Savannah River (beginning about 2400 cal BC) is perhaps filled by poorly described and dated Lamoka-like points. At the Slade Site on the Nottoway River, a stratum containing only Lamoka-like points lay above the zone that yielded Halifax points, and below Savannah River artifacts (Egloff and McAvoy 1990:74). In New York, Lamoka sites date to about 3200 cal BC, and Egloff and McAvoy suggest a coeval age for this material at the Slade Site.

Based on limited data, neither Halifax nor Lamoka points seem to be as common in Pittsylvania County as elsewhere in the Piedmont. Very few are represented in the collections from Leesville Lake. Only 10 Late Archaic components have been recorded in the county in DHR files.

5. Terminal Archaic Period (2200 to 1450 cal BC)

A very sharp break in material culture and settlement patterns occurred at 2400 to 2200 cal BC, when the Savannah River broadspear complex appeared in the Potomac Piedmont. This cultural transition—the beginning of the Terminal Archaic or Transitional period (Mouer 1991)—closely coincides with a pan-continental, possibly even global "megadrought" (Booth et al. 2005). This abrupt change may have destabilized the local cultures of the Middle Atlantic region and thus facilitated northward expansion by the broadspear makers. The latter had previously adapted to the estuarine environments of the southern coast, newly created at ca. 4000 cal BC as the rate of sea-level rise slackened. Renewed investigations at the Stallings Island Site on the middle Savannah River in Georgia have shown that the people (locally known as the Mill Branch phase) who made Savannah River broadspears from metavolcanic stone began to collect riverine shellfish at about 2600 cal BC (Sassaman et al. 2006). The Mill Branch phase at Stallings Island and other nearby sites persisted until ca. 2200 cal BC, when people from the lower Savannah, who made fiber-tempered (Stallings) pottery, replaced the broadspear makers (Sassaman et al. 2006).

Terminal Archaic populations seem to have been much more numerous than their Late Archaic predecessors. Although some upland sites are known, most occur in riverine settings. Large sites ranging in extent from 0.2 to 2 hectares (0.5 to more than 5 acres), which probably represent macroband encampments to exploit seasonal fish spawning runs, are known in the James River Piedmont and Coastal Plain. Smaller sites of about 480 square meters (5,000 square feet), which may represent single band camps, are a more common site type in the Piedmont; very small microband camps are also known (Mouer 1991).

Savannah River broadspears were typically made of quartzite, although other locally available lithic materials were sometimes used opportunistically. Apart from the broadspears, Terminal Archaic assemblages include two other significant new artifact types: grooved groundstone axes, which replace earlier chipped stone forms, and carved soapstone (steatite) bowls. Soapstone was quarried in the Piedmont of Virginia, Maryland, and Pennsylvania (Holland et al. 1981; Luckenbach et al. 1975). The most extensive deposits of soapstone in Virginia were located between Lynchburg and Charlottesville. Neutron activation analysis indicates that vessels derived from the Albemarle-Nelson source in this area were used throughout the Piedmont. Vessels were carved at the quarries and transported in finished form, probably by canoe. Soapstone pots were clearly used for cooking. Soapstone vessels apparently were not part of the original Savannah River complex; they seem later, with radiocarbon dates on external soot residues clustering between 2000 and 800 cal BC, coeval with the Susquehanna Broadspear complex (Sassaman 2006). The use of fiber-tempered and sand-tempered ceramics preceded manufacture of soapstone vessels along the lower Savannah River; however, the earliest ceramic pots in the Middle Atlantic seem to be imitative of soapstone pots.

Around 1900 cal BC the Perkiomen and Susquehanna point types probably developed in Pennsylvania from northern Savannah River variants, and were spread back, by diffusion or migration, into parts of northern Virginia such as the Potomac Valley. The nearly exclusive reliance on rhyolite in making Susquehanna

points contrasts sharply with the quartzite preference manifested in Savannah River assemblages. Isolated clusters of Perkiomen points in Virginia, on the margins of the Dismal Swamp (Painter 1988) and in the northern Shenandoah Valley, appear to represent intrusive populations from Pennsylvania or New Jersey.

Boyd (1997) found a few Savannah River points at Site 44PY0043 near Smith Mountain Lake. In Louis Berger's 2008 survey and evaluation of sites in that area, two broadspears and a steatite bowl fragment were found on the beach at Site 44BE2050 (LaBudde et al. 2009).

6. Early Woodland Period (1450 to 600 cal BC)

The Early Woodland in the Middle Atlantic region began with the adoption of ceramic technology. The earliest modeled clay vessels of the Marcey Creek type (ca. 1450 to 1000 cal BC) imitated the shapes of flat-bottomed soapstone pots, including lug handles, and were even tempered with bits of soapstone (Manson 1948). A brief period of experimentation with ceramic technology ensued, resulting in creation of several types. Small Savannah River points, Calvert points, and forms reminiscent of the Orient Fishtail type of New York and the Delaware Valley are found in association with Marcey Creek pottery, demonstrating the *in situ* transformation of Terminal Archaic into Early Woodland cultures. The point types associated with later Early Woodland ceramics (such as sand-tempered Accokeek ware) include Piscataway/Rossville, Teardrop or ovoid, Calvert, and possibly Clagett and Vernon.

In the southern Virginia Piedmont, the early experimental phase of the Early Woodland seems to be virtually absent. One rare exception is a reported discovery of net-marked, steatite-tempered sherds about 5 miles west of the Kerr Dam (Wells 2002:220). Otherwise, the oldest ceramics in this area appear to be Stony Creek (also found in the interior Coastal Plain of Virginia) and similar Vincent ware (in the Roanoke Basin of North Carolina), although their temporal placement remains ambiguous. These wares resemble the Early Woodland Deep Creek pottery of the North Carolina Coastal Plain in their conical shape and sand or grit temper (Coe 1964; Ward and Davis 1999:91). Coe (1964:101) explicitly linked his Vincent Cord-Marked and Fabric-Marked types to Stony Creek ware defined by Evans (1955).

Ward and Davis (1999:95) note that this ubiquity of presumably Early-Middle Woodland occupation of the Roanoke Piedmont contrasts with the scarcity of contemporaneous sites to the south and west. This might indeed be a regional contrast in coeval settlement patterns, or perhaps it is an indication that their early dating of Vincent ware is erroneous. At the Gaston Site, a clear stratigraphic break and 15 inches of culturally sterile, alluvial sand intervened between the Savannah River zone and the "black midden" that contained Vincent ware (Coe 1964: figure 89). Coe (1964:119) guessed that the Vincent occupation represented "a new group of people…around the year A.D. 500."

In his earlier survey (1952) of the Buggs Island Basin (John Kerr Reservoir area), Coe had recognized a sequence of three Woodland ceramic types. The earliest, cord-marked, fine-sand-tempered ware, with a compact, hard paste, closely resembled Vincent ware. Miller (1962) assigned this pottery (also including fabric-impressed and net-impressed varieties) to the "Hyco" series. In Coe's terms the Vincent-like ware was followed by Roanoke (or "Piedmont Cord-Marked") ware (closely resembling Clements), which in turn was followed by Clarksville pottery (Coe 1964:100). Wells (2002) sees a sharp stylistic break, again mainly in vessel shape, separating Hyco from Clarksville pottery. Based primarily upon shape (temper, surface treatment, and rim forms are all different), Wells equates Clarksville Type I with Coe's Clements ware, and Type II with Coe's Gaston ware as well as the Dan River series.

DHR site files contain no sites attributable to the Early or Middle Woodland in Pittsylvania County.

7. Middle Woodland Period (500 cal BC to cal AD 1000)

The distinction between Early and Middle Woodland was transposed from the Ohio Valley region eastward to the archaeology of the Atlantic seaboard, where it does not fit very well. The Early Woodland Adena complex flourished in the Ohio Valley between ca. 600 and 100 cal BC. The construction of burial mounds, characteristic of this complex, did not spread to the Atlantic coast; nevertheless, sustained cultural contact with the Adena complex is demonstrated by massive caches of typical Adena artifacts (lobate-stemmed points, tubular pipes made of Ohio fireclay, shale and slate gorgets, etc.) found in cremation burials on the Delmarva peninsula. According to the standard regional chronology, which is based on the appearance of some new pottery types around 500 cal BC, the Delmarva Adena sites are attributed to the local Middle Woodland. In Ohio, the Adena mortuary cult was succeeded by the Middle Woodland Hopewell interaction network, which flourished until about cal AD 500. Characteristic Hopewell artifacts such as zoned-dentate-stamped pots and chert bladelets were traded into, and some were produced in, the mountains of western North Carolina. A platform mound of Hopewellian style—the Biltmore Mound—was constructed near Asheville ca. cal AD 400-550; however, Hopewell cultural influence did not extend farther east into the Piedmont.

After the collapse of the Hopewell system, long-distance trade routes were re-established about cal AD 600 to 1000, again in a context of mortuary ritual. This late Middle Woodland network linked Middle Atlantic societies to groups in New York, New England, Ontario, Michigan, and Ohio. Distinctive items exchanged among these peoples included combs made of moose or elk antler, fossil shark teeth, polished stone gorgets, and stone platform pipes with tulip-shaped bowls. In central Virginia such artifacts were associated with late Middle Woodland burials at the Hand Site (44SN22) in Southampton County and in the Linville Mound in Rockingham County.

Piscataway/Rossville points frequently occur on early Middle Woodland sites in Virginia. Diagnostic Middle Woodland point types include Potts corner-notched (and similar Nomini points on the Northern Neck) and Fox Creek or Selby Bay points, which are often associated with Mockley pottery. Triangles resembling the Yadkin type of the Carolina Piedmont seem to occur as early as AD 350, which might suggest that introduction of the bow and arrow occurred prior to the Late Woodland period; however, this date appears suspiciously precocious in comparison to the dates for the bow's arrival elsewhere in North America, after AD 500. Jack's Reef corner-notched points occur in small numbers in eastern Virginia, ca. AD 600 to 900.

8. Late Woodland Period (AD 1000 to 1600)

The inception of the Late Woodland is marked by the appearance of maize-based horticulture and sedentary villages. Although actual remains of cultigens are very rare, maize horticulture had been adopted by many Middle Atlantic groups by ca. cal AD 1000. Late Woodland sites in the Piedmont are often located in floodplains of higher-order streams and adjacent to high-yield agricultural soils (Hantman and Klein 1992). As a complementary trend, interior areas and secondary drainages were used much less frequently during the Late Woodland than in earlier periods. This shift probably reflects reliance on cultivation of maize in the floodplain and terrace locations along major drainages (Turner 1992:114). Hunting, gathering, and fishing still provided important dietary supplements. Storage of surplus crops permitted the establishment of small permanent hamlets and larger villages. Prior to cal AD 1300/1400, settlements were not stockaded, suggesting that inter-tribal hostilities may not yet have been so severe that populations had to cluster for defense (Stewart 1993:171-173); however, around cal AD 1300 to 1400 throughout the Middle Atlantic region, population density increased, nucleated settlements and stockaded villages were established, and there is evidence of population movement and displacement (Stewart 1993:172-173). In the Piedmont of southern Virginia and northern North Carolina, circular palisaded villages enclosing about 1 to 2 acres appear around AD 1300, in the latter part of the Dan River phase.

The dramatic increase in the number of small villages, and the deep cultural deposits and numerous storage pits found at these sites suggest that Late Woodland populations were not only sedentary but expanding both spatially and in absolute numbers. In response to population growth, establishment of sedentary villages, and availability of food surpluses, more complex sociopolitical structures may have developed during this period. Thus, the middle Late Woodland period (around AD 1300) is characterized by the emergence, or in some cases the reappearance, of ranked societies and rank-differentiated burial regimes (Potter 1989; Rountree 1990; Turner 1992). These ranked societies developed into the complex tribes and chiefdoms encountered by the European colonists in the late sixteenth and early seventeenth centuries (Potter 1993; Turner 1976).

What is known as the Little Ice Age began ca. cal AD 1200. This sudden cold period probably reduced crop yields, causing nutritional crises and sparking raids and protective measures such as palisades (Milner 1999). Although climate change, exacerbating endogenous economic and demographic forces, may have pushed Middle Atlantic societies into complexity, exogenous factors may also have played some role. Large-scale chiefdoms, capable of monumental construction, craft specialization, long-distance exchange, and organized warfare, arose in the Mississippi drainage after AD 800. Cahokia, the greatest center, flourished between AD 1050 and 1200. Major Mississippian chiefdoms (e.g., Moundville in Alabama and Etowah in Georgia) were established in the Southeast between AD 1000 and 1550. There is little evidence of actual colonization or imperial penetration of Mississippian chiefdoms into the Piedmont (the Pee Dee culture at the Town Creek Site in southern North Carolina, ca. AD 1200 to 1400, is a notable exception). Nevertheless, the Piedmont villagers must have been peripheral participants in a Mississippian world system.

The Uwharrie phase (cal AD 800 to 1200) represents the first colonization of Piedmont river drainages in North Carolina by Late Woodland maize-farmers, ending centuries of apparent virtual abandonment of the region following intensive Terminal Archaic occupation. "...The Uwharrie phase is the 'mother' of all succeeding phases that comprise the Piedmont Village Tradition" (Ward and Davis 1999:100). The Uwharrie phase, as conventionally defined, overlaps for 200 years (AD 1000 to 1200) with the Dan River phase (AD 1000 to 1400), so that there is no real chronological distinction between late Uwharrie and early Dan River material.

In 1608 the peoples of the Virginia Piedmont seem to have been speakers of several related Siouan languages, including Tutelo. Although the latter tribes were living on the lower Mississippi in the eighteenth century, they were probably descended from the Mosopelea, who, according to a few French maps, lived along the Ohio in the mid-seventeenth century (Rankin n.d.). For that reason these languages are classified as "Ohio Valley Siouan." Tutelo diverged from Ofo and Biloxi perhaps about AD 950 (Rankin n.d.). This linguistic evidence offers some support for the inference that the people who spread the Uwharrie culture into the Piedmont were ancestral Virginia Siouans. Over the following centuries the basal Uwharrie ceramic tradition diversified into the recognized Late Woodland pottery types of the southern Piedmont and southwestern Virginia; although tempered with different materials, these wares have similar shapes, surface treatments (mostly net impression), and decoration. Egloff (1992:203) suggested that "Clearly the distribution of Clarksville/Dan River/Wythe wares is associated with the documentation of the Siouan-speaking Occaneechi (near Clarksville), Saponi (Charlotte County), and Tutelo (Roanoke or Radford area) Indians. The closely related Radford, New River, and Smyth wares also probably represent Siouan-speaking people." Ward and Davis (1999:99) alternatively propose that the Gaston phase "may represent the ancestral remains of the Occaneechis, Tutelos, and Saponis." They suggest that the "the Dan River and Saratown phases of the northern Piedmont probably represent the remains of peoples ancestral to the Sara Indians."

Diagnostic artifacts of the Late Woodland period (cal AD 1000 to 1600) in south-central Virginia include Levanna/Yadkin and smaller Madison/Clarksville triangular projectile points and Clarksville/Dan River/Wythe and Gaston pottery (Coe 1964; Egloff 1992).

At the Leesville Lake sites in northern Pittsylvania County excavated by Louis Berger (LaBudde et al. 2009), the early Late Woodland period is represented by Uwharrie pottery. Site 44PY0043 in this area, excavated by Boyd (1997), contained human burials, Dan River pottery, pendants, gorgets, stone pipes, bone flutes, bowls, and projectile points. This appears to have been a palisaded village. Two features yielded radiocarbon-dated charcoal; the calibrated ages were ca. cal AD 1485 and cal AD 1020 (Boyd 1997).

DHR files contain only four recorded Late Woodland sites for Pittsylvania County, but 35 sites are classified more broadly as "Woodland" based mainly on the presence of nondiagnostic potsherds. Given the regional pattern, most of these sites are probably also of Late Woodland age.

9. Contact and Protohistoric Period

When English fur traders began exploring the Virginia Piedmont in the 1670s, there were still a few organized Siouan-speaking polities left in the region. The most powerful group were the Occaneechi, whose main town was located near modern Clarksville. It is still a matter of contention whether infectious diseases introduced by Europeans had already caused a series of devastating "virgin-soil" epidemics in eastern North America in the early to mid-sixteenth century, or if native people remained largely unscathed by disease until the 1630s or even later. Ward and Davis (1991) saw no archaeological evidence of population decline in the North Carolina Piedmont prior to the 1670s. After the Five Nations Iroquois and English militias defeated the Susquehannocks in 1675, and Nathaniel Bacon's army destroyed the Occaneechi town in 1676, the Tutelo, Saponi and other Siouan refugees moved farther south.

In 1714 Governor Spotswood of Virginia brought the various Siouan-speaking refugee groups in southern Virginia and North Carolina, collectively labeled as Saponi, to live at the newly constructed Fort Christanna, on the Meherrin River in Brunswick County. Other splinter groups of Siouans wound up in mixed refugee communities elsewhere during the eighteenth century; for example, some Tutelos settled at Conestoga, a mainly Susquehannock settlement in Pennsylvania. In 1753 most of the remaining Tutelo and Saponi were absorbed by the Cayuga in New York; however, several mixed-race communities still living today in southern and central Virginia, particularly in Albemarle County, have recently reasserted their identity as Monacans or Saponi.

Previous testing of the Southern Virginia Megasite tract identified 44 prehistoric components (BAL 2011). These were mostly light scatters of temporally undiagnostic debitage, but 23 projectile points were also recovered, which provide some chronological information. These include two Palmer points (from Sites 44PY0364 and 44PY0365), a Morrow Mountain point (from Site 44PY0322), a Guilford point (from Site 44PY0357), two Halifax points from Site 44PY0353, a Brewerton point from Site 44PY0366, an unspecified Late Archaic point from Site 44PY0368, three Savannah River points (two from Site 44PY0026 and one from Site 44PY0360), and a Late Woodland Caraway triangle from Site 44PY0392. Woodland occupations are indicated by sherds from Sites 44PY0392, 44PY0350, and 44PY0351. No further work was recommended for any of these components because of low artifact density, evident loss of integrity and/or lack of stratigraphic depth, and the inordinate cost of acquiring any additional information (BAL 2011). In the Phase II evaluation of 10 sites in Lots 4 and 5, a medial portion of a Palmer/Kirk point was recovered from Site 44PY0359 (Tippett et al. 2015)

B. HISTORIC CONTEXT

The potential significance of the Southern Virginia Megasite sites is associated entirely with architectural and archaeological remains of the historic era, primarily the late eighteenth, nineteenth, and early twentieth centuries. Consequently, the historic context for these sites focuses on those periods. Included in the context are the results of background research on the properties that are included within or partially within the current boundary of the Southern Virginia Megasite.

Virginia history is conventionally divided into eight periods: Settlement to Society (1607 to 1750), Colony to Nation (1750 to 1789), Early National (1789 to 1830), Antebellum (1830 to 1860), Civil War (1861 to 1865), Reconstruction and Growth (1865 to 1917), World War I to World War II (1917 to 1945), and The New Dominion (1945 to present).

1. Contact Period, Settlement to Society (1607 to 1750)

After an abortive venture in the 1580s on the coast of North Carolina, an English colony was established successfully at Jamestown in 1607. The first expedition under command of Christopher Newport sailed as far as the falls of the James at the site of modern Richmond, but they turned back as their ship could go no farther. For the next century English settlement was restricted to the Coastal Plain, and historical maps demonstrate that the colonists were remarkably ignorant about the region beyond the Fall Line until the 1730s.

After John Rolfe showed in 1612 that West Indian tobacco could be cultivated in Virginia, tobacco became the basis of the colonial economy. Until the 1680s, the work force on the tobacco plantations consisted mainly of indentured servants from England. As English emigration fell off, planters began to import large numbers of Africans for enslavement. The tobacco-based economy depended on export of this cash crop, which was most easily accomplished by ship. Colonial penetration beyond the Fall Line into the Piedmont was slowed by the lack of easy water transport as well as resistance from the surviving native peoples. The improvement of inland roads was initially prompted by the need to transport tobacco to Tidewater ports. Subsequent road development was designed to accommodate the communication needs of plantations and settlements located both east and west of the Fall Line. The Virginia Assembly passed laws ordering road construction in 1632, 1657, and 1661 (Miller 2011).

When the English colonists were becoming established in coastal Virginia, the native inhabitants of that region were Algonquian speakers, most of whom belonged to the chiefdom ruled by Powhatan. The native peoples living west of the falls of the James, Potomac, and York rivers spoke Siouan languages. These tribes of the southern Piedmont, traditional enemies of the Powhatan chiefdom, included the Saponis, Tutelos, and Occaneechis. It is still debatable whether these groups of the interior had been decimated by European-introduced contagious diseases already in the 1500s, or if the first major outbreaks occurred only after contact with English fur traders intensified in the 1670s (see Section IV.A.9, above).

The focal points of the fur trade were Thomas Stegg's plantation in modern Richmond and the Indian town of Occaneechi. In 1670 the German-born trader John Lederer trekked west from Stegg's along the James and southward, visiting several Indian towns, including Occaneechi. Among the traders who quickly followed in Lederer's wake were John Hatcher, Henry Hatcher, and Benjamin Bullington. They cut their initials into a big beech tree near the Dan River on May 24, 1673; William Byrd II would stumble upon this inscription during his survey of the area in 1733 (Bassett 1901:309). When Thomas Stegg died, his nephew, William Byrd I (father of Byrd II), took over his fur trading operations. As beaver had been over-hunted, the fur trade shifted to deer hides in the late seventeenth century. War parties of the Iroquois Confederacy frequently traveled south to the Carolinas to attack the Catawbas, their rivals in the hide trade, and these warriors deterred English colonization of Virginia's interior. When the Iroquois agreed under the Treaty of Albany in 1722 to desist from warfare east of the Appalachians in Virginia, this deterrent to settlement was removed.

Frequent raids by the Iroquois and waves of disease had had devastating effects on the Siouans of the southern Piedmont. In 1714 the surviving Indians congregated at a fort and school built by Governor Alexander Spotswood at Fort Christanna in Brunswick County. For several years the Virginia Indian Company organized by Spotswood had a monopoly of the fur trade, which was channeled to this fort. However, Spotswood's political enemies thwarted his plan, the monopoly was lifted, and the fur trade at

Christanna ceased in 1722 (Beaudry 1985). In 1740 the remaining Saponis emigrated to New York, where they lived among the Iroquois.

In 1728 William Byrd II (of Westover) headed an expedition tasked with surveying the boundary between Virginia and North Carolina. Their guide was a Saponi from Fort Christanna, called Bearskin. On October 10 they crossed the south branch of the Roanoke River. Camping beside Cane Creek that night, Byrd decided to name the river they had just crossed the Dan, presumably having in mind the northern boundary of ancient Israel, which stretched "from Dan to Beersheba." In a similar Biblical vein, Byrd would call the tract of 100,000 acres he was granted along the border in 1733 "Land of Eden." Byrd's party saw native cornfields along the south bank of the Dan about a mile southeast of the Berry Hill tract on October 16, 1728, and the next night they camped by Cascade Creek, about 3 miles west of the present project (Mitchell 1993). In 1733 Byrd returned to this area to survey his Eden tract. On September 25 his men camped near Pumpkin Creek and were alarmed by the discovery nearby of the very recently abandoned camp of a large Iroquois war party. They did not encounter the warriors, however, and the survey of Eden proceeded without incident.

Byrd felt disdain for the frontier folk of North Carolina. He hoped instead to attract Swiss German Protestants to settle on his Eden tract, but this scheme failed, and the tract was undeveloped when Byrd died in 1744. The first settlers of what would become Pittsylvania County were Quakers from Pennsylvania, who began to arrive in 1738. Later, Tidewater Virginians moved into the eastern section of the county with their enslaved workers, while the Quakers, Germans, and Scots-Irish from Pennsylvania settled the western half (Clement 1929).

The sequence of creation of early Virginia counties generally reflected the expansion of the colonial population into new areas where they required new, less distant administrative and religious centers. Pittsylvania was originally part of Brunswick County, which had been created out of Prince George County in 1720. Lunenburg County was created out of Brunswick County in 1746, and in 1752 Halifax County was created out of Lunenburg County. Pittsylvania County was created out of Halifax County in 1767, when its population included 1,000 taxable individuals (Clement 1929). Even after the later removal of Patrick and Henry counties from western Pittsylvania, it remained the largest county in Virginia.

2. Colony to Nation (1750 to 1789), Early National Period (1789 to 1830)

Friction on the western frontier ignited the French and Indian War in 1754. This conflict between Britain and France assumed global dimensions in 1756 as the Seven Years' War. Things went badly for Britain until William Pitt (the Elder, Earl of Chatham) took control of military strategy in 1758. In 1759 Quebec fell to the British, and the capture of Montreal in 1760 ended the war in North America. The Treaty of Paris ended the global conflict in 1763. Parliament enacted the Stamp Act in 1765 to help defray the war's costs at the expense of the American colonists. Pitt's arguments against this tax were instrumental in its repeal in 1766, and Pittsylvania was named in gratitude to William Pitt for his pro-American stance when the county was formed in 1767.

One of the first major landowners in the area that would become Danville was William Wynne, who patented 200 acres on the south side of the Dan River in 1738 (Fountain 1979:13). He was granted a much larger patent of 2,000 acres in 1752. He seems to have been actually residing on this tract by 1754, when reportedly he was operating a mill on Pumpkin Creek. William Wynne died in 1777.

Although some land patents were granted in the 1730s, it is evident that settlement intensified in the area that would become Pittsylvania in the 1750s and 1760s (Swanson 2010:22). Research by Roger Dodson (1995) indicates that portions of the Berry Hill project were included within as many as 11 eighteenth-century patents (Table 2).

The "P Perkins" in Table 2 is Peter Perkins. His father, Nicholas Perkins, came to southern Virginia in 1752 with his wife Bethenia Harden and son Peter. In 1756 and 1757, Nicholas commissioned a survey for a tract of land in what was then Halifax County, now Pittsylvania County. He was living at or near Berry Hill by about 1755. At the death of Nicholas in 1762, his estate was divided among his children. The portion including Berry Hill was inherited by Peter Perkins. Clement (1929:95) attributed the construction of the house at Berry Hill to Peter, although she also noted that he moved to North Carolina in 1795. However, according to the NRHP nomination form (Virginia Historic Landmarks Commission [VHLC] 1977), architectural evidence indicates that construction of the house began after Peter Wilson (a cousin of Peter Perkins's son, Nicholas) acquired the property in 1812. This house is stated to have been a frame copy of the brick Federal-style house called "Little Cherrystone" in Chatham. In 1819 the property was acquired by Robert Hairston, who was a brother-in-law of Peter Wilson's daughter. In 1881 the property would pass to Hairston's niece, Ruth Hairston Sims, who married Alfred Varley (A.V.) Sims. She did not live in the house, which was occupied by tenants.

Three years prior to his death, in 1759, Nicholas Perkins is credited with seating the Perkins Mill along Moberly's Creek (now Trotter's Creek) (BAL 2011:49). A house and kitchen (The Perkins Mill Miller's House) located north of the mill were likely constructed to house a miller, hired or enslaved, to run the mill. The Hairston family had acquired the mill and dwelling by 1820 within their acquisition of the Mill Place Tract; however, the nature of the transfer of ownership is unknown (Pittsylvania County Land Book [PCLB] 1818-1820). Herman Melton (1989, 1999) (Browning 2011:50) identifies Perkins Mill as the third oldest gristmill in today's Pittsylvania County and a typical feature of large plantations seeking to feed enslaved workers and tenants, as well as a means of surplus production for sale. Census research for the Mill Place tract shows several Millner families in the area in 1880 (John P. Millner, a white tobacco manufacturer and Jack Millner, a Black farm laborer), but no one named Henry Mill that was listed as a tenant. Records indicating the continued operation of the gristmill were also not found (United States Bureau of the Census [U.S. Census] 1880; Wilson-Hairston Papers: Reel 31). It is therefore unknown how long the gristmill was in operation as well as how long the dwelling was inhabited.

TABLE 2: EIGHTEENTH-CENTURY LAND PATENTS AT SOUTHERN VIRGINIA MEGASITE

PATENTEE	YEAR	ACRES
Marr	1759	404
Marr	1781	404
Bean	1762	179
Graven	1762	330
P Perkins	1764	820
N Perkins	1784	400
Hardiman	1768	400
Davis	1772	360
Harrison	1780	344
Wadlow	1780	300
Chadwell	1781	404

Dodson 1995

After the Revolutionary War (1775 to 1783), veterans who had settled near the Dan River met once a year at Wynne's Falls to fish and socialize. In 1793 they petitioned the Virginia General Assembly to form a town nearby that would also become a tobacco inspection station. The legislature granted both requests, and the town of Danville was established on November 23, 1793, on 25 acres owned by John Barnett. The 12 original trustees of Danville were Thomas Tunstall, Matthew Clay, William Harrison, John Wilson, Thomas Fearn, George Adams, Thomas Worsham, Robert Payne, James Dix, John Southerland, John Call, and Thomas Smith. One-acre lots along the Salisbury Road (now Main Street in downtown Danville) were platted and offered for sale beginning in 1795. By 1800 the new town was big enough to warrant a post office (Pollock 1885:13).

The county seat of Pittsylvania was originally located in Callands but was moved from there in 1777 to modern Chatham. The courthouse was located where Chatham's Town Hall now stands at 16 Court Street. In 1806 a controversy over the location of a new courthouse resulted in the General Assembly's establishing the town of Competition. In 1852 the name of Competition was changed to Chatham. Chatham was incorporated as a town in 1874.

When Pittsylvania County was created in 1767, there were only 271 enslaved people in the county. By 1800 the enslaved population had grown to 4,200. The white population of the region grew until 1830, when westward emigration was accelerated by economic depression (Swanson 2010:35).

The Roanoke Navigation Company, chartered jointly by Virginia and North Carolina in 1815, constructed canals, locks, and dams along the Roanoke and Dan rivers in the 1820s. Foodstuffs and tobacco (Danville's main crop) were shipped down the larger rivers as well as smaller tributaries on *bateaux*, flat-bottomed double-ended boats typically piloted by three enslaved persons (Trout 1968). Construction of the canal and clearing of the waterways to promote navigation spurred Danville's growth after 1830.

In February 1774 William Harrison commissioned a survey of 344 acres of land in what is now Lot 4. By 1779 he was living on the land (State of Virginia 1607-1890). In 1785 the land was sold to Robert Harrison, Jr. By that time the land had been designated the Harrison place. Harrison made $300 in building improvements on the land in 1818 (PCLB 1818-1820).

The Trahern tract was granted to David Chadwell on September 22, 1766. By 1781 the 219-acre parcel was owned by Nehemiah Trahern and was being surveyed. He lived on the land until his death in 1804. Nehemiah bequeathed 14 enslaved workers to his wife Amelia and his nine children (Pittsylvania County Wills [PCW] 1767-1820:272). In Nehemiah's will, filed in 1819, the land was deeded to his eldest son James. Personal items inventoried as part of the estate by the administrators, James Patterson and Samuel Hairston, included one yoke of oxen, 13 head of hogs, one red cow and calf, one bay mare, and one gray mare (Pittsylvania County Courts 1819).

By the early 1820s brothers Samuel and Robert Hairston owned much of the land on both sides of the Dan River from the North Carolina state line to the outskirts of Danville (Wiencek 1999:22). Land records indicate that in 1820 Samuel Hairston had purchased several large tracts of land, including 933 acres on the northern side of the Dan River and 458 acres around Mobley's Mountain. Overall, Samuel owned over 2,500 acres in Pittsylvania County (PCLB 1818-1820).

By 1820 Robert Hairston and his wife, Ruth S. Hairston, owned over 1,000 acres of land that made up the Berry Hill Plantation and a smaller parcel called the Mill Place tract (PCLB 1818-1820) (Figure 4). Robert's brother Samuel Hairston expanded his holdings with the acquisition of the Trahern tract in 1822 (Pittsylvania County Deed Book [PCDB] 25:24).

The earliest records of tobacco crops from Samuel Hairston date to 1822. Eighteen hogsheads from the Liberty warehouse were sold at Lynchburg from January to July 1822 for $2,132.06. The same number of hogsheads was sold in 1823. Lynchburg was the primary market for the sale of the tobacco produced by Samuel Hairston. Tobacco was stored in the Liberty warehouse in Marseilles, Halifax County, until market prices were favorable (Wilson Hairston Papers: Reel 15).

While Samuel Hairston was increasing his land holdings, the 1820 land book reported buildings valued at only $150; however, in 1823 the Oak Hill plantation was established along the Dan River. Tax records from that year indicate that Samuel had 38 enslaved people, 21 horses, and several carriages. The 933 acres taxed was much less than the land reported under his possession in the 1820 land book (Wilson Hairston Papers: Reel 15).

3. Antebellum (1830 to 1860)

In 1829 Danville was a "mere straggling village" (Pollock 1885:20). A year or so later, growth of the tobacco trade required construction of two warehouses, Claiborne's on Main Street and Pannill's on Bridge Street. More warehouses would be created for the storage and auction of tobacco (Pollock 1885:32). In

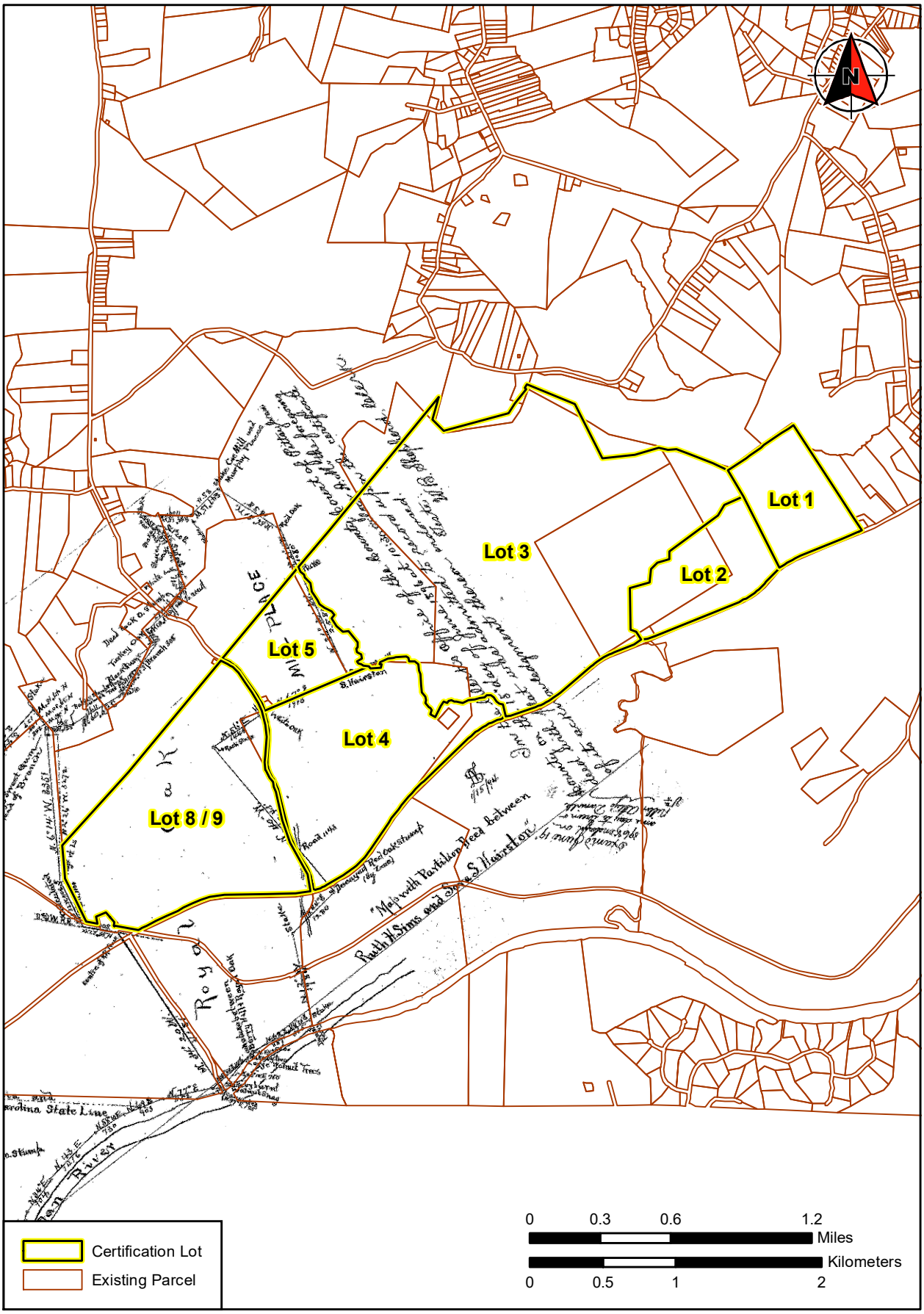

FIGURE 4: Historical Map Overlay onto Lot Boundaries Showing Boundaries of Berry Hill, Royal Oak, and Mill Place (PCDB 106:368, 8/17/1895)

1840 Pittsylvania County ranked first in the state in production of tobacco with nearly 6.5 million pounds. Corn also was an important crop; Pittsylvania's 674,000 bushels ranked second in the state.

A charter for the town of Danville was drawn up on February 17, 1830, but by the time it was issued, the population had spread beyond the established boundaries, and a new charter was issued in 1833. In 1836 the population of Danville was about 1,000. The town boasted 115 houses, three groceries, two commission houses, two tobacco warehouses, two branch banks, a Masonic Hall, a female academy, a male academy, and a seminary for young ladies. It had one apothecary shop, two tobacco factories, one oil mill, two flour mills, three sawmills, one iron foundry, two taverns, one printing office, two tanyards, one saddler, two boot and shoe factories, four tailors, three cabinet makers, one chair maker, two milliners, one plow factory, and three blacksmiths. Danville also had three lawyers and seven doctors (Martin 1836:261).

Local businessman Whitmell P. Tunstall pushed for a rail line between Danville and the state capital. The Richmond and Danville Railroad, predecessor of the Norfolk Southern, was incorporated in 1846; construction began in 1849, and the railroad was operating to Danville by 1856. The railroad allowed shipment of local produce directly to Richmond's massive port on the James River. Previously, tobacco had been transported in *bateaux* for hundreds of miles along rivers and streams to ports on Albemarle Sound in North Carolina.

According to a possibly apocryphal tale first attested in 1886, a new method for charcoal-curing tobacco was accidentally discovered in 1839 by an enslaved man named Stephen on the Slade plantation in Caswell County, a few miles south of Danville (Swanson 2010; Tilley 1949). In the two decades preceding the outbreak of the Civil War, planters and farmers of Caswell, Halifax, and Pittsylvania counties developed a new form of tobacco: bright leaf. This new variety had a fine textured, mild-tasting leaf that cured to a lemon yellow color. Bright leaf could be cultivated in sandy soil and was dried using charcoal or flues. The best soils for this crop are now classified as Appling, Cecil, Durham, and Granville sandy loams, which occur on interfluvial ridges that comprise about one third of the land of the three counties (Swanson 2010:68). These seemingly poor, marginal soils suddenly became very valuable. Bright leaf sold in antebellum markets for at least two or three times as much as dark tobacco (Swanson 2010:84).

Already in the 1820s, a few small factories were manufacturing chewing tobacco in Danville. By 1860 there were at least 53 tobacco factories in Caswell, Halifax, and Pittsylvania counties, mostly located in or near Danville, Milton, and Yanceyville. Danville had become the world's fifth largest tobacco manufacturing center. Danville tobacco factories purchased more than 3.5 million pounds of local tobacco each year, employed almost 500 hands (mostly enslaved), and produced finished tobacco worth $610,332 (Swanson 2010:87). Outside Danville, smaller factories had been set up in rural Pittsylvania County; there were 39 facilities in the county as a whole in 1860.

As recorded in the 1860 census, the population of Pittsylvania County was 31,445—17,105 free whites and 14,340 enslaved Blacks. Of the 3,253 white men over the age of 21, 1,225 (38 percent) were enslavers (Dyer 1905). Swanson (2010:39) offers a slightly greater number of enslavers (1,414) and notes that 189 of them held 20 or more enslaved workers. Samuel Hairston was probably the largest enslaver in the entire South; his enslaved workforce is estimated to have numbered around 1,600 (Swanson 2010:38).

Samuel Hairston greatly expanded his land holdings around Oak Hill Plantation during the Antebellum period (Figure 5). The Harrison Place tract was sold to Samuel in 1842 for $800 (PCDB 47:252). A 204-acre tract was purchased from John B. Murphy for $510 in 1834 (PCDB 37:8). This tract would be known as "Murphy's Place" on subsequent maps of Oak Hill. Erastus M. Adams sold just over 189 acres of land to Samuel for $3,200 in 1860 (PCDB 59:33). This property, depicted as Worsham Place on maps of Oak Hill, was occupied by Benjamin Watkins around 1840. Transfer of the property from Watkins to Adams in 1853 was valued at $1,137, nearly one third the value given just seven years later (PCDB 8:20).

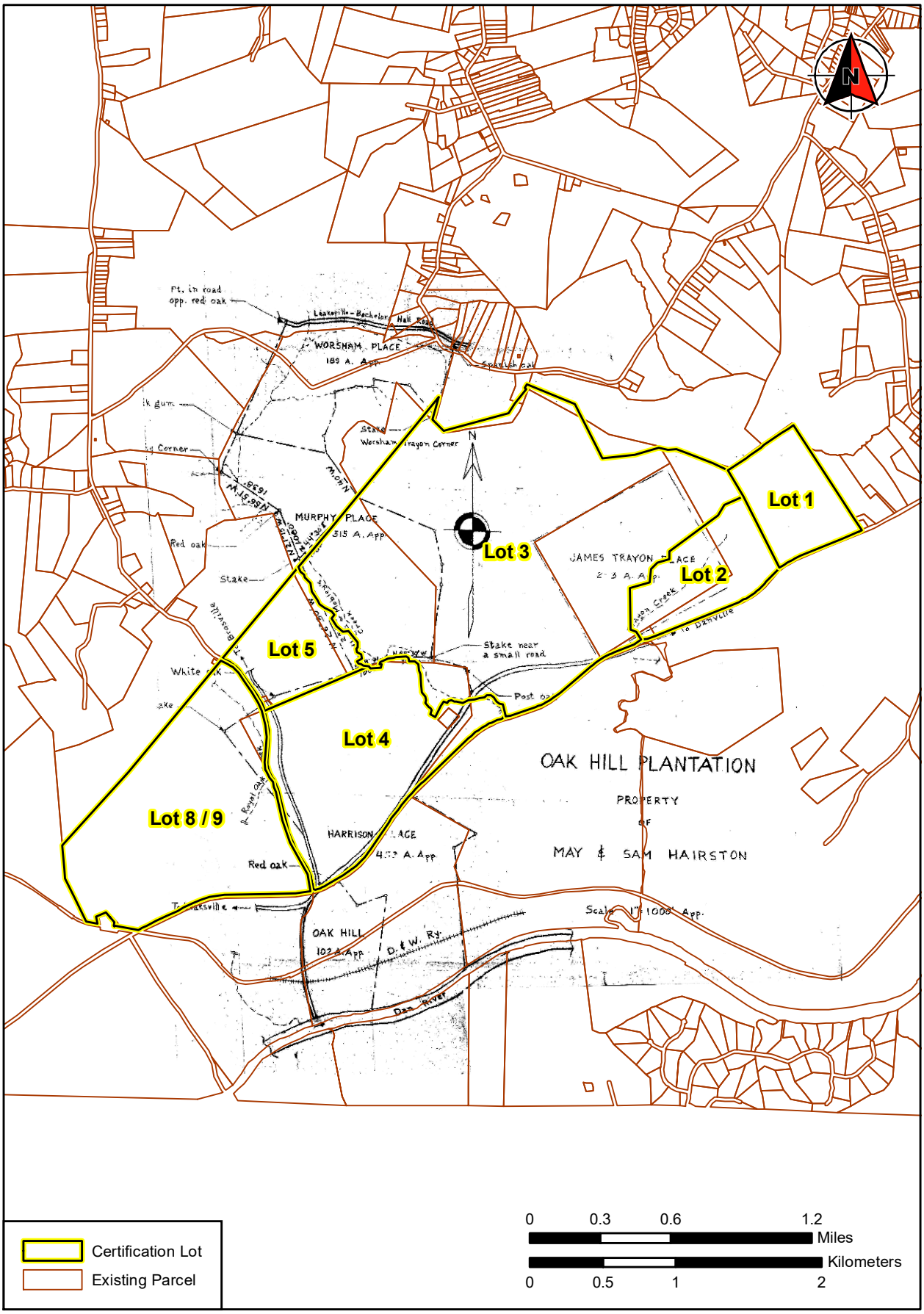

FIGURE 5: Boundary of Oak Hill Plantation Shown on Southern Virginia Megasite Lots (PCDB 1:74, 6/22/1964)

In 1837 Robert Hairston moved to Lowndes County, Mississippi, to start a new plantation under a cloud of conflict over the attempt to free several Berry Hill enslaved people. Ruth S. Hairston took over the management of Berry Hill at that time. Both Ruth S. Hairston of Berry Hill and her brother-in-law (Robert's brother) Samuel Hairston of Oak Hill Plantation were heavily invested in bright leaf tobacco production through this period. Ruth S. Hairston produced 15,000 pounds of tobacco on 700 acres of improved land. Samuel reported owning four different 2,000-acre parcels that each produced 25,000 pounds of tobacco. The second largest crop produced was corn; Ruth produced 2,500 bushels, and Samuel produced a staggering 10,000 bushels on his vast holdings (United States Department of Agriculture [USDA] Census 1850).

Danville tobacco was sold in the Richmond markets by the firm of Watkins and Trabue in 1858. Tobacco sold in the Richmond markets for as low $0.085 to as high at $0.10 per pound, depending on the quality. From May to September 1858, Ruth S. Hairston sold 19 hogsheads of tobacco weighing 22,765 pounds for $1,919.31. Tobacco was not the only crop sold in the Richmond market; in 1858 Ruth S. Hairston sold 248 bags of wheat at a price per bag as high as $1.35 and as low as $0.77 (Wilson Hairston Papers: Reel 29).

In 1860 Samuel reported only 750 acres of improved land in Pittsylvania County, on which he produced 30,000 pounds of tobacco. It appears that Samuel under-reported his agricultural production, as he lists his real estate value in the population census as $130,000, which far exceeds the $3,500 value of the farm from the agricultural census. Ruth S. Hairston's production remained steady at 15,000 pounds of tobacco on 900 acres (USDA 1860).

Preparing the fields for tobacco was a long process that started each year in December. Seedbeds were created out of fallow land that had an abundance of overgrowth from trees to brush, which was likely used as fuel for the bright leaf curing process. The land was cleared and any remaining stumps and roots were burned out. Once the field was cleared, the earth was scorched using sleds of burning wood. This scorching was to sterilize the earth of insects and weed roots. Once the ground was sterilized and smoothed, tobacco seeds, which are very small, were mixed with ash and spread across the ground carefully. Once the tobacco plants sprouted, they were carefully moved to another field that had been meticulously prepared with individually sculpted mounds of manure and wet earth a foot high. This transplantation could only be done in the wet weather of spring to protect the delicate seedlings. The tobacco was usually harvested by hand in the late summer, letting the stalks dry in the fields for a few days before hauling them to the curing barns using oxcarts (Wiencek 1999:62-63).

The toll of this work on Samuel Hairston's enslaved workforce was evident in the daily visits by William Hereford to treat various ailments between April and August 1832. Pills were dispensed as well as other treatments, abbreviated as "Phleb, Pil, Pul, Emplast, and Oleum" (Wilson Hairston Papers: Reel 19). No records could be found as to the profession of William Hereford. He is listed as living in Henry County next to Robert Hairston (United States Bureau of the Census [U.S. Census] 1830).

In 1850 the Hairstons owned a large number of enslaved people: Ruth S. Hairston owned 92 and Samuel owned 246 (U.S. Census 1850). By 1854 Samuel owned between 1,600 and 1,700 enslaved people on his plantations in Henry, Patrick, and Pittsylvania counties in Virginia and North Carolina (*Texas Ranger* 1854).

4. Civil War (1861 to 1865)

At the start of the Civil War in 1861, Danville was a thriving town of about 4,000 people. During four years of war, it became a strategic center, serving variously as a quartermaster's depot, rail center, hospital station for Confederate wounded, and prison camp. Six tobacco warehouses were converted into prisons, housing over 5,000 captured Union soldiers. Starvation and dysentery, plus a smallpox epidemic in 1864, caused the deaths of 1,314 of these prisoners, who are buried at the Danville National Cemetery.

Only a week after the Virginia Convention voted to secede on April 17, 1861, the 160-man volunteer unit known as the Danville Grays (18th Virginia Infantry, Company B) formed on April 23 (Pittsylvania County History.com 2012). A second infantry company became known as the Danville Blues. Volunteers also formed the Danville Artillery. In the winter of 1862, Danville raised a company of cavalry, later designated as Company C, 5th Virginia Cavalry (Wright 2011). Ten companies from Pittsylvania County participated in Pickett's Charge at the Battle of Gettysburg on July 3, 1863.

When the Richmond and Petersburg rail line was cut in 1864, the Richmond and Danville Railroad's connection with the Piedmont Railroad was the Confederate capital's only remaining connection to the rest of the South. The Richmond & Danville was also the main supply route into Petersburg, where Gen. Robert E. Lee's Army of Northern Virginia maintained a defensive line to protect Richmond.

On April 2, 1865, having received word that General Lee had abandoned Petersburg and that Union troops would soon invade Richmond, Confederate President Jefferson Davis and his cabinet fled to Danville along the Richmond and Danville Railroad. Danville thus became the last capital of the Confederacy, albeit for only eight days. Davis stayed at the palatial home of tobacco magnate William T. Sutherlin from April 3 to 10, 1865. It was there that Davis issued his final Presidential Proclamation. The final Confederate Cabinet meeting was held at the Benedict House (later destroyed) in Danville. Davis learned of Lee's surrender on the afternoon of April 10, and fled southward that night. He would be apprehended a month later in Irwin County, Georgia. Danville surrendered formally to Union troops on April 27, 1865 (Pollock 1885:50-65).

At the onset of the Civil War, the Confederate government informally impressed crops, supplies, and enslaved workers from plantation owners and farmers. This policy was formally backed by legislation in 1863 to support the Confederate Army. Receipts were provided for impressed supplies that guaranteed repayment upon conclusion of the war. In 1864 the Confederate government assessed an in-kind tax on Ruth S. Hairston that included 200 bushels of corn (valued at $6,000), 1,360 pounds of cured fodder (valued at $232), eight gallons of molasses, and eight bushels of peas (Wilson-Hairston Papers: Reel 31). This tax was assessed on a reported 2,120 bushels of corn, 13,600 pounds of cured fodder, 80 gallons of molasses (sorghum), and 80 bushels of peas. Ruth S. Hairston also paid 50 bushels of wheat totaling 3,000 pounds. A March 1864 receipt notes the receipt of 366¾ pounds of bacon from Ruth S. Hairston as an in-kind tax payment to the Confederate States (Wilson-Hairston Papers: Reel 31). Similarly, Samuel Hairston paid an in-kind tax of 1,628 pounds of tobacco leaf assessed on a gross quantity of 14,280 pounds. The Army of Northern Virginia impressed nine enslaved persons, valued at $46,500, from Samuel Hairston in October 1864, under Special Order No. 224 (Wilson-Hairston Papers: Reel 31). These enslaved were to be used for manual labor. Samuel also provided crops that included 61 bushels of corn, 10 bushels of peas, 31 bushels of oats, and 1,500 pounds of fodder (Wilson-Hairston Papers Reel 31). A March 1865 Confederate Army Quartermaster's receipt notes that Ruth Hairston supplied 5,813 pounds of corn to the Army of Northern Virginia (Wilson-Hairston Papers Reel 31).

5. Reconstruction and Growth (1865 to 1914)

On May 6, 1865, less than two weeks after Danville's surrender, the Provost Marshal in charge of the town authorized business to resume (Pollock 1885:66-67). Danville, like most of Virginia, suffered economically during the Reconstruction era; however, the area had not been affected directly by fighting, and it rebounded rapidly owing to the continuing profitability of bright leaf tobacco.

The main change wrought by the war was the emancipation of over 14,000 enslaved Blacks. New forms of labor relations had to be invented. The white landowners retained control of the landscape and regained control over Black laborers, even resorting to violent coercion. Freed Blacks might have hoped that the federal government would redistribute the lands of the defeated secessionists, but by the end of 1868, the federal authorities had returned all Virginia acreage to its antebellum owners or their families.

Encouraged or compelled by agents of the Freedmen's Bureau, most freedmen in Pittsylvania County signed labor contracts with white landowners during the first winter after their emancipation. During the first few years, these local labor contracts took a variety of forms. Nevertheless, most of the surviving contracts from Pittsylvania County may be sorted into one of three general models: wage labor, sharecropping, or exchange of provisions and housing for labor. In wage labor contracts the landowners promised to pay a specified wage to freedmen over the course of a year; in return the laborers would work under their direct supervision, often in large gangs under a white overseer. Under sharecropping contracts, in return for either directed or independent labor, freedmen would receive an agreed-upon share of the crops at the conclusion of the contract. The third, relatively rare contract entailed only the landowner's promise of provisions and housing to elderly or ill freedmen in exchange for work. In the first two models, the landowner would usually provide housing and clothes, and in share contracts he typically promised to furnish seeds, tools, and often draft animals.

Pittsylvania was unusual in the South for its high percentage of wage contracts. For the 1866 crop season, 73 of the surviving 108 contracts in the Freedmen's Bureau records were for wages, 28 for shares, and seven for provisions only. The average annual wage was $93.31 (Swanson 2010:200-201).

Landowners in Pittsylvania County resisted sharecropping throughout Reconstruction. They preferred wage labor out of a belief that Blacks could not raise quality bright leaf tobacco without direct (white) supervision. The planters sought to impose a wage labor system that coupled tight control over daily work regimens with assurances of long-term Black labor (Swanson 2010:207). By the early 1870s, however, sharecropping was replacing wage contracts. Sharecropping may reflect both Blacks' resistance to the delayed-wage contracts that mimicked slavery and freedmen's desires to manage their own land, and white landowners' realization that this system entailed decreased management costs coupled with retention of control of the tobacco crop through sharecropper debt (Swanson 2010:229-230)

From 1860 to 1870, the total number of county farms had increased from 1,680 to 2,366, while the average farm shrank in size from 345 to 253 acres. These figures show that large landowners were dividing their holdings among tenants. The 1880 census shows that most tenants were farming on shares, so the 1870 figures probably show a growth in sharecropped acreage rather than cash rentals or freedmen obtaining their own small farms (Swanson 2010:231). The Virginia General Assembly passed "An Act to Secure Advances for Agricultural Purposes" on April 2, 1873. It gave landlords the first lien on crops tended by their tenants, guaranteeing them their share of the tobacco crops before the sharecroppers or any other lenders. Even when tobacco land dropped in value at the turn of the century, this did not lead to acquisition of farms by African Americans. In 1900 African Americans made up roughly half the population of Pittsylvania County, but they owned only 2 percent of the county's land.

By 1880 Danville was home to more than 7,500 people. According to that year's census, there were 1,000 more African Americans than whites. The city once again began to expand economically. Two new railroad lines, the Virginia Midland Railway and the Danville & New River Railroad, were built. A second bridge, the Union Street Bridge, was built across the Dan River on the western side of the falls in 1878. A new United States Courthouse and Post Office were built in Danville in 1881 (Pollock 1885:70-82, 85).

Cotton manufacturing began in Danville after the Civil War. The new industry was pioneered by the Riverside Cotton Mills, which began operation in 1882. The mills were run using water power from the canals constructed by the Roanoke Navigation Company along the Dan River earlier in the century; the canals had fallen into disuse because of the railroad. In 1884 over five million yards of cloth were manufactured in Danville (Pollock 1885:130). The industry continued to expand with the creation of the Dan River Mills in 1895 (Isaacs 1913:35).

New railroad construction helped spur Pittsylvania County's postwar recovery. In the 1870s the Southern Railway constructed a rail line from Washington, D.C., to Atlanta through Campbell County and

Lynchburg, and Pittsylvania County and Danville. One of the most famous railroad wrecks in American rail history occurred in Danville. On September 27, 1903, "Old 97," the Southern Railway's express mail train, jumped the tracks on a high trestle overlooking the valley of the Dan. The engine and five cars plunged into the ravine below, killing nine and injuring seven. A marker is located on U.S. Route 58 between Locust Lane and North Main Street at the train crash site.

As in the antebellum era, tobacco continued to be the mainstay of postbellum Danville's economy. Between 1873-1874 and 1879-1880, Danville bright leaf sales increased from 12 million pounds to more than 33 million pounds. By 1879 the city had eight major warehouses that each sold between 3 and 5 million pounds annually. By 1885 there were 10 warehouses and 26 tobacco manufactories in the city (Pollock 1885:126-130). Annual sales in 1885 were almost 41 million pounds, and in 1899 sales exceeded 54 million pounds (Swanson 2010:244). Growth in the tobacco industry continued, but by 1890 Danville's share of the business was beginning to be affected by major national conglomerates such as the American Tobacco Company. This company, founded by James Buchanan Duke, was reorganized as a massive trust in 1902. The center of bright leaf tobacco production moved south and east, and such cities as Durham, Raleigh, and Winston Salem in North Carolina developed into warehouse and manufacturing centers. By the first decade of the twentieth century, nearly all tobacco was being sold for only a few cents per pound, and the profits previously obtainable by landowners from their tenants' crops became a thing of the past. Despite these changes, Danville's market for loose bright leaf tobacco remained the largest in the world (Isaacs 1913:11).

According to Swanson (2010:310):

> The conditions that would characterize Southside bright tobacco production until the Great Depression were present in full force by 1900. Tobacco culture dominated almost every farm in the three counties, competition was fierce thanks to the expanding yellow tobacco districts of eastern North Carolina and South Carolina, commercial fertilizers were an expensive and ubiquitous farm input, market prices remained lower than during earlier decades, there were no more lottery prices for the best tobacco, and racial inequities accompanied regional agriculture. Farmers would make continued efforts to improve their situation; they tried new organization tactics, they continued to publish and read instructions on making better tobacco, and they sought new and better government research into tobacco cultivation. Despite these efforts, the promising bright tobacco culture first created on the Southside's sandy ridges was effectively dead as the twentieth century began. In its place was an agricultural system that closely mirrored the cotton empire of the Deep South, with impoverished farmers beset by crop liens, increasing tenancy, low prices, and few alternatives.

In 1867 Samuel Hairston owned or had under contract 5,783 acres of land in Pittsylvania County, over double his holdings in 1820. Two tracts had buildings that were worth $3,500 and $500, respectively (PCLB 1867:11). The parcel with buildings valued at $3,500 was clearly Oak Hill plantation. The parcel with $500 worth of buildings was listed as Mobley's Creek, which likely corresponds to the tracts known as Mill Place or Murphy's Place, located on either side of Mobley's Creek.

Following the Civil War, Ruth S. Hairston entered into wage contracts with her formerly enslaved workers on the Berry Hill Plantation that also provided provisions and housing. To ensure they stayed on to work for the entire year, half of the wages were retained by Hairston until the end of the year. Any violation of these contracts, which included quitting at any time during that year, would result in forfeiture of the retained wages. Workers were not paid for days not worked because of illness or absence. A contract from December 1866 shows 13 individuals, who appear to be heads of households, receiving an annual salary and provisions, including barrels of corn and enough meat for the year (Table 3). It is unclear whether provisions were still supplied after 1870. Receipts from 1871 in the Wilson Hairston Papers indicate that wages continued to be held until the end of the year (Wilson Hairston Papers: Reel 31).

TABLE 3: WAGE LABORERS UNDER CONTRACT WITH RUTH S. HAIRSTON, DECEMBER 1866

NAME	PAY PER YEAR	REMARKS
Savory	$125	
George	$84	To be fed from the kitchen
Ben and Two Boys	$150	Find him 6 barrels corn, 150 lbs. meat
Nat	$60	Find him
Tom	$90	Find him 3 barrels corn, 100 lbs. meat
Peyton	$90	Find him 3 barrels corn, 100 lbs. meat
Remas	$60	Find him 1 pick meal, 50 lbs. meat
Joe Miller and Three Boys and Mary Tucker	$240	Find 10 barrels corn, 250 lbs. meat
Ruth	$36	Find her in provisions
Silva	$60	Find him 2 barrels corn, 100 lbs. meat
Clem	-	-
Marry Ann	$4 per month	-

Wilson Hairston Papers

Samuel Harden Hairston, Jr. purchased 848 acres of land from the A.S. Buford estate in the 1890s. This land was added to the existing 933-acre Briarfield Plantation owned by Samuel Hairston. In 1902 Harden builds a large house with extensive gardens along the Dan River as part of the Briarfield Plantation (James River Garden Club 1923:317-318). Samuel Hairston produced 7,000 pounds of tobacco, 40 bushels of wheat, 150 bushels of Indian corn, and 125 bushels of oats on 150 acres of improved land in 1870 (USDA 1870).

Alfred Varley (A.V.) Sims married Ruth Hairston, daughter of Maj. Samuel Harden Hairston, in 1891 and took over the management of Berry Hill Plantation around that same time. In 1895 Sims moved to Iowa City to teach engineering at the University of Iowa. In 1905 he moved to Guantanamo, Cuba, to serve as general manager for the Cuba Eastern Railroad Company. During this period Berry Hill was run by managers James Setliffe and Robert L. Soyars (Wilson-Hairston Papers: Guide 1978:4).

All the lands acquired by the Hairston family in Pittsylvania County were operated as one with accounts for the different plantations and tracts, such as Oak Hill, Briarfield, Royal Oak, and Mill Place. By the early 1890s there were a large number of tenants, both Black and white, on the Hairston lands. Four major tenants—Charles R. Ashworth, Nat and Tommie Hairston, White and Thornton, and W.S. Ashworth—were responsible for growing the bulk of the tobacco crop. Nat and Tommie Hairston were freedmen from the Berry Hill Plantation. Census records from 1900 indicate that White and Thornton were also freedmen. In the 1897/1898 season these tenants planted an estimated 85,000 tobacco plants to yield 8,829 pounds of tobacco (Wilson-Hairston Papers: Reel 60, Vol. 139).

The 1880 census listed a number of Hairston tenant farmers as “black” or “mulatto,” indicating that they were former enslaved people or their descendants. By the 1890s plantation ledger records indicate a mixture of white and Black/mulatto tenants. Notable tenants included James P. Hiler (Briarfield), Henry Miller [Millner] (Mill Place), W.A. Thornton, J.W. Soyars (Manager of Berry Hill in 1897), John Overly, and others (Wilson-Hairston Papers: Reel 31).

The farm ledger from 1884-1891 lists mostly cash transactions, indicating that a wage system continued in place on the Berry Hill Plantation for multiple tenants. Many of the tenants still received meat, coffee, and other provisions from the Berry Hill stores. The amount charged for the provisions was offset by the amount paid for labor hours worked or livestock raised and sold back to the plantation. Many tenants charged as

much as they earned, while others were owed money at the end of the year. A.V. Sims also provided the tenants of Berry Hill with guano to use as fertilizer in the tobacco fields.

Housing was also provided to tenants. Farm ledgers from the twentieth century show laborers being paid to haul or cut lumber and construct new houses and barns on the property. In September 1900 A.V. Sims entered into an agreement with David Jones to construct a log house that measured 18 feet square. The house was to have a ceiling 8 feet high and a loft with a clearance of 5 feet. The logs used were to be cut from trees on Berry Hill (Wilson-Hairston Papers: Reel 35). Barns and other buildings were moved and often converted to serve different purposes. In 1900 farm manager James Sutliffe moved a barn from the "sow grounds" to a nearby hillside and made it into a curing barn. That same year he moved a larger barn to a hillside and cut it down to 18 feet square for use as a curing barn (Wilson-Hairston Papers: Reel 35). The 1900 U.S. census lists residents in the Berry Hill area, with known landowners including Alfred Sims and Samuel Hairston Jr. (Table 4).

TABLE 4: U.S. FEDERAL CENSUS 1900, PITTSYLVANIA COUNTY, VIRGINIA, TUNSTALL DISTRICT 92

NAME	ADDRESS/ ROAD	AREA/ PLANTATION/ SITE	HOUSEHOLD NO.	OWNER OR RENTER	RACE	AGE	NOTES
Alfred T. Sims	**Leaksville Road (Berry Hill Rd)?**	**Berry Hill**	**170**	**Owner (House)**	**White**	**35**	**-**
Robert Soyars	Leaksville Road (Berry Hill Rd?)	-	171	Renter (House)	White	25	-
Addie Alverson	Leaksville Road (Berry Hill Rd?)	-	172	Renter (Farm)	White	45	-
Even T. Adams	Leaksville Road (Berry Hill Rd?)	-	173	Renter (Farm)	White	51	-
Major Wilson	Leaksville Road (Berry Hill Rd)	-	174	Renter (Farm)	Black	35	-
Harrison Hairston	Leaksville Road (Berry Hill Rd)	-	175	Renter (House)	Black	19	-
John Hairston	Leaksville Road (Berry Hill Rd)	-	176	Renter (House)	Black	23	-
John Setliffe	Leaksville Road (Berry Hill Rd)	Berry Hill (Manager)	177	Renter (Farm)	White	46	-
Charles T. Coleman	Leaksville Road (Berry Hill Rd)	-	178	Renter (House)	White	34	-
Nathaniel Hairston	Leaksville Road (Berry Hill Rd)	-	179	Renter (Farm)	Black	55	One of the major tobacco growing tenants?
Thomas Hairston	Leaksville Road (Berry Hill Rd)	-	180	No Info	Black	24	-
Almond C. Pruitt	Leaksville Road (Berry Hill Rd)	-	181	Renter (House)	White	31	-
John H. Pruitt	Leaksville Road (Berry Hill Rd)	-	182	Renter (House)	White	28	-
Samuel Hairston Jr.	Leaksville Road (Berry Hill Rd)	**Oak Hill Farm/ Plantation**	**183**	**Owner (Farm)**	**White**	**35**	**-**
Taylor Muse	Leaksville Road (Berry Hill Rd)		184	Renter (House)	Black	50	Lucy Hairston (niece) is a servant (perhaps for Oak Hill?)
William H. Marshall	Leaksville Road (Berry Hill Rd)	071-5316	185	Renter (House)	White	35	Listed as farm laborer and has three boarders

NAME	ADDRESS/ ROAD	AREA/ PLANTATION/ SITE	HOUSEHOLD NO.	OWNER OR RENTER	RACE	AGE	NOTES
William J. Hairston	Leaksville Road (Berry Hill Rd)	-	186	Renter (Farm)	Black	64	-
William Townes	Leaksville Road (Berry Hill Rd)	-	187	Renter (Farm)	Black	30	-
Lonzo C White	Leaksville Road (Berry Hill Rd)	071-5336	188	Renter (Farm)	White	23	-
William T. Overbey	Leaksville Road (Berry Hill Rd)	071-5322	189	Renter (Farm)	White	47	-
Daniel Adams	Leaksville Road (Berry Hill Rd)	-	197	Renter (Farm)	Black	37	-
Joe Millner	Leaksville Road (Berry Hill Rd)	-	198	Renter (House)	Black	36	-
William P. Gammon	Leaksville Road (Berry Hill Rd)	-	199	Renter (Farm)	White	40	-
Samuel A. Robertson	Leaksville Road (Berry Hill Rd?)	-	200	Renter (Farm)	Black	58	-
Selia Hairston	Leaksville Road (Berry Hill Rd?)	-	201	Renter (House)	Black	64	-
P.S. Kemp	Leaksville Road (Berry Hill Rd?)	-	203	Renter (Farm)	White	32	-
H.C. Young	Leaksville Road (Berry Hill Rd?)	-	202	Renter (Farm)	White	30	-
John T. Soyars	?	-	204	Renter (Farm)	White	23	-

U.S. Census 1900

Tobacco was still the primary crop for Berry Hill and its tenants, but corn and wheat were also important. Rye and oats were grown to a lesser extent for animal feed. Meticulous granary accounts kept track of grains sent to the granaries for storage and removed for feed. Thirty percent of crops grown by tenants were kept by the farm to pay for rented land. Crops were grown on both the bottomlands along the Dan River and in the upland areas (Wilson-Hairston Papers: Reel 60). From October 1898 to March 1899, 308 bushels of corn was sold for $11,545 (Wilson-Hairston Papers: Reel 35). Corn was also used for feeding horses and hogs on the plantation as well as stored in cribs and granaries located around the plantation for future use (Wilson-Hairston Papers: Reel 60).

The process of clearing fallow land of trees and burning the soil in preparation for tobacco planting continued into the twentieth century. Tobacco fields were located throughout the property, including on Judy Byrd Mountain.

6. World War I to World War II (1914 to 1945)

World War I provided a boost for agriculture in Pittsylvania County. Tobacco continued to be an important cash crop, but corn and wheat were now grown in large quantities. Danville continued to be one of the South's largest tobacco-producing cities during this period.

The Riverside and Dan River Mills merged in 1909 and the waterfront area was dominated by a succession of their mills. The company experienced its first major downturn after 1924, precipitating a stagnation that continued through the Great Depression. A strike by textile workers began in 1929 and continued for two years, and the associated violence led Governor John Pollard to send in troops to intervene (Fountain 1979:101). The tobacco industry also had problems in the 1920s, stemming largely from over production.

The Depression forced many farmers out of business, and it was not until after World War II that the market was able to recover (Fountain 1979:101).

A.V. Sims continued to run Berry Hill from Cuba and New York City, where he worked as an independent civil engineer. It is unclear who ran the farm locally during Sims's absence, as the farm records from this period are quite scattered. The census from 1910 shows J. Willie Soyars living close to Berry Hill. Census data show a mixture of white and Black tenants living along Leaksville (now Berry Hill) Road (Tables 5 and 6). The system of charging farm tenants 30 percent of crops raised for renting the land continued well into the twentieth century. Tobacco continued to be produced in 1915, with 272,000 plants producing 25,960 pounds of tobacco (Wilson-Hairston Papers: Reel 60).

In 1930 Samuel Hairston, Jr. lived on Oak Hill farm with his wife May and four children (Table 7). Samuel died in January 1933. Samuel left his wife and his son George Hairston the Oak Hill farm, which consisted of the Oak Hill Tract, Harrison Tract, Murphy Tract, Worsham or Adams Tract, and James Trahern Tract.

TABLE 5: U.S. FEDERAL CENSUS 1910, PITTSYLVANIA COUNTY, VIRGINIA, TUNSTALL DISTRICT 113

NAME	ADDRESS/ ROAD	AREA/ PLANTATION/ SITE	HOUSEHOLD NO.	OWNER OR RENTER	RACE	AGE	NOTES
John W. Soyars	Leaksville Road (Berry Hill Rd)?	-	239	Renter (House)	White	33	Produce Peddler
M.S. Soyars	Leaksville Road (Berry Hill Rd)?	-	240	Owner (Farm)	White	60	Farmer on General Farm
Elija Peatross	Leaksville Road (Berry Hill Rd)?	-	241	Renter (House)	Black	55	Laborer on farm, renting a home
J.D. Gray	Leaksville Road (Berry Hill Rd)?	-	242	Renter (Farm)	White	65	Farmer on General Farm
G.H Fitzgerald	Leaksville Road (Berry Hill Rd)?	-	243	Renter (Farm)	White	64	Farmer on general farm
J.W Fitzgerald	Leaksville Road (Berry Hill Rd)?	-	244	Renter (Farm)	White	33	Farmer on general farm
J.T. Soyars	Leaksville Road (Berry Hill Rd)?	-	245	Renter (Farm)	White	33	Farmer on general farm
J. Willie Soyars	Leaksville Road (Berry Hill Rd)?	Berry Hill (Manager)	246	Owner (Farm)	White	57	Soyars likely lived at or near Berry Hill given A.V. Sims living in Cuba at the time.
John Lillard	Leaksville Road (Berry Hill Rd)?	-	247	Renter (House)	White	25	Laborer on farm, renting a home
Sallie A. Hiler	Leaksville Road (Berry Hill Rd)?	-	248	Owner (Farm)	White	47	widowed, occupation listed as farmer on general farm.
Samuel Hairston Jr		Oak Hill Farm/ Plantation	249	Owner (Farm)	White	45	Griff Hairston, Sallie Raliegh, and Peter Hairston are adjacent renters that are assumed to live on the Oak Hill farm property next to Oak Hill.
Griff Hairston	Leaksville Road (Berry Hill Rd)	-	250	Renter (House)	Mulatto	-	Laborer on a general farm (may live on Oak Hill plantation)
Sallie Raliegh	Leaksville Road (Berry Hill Rd)	-	251	Renter (House)	Black	-	Laundress at home is listed as her occupation (may live on Oak Hill plantation)

NAME	ADDRESS/ ROAD	AREA/ PLANTATION/ SITE	HOUSEHOLD NO.	OWNER OR RENTER	RACE	AGE	NOTES
Peter Hairston	Leaksville Road (Berry Hill Rd)	-	252	Renter (House)	Mulatto	44	Occupation listed as Gardener at a private home (Oak Hill gardens?)
E L Hatchett	Leaksville Road (Berry Hill Rd)	071-5316	253	Renter (House)	White	-	First white renter to the east of Oak Hill
W P Mangum	Leaksville Road (Berry Hill Rd)	071-5336	254	Renter (Farm)	White	-	Ellen, Addie and Lizze Wilson (age 45-15 respectively live with W P Mangum.
Major Wilson	Leaksville Road (Berry Hill Rd)	-	255	Renter (House)	Mulatto	-	-
R J Duncan	Leaksville Road (Berry Hill Rd)	071-5322	256	Renter (Farm)	White	-	-
A T Duncan	Leaksville Road (Berry Hill Rd)	-	257	Renter (Farm)	White	-	-
Sally Hairston	Leaksville Road (Berry Hill Rd)?	-	258	Renter (House)	Black	-	-
Joe Hairston	Leaksville Road (Berry Hill Rd)?	-	259	Renter (Farm)	Black	-	-
P. S. Kemp	Leaksville Road (Berry Hill Rd)?	-	260	Renter (House)	White	-	-
H.C. Young	Leaksville Road (Berry Hill Rd)?	-	261	Renter (Farm)	White	-	-
J McMillan	?	-	262	Owner (Farm)	White	-	First Owner outside the boundary of Berry Hill/Oak Hill?

U.S. Census 1910

TABLE 6: U.S. FEDERAL CENSUS 1920, PITTSYLVANIA COUNTY, VIRGINIA, TUNSTALL DISTRICT 170

NAME	ADDRESS/ ROAD	AREA/ PLANTATION/ SITE	HOUSEHOLD NO.	OWNER OR RENTER	RACE	AGE	NOTES
John J. Thornton	Leaxsville Road (Berry Hill Rd)	-	294	Renter (Farm)	White	52	-
Nathaniel Cox	Leaxsville Road (Berry Hill Rd)	-	295	Renter (Farm)	White	54	-
Will J. Hairston	Leaxsville Road (Berry Hill Rd)	-	296	Renter (Farm)	Black	53	-
Robert W. Hairston	Leaksville Road (Berry Hill Rd)	-	297	Renter (Farm)	Black	50	-
Harrison Hairston	Leaksville Road (Berry Hill Rd)	-	298	Renter (Farm)	Black	46	-
Samuel Hairston Jr	Leaksville Road (Berry Hill Rd)	Oak Hill Farm/Plantation	299	Owner (Farm)	White		-
Charles Hughes	Leaksville Road (Berry Hill Rd)	071-5316	300	Renter (Farm)	White	32	-
Charles W Barnett	Leaksville Road (Berry Hill Rd)	071-5336	301	Renter (House)	White	42	-
William J. Fulton	Leaksville Road (Berry Hill Rd)	071-5322	302	Renter (Farm)	White	38	-
Julius C Hairston	Leaksville Road (Berry Hill Rd)	-	303	Renter (Farm)	Mulatto	23	-

NAME	ADDRESS/ ROAD	AREA/ PLANTATION/ SITE	HOUSEHOLD NO.	OWNER OR RENTER	RACE	AGE	NOTES
Major Wilson	Leaksville Road (Berry Hill Rd)	-	304	Renter (House)	Black	60	-
Fleur Adams	Leaksville Road (Berry Hill Rd)	-	305	Renter (Farm)	Black	64	-
Nathaniel Adams	Leaksville Road (Berry Hill Rd)	-	306	Renter (Farm)	Black	24	-
John H. Vaughn	Leaksville Road (Berry Hill Rd)	-	307	Renter (Farm)	White	52	-
Joseph Gammon	Leaksville Road (Berry Hill Rd)	-	308	Renter (Farm)	White	35	-
Guss Hairston	Leaksville Road (Berry Hill Rd)	-	309	Renter (Farm)	Black	64	-
Nat W. Hairston	Leaksville Road (Berry Hill Rd)	-	310	Renter (Farm)	Black	50	One of four major tobacco-growing tenants
Sallie B. Hairston	Leaksville Road (Berry Hill Rd)	-	311	Renter (House)	Black	85	-
William M. Covington	Leaksville Road (Berry Hill Rd)	-	312	Renter (Farm)	Black	40	-
James E. Atkinson	Leaksville Road (Berry Hill Rd)	-	313	Renter (Farm)	White	62	-

U.S. Census 1920

TABLE 7: U.S. FEDERAL CENSUS 1930, PITTSYLVANIA COUNTY, VIRGINIA, TUNSTALL DISTRICT 30

NAME	ADDRESS/ ROAD	AREA/ PLANTATION/ SITE	HOUSEHOLD NO.	OWNER OR RENTER	RACE	AGE	NOTES
William Townes	Leaksville Road (Berry Hill Rd)	-	332	Renter Farm)	Black	68	Farmer on General Farm
William C. Smith	Leaksville Road (Berry Hill Rd)	-	333	Renter (Farm)	Black	28	Farmer on General Farm
Joe L. Wilson	Leaksville Road (Berry Hill Rd)	-	334	Renter (Farm)	White	48	Farmer on General Farm
Samuel C. McMillan	Leaksville Road (Berry Hill Rd)	-	335	Renter (Farm)	White	45	Farmer on General Farm
James Richardson	Leaksville Road (Berry Hill Rd)	-	336	Renter (Farm)	White	44	Farmer on General Farm
Samuel Hairston Jr	Leaksville Road (Berry Hill Rd)	Oak Hill Farm/ Plantation	337	Owner	White	65	-
Peter Hairston	Leaksville Road (Berry Hill Rd)	-	338	Renter (House)	Mulatto	25	Occupation listed as Butler (Oak Hill?), no immediate relationship to Peter Hairston (Gardener)
Major Wilson	Leaksville Road (Berry Hill Rd)	-	338a	Renter (House)	Black	75	-
Alvin L. Davis	Leaksville Road (Berry Hill Rd)	071-5316	339	Renter (Farm)	White		First white renter to the east of Oak Hill
Camelia Barnett	Leaksville Road (Berry Hill Rd)	071-5336	340	Renter (House)	White	52	Occupation listed as merchant, wife of Charles W. Barnett (1920 census).
Jessie Moore	Leaksville Road (Berry Hill Rd)	071-5322	341	Renter (Farm)	White	66	-

NAME	ADDRESS/ ROAD	AREA/ PLANTATION/ SITE	HOUSEHOLD NO.	OWNER OR RENTER	RACE	AGE	NOTES
Newton Whitaker	Leaksville Road (Berry Hill Rd)	-	342	Renter (Farm)	White	53	-
Willie E. Fugua	Leaksville Road (Berry Hill Rd)	-	343	Renter (Farm)	White	24	-
James T. Fugua	Leaksville Road (Berry Hill Rd)	-	344	Renter (Farm)	White	43	-
James Overton	Leaksville Road (Berry Hill Rd)	-	345	Renter (Farm)	White	18	-

U.S. Census 1930a

In 1927 Harden Hairston died at his home on the former Chatmoss plantation in Henry County. His will, recorded in July 1932, left the land associated with the Briarfield plantation to his two sisters, Sara H. Glenn and Ruth H[airston] Sims, wife of A.V. Sims, who had been running Berry Hill since 1891 (PCDB 214:158).

Topographic and road maps of the Berry Hill area between 1926 and 1944 show the number and distribution of the buildings on the farm (Figures 6-8). Sixteen residences were scattered throughout the area in 1926. A few additional dwellings had been constructed in Lot 4 by 1941. The greatest increase in building numbers occurred in 1944, almost doubling the number depicted in 1926. It is unclear whether the buildings on the 1944 map represent dwellings or both dwellings and major outbuildings such as tobacco barns. The network of roads also significantly changed from 1926 to 1944.

7. The New Dominion (1945 to present)

Although Pittsylvania County's industrial growth continued during the late twentieth century, agricultural activities remained dominant as the county's farms became larger and more diversified. Tobacco remained the principal cash crop in the county.

Danville grew dramatically after World War II. Some 60,000 people were living in the city by 1960, and many new areas were added through annexation. Housing developments were constructed in new suburbs outside the city. Local industries also began to construct new facilities outside the downtown business area that had been in use since the end of the nineteenth century (Fountain 1979:131). Companies including U.S. Gypsum, Corning, and Goodyear built new plants in Danville. The Goodyear plant became the world's largest plant at the time, manufacturing automobile and airplane tires (Fountain 1979:161). Today, however, many of the older industries in downtown Danville have shut down and moved to industrial parks in the suburbs and elsewhere. The tobacco industry that sustained the city throughout the nineteenth century has shrunk substantially. The iconic Riverside Dan River Mills has closed, and its buildings that remain standing along the river are vacant.

Most of the Hairston lands remained in the family until the 1950s. A small (236-acre) parcel was sold to William Bethell Canter in August 1951 (PCDB 332:428). In 2008 and 2009, the Danville Pittsylvania RIFA purchased much of the Hairston land that was formerly part of the Oak Hill and Briarfield plantations.

Several extant curing barns (Site 44PY0330) and one tenant house (DHR No. 071-5302) display concrete-block foundations, indicating that improvements to these buildings were made in the mid- to late twentieth century, confirming the production of tobacco at that time. Although the number of buildings did not appreciably change between 1944 and 1965, the road network changed significantly, with many roads abandoned (Figure 9). Numerous open fields near clusters of buildings and along roads are evident on a 1963 aerial of the area (Figure 10). Only the open fields in the former Trahern Place Tract in Lot 3 are evident today. A transmission line was also constructed along the northwestern boundary of the Berry Hill area.

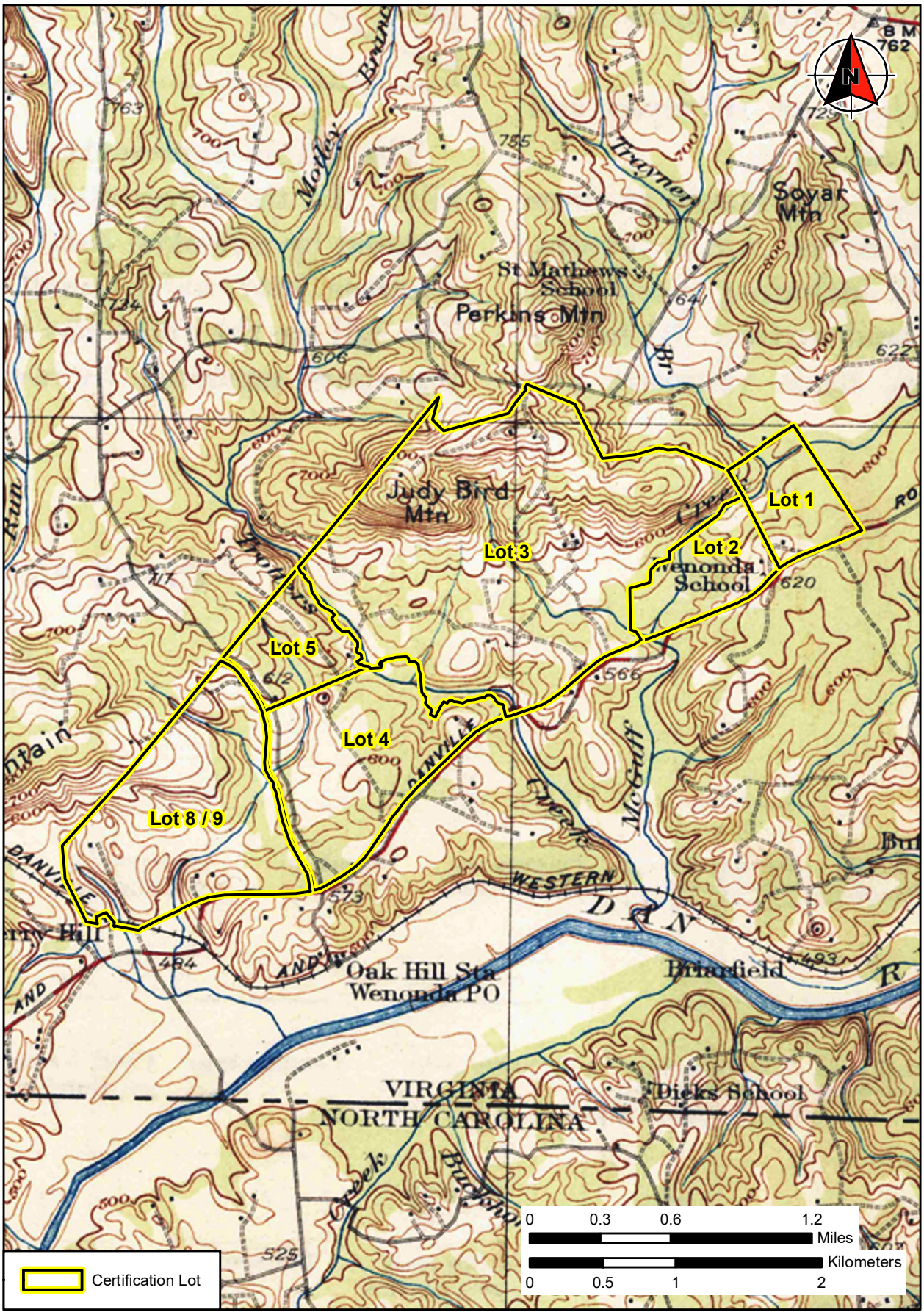

FIGURE 6: Overlay of 1926 Map on Southern Virginia Megasite Lots (USGS Draper 1926)

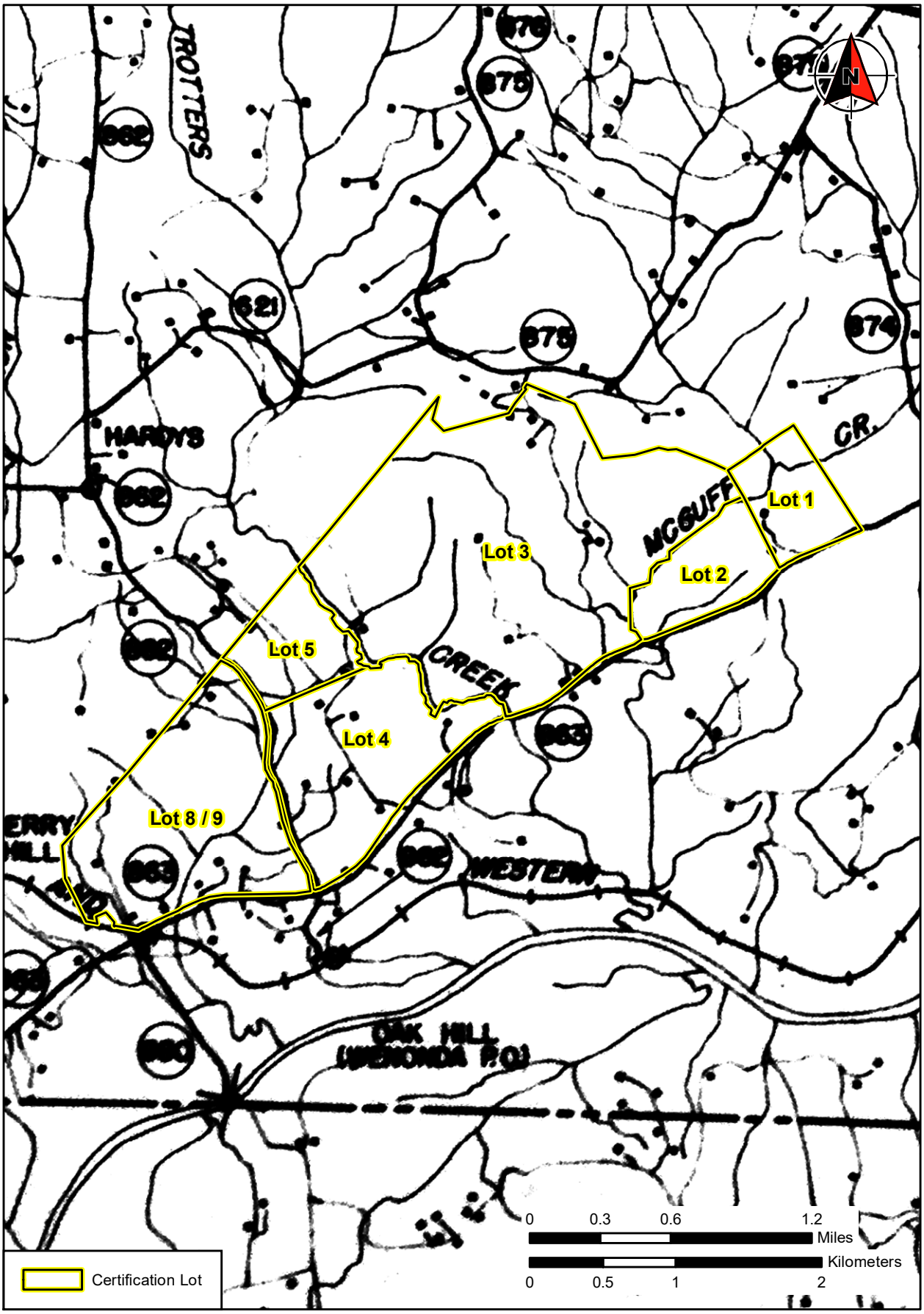

FIGURE 7: Overlay of 1939-1941 Map on Southern Virginia Megasite Lots (Virginia State Planning Board 1939-1941)

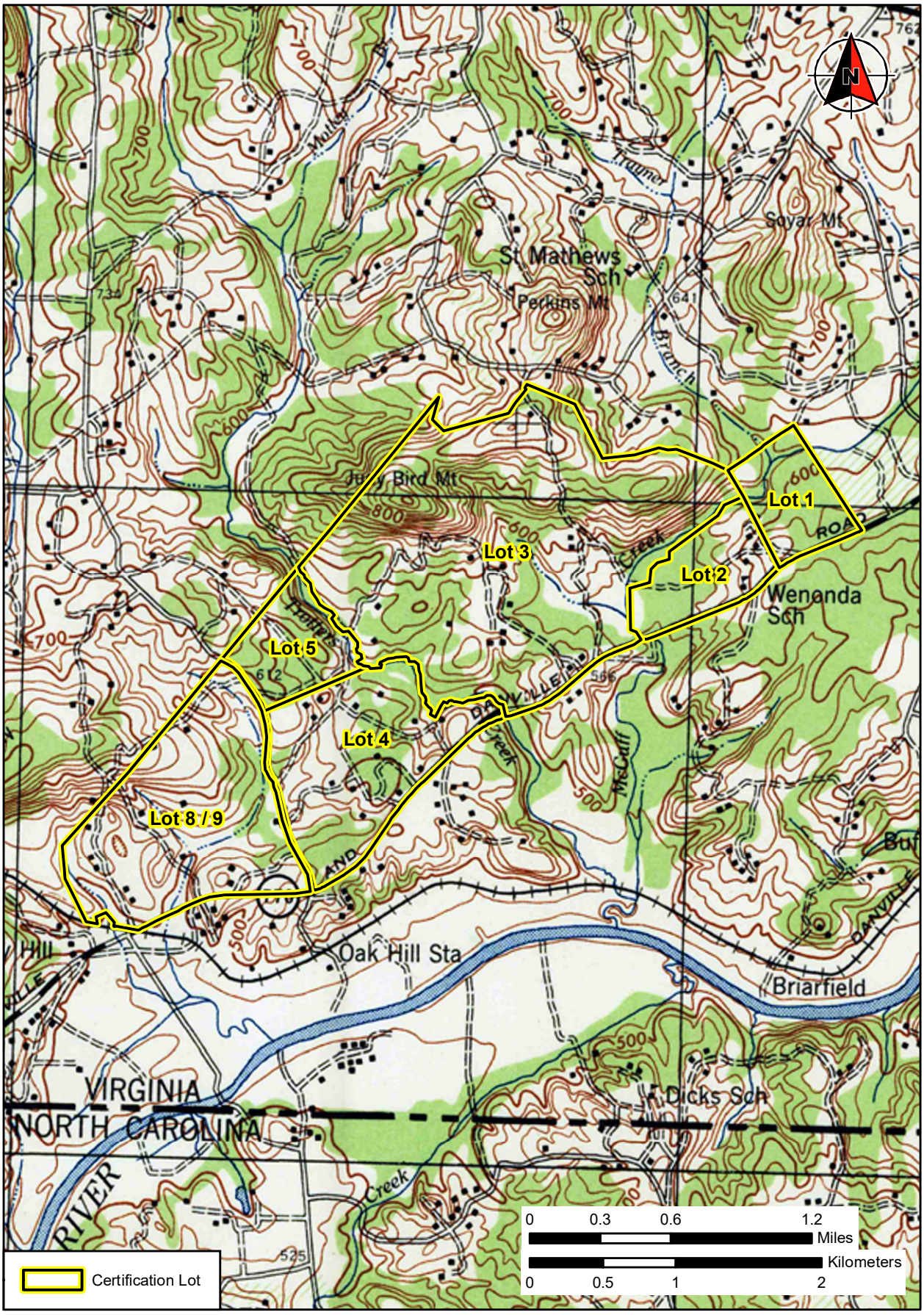

FIGURE 8: Overlay of 1944 Map on Southern Virginia Megasite Lots (USGS Draper 1944)

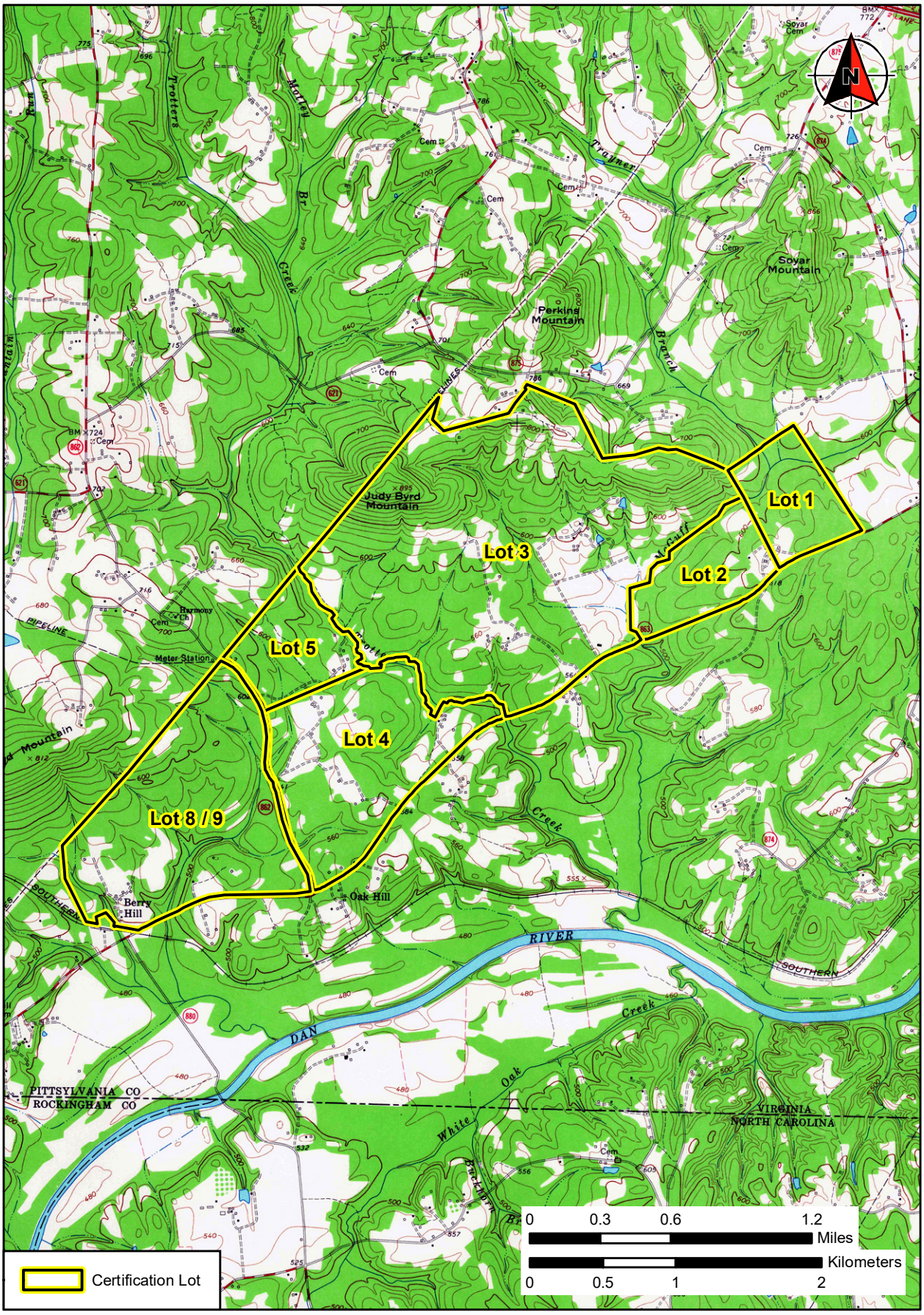

FIGURE 9: Overlay of 1965 USGS Quadrangle Map on Southern Virginia Megasite Lots (USGS Brosville 1965)

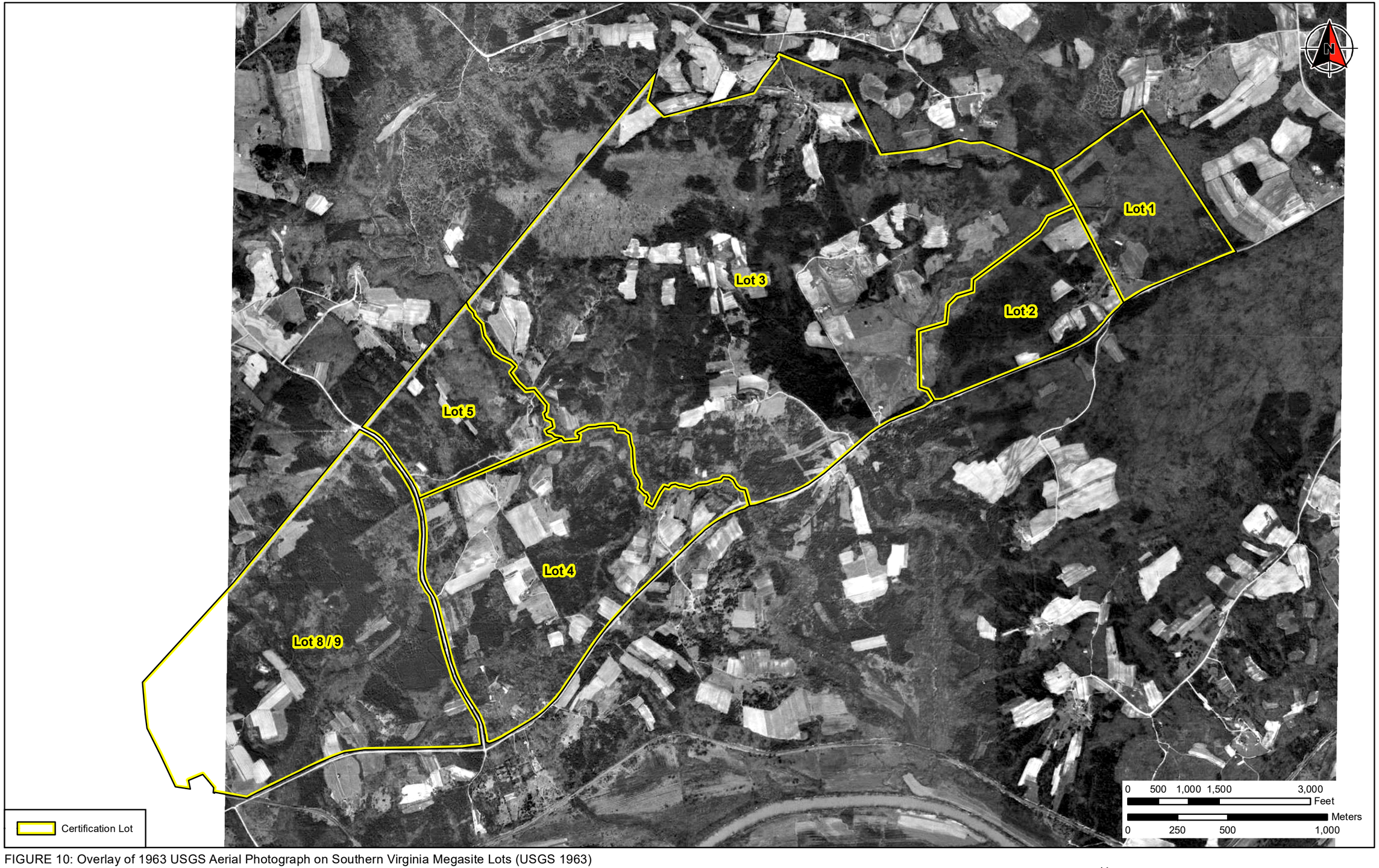

FIGURE 10: Overlay of 1963 USGS Aerial Photograph on Southern Virginia Megasite Lots (USGS 1963)

V. FIELD METHODS AND TECHNIQUES

The archaeological evaluations were carried out by a combination of surface inspection, shovel testing, and test unit excavations.

A. SHOVEL TESTING

Shovel tests were arrayed on parallel transects at intervals of 15 meters (50 feet) or 7.5 meters (25 feet), depending on the size of the site. When archaeological materials were encountered at sites initially covered by a 15-meter grid, a focused 7.5-meter grid was subsequently excavated that encompassed all the positive shovel tests and was extended until two negative tests were excavated or the natural landform precluded further testing. The use of focused 7.5-meter testing around surface features and artifact clusters for multi-acre sites with large areas of negative space was approved by the DHR as a change to the original work plan. Where detailed site plan maps were available, the previous testing grid was incorporated into the current testing, and shovel tests were not re-excavated at previously tested locations. To ensure adequate testing of locations near stone foundations or cellar holes, judgmental shovel tests were placed in those areas as needed.

Shovel tests excavated during the archaeological evaluations conformed to the same standards as outlined above for the archaeological survey.

B. HAND-EXCAVATED TEST UNITS

Data generated from the results of the shovel testing, the locations of surface cultural features, and observations from the surface inspection were used to establish the locations of hand-excavated 1x1-meter (3.3x3.3-foot) test units (units). The unit excavations were aimed at supplying information on site stratigraphy, chronology, artifact variability, and the presence/absence of subsurface cultural features or deposits. Units were located near extant structures, stone foundations, and piles that might represent houses, kitchens, or other ancillary structures.

Each unit was excavated in 10-centimeter (4-inch) arbitrary levels within cultural or natural stratigraphic layers. All cultural material recovered from unit was collected and bagged according to provenience (test unit, stratum, level, etc.). Excavated fill was screened through 0.25-inch mesh hardware cloth. Units were hand excavated to culturally sterile soil. WSP's standardized test unit forms were used to record all pertinent information concerning each unit. A profile drawing was completed of at least one wall of each unit, and soils were described using standard texture descriptions and Munsell color charts. Photographs were taken of at least one wall in each unit. All test units were backfilled upon completion of fieldwork.

C. MAPPING

Using a Trimble 7x GPS receiver, and GIS digital data provided by Dewberry, WSP completed a map of each site showing natural features and cultural features visible on the surface as well as shovel tests, collection areas, and test units.

A final site map was prepared to illustrate the site's boundaries in relation to prominent topographic and natural landmarks in the vicinity.

D. RECORDATION

In addition to WSP's standardized field forms for shovel test, test unit, and feature excavation, the field supervisor maintained a daily log of field notes. These notes documented daily field conditions and

methodologies as well as site-specific observations and documentation of testing, surface and subsurface features, site environmental conditions, and other factors. Conditions and testing at each site were also documented by digital photography and by hand-drawn sketch maps.

E. ANALYSIS

All recovered artifacts, including floral and faunal remains, were cleaned and conserved in a manner appropriate to assure their stability. All diagnostic artifacts were fully provenienced and labeled. The cultural and temporal affiliation, material of manufacture, style, function, form, etc. of recovered artifacts were identified to the fullest extent possible. These activities took place at WSP's laboratory facility.

VI. RESULTS OF THE WSP ARCHAEOLOGICAL INVESTIGATIONS

Sites 44PY0394 and 44PY0398 were surveyed by both BAL and WSP in separate Phase I investigations. After the 2020 survey, WSP recommended both sites as not eligible for NRHP as they are not associated with the broad patterns of local, state, or national history (Criterion A); they are not associated with individuals of local, state, or national significance (Criterion B); and they are unlikely to contribute important information about history or prehistory (Criterion D). Criterion C was applied but found to be not applicable to these sites. The DHR did not concur with WSP's recommendation and listed these sites as potentially eligible, requiring a need for either avoidance or further investigation. Imminent plans to carry out grading on Lots 1 and 2 at the Southern Virginia Megasite prompted the Phase II investigation to determine the sites' eligibility status.

A. SITE 44PY0394

BAL (2011) identified Site 44PY0394 as a historic domestic single-dwelling site dating to the nineteenth century, with an isolated prehistoric find. WSP (2020) relocated this site and conducted another Phase I investigation. WSP identified new site boundaries to cover an area of 0.95 hectare (2.335 acres). The site measures 60x40 meters (197x131 feet). It is located on a ridge crest, finger, and gentle sideslope in mature planted pine forest with a light understory of deciduous saplings and a ground surface slope of less than 5 percent (see Figure 3). Elevations range from 194 to 206 meters (638 to 676 feet) amsl. The nearest water source is McGuff Creek, 215 meters (700 feet) to the northwest.

1. Phase I Investigation

BAL described a partially collapsed log cabin and the foundations of a presumed outbuilding in the core of the site, along with an extant tobacco barn. The historic artifact assemblage included six whiteware fragments, five bottle glass fragments, one wire nail, and eight assorted metal fragments (iron cans, iron kettle, iron straps, and sheet metal). A single unidentified quartzite tool was also recovered from the site. BAL (2011:64-65) concluded that the site was primarily a nineteenth-century domestic site, with the extant buildings converted for storage of modern agricultural equipment. BAL recommended no additional work for the prehistoric component but recommended further work for the historic component.

WSP carried out a more detailed Phase I investigation of the site in 2020. The collapsed log cabin is a one-story rectangular structure with notched corners, a fieldstone chimney, and a metal roof, possibly an A-frame (Plates 1 and 2). It appeared to have a main structure with a porch addition on the eastern side. The main structure measured 6.0x6.8 meters (19.7x22.3 feet), with the porch extension adding another 3 meters (9.8 feet) to the eastern side. Clay and cement chinking remnants were still present between some logs (Plate 3). The identification of a porch or addition on the eastern side was based on the presence of building debris. The fieldstone chimney had been patched with modern cement, and only wire nails were observed in the log wall remnants. The immediate vicinity (yard) of the cabin appeared to have been mostly avoided by logging, based on the presence of mature trees and the absence of surface ruts. WSP also relocated the stone wall southwest of the log cabin that separated the yard from surrounding forest; this wall was constructed of loose fieldstones and was 45 meters (150 feet) in length. No other foundations or structures were relocated within or close to the mapped site boundaries. Bulldozer cuts and push piles demarcated the yard area on the northern and southern sides. An old road cut was also still visible along the northern side, along with evidence that it had been used in recent years by loggers. A thin surface scatter of recent artifacts, such as screw-top bottles, was present across the yard area.

During the Phase I resurvey WSP excavated 111 shovel tests on a 15-meter (50-foot) grid across the mapped boundaries of the site. Four of the shovel tests were positive for historic artifacts, and one shovel test was

PLATE 1: Collapsed Cabin at Site 44PY0394, Facing Northwest

PLATE 2: Collapsed Cabin at Site 44PY0394, Facing North

PLATE 3: Northwest Corner of Collapsed Cabin at Site 44PY0394

positive for prehistoric artifacts. An additional 29 close-interval shovel tests were excavated around the positive shovel tests and yard area of the cabin; of these shovel tests, four were positive for historic artifacts (Figure 11). The single prehistoric shovel test was located in the southwestern corner of the site, and the historic positives were clustered in the immediate vicinity of the cabin yard, in the northeastern corner of the site. Prehistoric artifact density was limited to a single artifact; historic artifact densities ranged from one to five artifacts per shovel test, with a single shovel test containing 15 artifacts.

Shovel tests exhibited relatively consistent soil profiles throughout the site, with some variation in color and texture. A typical soil profile contained two strata: Stratum A (Ap/A horizon), a dark brown (7.5YR 3/3) or dark reddish brown (5YR 2.5/2) silt loam extending to an average of 23.6 centimeters (9.3 inches) below ground surface (bgs); and Stratum B (Bt horizon), a strong brown (7.5YR 4/6) or reddish brown (5YR 4/4) silty clay or clay to an average of 35.3 centimeters (13.9 inches) bgs. The primary mapped soil series was Stoneville silt loam. The shovel tests identified no intact subsurface features.

One prehistoric and 41 historic artifacts were recovered from nine positive shovel tests within Site 44PY0394 (Table 8). All artifacts collected from the site came from Stratum A (Ap horizon). The single prehistoric artifact was a quartz biface reduction flake from Shovel Test B-16. Artifact density in the site ranged from one to 15 artifacts per shovel test. Most of the shovel tests (n=6; 67 percent)) contained one to five artifacts, two (22 percent) contained five to 10 artifacts, and a single shovel test contained 15 artifacts (11 percent). The only artifact found beyond the immediate yard around the cabin is a single nail.

Positive historic shovel tests were concentrated in the immediate vicinity of the cabin. No shovel tests were positive on the eastern side; a large amount of sheet metal debris was noted in that area.

2. Phase II Investigation

For the Phase II investigation, two test units were placed in the yard adjacent to the structure, one immediately north in alignment with the northern cabin wall (Test Unit 4) and the other on the southwestern corner, approximately 0.6 meter (2 feet) southwest of what appeared to be a porch or addition (Test Unit 5) (see Figure 11).

a. Test Unit 4

Three strata were observed in Test Unit 4. The A/Ap horizon in Test Unit 4 was described as a very dark grayish brown (10YR 3/2) silt loam (Figure 12) extending to 10 to 14 centimeters bgs across the test unit, varying with the natural slope. Beneath the plowzone was a second cultural horizon consisting of a brown (7.5YR 4/4) silty clay loam. This layer was 21 centimeters thick and extended from 10 to 31 centimeters (3.9 to 12.2 inches) bgs. Below this was an irregular but clear transition to the Bt horizon, consisting of a very hard compact reddish brown clay (5YR 4/4) subsoil. The second stratum may represent an old plowzone. The reason for the deep stratigraphy in this location was not clear, but Stratum B did not appear to be a cultural feature.

Historic artifacts recovered from Test Unit 4 include 11 pieces of bottle glass, seven sherds of whiteware and stoneware ceramics, eight machine-cut nails, nine unidentified nails, four pieces of window glass, three cartridges from .22 and .32 caliber guns, and some unidentified items. One precontact artifact was found, a small, rather crude stone tool identified as a drill. A majority (n=33) of this material was recovered from Stratum B, but there was no observable difference between the material from the different strata.

b. Test Unit 5

The stratigraphy in Test Unit 5 was different from that in Test Unit 4 (Figure 13). The upper stratum was very similar, an A/Ap horizon consisting of a very dark grayish brown (10YR 3/2) silt loam soil with a thick

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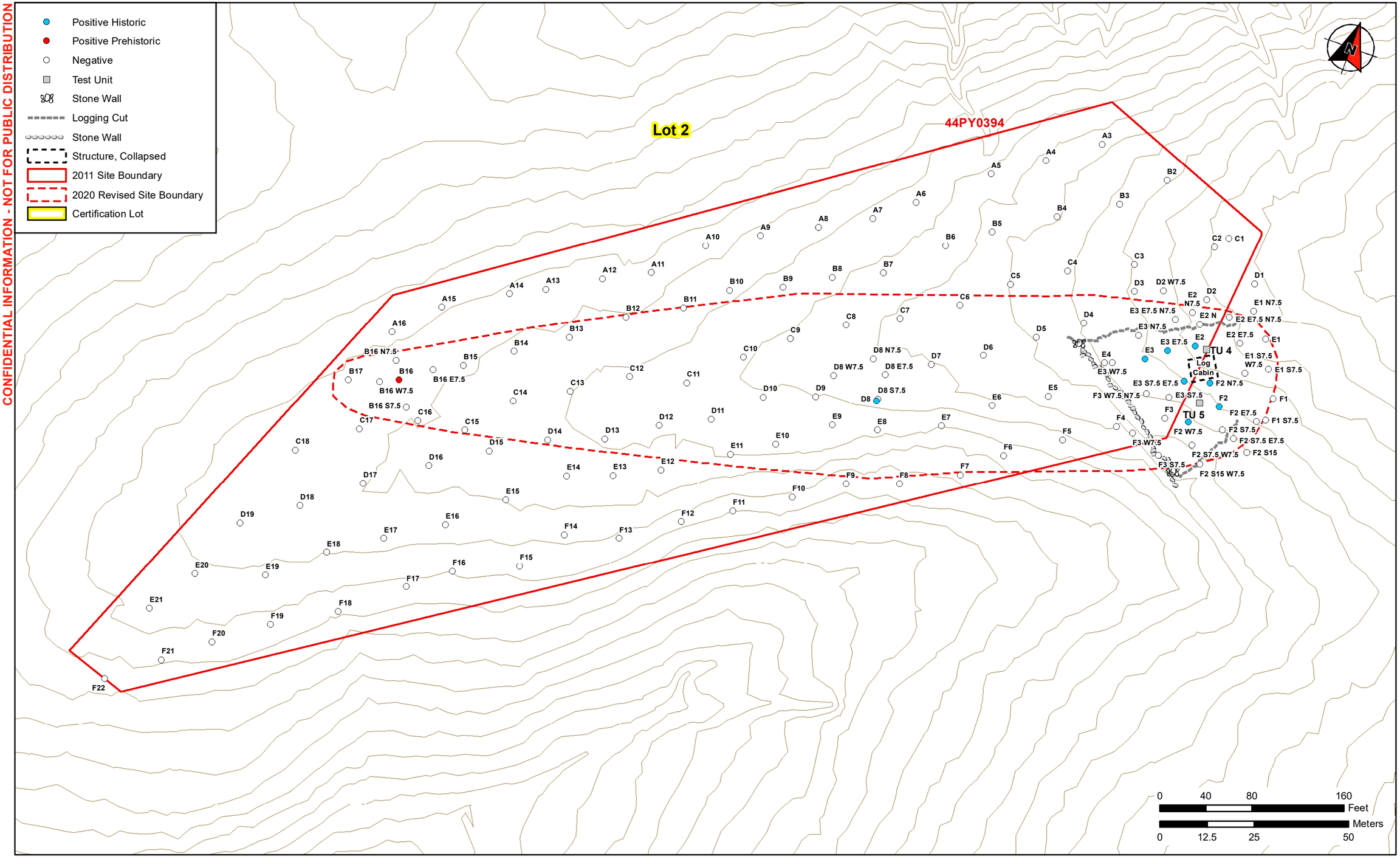
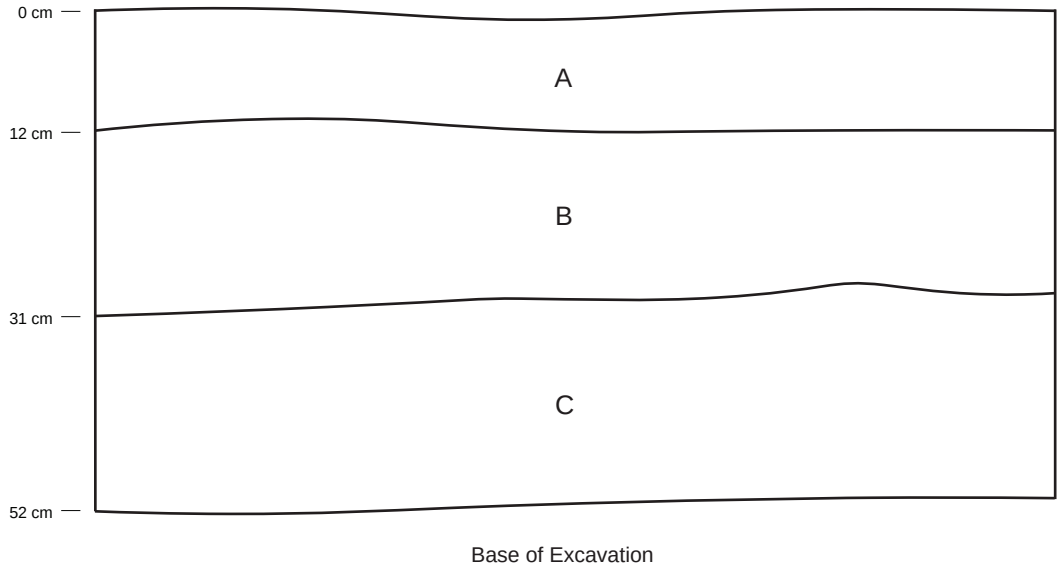


FIGURE 11: Plan of Archaeological Testing at Site 44PY0394, Southern Virginia Megasite Lot 2

Site 44PY0394
Test Unit 4
North Wall Profile



Legend

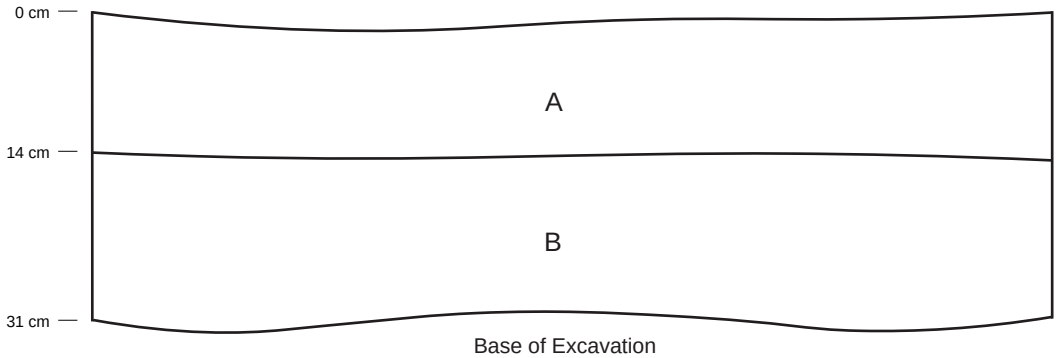
A Plowzone. Very dark grayish brown (10YR 3/2) silt loam

B Brown (7.5YR 4/4) silty clay loam

C Subsoil. Reddish brown (5YR 4/4) compact clay

FIGURE 12: Stratigraphic Profile of Test Unit 4, Site 44PY0394, Southern Virginia Megasite Lot 2

Site 44PY0394
Test Unit 5
North Wall Profile



Legend

A Plowzone. Very dark grayish brown (10YR 3/2) silt loam

B Dark reddish brown (5YR 3/4) compact clay

FIGURE 13: Stratigraphic Profile of Test Unit 5, Site 44PY0394, Southern Virginia Megasite Lot 2

root and humic mesh. In Test Unit 5 the A/Ap horizon was deeper, excavated to 14 to 16 centimeters (5.5 to 6.3 inches) bgs across the unit. Compact reddish brown clay subsoil was directly below the Ap horizon.

Historic artifacts from Test Unit 5 include 27 pieces of bottle and vessel glass, 21 pieces of refined ceramic (ironstone, porcelain, whiteware), two wire nails, five unidentified nails, 33 pieces of window glass, and 11 unidentified bits of iron. Most of this material came from Stratum A, with a few items in the top of Stratum B.

c. Summary

The yard within about 6 meters (20 feet) of the structure at Site 44PY0394 appeared to be largely undisturbed since abandonment of the dwelling, having been spared from logging. If there were any more elements to the site, however, they have been destroyed. The house is typical for this time period (late nineteenth to early twentieth centuries).

The artifacts from Site 44PY0394 (see Table 8) are typical of those previously recovered from sites at Berry Hill: common forms of refined ceramics and stoneware, bottle glass, and both machine-cut and wire nails. Given the low counts of artifacts and the narrow range of dates represented, the site probably had a fairly short occupation period. Use of the site probably began after 1890 and certainly ended before 1930. A map of artifact distribution (Figure 14) shows only that all types of historic artifacts are concentrated in the less disturbed area around the house.

TABLE 8: HISTORIC ARTIFACTS FROM SITE 44PY0394, WSP INVESTIGATIONS, PHASES I AND II

ARTIFACT TYPE	DATE RANGE	COUNT	ARTIFACT TYPE	DATE RANGE	COUNT
Ceramics			*Glass*		
Whiteware, Plain	1820-2000	11	Bottle/jar		
Ironstone, Plain	1840-2000	11	Machine-made, clear	1905-2000	1
Ironstone, Embossed Rim		2	Clear/aqua	-	33
Hard-Paste Porcelain			Amber/Brown	-	2
Plain	-	3	Amethyst Tint	-	8
Embossed	-	1	Green	-	1
Hotel China	1860-2000	1	Tableware		
Overglaze Trns-Printed	1820-1915	2	Amethyst Tint	-	2
Soft-Paste Porcelain, Plain		1	Milk Glass	-	1
Stoneware			Cobalt	-	1
Gray Salt-Glazed		1	*Architectural*		
Albany Slip	1800-1940	2	Nails		
Bristol & Albany Slips	1880-1950	6	Machine-cut	1790-2000	9
Other			Wire	1880-2000	5
Cartridges	-	4	Unidentified	-	14
Fence, Stable	-	2	Window glass	-	44
Unidentified Metal	-	18	Total		186

The artifact density is low, and only broadly diagnostic artifacts were recovered. Modern artifacts were mixed in with older artifacts in the A/Ap horizons, and it appears that some of the modern artifacts are related to the use of the cabin as a hunting lodge in the mid- to late twentieth century. Some of the historic-era artifacts recovered from this location were likely related to the tenants or sharecroppers who occupied

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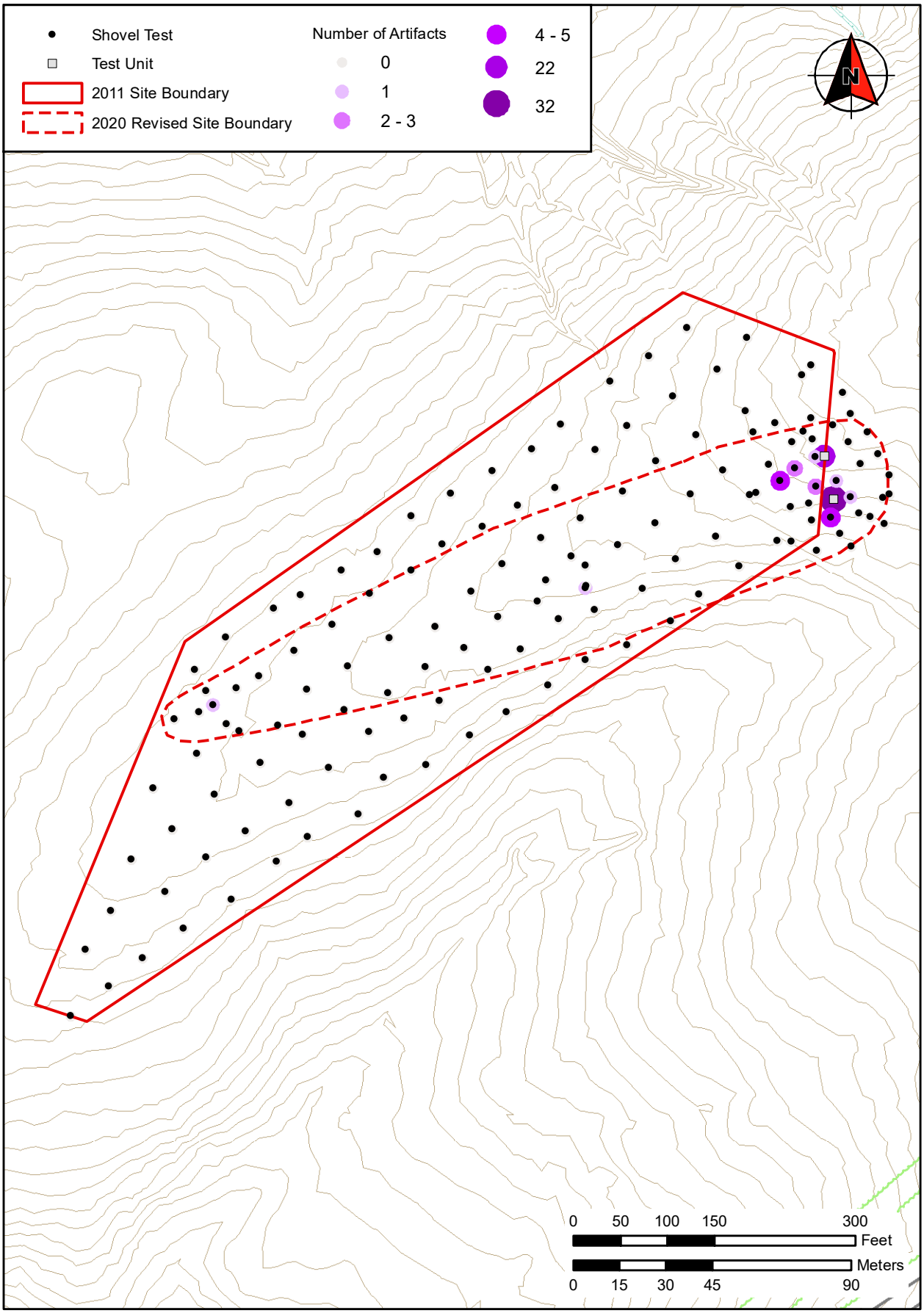

FIGURE 14: Distribution of Historic Artifacts at Site 44PY0394

this cabin, but the artifacts are small and only broadly diagnostic, consisting primarily of window glass, colorless vessel glass, and whiteware sherds.

A single prehistoric artifact was recovered from Test Unit 4, a fishtail projectile point base. This is the third prehistoric artifact recovered from Site 44PY394 (one from each survey, in 2011, 2020, and 2021). These have been found in disparate locations across the site. WSP's 2020 survey found one nondiagnostic prehistoric tool at the far southwestern end of the site around 61 meters (200 feet) away from the cabin where the projectile point base was found. The fishtail projectile point base indicates that there was some Native American activity at the site in the Terminal Archaic period; however, no further investigation is recommended because of the limited and widely dispersed nature of the prehistoric component.

B. SITE 44PY0398 (WENONDA SCHOOL)

1. Phase I Investigation

BAL recorded Site 44PY0398 as a historic nineteenth- and twentieth-century domestic single-dwelling site. The main house is a collapsed structure with a stone end chimney and a northern addition. A more modern storage barn and tobacco barn were observed, and BAL noted the remnants of other structures present in adjacent logging push piles. A collapsed outbuilding and possible cellar depression were observed in the southwestern part of the site, roughly 120 meters (400 feet) from the main house. BAL noted that some historical maps record this set of buildings as "Wenonda School," with others marking it as a church. The functions of the remaining building features could not be absolutely determined, and the report notes that the site had been heavily disturbed by logging activities. The artifacts included eight whiteware fragments, 10 clear bottle glass fragments, one copper thimble, 12 wire fragments, seven wire nails, five cut nails, and one window glass fragment (BAL 2011:66). BAL recommended additional work at the site.

WSP reinvestigated the site in 2020 and expanded the boundaries to cover an area of 0.76 hectare (1.88 acres). The site measured 180x55 meters (600x175 feet). The site is located on a ridge sideslope and crest in a secondary mixed-growth forest with a light understory of deciduous saplings and a ground surface visibility of less than 5 percent (see Figure 3). Elevations range between 194.5 and 205 meters (638 and 674 feet) amsl. The nearest water source is McGuff Creek, 380 meters (1,248 feet) northwest of the site.

WSP observed three or possibly four collapsed or remnant structures at Site 44PY0398, the same ones noted by BAL: a collapsed log cabin in ruinous condition (Plates 4 and 5); a collapsed structure that may be a second cabin, 120 meters from the larger house (Plate 6); adjacent to that second cabin, a cellar hole with collapsed structure remnants (Plate 7); and an extant modern farm outbuilding/shed (Plate 8). No other surface features were noted. The two cabins are on opposite sides of the site. WSP conducted shovel testing around all of these structures for the Phase I survey, and the only positive shovel tests were located around the vicinity of the collapsed log cabin at the northeastern end of the site.

The collapsed log cabin, at the northern end of the mapped site boundaries, was a corner-notched log structure with a sheet-metal roof and a large unmortared fieldstone chimney (Plate 9). The chimney had been patched with cement in places. This structure measured 7x11 meters (23x36 feet).

Both Browning and WSP noted and mapped heavy disturbance, including numerous push piles, adjacent to the dirt roads and within the site boundaries. There was a large push pile at the northeastern corner of the collapsed cabin. The area had also clearly been logged and then replanted in pines. A modern large-appliance dump area was located along the northern edge of the site. Tire dumps were noted in two areas. Deep logging ruts were prevalent throughout the site, including in the vicinity of the collapsed cabin. Graded and scraped areas were evident at the southern end of the site. There appeared to be a very small undisturbed margin around the cabin, approximately 1.5 meters (5 feet) on the northern and western sides, 3 meter (10 feet) on the southern side, and 6 meters (20 feet) on the western side.

PLATE 4: Collapsed Cabin at Site 44PY0398, Facing Northwest

PLATE 5: Collapsed Cabin at Site 44PY0398, Facing Northwest

PLATE 6: Second Structure at Site 44PY0398

PLATE 7: Cellar Hole and Building Remains, Site 44PY0398

PLATE 8: Modern Outbuilding at Site 44PY0398

PLATE 9: Fieldstone Chimney of Collapsed Cabin at Site 44PY0398

For the Phase I investigation, WSP excavated 42 shovel tests across the site on a 15-meter (50-foot) grid, expanding outside the mapped boundaries as needed; 11 of the shovel tests were positive for historic artifacts. One shovel test was not excavated as it fell inside an extant structure. An additional 26 close-interval shovel tests were excavated, eight of which were positive (Figure 15). Four close-interval shovel tests were not excavated because of an existing dirt road cut. The positive shovel tests were clustered around the collapsed log cabin structure, generally in the yard space to the north and south. No positive shovel tests were encountered in the vicinity of the two historic structural remnants on the southern side of the site. The site was bounded in all directions by two negative shovel tests.

Shovel tests exhibited relatively consistent soil profiles throughout the site, with some variation in color and texture. A typical soil profile contained two strata: Stratum A (Ap/A horizon), a brown (10YR 5/3) or dark yellowish brown (10YR 3/4) silt loam extending to an average of 22 centimeters (8.7 inches) bgs; and Stratum B (Bt horizon), a strong brown (7.5YR 3/4) or yellowish brown (10YR 5/8) silty clay or silty clay loam to an average of 36 centimeters (14 inches) bgs. Stratum A was absent in four shovel tests. A third stratum, Stratum C (C horizon) was encountered in five shovel tests, consisting of a red (2.5YR 4/6) clay extending to an average of 40 centimeters (16 inches) bgs. The primary mapped soil series was Stoneville silt loam. The shovel tests identified no intact subsurface features. One shovel test (J-1) was excavated inside the second collapsed structure; this shovel test did not exhibit a noticeably different stratigraphy from the shovel tests located outside the structure.

Two prehistoric and 95 historic artifacts were recovered from 19 positive shovel tests and one surface scatter within Site 44PY0398. Six artifacts were collected from the ground surface, 81 from Stratum A (Ap horizon), and 10 from Stratum B in a single shovel test. The artifacts recovered from Stratum B came from a buried Ap horizon that was overlain by a recent fill deposit. Artifact density in the shovel tests ranged from one to 17 artifacts per test, with the eight of the shovel tests (42 percent) containing five to 10 artifacts per test, 10 (53 percent) containing one to four artifacts, and one (5 percent) containing 17 artifacts. The lone prehistoric artifact was a nondiagnostic piece of quartz general debitage. Historic artifact types collected include glass (n=34), historic ceramic (n=39), and small finds and architectural debris (n=23).

Glass artifacts present in this assemblage are mostly indeterminate vessel glass of various colored or colorless varieties (n=28), with some bottle and jar fragments (n=6). Three of the glass fragments are solarized, which dates them to the early twentieth century. A majority of the historic ceramics are whiteware (n=23), with ironstone (n=7), porcelain (n=2), Rockingham glazed yellowware (n=4; 1812-1920), and various stonewares (n=3) present. The general ironstone has a date range between 1840 and 2000, and the sponged ironstone dates from 1840 to 1940. Of the stoneware, only the alkaline-glazed stoneware has a date range (1800-1950). Date ranges for the whiteware are 1820-2000 for the general whiteware, and 1880-2000 for the overglaze decal variety. Architectural debris consists of machine-cut nails (n=7; 1880-present), unidentified nails (n=4), and window glass (n=1). A modern battery part, a .22 caliber bullet, and a wire strand were also recovered.

2. Phase II Investigation

During the Phase II investigation, four judgmental shovel tests and four 1x1-meter test units were excavated. The test units were placed around the collapsed log cabin in the undisturbed areas and near positive shovel tests. Four judgmental shovel tests (J2-J5) were placed around the house in areas that appeared to be undisturbed to define the extent of an artifact deposit and assess the level of disturbance adjacent to the structure.

Soil profiles were consistent amongst test units and shovel tests. They each contained a thin Ap/A horizon consisting of a very dark gray brown (10YR3/2) silt loam extending to between 4 and 10 centimeters (1.6 and 3.9 inches) bgs. Directly below this was a B horizon consisting of a very compact brown (7.5YR4/4)

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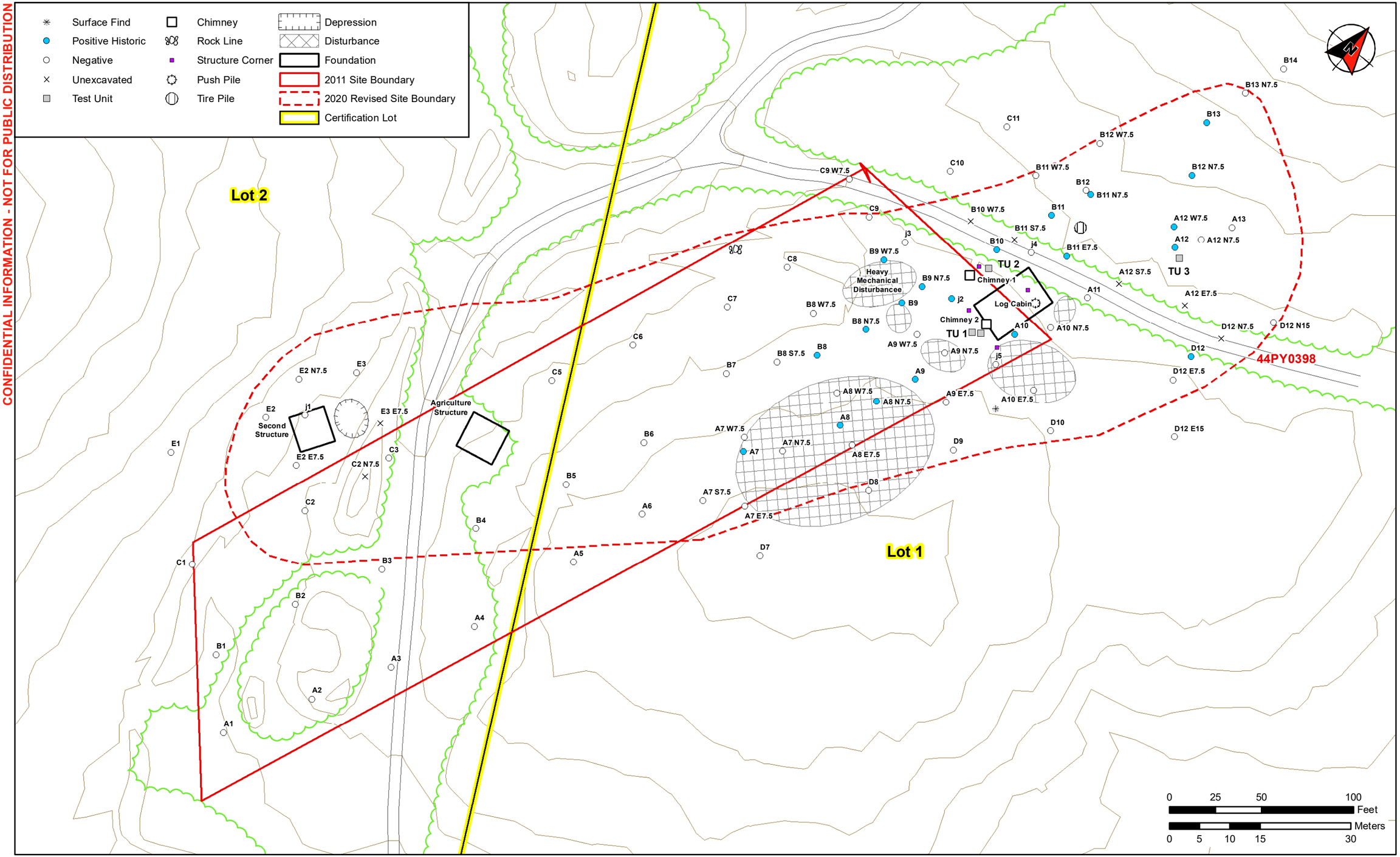


FIGURE 15: Plan of Archaeological Testing at Site 44PY0398, Southern Virginia Megasite Lots 1 and 2

clay loam. This was sterile except for some artifacts in the transitional area. All test units were excavated to a maximum depth of 20 centimeter (7.9 inches) bgs. Shovel Tests J3-J5 had similar soil profiles; however, J2 contained a Stratum B between 10 and 22 centimeters (1.6 and 8.7 inches) bgs that was a brown (10YR 5/3) compact silt loam. Below this was a brown (7.5YR 4/4) clay excavated to 32 centimeters (12.6 inches) bgs. The soil profile indicated substantial erosion of the site.

a. Test Units 1 and 6

Test Units 1 and 6 were placed in an apparent trash midden on the southern side of the collapsed cabin. Test Unit 1 was excavated first, and Test Unit 6 was placed diagonally northeast of Test Unit 1 to investigate this deposit further. These two units produced 84 percent of all the artifacts recovered from the site during the Phase I and the Phase II, 1,106 out of 1,321. Almost all of this material was recovered from the shallow A horizon. Artifacts include window glass, wire and cut nails, refined ceramics, stoneware, and miscellaneous hardware. Test Unit 6 yielded six pieces of large mammal bone. However, the lion's share of the artifacts were glass fragments from machine-made bottle and jars. Two pennies were found, one dated 1946 in Test Unit 1 and one dated 1935 in Test Unit 6. These dates provide a good time frame for this deposit, which probably dates to the 1920 to 1950 period. Since it is unusual at Berry Hill for so many artifacts to be found close to a house, much of this deposit may have been put down either late in the site's occupation or after it was abandoned. Figure 16 shows the shallow profile of Test Unit 1.

b. Test Unit 2

Test Unit 2 was placed in the yard approximately 3 meters (10 feet) west of the chimney on the western wall. This location was chosen because it was on the edge of disturbance in the yard and was near positive shovel tests. This unit yielded rather few artifacts (n=31). They include window and vessel glass, plain and decorated whiteware, stoneware, a porcelain figurine ballerina shoe, and one prehistoric chert flake. The stratigraphy consisted of a dark grayish brown silt loam plowzone, 6 to 8 centimeters (2.4 to 3.1 inches) thick, over subsoil.

c. Test Unit 3

Test Unit 3 was placed approximately 100 feet northeast of the cabin on the other side of the historic road. This location was chosen because of the number of positive shovel tests in this vicinity. Again, the stratigraphy was very shallow. Twenty-seven historic artifacts were found, including ceramic, nails, glass, and a piece of graphite pencil. The stratigraphy was very similar to that in the other test units, 8 to 10 centimeters (3.1 to 3.9 inches) of very dark grayish brown silt loam, probably a plowzone, over subsoil.

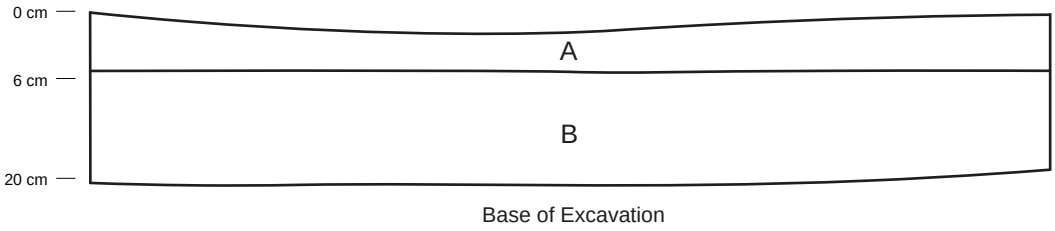
d. Shovel Tests

All four judgmental shovel tests were positive for historic artifacts (n=60). Shovel Tests J2, J4, and J5 contained a fairly high number of historic artifacts in the Ap horizon, although they were small and broadly diagnostic. These shovel tests were the closest to the cabin structure on the southwestern, northwestern, and southeastern corners. Otherwise, the artifacts themselves were unremarkable and include plain whiteware, architectural and vessel glass fragments, and nails. Shovel Test J3 was placed a bit farther away from the structure, where an architectural feature had been noted during the Phase I survey. The architectural feature was not relocated, but the judgmental was placed in hopes of encountering any features. None were noted, and only three glass fragments were recovered from the Ap horizon.

e. Summary

The main discovery of the Phase II investigation was the trash midden on the southern side of the collapsed cabin, investigated in Test Units 1 and 6. Because of the high artifact density in those two units, the site

Site 44PY0398
Test Unit 1
North Wall Profile



Legend

A Plowzone. Very dark grayish brown (10YR 3/2) silt loam

B Brown (7.5YR 4/4) compact clay loam

FIGURE 16: Stratigraphic Profile of Test Unit 1, Site 44PY0398, Southern Virginia Megasite Lots 1 & 2

produced a substantial artifact sample (Table 9). The ceramic assemblage is relatively large and diverse, 125 sherds of several types. Stoneware jars and pans were represented, as well as whiteware, ironstone, and porcelain tableware with several different types of decoration. The bulk of the collection, however, consists of glass fragments from machine-made bottles and jars. The material all came from a shallow, eroded A horizon, where plastic buttons were mixed with older artifacts such as machine-cut nails and a fragment of a hand-blown olive glass bottle. A map of artifact distribution (Figure 17) shows only that the material is concentrated around the cabin, and only the deposit sampled with Test Units 1 and 6 had enough artifacts for any further analysis.

The collection dates overwhelmingly to the twentieth century. A large amount of quite late material was found, including plastic buttons and other pieces of plastic, screw-top jars and jar lids, can keys, and pennies dated 1935 and 1946. Only a handful of artifacts suggest an earlier occupation, including a single sherd of a free-blown olive glass bottle and a sherd of black-glazed coarse earthenware. The material is mainly domestic; however, it is not certain that all of it relates to the people who lived at the site. The presence of the later outbuilding shows that someone visited the site after the cabin was abandoned, and the dumps of tires and appliances indicate that trash was sometimes brought here for disposal. The large amount of bottle glass in the deposit near the cabin might also represent a later bottle dump, crushed during the logging activity that left a push pile adjacent to the cabin.

The nature of the second collapsed structure, or possibly two structures, remains uncertain. No evidence was found to identify it convincingly as either as school or a church. The great paucity of artifacts suggests that it was not domestic, but it might have been agricultural. The structure that has collapsed into a shallow cellar might have been an ordering pit, a semi-subterranean structure used to get tobacco ready for market (Morgan 1978:102).

Overall, the situation of the site remains the same as after the Phase I investigation. Most of the site is heavily disturbed, with numerous push piles, deep ruts, and discarded trash such as tires and appliances. The recent dumping raises questions about the integrity of the artifact deposits around the cabin, as the large number of glass pieces in particular could have come from post-occupation dumping. The chance of identifying any intact subsurface features or deposits is very low.

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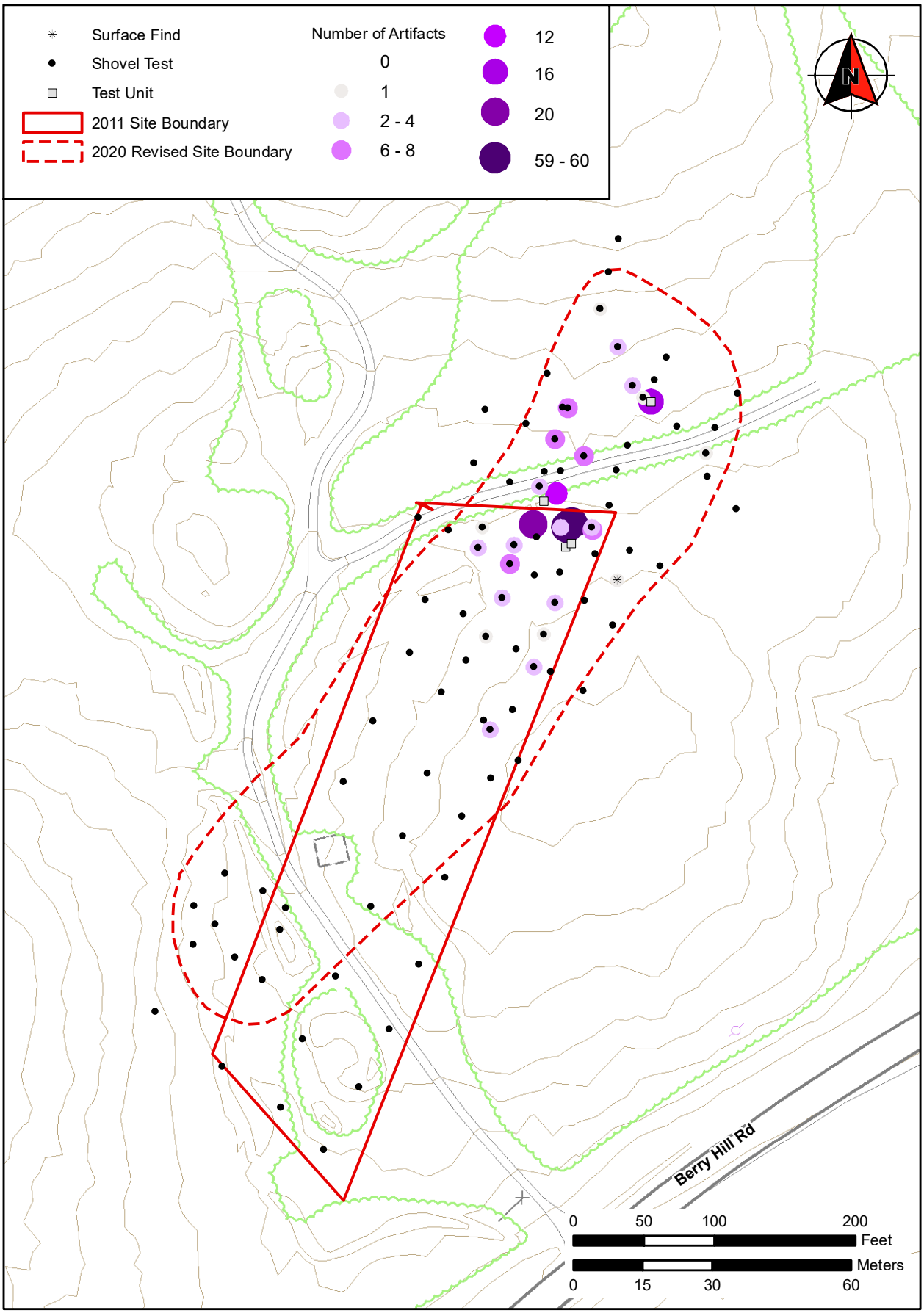

FIGURE 17: Distribution of Historic Artifacts at Site 44PY0398

TABLE 9: HISTORIC ARTIFACTS FROM SITE 44PY398, WSP INVESTIGATIONS, PHASES I AND II

ARTIFACT TYPE	DATE RANGE	COUNT
Ceramics		
Whiteware		
Plain	1820-2000	36
Hand-painted	1820-2000	1
Hand-painted, Overglaze	1820-2000	1
Decal, Overglaze	1880-2000	2
Sponged	1820-1930	1
Trns.-Printed, Brown	1820-1915	1
Trns.-Printed, Filled	1820-1915	13
Ironstone		
Plain	1840-2000	29
Colored Glaze	1840-2000	2
Decal, Overglaze	1880-2000	9
Sponged	1840-1940	1
Embossed Body	1840-2000	5
Hard-Paste Porcelain		
Plain	-	5
Biscuit	-	1
Yellowware, Rockingham	1812-1920	4
Stoneware		
Gray Salt-Glazed	-	1
Hand-painted Decoration	-	2
Misc. Brown Slip	1800-1940	1
Bristol & Albany Slips	1880-1950	8
Alkaline Glaze	1800-1950	1
Redware, Black-Glazed	-	1
Other		
Bottle Opener	-	1
Can Key	-	1
Cartridge	-	5
Bullet, .22 Caliber	-	1
Figurine Fragment	-	1
Glass Marble	-	1
Jar Lid	-	21
Buckle	-	2
Misc. Hardware	-	17
Metal Can	-	4
Plastic	-	23
Unidentified Metal	-	26

ARTIFACT TYPE	DATE RANGE	COUNT
Glass		
Pharmaceutical Bottle	-	1
Bottle		
Free Blown, Olive		1
Machine-made, Clear	1905-2000	2
Machine-made, Brown	1905-2000	7
Mold-blown, Aqua	-	1
Amethyst Tint	-	1
Clear/Aqua	-	8
Jar		
Machine-made, Mayo Jar	1905-2000	3
Machine-made, Clear	1905-2000	59
Clear/Aqua	-	2
Tumbler, Machine-made	1905-2000	1
Tableware		
Milk Glass	-	12
Clear	-	2
Bottle/Jar		
Machine-made, Clear	1905-2000	716
Machine-made, Brown	1905-2000	23
Clear/Aqua	-	49
Green	-	5
Pink	-	1
Amethyst Tint	-	5
Unidentified/Other	-	5
Faunal	-	
Large Mammal Bone	-	9
Architectural		
Nails		
Machine-cut	1790-2000	27
Wire	1880-2000	28
Unidentified	-	8
Window glass	-	110
Clothing		
Button, Metal	-	1
Button, Plastic	1920-2000	3
Total		1318

VII. ARCHAEOLOGICAL EVALUATION

A. THE ARCHAEOLOGICAL SITES IN CONTEXT

WSP examined the results of the archaeological evaluations in relation to research topics relevant to the period of significance, the types of sites encountered, and NRHP criteria, establishing a framework for evaluating each of the five sites.

1. Evaluation Framework for the Historic Components

In a 2020 report on extensive Phase I and II investigations, WSP laid out a framework for interpreting historic sites or components at Berry Hill (WSP 2020b). The framework was based on extensive research in census and other government records, records of the Hairston family, local histories, and secondary literature on sharecropper plantations across the South. The two sites considered in this report are similar to the others that have been investigated at Berry Hill, so the evaluation of Sites 44PY0394 and 44PY0398 uses same analytical framework.

All of the historic sites identified and evaluated in the 2020-2021 investigations at Berry Hill appear to date from the post-Civil War era into the mid-twentieth century. Particularly telling is the absence of green or blue shell-edged pearlware or whiteware sherds; these are generally ubiquitous at antebellum domestic sites. Still, many of the nails recovered are machine-cut. These nails were first widely marketed in the 1830s and were rapidly replaced in the 1890s by wire nails. Their relative prevalence in the Berry Hill sites, taken together with the ceramic evidence, suggests that the wood frameworks of the dwellings may have been constructed between ca. 1870 and 1900. Archival evidence indicates that these dwellings were occupied mainly by tenant farmers, some of them African American and others white.

Archaeological research on nineteenth- though early twentieth-century tenant households generally focuses on issues of race, class, and consumer behavior. Archaeologists have developed several theoretical approaches to recognize patterns in the archaeological record of late nineteenth- to early twentieth-century farmsteads. Patterning has been observed in settlement systems, refuse disposal, and the use of space within individual sites, and the kinds of artifacts associated with these site types. As Orser (1999:151) notes, “The hierarchical nature of tenancy, with its obvious economic implications, suggests that social distinctions between tenure classes will have material dimensions that can be investigated and interpreted by archaeologists.”

Numerous archaeological studies of postbellum tenant settlements in the Deep South have been conducted since about 1980. An excellent summary of archaeological approaches to tenant sites in the South is provided by Clement (2009) (see below); however, relatively few researchers have focused on such communities in Virginia. Exceptions are the work of Austin et al. (2011) and Mahoney (2013) on the Charles’ Corner community near Yorktown. Reeves (2007) has reported on excavation of a freedman’s farm in Manassas.

Swanson’s (2010) research on bright leaf tobacco suggests another complementary approach. He documents gradual, accelerating environmental degradation, changes in the intensity of settlement, changes in average farm size, and economic stagnation after 1900. With tight chronological control of feature contexts, it may be possible to track changes in residential arrangements and consumer behavior in relation to tobacco prices and changes in labor and race relations (e.g., after political suppression of African Americans in Danville in 1883).

a. Settlement Patterning

Archaeologists' early efforts to understand late historic farmsteads and tenant sites built on the work of geographer Merle Prunty (1955), who saw the post-emancipation plantation as a direct extension of the antebellum plantation. The plantation as a whole contained a variety of domestic structures, including the landowner's residence and those of tenants. Prunty differentiated "ideal" settlement patterns associated with sharecroppers vs. renters, the former indicated by isolated domestic structures and the latter by domestic structures co-occurring with certain classes of agricultural outbuildings. Sharecroppers who provided only their labor did not require easily accessible equipment/tool storage; instead, the farm implements and machinery were stored in outbuildings associated with the landowner's farmstead. In contrast, renters provided some or all of the necessary farming equipment depending on their rental arrangement, and thus their farmsteads would include storage facilities.

Where Prunty saw two basic patterns of settlement on post-emancipation plantations, Adams (1980) identified five possible patterns at Waverly Plantation in Mississippi, based on the kind of rental agreement tenants had with landowners. At Bay Springs, Mississippi, Smith et al. (1982) found that home site selection generally followed selection factors identified by Keber (1979:198) in western North Carolina: accessible gravity-flow water, aspect, protection from prevailing winds, road proximity and accessibility, gently sloping ground necessitating little preparation for building, and nearby tillable land. These factors seem to be fairly uniform across the upland regions of the South.

Joseph et al. (1991) noted many similarities at farmsteads in upstate South Carolina to the settlement patterning observed in Mississippi by Smith et al. (1982). At the Finch Farm in Spartanburg County, the main road passed right by the house and tillable land was immediately adjacent and accessible by farm roads. None of these roads went through the domestic yard. Unlike farmsteads in Mississippi and North Carolina, at the Finch Farm the house was located on a slight rise rather than in the lee of a hill or landform for wind protection. This situation provided greater visibility, both of and from the house. The house itself may have been protected from winds by large trees that surrounded it. The trees also separated the domestic yard area from the yard areas used for agricultural tasks. Tenant structures recorded by Linda Worthy (1983) on the upper Savannah River and by Stine (1989) in the Piedmont conform to these patterns. Orser and Nekola (1985) found that 53 tenant sites of the 1930s at Millwood Plantation in Abbeville County, South Carolina, occupied moderately productive soils with a slight slope and a southern aspect. They were located within 0.5 kilometer of intermittent water and 0.8 to 2.4 kilometers (0.5 to 1.5 miles) of the nearest road or railroad. Their nearest neighbor occurred at a distance of about 0.5 kilometer (0.3 mile).

Joseph et al. (2004, citing Crass and Brooks 1995) using the same data, suggest that although tenant sites tend to be dispersed, there may also have been a tendency to cluster or organize along kinship lines. At the Bay Springs farmsteads in Mississippi, the settlement pattern was also affected by kinship ties and church affiliation (Smith et al. 1982:213-214). Individual farmsteads would be included as members of specific settlements based loosely on kinship and church membership. Schools also tended to be associated with each settlement. Each settlement had a dominant family. The houses were built on relatively high ground adjacent to major roads that generally followed the ridgelines. These provided access to country stores and cotton gins. Inter-riverine sites on higher ground became more prevalent in the early twentieth century in the South Carolina Piedmont. This trend may have been mainly a result of increasing population and earlier occupation of most of the lower-lying areas. It may have also been a consequence of Piedmont erosion caused by certain farming practices, which caused destructive flooding of bottomlands (Benson 2006:219). In the Southside counties of Virginia, tenants may have been more reluctant to occupy ridgelines because the most productive sandy soils for bright leaf cultivation were located in those areas (see Chapter III).

Orser (1988, 1989) and Orser and Nekola (1985) show how the settlement pattern shifted at Millwood Plantation in South Carolina as an outcome of post-emancipation labor relations. On postbellum plantations

the squad system was created as a labor organization intermediate between enslavement and tenancy. The freedmen had to sign contracts to become sharecroppers or wage laborers. These laborers worked in groups in the same fields where they had worked while enslaved, with supervision provided by the planter or an overseer. Initially, these laborers would have lived in the extant enslaved quarters they had inhabited prior to emancipation. As soils near these quarters became less productive, worker housing would be shifted to be closer to outlying soils that were more fertile (Joseph et al. 2004). Each residential cluster would house the families comprising a work squad and would be near the fields worked by the squad. When the freedmen resisted this arrangement, with its obvious echoes of enslavement, it was replaced by the more traditional tenant arrangement. In the tenant system individual domestic sites were scattered about the plantation landscape, each housing a family that worked the surrounding land either for shares or through rental.

Orser (1988:92) shows how the distribution of households and functional structures on the landscape differed between sharecroppers and tenants:

> The spatial organization symbolized the tenant's position vis-à-vis the landlord and reflected his relative lack of personal choice in labor matters. A major difference existed in the tenant-renter settlement form in that barns, sheds, and outbuildings were placed near the renter's home. When a tenant became a full renter, owning his own work animals and tools, his part of the plantation theoretically began to appear as a distinct little farm.

The landholder divided the plantation into plots of land and erected houses for sharecroppers or tenants to occupy. The sharecroppers were closer to their respective crops but were farther from the plantation house. These arrangements, in turn, affected the social lives of the community and family network. The frequency with which a family might see their neighbors or the landowner was, to some extent, dictated by the landscape and the working relationship with those involved. Unlike sharecroppers who provided only their labor, share renters also provided some of the necessary farm equipment, and cash renters typically provided everything required to plant, tend, and harvest the crop. Archaeological remains of the households of each labor type would be distinguishable: a sharecropper's place would contain a domestic residence with associated domestic outbuildings and activity areas but no structures for equipment storage. A cash renter's farmstead, with all equipment in storage buildings, might look much like an owner's place. In the mid-range would be a share renter's site, with fewer outbuildings.

Regardless of the particular form of tenancy, Piedmont farms tended to be regular in size. Joseph et al. (2004) suggest that in a typical settlement pattern in the tenant system, the houses would be distributed within plots of about 40 acres, which was the amount of land that could be worked by a single farmer with a mule. Larger tracts would have required additional labor and stock to work but would tend to conform to multipliers of 40 acres. Thus, cash renters who could afford additional working stock would tend to work farms in the ranges of 80, 120, or 160 acres.

In the Piedmont the first tenant houses built after emancipation were probably built of logs, much like antebellum enslaved quarters. As tenancy became more prevalent, there was a shift to earthfast framed housing. Floor plans changed little, however, and the typical structure was a "saddle-bag" house consisting of two rooms with a central chimney (Benson 2006; Clement 2009; Joseph et al. 1991; Page 1982; Smith et al. 1982).

Beyond the houses, the yard areas and support structures also conformed to a general pattern. For example, at the Webb farm near Spartanburg, South Carolina, a house garden was maintained some 20 feet from the house within a chicken wire enclosure. A barn was located some 60 feet from the house, and the outhouse was an additional 100 feet beyond the barn. A chicken coop and an okra patch were located between the barn and the house. A typical tenant site in the 1920s would contain a one-story house, a small barn in which to keep the feed for the livestock and to house work animals and, perhaps, a cow, and a shed in which to store machinery or an automobile (Benson 2006:150).

Joseph et al. (2004) suggest that gendered activities may be represented in distinct areas in renters' yards: "female" activities, such as hog rendering, meat smoking, and hog and chicken raising, in one area, and structures associated with "male" activities, such as the barn and corn crib as well as the cow and the mule, in a separate area. Wells and springs were typically close to the house (Joseph et al. 1991, 2004; Smith et al. 1982).

b. Refuse Disposal and Spatial Organization Patterns

Drucker et al. (1982) noted basic similarities between refuse disposal patterns at two late nineteenth-/early twentieth-century farm sites in Abbeville County, South Carolina, which they dubbed the "Piedmont Refuse Disposal Pattern." Drucker et al. (1982:106) describe the pattern:

> A—The immediate environs of the main dwelling will be regularly clean-swept so as to effectively prevent the accumulation of household debris, food refuse and various structural and equipment paraphernalia; manor food scraps were probably thrown into the adjacent yard areas for consumption by dogs and hogs. Based on current observation and oral tradition, mainly the front and sides of the dwelling area will be regularly cleaned. Larger items of equipment, machinery and structural members will be removed at significantly longer time intervals, often on the order of months or years.
>
> B—Refuse will be gathered in heaps rather than buried in large excavated pits, for the purpose of loading the refuse into a wagon and transporting it to a location at some distance from the domestic complex for disposal; likely areas to attract such disposal will be gullies, ravines, creeks or borrow pits; or
>
> Refuse will be transported to the outermost edges of the domestic complex and discarded down the hillside(s).

Where farms were located adjacent to abrupt topographic depressions, the refuse would be pitched "overboard" on a regular basis. On broader landforms without immediately convenient disposal sites, the trash would be periodically transported for disposal. Drucker et al. (1982:107) itemizes the archaeological implications of this behavior:

> 1. Total artifact assemblages from Piedmont historic sites in geographic areas characterized by pronounced relief will be numerically sparse;
>
> 2. Artifact assemblages from these contexts will reflect truncated material classes; for instance, a general absence will exist of the full range of domestic classes; also, the assemblages will be largely characterized by the occurrence of architecturally associated classes, such as nails and window glass;
>
> 3. Refuse areas associated with domestic sites will be located peripheral to the main occupation complex, defined by structures and features, and will also be at lower elevations than the main occupation complex;
>
> 4. Secondary refuse accumulations will occur at the bottom of slopes and ravines through colluviation from the upper slopes, and will reflect mostly short term refuse disposal, that is, single-episode to perhaps several months' worth;
>
> 5. Secondary refuse accumulations at the bottom of slopes and ravines will not bear any necessary relation to the closest domestic unit, since one stated purpose of the distant transport of refuse is to "get it away from our property;" thus, dumping debris on someone else's property may be an acceptable alternative if the location is otherwise convenient and suitable.

Stine (1989) documented two additional refuse disposal patterns in her dissertation research, which focused on two late nineteenth-/early twentieth-century farmsteads in the North Carolina Piedmont (Stine 1989). These entailed trash burning in one case, and dumping at different distances (70 feet and 140 feet) from the house in the other. Stine also documented the presence of "inner" and "outer" yard areas; these terms derived from Jurney and Moir's work in the Richland Creek and Mountain Creek areas of Texas. Moir (1987, 1988) reported that artifact distributions at late nineteenth-/early twentieth-century farmsteads defined two major zones, the active and outer yard areas. The active yard itself was divided into an inner and outer yard. Although one of Stine's sites had been inhabited by African Americans and the other by Euro-Americans, she found that the artifacts were not indicative of ethnicity. The "artifacts at both sites seem to reflect, instead, the shared general farm lifestyle of site inhabitants" and:

> Members of both families were apparently acquiring goods from the same sources (local stores, mail-order, locally crafted, home produced) using the same means (cash from lumber/carpentry, cash from cotton/farm produce, barter, perhaps some credit). They also seem to have purchased or made similar items, sometimes for one another's families. These goods were also used in comparable ways. The disposal of goods may also be analogous, in that both families threw trash into piles. However, the Nicholses seem to have created their rubbish heaps a bit closer to the house than those at the Stine farmstead. Topographic difference may help explain some of this disparity, as the Stines had an obvious ravine to use for trash disposal. Topographic differences at the Nichols site are less extreme, with no obvious ravines present [Stine 1989:359].

Joseph et al. (1991) also examined refuse disposal patterning in South Carolina and outlined a temporal dimension. During the eighteenth century trash was tossed from doors and windows into the adjacent yard areas. This "Brunswick pattern" was first documented by South (1977) at house sites in Brunswick, North Carolina. Joseph et al. (1991:170) suggest that this pattern may have been replaced in the first half of the nineteenth century by refuse disposal in sheet middens in rear yards, followed by trash burning in the second half of the nineteenth century and the beginning of the twentieth century, and finally by off-site disposal in ravines and other depressions (the Piedmont pattern) after 1850 and on into the twentieth century. The later modes of disposal would reflect the sanitation movement that spread through the South in the late nineteenth century. Joseph et al. (1991) also propose that the shift from trash burning to the Piedmont pattern may reflect changes in the types and availability of containers. Bottle glass replaced more traditional stoneware mainly because it was cheaper to manufacture. It therefore became far more commonly available, and reuse of containers was no longer an economic necessity, so bottle glass containers became increasingly common in household trash. Because they could not be disposed of by burning, they were tossed into the "bottle dumps" that were ubiquitous in Piedmont gullies and ravines.

c. Artifacts and Artifact Patterning

Orser's analysis of artifacts at the Millwood Plantation (Orser 1988; Orser et al. 1982) used the artifacts to explore issues of "power, racism, exploitation, and accommodation" (Orser 1988:247). Based loosely on South's (1977) approach to artifact patterning (i.e., relative percentages of various classes of artifacts occur in an assemblage), Orser (1988:233) created a functional typology of artifacts that included the major classes of foodways, clothing, household/structural, personal, and labor. Using these functional classes to examine sociocultural variables, Orser (1989) compared the percentages of artifacts from each class (the artifact pattern) recovered from six contexts on Millwood Plantation. He noted a broad similarity in artifact patterning between the owner's home and the tenant home, and some similarity between the resident manager's home and the home of a millwright who lived on the plantation. Unique artifact patterns were associated with the home of the owner's female companion and the home of a wage hand on the plantation.

Trinkley and Caballero (1983) also addressed artifact patterning at tenant sites. Unlike Orser, they simply used the classes of artifacts initially proposed by South (1977). They proposed a "Tenant Artifact Pattern" that could be contrasted with South's Carolina and Frontier patterns, and with the Slave pattern described

by Singleton (1980). Their tenant pattern contains a higher percentage of kitchen-related artifacts than any of the other patterns. They found a low ratio of architectural items, and the clothing-, personal- and activity-related artifacts fell within the ranges of the Carolina, Frontier, and Slave patterns. Trinkley and Caballero (1983:64) state that:

> This Tenant Pattern appears to reflect what is known historically about tenant farming. The dilapidated houses contribute few durable artifacts to the overall pattern, clothing and personal effects are sparse, and activity related artifacts (particularly those related to farming) are relatively abundant.

At the Finch Farm (Joseph et al. 1991) the artifact pattern is dominated by the kitchen group, as is the artifact pattern at the associated tenant site, the Webb Farm. In both cases the architecture group makes up a still notable percentage of the collection, and the activities group is also relatively well represented when compared to Trinkley and Caballero's Tenant Pattern. Joseph et al. (1991:175) suggest that the critical factor in artifact patterning might not be ownership vs. tenancy but rather the long-term stability of the occupation. Trinkley et al. (2006) summarized data on artifact patterns from many of the sites discussed above, along with data from several tenant farms in Aiken County (Cabak and Inkrot 1997), a tenant site in Berkeley County (Brockington et al. 1985), one in Horry County (Trinkley and Caballero 1983), and several sites in Sumter County (Trinkley et al. 2006). In general, they find two different patterns in late nineteenth- to early twentieth-century farmsteads. These correspond closely to the patterns previously identified by Joseph et al. (1991): (1) sites that have a high proportion of food-related artifacts owing to a general scarcity of the architectural group, and (2) sites with a greater frequency of architectural artifacts and thus a relative paucity of kitchen artifacts. Clement (2009) cautioned that artifact patterns may be misleading if they are based on results of a poorly designed sampling strategy.

d. General Assessment of the Historic Sites' Research Potential

The research potential of all the sites investigated by WSP in 2020 and 2021 is limited by their lack of integrity, the destruction of cultural deposits by land-leveling and logging activities, the recovery of modern and historic artifacts from the same disturbed strata in shovel tests and in test units, and the absence of sealed contexts. The sites will therefore not contribute information useful for the study of the region's history or prehistory (NRHP Criterion D). The artifact samples and the building remnants at these sites appear inadequate to address most of the research issues that have been developed concerning the transition from the antebellum agricultural plantation economy based on an enslaved workforce to postbellum tenant farming (see Clement 2009; Orser 1988). The mixture of artifacts manufactured between ca. 1860 and 1960 makes it impossible to achieve the decadal-scale temporal resolution necessary to perceive the consequences of, and residents' reactions to, such events as the depressions of 1873-1879 and 1929-1933, fluctuations in the bright leaf tobacco market, or the imposition of segregation laws in Virginia after 1900 (Wynes 1967).

As Orser (1999:153) notes, "it seems unlikely that historical archaeologists will ever be able to make definite statements about tenant-farmer social distinctions strictly from artifacts alone." He observes that archaeologists are often constrained by a lack of temporal resolution in their analyses of the development of the site and associated structures, the previous use of space, and the character and development of an artifact assemblage. Orser further notes that tenant "shifting" can complicate analysis of material remains as "even the tenants on the lowest rungs of the agricultural ladder generally occupied farms for the shortest period of time"; in his study area six families occupied one farm over a period of 10 years.

The number of artifacts recovered from the domestic sites at Berry Hill varies considerably. This is true for the two sites under consideration here, with Site 44PY0398 yielding much more material than Site 44PY0394. The variation presumably relates to some combination of the length of occupation, the size of the household, how clean the area around the dwelling was kept, and where trash was disposed. Given the

complete absence of sealed, datable deposits, it is impossible to say which of these factors had the most influence on any particular sites.

The investigated sites did not produce a substantial artifact assemblage dating from the antebellum period. The initial manufacturing dates for some of the ceramics (e.g., whiteware, ironstone) do extend into the early nineteenth century, as does the first appearance of cut nails (ca. 1820); however, on Middle Atlantic sites occupied ca. 1790-1850, pearlware is generally abundant, and therefore the total absence of pearlware (particularly the ubiquitous shell-edged types) from these assemblages is a strong indication of solely postbellum occupation. Machine-cut nails are present at most of these sites and even appear to outnumber wire nails in some cases; however, cut nails were used from ca. 1820 to 1890. Although a form of wire nail was patented in 1815, wire nails were not manufactured in sufficient numbers to appear in widespread use or in archaeological contexts before the mid-1880s (Adams 2002). The cut nails from the Berry Hill sites are therefore also probably postbellum.

Of course, if the residents of these sites were, as has been assumed, mostly African Americans, antebellum occupations would not be expected. Prior to their emancipation in 1865, enslaved African Americans would have lived in an enslaved "quarter," not in dispersed homesteads. The quarters of the Berry Hill Plantation have not been excavated, and therefore there is no baseline for analytical comparison of antebellum and postbellum African American lifeways in this area.

Intact cultural features are often considered the *sine qua non* for establishing the significance of an archaeological site. Some foundations and structure ruins were identified, but excavations revealed no sealed artifact deposits associated with the sites, which would have permitted assignment of construction, use, or abandonment dates, or even allowed determination of specific functions of the buildings. After rather intensive investigation, no discrete contexts have been identified that could be compared to detect changes over time or variability between households of differing economic/social status during a single well-constrained temporal interval. Any artifact patterning that might be discerned in these assemblages, following South (1977) or Orser (1989), would be a conflated amalgam obscuring from the outset the very diachronic changes that would be the aim of the analyses.

Instead of additional fieldwork, alternative avenues of investigation may be more appropriate to document the changes in human-landscape interactions in this region from the Antebellum period to the period of Reconstruction and Growth.

A landscape-scale approach to settlement patterning might be informative; however, such research would also be hampered by a lack of evidence. The earliest available detailed maps of this area showing individual residences and topographic contours date from 1926. Unless plats of the Hairston plantation era are unexpectedly discovered, there is no way of knowing what the antebellum landscape looked like. Was the entire area covered with tobacco fields? Were there enslaved quarters? How much erosion had occurred before 1926? Without traces of the dwellings of enslaved African Americans, we cannot address the questions of residential continuity and changing community organization from slavery into tenancy. The effects of the late nineteenth-century sanitation movement on rural trash disposal patterns (Joseph et al. 1991) would also be hard to discern because well-defined sheet midden contexts were not identified at these sites. The very sparse archaeological assemblages would contribute little to any landscape-scale research based on other data sets.

A more productive approach might be to pursue archival research to identify some of the former occupants (or their descendants) of the residential sites and to collect oral histories of these locations from them; this could shed some light on variants of tenant farming and sharecropping in the nineteenth and twentieth centuries in this area. This is the sort of investigation proposed by Holland (1990) and further developed by Orser (1999). Comparable research has been conducted by Mahoney (2013) at Charles' Corner near Yorktown.

Confining evaluation only to the archaeological significance and potential of these sites, however, WSP's opinion is that Sites 44PY0394 and 44PY0398 are not eligible for the NRHP.

If archaeological deposits and features at any one of these sites possessed demonstrable integrity, the site might perhaps be considered eligible for the NRHP under Criterion A (associated with the broad patterns of local, state, or national history, particularly early settlement and plantation agriculture), Criterion B (associated with regionally prominent individuals), and/or Criterion D (might yield important information about history). The sites are not eligible under Criterion C, as the building remnants lack architectural distinction. Because these sites lack archaeological integrity, however, they are unlikely to provide important information about the proposed periods of significance, i.e., the Antebellum, Civil War, and Reconstruction and Growth periods; lifeways and historical patterns generally; or specific details about the lives of the locally prominent occupants (Criteria A and B). The excavation results indicate that the associated material culture remains are not likely to provide important historical information (Criterion D). Louis Berger previously recommended Sites 44PY0331, 44PY0332, 44PY0373, 44PY0374, 44PY0375, and 44PY0376 as not eligible for the NRHP under Criteria A, B, C, and D. With additional information in hand, WSP affirms those recommendations, and also recommends Sites 44PY0353, 44PY0354, 44PY0026, 44PY0329, 44PY0333, 44PY0334, 44PY0396, 44PY0397, 44PY0398, 44PY0394, 44PY0395, 44PY0380, 44PY0382, 44PY0386, 44PY0454, and 44PY0455 as not eligible for the NRHP under Criteria A, B, C, and D.

2. Hairston Enslaved Quarter

To demonstrate how much is missing from the Berry Hill collections, perhaps a comparison is in order. In 2016 archaeologists from Hurt & Profit carried out a small excavation inside one of the enslaved quarter buildings at Oak Hill Plantation in Pittsylvania County (Lichtenberger and Moore 2017). Only two test units were dug, both of them within brick-lined storage pits inside the quarter. The two pits were bisected, so one half was excavated. One of the excavations measured 2.3x3.7 feet, the other 2.2x3.5 feet. The larger pit was 3.2 feet deep, the smaller one 2.0 feet deep. These two small excavations, completed in a few days, provided a rich trove of information about the residents of the quarter. The description of the material from just one of the three strata in the larger pit reads:

> The layer contained 11 glass beads (including clear, white, blue, light blue, dark blue and black), 8 brass straight pins, 3 sheet brass pieces, 3 needles, a brass eyelet, brick, lime mortar, 1milk glass button, 1 bone button, 2 porcelain buttons, 2 mother of pearl buttons, whiteware, creamware, pearlware, Delft, refined stoneware, porcelain, fish scales, shell, bird and mammal bones, mammal teeth; amber, clear and aqua bottle glass; flat glass, 24 wrought nails, 5 cut nails, sheet iron, a spring, part of a chain, and 2 kaolin pipe bowl fragments [Lichtenberger and Moore 2017:39].

Other artifacts from these features include the handle of a cast-iron frying pan, an Archaic spearpoint, a bone-handled knife, and lead shot.

The most impressive thing about the collection is the faunal material. In all, more than 6,000 faunal specimens were recovered from the pits, including fish scales and eggshells. When the report was written, analysis of this material was not complete, but more than 600 bones had been identified. They represent numerous animal species, including pig, cow, chicken, squirrel, opossum, rabbit, turkey, musk turtle, gar, and freshwater mussels. The evidence demonstrates hunting and fishing carried out by the enslaved residents.

A few later artifacts were found in the upper part of the feature fill, but below the top few inches these features represent a sealed context dating to between 1830 and 1850. They can be associated with a known population, the enslaved people of Oak Hill Plantation.

The artifacts from the Phase I and II testing at Berry Hill, carried out over the past decade at considerable expense, present a poor contrast. All of them come from shallow, near-surface deposits. They cannot be associated with known households, and as the Berry Hill tenants included Black and white families, their social and ethnic associations are unknown. Some categories of material common in the Oak Hill pit features are completely missing at Berry Hill: sewing items, jewelry, and especially animal bones. The faunal remains from the Oak Hill enslaved quarter pits are tremendously evocative of the residents' lives, and the absence of faunal material in the Berry Hill collections greatly limits analysis of the occupation.

The spearpoint found in the quarter must have belonged to one of the residents, making it an informative document about their lives. Stone spearpoints were also found on some of the Berry Hill tenant sites, but as they all came from surface deposits, there is no way of knowing if they had been possessed or even handled by the historic-era residents of the site.

For an archaeological site to have scholarly significance, it is not enough for it to be old, or associated with an interesting class of people. It must contain data. The Berry Hill sites do contain certain data about the past: collapsed log cabins provide good data on housing, and quite a few outbuildings are also present, showing how the farms were laid out. These data has now been recorded for dozens of Berry Hill sites. The artifacts do show certain basic things about how people lived: they had decorated dishes, jars for home canning, stoneware crocks for storage. But the collections are small and missing many things one would expect to find. The most likely explanation is that most trash was carefully collected and disposed of some distance from the house, perhaps by dumping into a ravine. What remains is simply not highly representative of life in these homes, and not informative about the people's lives.

B. EVALUATION OF SITE 44PY0394

Site 44PY0394 is a domestic site occupied in the late nineteenth and early twentieth centuries, likely by a sharecropping family. The site is centered on a collapsed log cabin that measures about 6x6.7 meters (20x22 feet). The immediate environs of the house have not been disturbed, but the rest of the site has been heavily impacted by logging. Artifact density is low, and fewer than 200 artifacts have been recovered from the site. These are mostly rather generic, datable only to very broad periods, and in no way distinct from those found at other Berry Hill sites. No intact subsurface features have been identified at the site, nor any sealed artifact deposits.

Artifact deposits are present at the cabin; however, the Phase II investigation did not yield any new information about the site's occupation period, use, or its inhabitants. WSP excavated two 1x1-meter (3.3x3.3-foot) test units at this site, and these excavations yielded a total of 186 historic artifacts and one prehistoric artifact. The few artifacts with a tighter date range suggest a late nineteenth- to mid-twentieth-century occupation, although the presence of modern artifacts suggests that the site continued to be used through much of the twentieth century. One collapsed log cabin with an associated fieldstone wall was relocated. No intact subsurface features were identified, and there was no evidence of other structures or activity areas.

It is WSP's opinion that the recent findings do not alter the previous recommendation that Site 44PY0394 is not eligible for listing in the NRHP. Further archaeological investigation of the site would not produce additional information about the site or its occupants. The integrity of the site has been heavily impacted by logging, and artifacts dating to the post-1950 period suggest that it continued to be used in some way after the tenants moved away, perhaps as a hunting cabin. No sealed artifact deposits have been identified, and the historic assemblage was limited to broadly diagnostic domestic and architectural materials that are typical of late nineteenth- to twentieth-century domestic subsistence occupations or tenancies.

WSP therefore retains the prior opinion that Site 44PY0394 is not eligible for the NRHP, because of its compromised integrity and low information potential.

C. EVALUATION OF SITE 44PY0398

Site 4PY0398 includes a historic dwelling and a second group of structures more than 120 meters (400 feet) away, which may be agricultural or possibly the remains of the Wenonda School. A more modern agricultural outbuilding also stands on the site. In the Phase I investigation WSP excavated 68 shovel tests, and these excavations yielded a total of 95 historic artifacts, and the BAL (2011) investigation yielded approximately 44 historic artifacts. In the Phase II investigation, WSP excavated four 1x1-meter (3.3x3.3-foot) test units plus four judgmental shovel tests. WSP excavations during both phases yielded a total of 1,321 artifacts, of which only three are prehistoric. The historic artifacts are limited to broadly diagnostic artifacts associated with the late nineteenth to twentieth centuries, including whiteware. Four structural features were relocated, including a collapsed log cabin, a second collapsed building and associated depression, and an extant agricultural outbuilding. No intact subsurface features were identified.

Historical maps record the "Wenonda School" associated with buildings in this location in the 1920s and 1930s (see Figure 6). Additional research was conducted to determine the nature of this school, but nothing definite was found. It has been suggested that this might have been one of the "Rosenwald Schools" that were built across the country around this time, including 382 in Virginia. According to Preservation Virginia (2019), the Rosenwald Schools were a program created by Booker T. Washington and the Tuskegee Institute, financed by Julius Rosenwald (philanthropist and president of Sears, Roebuck), to improve public education for African Americans living in the rural South during segregation. Preservation Virginia conducted a year-long survey documenting these schools, and although several were located in Pittsylvania County, Wenonda was not one of them. Also, the Rosenwald Schools documented by Preservation Virginia were better built and larger than the collapsed structure at Site 44PY0398. The only artifact that may be related to the use of this location as a school is the graphite pencil recovered from Test Unit 3, but this is far from conclusive archaeological evidence. Given the amount of disturbance at this site, it is possible that a school could have stood in one of the heavily disturbed areas, but if so, no trace was found of it.

WSP conducted extensive archival research on the historic sites at Berry Hill. Although WSP historians were able to reconstruct the general census data for the period between 1900 and 1930, they were generally unable to tie specific tenants and renters to specific properties within the larger plantation parcels (see Tables 4-7) (U.S. Census 1900, 1910, 1920, 1930a, 1930b). A review of the census data and other archival records was unable to firmly tie any specific renters or tenants to Site 44PY0398. Thus, the site could not be definitively tied to a specific cultural affiliation.

WSP's opinion is that Site 44PY0398 is not eligible for listing in the NRHP.

VIII. SUMMARY AND RECOMMENDATIONS

On behalf of Dewberry, WSP carried out a Phase II investigation of two archaeological sites on Lots 1 and 2 of the proposed Southern Virginia Megasite at Berry Hill, Pittsylvania County, Virginia (DHR No. 2012-0023) to determine their eligibility for the NRHP. Site 44PY0394 is a domestic site occupied in the late nineteenth and early twentieth centuries, likely by a sharecropping family. The site is centered on a collapsed log cabin that measures about 6x6.7 meters (20x22 feet). Beyond the immediate environs of the collapsed cabin, the site had been heavily disturbed by logging. Site 44PY0398, also with an occupation dating to the late nineteenth/early twentieth centuries, includes a historic dwelling and a second group of structures more than 120 meters (400 feet) away, which may be agricultural buildings or possibly the remains of the Wenonda School.

Sites 44PY0394 and 44PY0398 are two members of a group of more than 40 domestic sites at Berry Hill dating to between the late nineteenth and mid-twentieth centuries. Most of these properties were occupied by African American sharecroppers or cash tenants, but there were also white tenants on the plantation, and WSP has not been able to relate any of the archaeological sites to a name in the plantation records. It is therefore not possible to specify the ethnicity of the residents at Sites 44PY0394 and 44PY0398. After most agricultural activity on the plantation ceased in the mid-twentieth century, the property was logged, and some locations have been planted with trees. Logging has done significant damage to the old plantation landscape, including to both of these sites. The area has also been used for organized hunting, and several old houses were re-used as hunting clubs or camping spots. Some sites, including Site 44PY0398, were also used as dumping spots and are dotted with piles of appliances, tires, and bottles. Many of the artifacts on both sides could have been deposited after occupation ceased.

Sites 44PY0394 and 44PY0398 share a problem with the other Berry Hill sites, which is a complete absence of datable deposits. All artifacts from these sites have been recovered from generalized near-surface deposits, within which are mixed everything from precontact stone artifacts to post-occupation shotgun shells. Almost all of the artifacts are datable only to general periods. Many could have been made any time in the nineteenth or early twentieth century; this applies to the ceramics and also much of the bottle glass. The structures on the sites are also difficult to date precisely, although the widespread use of wire nails shows that all were built after 1880. Historical research shows that the economic and social situation of African Americans in this region changed greatly across the 1865 to 1950 period, but without better chronological control, the archaeology at Berry Hill can tell us nothing about how everyday life changed in response. Important categories of artifacts, such as faunal remains, are almost entirely missing.

Because of their diminished integrity and lack of information potential, WSP finds that Sites 44PY0394 and 44PY0398 are not eligible for listing in the NRHP under Criterion D. As the ethnicity of the residents cannot be established, and the chronology of the sites is so poor, they cannot be related to a broad theme that might make them eligible under Criterion A, such as Reconstruction or the shift from slavery to tenancy. Criteria B and C do not apply. It is WSP's opinion that Sites 44PY0394 and 44PY0398 are not eligible for listing in the NRHP.

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APPENDIX A: METHODS OF ARTIFACT CATALOG AND ANALYSIS; ARTIFACT INVENTORY

METHODS OF ARTIFACT CATALOGING AND ANALYSIS

A. LABORATORY PROCESSING

All artifacts were transported from the field to the heritage resource laboratory at WSP USA Inc. (WSP). In the field artifacts were bagged in 4-mil resealable polyethylene bags. Artifact cards bearing provenience information were included in the plastic bags. A Field Number was assigned to each unique provenience in the field. This number appears with all the provenience information and is used throughout processing and analysis to track artifacts.

Prehistoric lithics and most historic artifacts were washed in water with a soft toothbrush. Prehistoric ceramics, faunal material, and fragile artifacts were wet-brushed with a soft natural-bristle paintbrush or were simply dry-brushed. Metal objects were cleaned using a dry toothbrush or stainless steel wire brush. All artifacts were laid out to air-dry in preparation for analysis.

During analysis individual Specimen Numbers were assigned to artifacts. After analysis the artifacts were re-bagged into clean perforated 4-mil resealable polyethylene bags. Artifacts are organized sequentially first by Site Number, then Field Number, and finally by Specimen Number. Before submitting for curation, catalog numbers were assigned in accordance with Virginia Department of Historic Resources guidelines. An acid-free artifact card listing full provenience information and analytical class was included in each bag.

When labeling, all artifacts dime-sized and larger were labeled as follows:

State Site Number	Example:	44PR000
Catalog Number		CAT ####

Please note that all nails and some of the window glass in the collection were not labeled. No conservation treatment on the artifacts was needed or performed.

B. ANALYTICAL METHODS

All artifact analyses were conducted by the Laboratory Supervisor and/or Material Specialist(s). WSP maintains an extensive comparative collection and laboratory research library to aid in making complete and accurate analyses.

WSP has also developed a flexible analytical database system that fully integrates all artifacts in one database for use in data manipulation and interpretation. The computerized data management system is written using Microsoft Access, a relational database development package that runs on a Windows® platform.

Each class of artifacts—historic ceramics, small finds/architectural, curved (vessel) glass, prehistoric lithics, prehistoric ceramics, floral, faunal, and historic tobacco pipes—has a series of attributes, sometimes unique to that class, that are recorded to describe each artifact under analysis. Artifact information (characteristics) was entered into the system during the process of analysis. The system was then used to enhance the artifact records with the addition of provenience information. WSP maintains a complete type and attribute coding system in the database.

The format for the historic artifacts is based on the South/Noël Hume typology (South 1977), as modified for use in a computerized system (Louis Berger 2013).

The Notes field allows individual written comments applicable to a specific entry. Notes are generally used to describe particulars of decorative motifs or unusual characteristics, or to record bibliographic references used for identification or dating.

1. Historic Ceramic Analysis

The ceramic tabulation provides the following information: identification of ware types and techniques of surface decoration; dates based on manufacturing and decorative techniques and, if present, maker's marks; identification of vessel forms and functions; and descriptions of decoration motifs.

Begin/End Dates. Sources for these dates include but are not limited to Cameron (1986), Denker and Denker (1985), Erickson and Hunter (2001), Howard (1984), Jefferson Patterson Park and Museum (2018), Ketchum (1983), Magid and Means (2003), McAllister and Michel (1993), Miller (1980, 1987, 1991), Noël Hume (1969b), Rickard (2006), South (1977), and Wetherbee (1980, 1985). When more precise dates can be determined from maker's marks or particular decorations or forms, these fields are entered manually. Sources used for identification of Maker's Marks or Decoration/Motif include Barber (1968), Gates and Ormerod (1982), Godden (1964, 1999), Hunter and Miller (1994), Kowalsky and Kowalsky (1999), and Lehner (1988).

Form. Form indicates the shape and possible function of the complete vessel as represented by the sherds present. General categories, such as "Tableware, Hollowware," are used for sherds whose small size or ambiguous characteristics make determination of form problematical. **Part** is used to indicate what part of a vessel is represented by the sherd(s) present. Definitions of forms are based, for the most part, on Beaudry et al. (1983), Greer (1981), Ketchum (1983), and Towner (1963).

2. Small Finds/Architectural Analysis

For the small finds/architectural analysis each artifact was identified by its group and class, Material Type and Part/Portion, and received a count and/or weight. Additional information, including Characteristic, Maker's Marks, Backmark, Color, and Decoration, is recorded as identified for the individual artifacts if present or needed.

Begin/End Dates. Dates for certain artifacts were generated in the database based on the Type/Subtype. Other dates were entered manually and were based on various artifact characteristics. References used for dating of artifacts include but are not limited to Edwards and Wells (1993), Friedel (1987), Gurcke (1987), Hogg (1985), Hughes and Lester (1981), Johnson (1942), King (1991), Kovel and Kovel (1961), Lamm et al. (1970), Lavitt (1983), Luscomb (1967), Martells (1976), McGuinn and Bazelon (1984), Melton (2014), Munsey (1970), Nelson (1968), Noël Hume (1969b), Rock (2000), Sacharow (1978), and Thomas and Thomas (1996).

Characteristic. A modifier that best described the form or manufacturing technique of each artifact was entered in this field.

3. Curved (Vessel) Glass Analysis

The glass artifacts from the collection were broken down, for analytical purposes, into functionally distinct groupings based on Bottle, Table, Lighting, and Other use-categories. All artifacts identified as to specific function and form were coded as such regardless of the degree of fragmentation. Window glass, considered more functionally inclusive under an architectural group of artifacts, was subsumed for analysis under Small Finds/Architectural materials.

Begin/End Dates. Dating of the glass artifacts was completed according to established diagnostic criteria. These criteria, utilized either singly or in combination, can include various technological aspects of glass manufacture, such as finish treatments, tooling methods, empontilling techniques, mold markings, Brand, Maker's Marks, Color, and various stylistic elements (including Decoration/Motif) associated with certain tablewares. Sources for glass dating include but are not limited to Busch (1987), Cheney (1980), Ferraro and Ferraro (1964, 1969), Fike (1987), Haynes (1959), Jones (1971, 1983, 1986), Jones and Smith (1985), Jones and Sullivan (1985), Kaplan (1982), Klamkin (1973), Kovel and Kovel (1986), Lief (1965), Lindsey (2018), Lockhart (2004), Lorrain (1968), McKearin (1970), McKearin and McKearin (1948), McKearin and Wilson (1978), Miller and Sullivan (1984), Munsey (1970), Noël Hume (1961, 1968, 1969a, 1969b), Paul and Parmalee (1973), Riley (1958), Spillman (1981, 1982, 1983), and Toulouse (1971, 1969).

Finish. Common names, such as "Blob-top," "Crown," and "Screw," were used when appropriate. Sources include Everette 1982.

Base. The majority of coded base types in the collection indicate the marks on the basal surfaces of glassware. "Snap case" indicates the lack of any markings when this device was used to hold a bottle in place while its finish was formed. Machine-made basal markings were also coded, if identifiable.

Manufacturing Technique. Manufacturing Technique refers to the distinctive mold seams and markings found on the bodies (and sometimes bases, finishes, or rims) of glassware.

Wear. The Wear category has been devised to aid in specialized analyses, e.g., in distinguishing commercial as opposed to domestic deposits from urban sites (Diamond in Geismar 1983:315). Vessels from establishments offering glassware for sale would not be expected to show more than slight evidence of use-wear; however, vessels from domestic deposits would be expected to show use-wear ranging from heavy to very heavy. The code Wear on Interior can be used to indicate artifacts associated with fill deposits. The code Waterworn or Rolled can be used to indicate artifacts that have been rolled in surf.

Lead/Non-lead (Comments). A short-wave ultraviolet light was used to examine select colorless glass vessels and sherds for the presence of lead. Leaded glass exposed to UV light appears ice-blue in color; non-leaded glass appears pale yellow or shows no change.

4. Lithic Artifact Analysis

The analytical approach to stone tool production and use that was used in this analysis can be described as technomorphological; that is, artifacts were grouped into general classes and then further divided into specific types based upon key morphological attributes, which are linked to or indicative of particular stone tool production (reduction) strategies. Function was inferred from morphology as well as from use-wear. Data derived from experimental and ethnoarchaeological research were relied upon in the identification and interpretation of artifact types. The works of Adams (2002), Andrefsky (2001), Callahan (1979), Clark (1986), Crabtree (1972), Custer (2001), DeRegnaucourt and Georgiady (1998), Flenniken (1981), Hatch and Miller (1985), Justice (1987), Parry (1987), Ritchie (1961), Whittaker (1994), and Wray (1948) were drawn upon most heavily. All types were quantified by both count and weight (in grams).

a. Debitage

Debitage is the by-product of lithic reduction and includes all types of chipped-stone refuse that bear no obvious traces of having been utilized or intentionally modified. There are two basic forms of debitage: flakes and shatter. Observations on raw material and cortex were recorded and are discussed later. The following descriptions are for the debitage types identified but do not include the full range of types described in Taylor et al. (1996).

Decortication Flakes are intact or nearly intact flakes with 50 percent or more cortex covering the dorsal surface. These are the first series of flakes detached during lithic reduction.

Early Reduction Flakes are intact or nearly intact flakes with less than 50 percent dorsal cortex, fewer than four dorsal flake scars, on the average, and irregularly shaped platforms with minimal faceting and lipping. Platform grinding is not always present. These flakes could have been detached from early-stage bifaces or cores of the freehand and bipolar types.

Biface Reduction Flakes are intact or nearly intact flakes with multiple overlapping dorsal flake scars and small elliptically shaped platforms with multiple facets. Evidence of platform grinding is usually present. Platforms are distinctive because they represent tiny slivers of what once was the edge of a biface. Biface reduction flakes are generated during the middle and late stages of biface reduction and also during biface maintenance (resharpening).

Pressure Flakes are made using a flaker. Because the force is applied by pressing and not striking, there are some morphological differences as compared with hard and soft hammer flakes. The platform is not a flat surface, but a slightly crushed edge. The edge grinding appears as the result of the edge preparation procedure.

Bipolar Reduction Flakes are intact or nearly intact flakes that have been struck from a bipolar core. They typically exhibit sheared cones, diffuse bulbs, closely spaced ripples, and crushed and splintered platforms. Crushing can also occur on the termination of flakes (distal end).

Finishing Flakes are small flakes, usually detached through pressure flaking, and are used to create the final cutting edge of the blade.

Resharpening Flakes are small, often rounded flakes that are usually detached through pressure flaking and exhibit evidence of prior use on the dorsal surface. These flakes are the byproduct of resharpening the blade edge for further use.

Uniface Resharpening Flakes are small J-shaped flakes that have been removed from the margins of a uniface. Their platforms often bear traces of use damage or polish.

Flake Fragments are sections of flakes that are too fragmentary to be assigned to a particular flake type.

Block Shatter consists of angular or blocky fragments that do not possess platforms or bulbs. Generally the result of uncontrolled fracturing along inclusions or internal fracture planes, block shatter is most frequently produced during the early reduction of cores and bifaces. Block shatter is also common in bipolar reduction, and it is equivalent to Binford and Quimby's (1963) "primary shatter." Thermal fracturing can also produce block shatter.

Flake Shatter consists of small flat fragments or splinters that lack platforms, bulbs, and other obvious flake attributes. Flake shatter is generated throughout a reduction sequence but is most common in later stages. It is a common by-product of bipolar reduction, and it is equivalent to "secondary shatter" (Binford and Quimby 1963). Trampling of debitage on living surfaces also generates flake shatter, whereas thermal fracturing produces both flake and block shatter.

Other Flake Types are flake types for which there is no Lithica designation (Taylor et al. 1996). Their characteristics are described in the Notes field, as needed.

Indeterminate Flakes are flakes that cannot be assigned to a specific type because their surface has been damaged, e.g., pot lidding, or severely eroded, e.g., argillite debitage.

b. Cores

Cores are cobbles or blocks of raw material that have had one or more flakes detached and that have not been shaped into tools or used extensively for tasks other than as a nucleus from which flakes have been struck. The types of cores identified are listed below, but this does not represent the full range of types possible as discussed in Taylor et al. (1996).

Freehand Cores are blocks or cobbles that have had flakes detached in multiple directions by holding the core in one hand and striking it with a hammerstone held in the other (Crabtree 1972). This procedure generates flakes that can be used as expedient tools or can be worked into formalized tools. Freehand percussion cores come in various shapes and sizes, depending upon the raw material form and degree of reduction.

Bipolar Cores are blocks or cobbles that have had flakes detached by direct hard-hammer percussion on an anvil: the core is placed on the anvil and struck vertically with a hammerstone (Crabtree 1972; Hayden 1980). Cores typically take on a tabular shape, exhibit heavy crushing and battering, and flake scars tend to run between areas of crushing and battering. Bipolar cores are normally smaller than freehand cores because bipolar reduction is a technique for maximizing available raw materials. Most flakes that are detached are only suitable for expedient flake tools.

Bifacial Cores are specific types of freehand amorphous cores flaked on both sides, i.e., reduced along one or more bifacially prepared edges for the purpose of flake production. Flaking occurs on both sides of a nodule to fully exploit the material.

Flake Cores are made from tubular large flakes usually flaked on one side, often with a defined flaking pattern. Some large early-reduction flakes could have been used as flake cores to produce flake-based scrapers or perhaps burins.

Tested Cobbles are unmodified cobbles, blocks, or nodules that have had a few flakes detached to examine raw-material quality.

Other Core Types are cores that do not easily fit into existing types, e.g., formalized blade cores. (The Notes field is used to record important attributes.)

c. Bifaces

A biface is a flake or cobble that has had multiple flakes removed from the dorsal and ventral surfaces. Bilateral symmetry and a lenticular cross section are common attributes; however, these attributes vary with the stages of production, as do thickness and uniformity of edges (see Callahan 1979). Included in this artifact class are all hafted and unhafted bifaces that functioned as projectile points and/or knives, as well as bifacially worked drill bits and unfinished bifaces. Specific types of bifaces represented in the collection are described below.

Projectile Points are finished bifaces that were usually hafted and functioned primarily as projectiles. Projectile points are usually triangular in overall form, with various types of hafting elements.

Knives are finished bifaces that were usually hafted and functioned primarily as cutting implements. Knives are characterized by one or more elongate cutting edges.

Finished Bifaces are finished bifaces that were probably hafted but are too fragmentary or ambiguous to assign to a functional category, e.g., projectile point or knife.

Late-Stage Bifaces are basically finished bifaces; they are well thinned, symmetrical in outline and cross section, and have centered edges. Small areas of cortex may still exist on one or both faces. These bifacial preforms are analogous to Callahan's (1979) Stage 4 bifaces.

Middle-Stage Bifaces look more like bifaces; they have been initially thinned and shaped. A lenticular cross section is developing, but edges are sinuous, and patches of cortex may still remain on one or both faces. These bifaces are roughly equivalent to Callahan's (1979) Stage 3 bifaces. Biface reduction is a continuum, and therefore middle-stage bifaces are often difficult to distinguish from early- and late-stage bifaces, depending upon the point at which their reduction was halted. Plus, rejected bifaces may have been used for other tasks (recycled).

Early-Stage Bifaces are cobbles, blocks, or large flakes that have had their edges bifacially trimmed and a few large reduction flakes detached. These bifacial blanks are equivalent to Callahan's (1979) Stage 2 bifaces. Because of their crude condition, these bifaces can be confused with freehand percussion cores and choppers.

Choppers or cleavers are sizable bifaces that may have been employed in tasks that required heavy-duty cutting, chopping, or severing. These implements are often crudely formed and can be mistaken for cores or early-stage bifaces.

Drills are slender bifaces that could have been used to perforate or pierce various materials.

Adzes or gouges are bifaces that were hafted and used as heavy-duty woodworking tools.

Other Bifaces are bifaces that do not easily fit into the above types. (The Notes field is used to record distinctive attributes).

Indeterminate Bifaces are sections of bifaces that are too badly damaged to be assigned to a specific type.

d. Unifaces

A uniface is a formalized tool fashioned from a flake by uniformly retouching its edges to create a specific working edge and a standardized shape. There are two basic types of formal unifaces: endscrapers and sidescrapers. In the former the working edge is transverse to the long axis of the tool; in the latter the working edge (or edges) parallels the long axis of the tool.

Endscrapers are formalized unifaces that have uniformly retouched edges, which creates a working edge and a standardized shape. The working edge is transverse to the long axis of the tool, and retouching often erases obvious indications that the tool is made on a flake.

Sidescrapers are formalized unifaces that have uniformly retouched edges, which creates a working edge and a standardized shape. The working edge parallels the long axis of the tool, and retouching often erases obvious indications that the tool is made on a flake.

Other Uniface Types are unifaces that do not fit easily into existing types. The Notes field is used to record distinctive attributes.

Indeterminate Uniface Fragments are unifaces that are too fragmentary to be assigned to a specific type.

e. Flake Tools

Utilized and edge-retouched flakes are informal expedient tools. They are flakes that were struck from a core or a biface and used to perform one or more tasks, with little or no prior modification. In some cases it is difficult to distinguish intentional retouch from use damage.

Utilized Flakes are expedient tools that exhibit traces of use damage and/or polish on one or more edges. These flakes could have been detached from cores or bifaces.

Retouched Flakes are expedient tools that have had one or more edges retouched, either to resharpen the working edge, to create a dulled edge for grasping, or to form a specific edge angle or shape. The flake itself could have been detached from a core or a biface.

Notched Flakes or spokeshaves are a special type of retouched flake. The retouching of one or more flake edges into a concavity distinguishes this morphological type.

Graver Flakes are a special type of retouched flake. The retouching of one or more edges into acute projections distinguishes this type.

Denticulated Flakes are a special type of retouched flake. They are distinctive because appropriately spaced flakes have been detached from one or more edges to form a toothed or serrated edge.

f. Cobble Tools

Alluvial cobbles or slabs of bedrock were used for various tasks, with little or no prior modification. These simple tools were used as hammers, anvils, grinding stones, abraders, or for a combination of functions. Battered, crushed, pitted, and/or smooth surfaces identify these stones as tools.

Netsinkers are notched cobbles. Direct hard hammer percussion was used to remove a few flakes from both ends of a cobble to facilitate the cobble's attachment to a net. Some specimens could have functioned as bolas stones.

Hammerstones are cobbles that show evidence of battering and crushing along their margins, indicating that they were intentionally used as percussors for either flaking siliceous materials or working other resistant materials.

Manos or grinding stones are hand-sized cobbles with one or more flat surfaces that were used to crush and grind various materials, as is evidenced by smoothed and polished surfaces.

Metates or grinding slabs are large cobbles or blocks of bedrock with one or two flat or concave surfaces, which exhibit evidence of grinding and crushing.

Pestles are linear (oblong) cobbles that exhibit crushing and smoothing on one or both ends or poles. Pestles can also be formalized tools that were shaped by pecking and grinding.

Mortars are large cobbles or blocks of bedrock with at least one deeply concave surface, which was used to hold various materials to be crushed and ground.

Pitted Cobbles or "nutting stones" are cobbles or blocks of bedrock with at least one smooth depression smaller than 4 centimeters in diameter. Unlike anvil depressions, these are smooth and tend to be circular or oval. These depressions may be the result of processing nuts and are different from anvil depressions created by bipolar lithic reduction.

Abraders are chunks of sandstone or related materials that were used to shape and sharpen tools made of various materials. Slotted abraders are believed to have been used in the manufacture and maintenance of bone and wood tools, e.g., needles, awls, shafts, and flat abraders are believed to have been used in the manufacture and maintenance of stone tools in addition to bone and wood tools.

Anvil Stones are cobbles or blocks of bedrock that were used as a base on which to rest materials while they were struck with a hammer. Anvil surfaces tend to possess shallow, coarse-textured depressions with amorphous outlines.

Other Cobble Tools are cobble tools that do not have pre-existing Lithica codes. A description of the specimen appears in the Notes field.

g. Groundstone Tool

Groundstone tools are formal stone tools and ornaments that were manufactured by pecking, grinding, and sometimes flaking. Typical artifact types are grooved axes, pipes, and pendants.

Stone Bowls are stone cooking vessels that were manufactured by carving, grinding, and polishing.

Grooved Axes are formal tools that were designed to be hafted, and their primary function was heavy-duty woodworking.

Celts are ungrooved axes; they were hafted by a different method from that used in grooved axes.

Adzes or gouges manufactured from granitic materials by pecking and grinding were hafted and functioned as heavy-duty woodworking tools, much like their chipped-stone tool counterparts.

Mauls are large heavy-duty round implements with a blunt bit and are most commonly associated with quarrying activities. Mauls are usually grooved and have defined polls. Mauls are often made from granite, diorite, basalt, or other hard stone. Ungrooved mauls are generally defined as hammerstones.

Other Groundstone Tools are those tools and ornaments that are not covered by the above types, e.g., bannerstones, pipes, and pendants.

Indeterminate Groundstone Fragments are sections of groundstone tools or ornaments that are too badly damaged to be assigned to a specific type.

h. Minerals

These are unmodified or minimally modified crystals or chunks of naturally occurring chemical elements, e.g., galena (lead ore) and limonite and hematite (iron ores). These materials can be manufactured into tools and ornaments, but then these artifacts would not be quantified as minerals. (The total number of items is recorded).

Other Minerals are mineral types for which there is no Lithica designation. Their characteristics are described in the Notes field.

i. Fire-cracked Rock

Cracked rock includes all fragments of lithic debris that cannot be attributed to stone tool production. Generally, fire-cracked rock is recognized by surfaces that exhibit reddening and irregular breakages. Whether a broken cobble is actually fractured as a result of thermal stress is often difficult to discern. For

this study all fractured cobbles are considered fire-cracked rock, even if they exhibit no clear signs of being thermally altered.

j. Unmodified Cobbles and Pebbles

Unmodified Cobbles exhibit no evidence of cultural use or modification; however, these items are of potential importance because they may represent manuports and/or cached raw materials. A cobble is generally greater than 6 centimeters in maximum dimension.

Unmodified Pebbles exhibit no evidence of cultural use or modification; however, they may allow interpretation of environmental conditions. A pebble is generally smaller than 6 centimeters in maximum dimension.

5. Faunal Analysis

The analysis of the faunal material allowed the identification of Species, Element, and completeness of the specimen. Identifications were made with the aid of a comparative faunal type collection and the use of reference materials, which include but are not limited to Abbott 1968, 1985; Gilbert (1973), Olsen (1964, 1968, 1979), and Schmid (1972).

6. Floral Analysis

The floral analysis provides identification of Species, Element, and any modifications to the specimen, e.g., Burning. Identifications were made with the aid of a comparative floral type collection and the use of reference materials, including Martin and Barkely (1961) and Pearsall (1989).

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Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date	End Date	Comments
44PY394	4	A	1	10	1610	1	Historic Ceramic	Stoneware - Buff Salt Glazed - Bristol & Albany Type Slips	3	3.2	1880	1950	Body sherds, hollowware fragments
44PY394	4	A	1	10	1610	2	Small Finds/Architectural	Window Glass	2	1.3			Aqua glass, body sherds, flat
44PY394	4	A	1	10	1610	3	Small Finds/Architectural	Machine Cut Nail	1	10.1	1830		Ferrous metal; complete
44PY394	4	A	1	10	1610	4	Small Finds/Architectural	Cartridge Casing - .32-.40	1	1.5			Copper alloy, headstamp present; "REM-UMC / 32 S&W"
44PY394	4	B	2	11	1611	1	Historic Ceramic	Whiteware	1	0.5	1820	2000	Spalled body sherd, undecorated
44PY394	4	B	2	11	1611	2	Glass	Unidentified Curved/Vessel Glass	2	1.1			Body sherds, colorless; one possible finish fragment
44PY394	4	B	2	11	1611	3	Glass	Unidentified Curved/Vessel Glass	1	0.5			Body sherd, aqua fragment
44PY394	4	B	2	11	1611	4	Small Finds/Architectural	Window Glass	2	2.1			Aqua flat glass fragments
44PY394	4	B	2	11	1611	5	Small Finds/Architectural	Machine Cut Nail	7	37	1830		Ferrous metal; square shank
44PY394	4	B	2	11	1611	6	Small Finds/Architectural	Unidentified Nail	7	30.5			Ferrous metal; heavily corroded
44PY394	4	B	2	11	1611	7	Small Finds/Architectural	Fence Staple	2	5.9			Ferrous metal; fragments
44PY394	4	B	2	11	1611	8	Small Finds/Architectural	Unidentified Metal	1	15.5			Ferrous metal; strap fragment
44PY394	4	B	2	11	1611	9	Small Finds/Architectural	Cartridge Casing - 22 Caliber	2	1.1			Copper alloy, casing; one with diamond stamped head
44PY394	4	B	2	11	1611	10	Small Finds/Architectural	Unidentified Metal	1	0.3			Copper alloy cap, possible ammunition related; fragment
44PY394	4	B	2	11	1611	11	Lithics	Drill	1	1.4			Base fragment; snapped mid-section; possible rhyolite
44PY394	4	B	3	12	1612	1	Historic Ceramic	Whiteware	2	0.8	1820	2000	Body sherd, spalled surfaces; undecorated
44PY394	4	B	3	12	1612	2	Historic Ceramic	Stoneware - Gray Salt Glazed	1	20.5			Base sherd, hollowware; glazed exterior, slipped interior

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date		Comments
44PY394	4	B	3	12	1612	3	Glass	Unidentified Curved/Vessel Glass	1	0.1			Colorless glass body sherd; unidentified manufacture
44PY394	4	B	3	12	1612	4	Small Finds/Architectural	Unidentified Nail	2	10.5			Ferrous metal, fragments
44PY394	4	C	4	13	1613	1	Glass	Unidentified Bottle/Jar	6	8.4			Aqua green glass body sherds; unidentified manufacture
44PY394	4	C	4	13	1613	2	Glass	Unidentified Curved/Vessel Glass	1	0.4			Solarized glass, body sherd
44PY394	4	C	4	13	1613	3	Floral	Charcoal	1	0.3			Fragment
44PY394	5	A	1	14	1614	1	Glass	Unidentified Bottle/Jar	4	5.9			Aqua glass body sherds, unidentified manufacture
44PY394	5	A	1	14	1614	2	Glass	Unidentified Curved/Vessel Glass	1	0.3			Solarized glass body sherd, small; unidentified manufacture
44PY394	5	A	1	14	1614	3	Glass	Unidentified Curved/Vessel Glass	1	1.3			Solarized glass base sherd, small, possible machine made, unidentified manufacture; likely not a bottle/jar
44PY394	5	A	1	14	1614	4	Glass	Tableware/General	2	2.5			Solarized glass, pressed glass body sherds
44PY394	5	A	1	14	1614	5	Glass	Window Glass	7	5.3			Aqua green body sherds, flat glass
44PY394	5	A	1	14	1614	6	Small Finds/Architectural	Unidentified Nail	2	5.6			Ferrous metal, fragments
44PY394	5	A	1	14	1614	7	Small Finds/Architectural	Unidentified Metal	7	24.9			Ferrous metal, fragments
44PY394	5	A	2	15	1615	1	Historic Ceramic	Ironstone	6	11	1840	2000	Body sherds, undecorated; unidentified ware
44PY394	5	A	2	15	1615	2	Historic Ceramic	Ironstone	1	2.1	1840	2000	Base sherd, flatware; undecorated
44PY394	5	A	2	15	1615	3	Historic Ceramic	Ironstone	3	2.4	1840	2000	Rim sherds, undecorated
44PY394	5	A	2	15	1615	4	Historic Ceramic	Ironstone - Embossed Rim	1	5.4	1840	2000	Rim sherd, scalloped; flatware
44PY394	5	A	2	15	1615	5	Historic Ceramic	Ironstone - Embossed Rim	1	3.6	1840	2000	Rim sherd, scalloped; hollowware

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date	End Date	Comments
44PY394	5	A	2	15	1615	6	Historic Ceramic	Ironstone	1	3	1840	2000	Handle fragment; hollowware; undecorated
44PY394	5	A	2	15	1615	7	Historic Ceramic	Hard Paste Porcelain	1	0.5			Base sherd, undecorated
44PY394	5	A	2	15	1615	8	Historic Ceramic	Hard Paste Porcelain	2	3.3			Rim and body sherd, mend; hollowware cup fragments; undecorated
44PY394	5	A	2	15	1615	9	Historic Ceramic	Hard Paste Porcelain - Embossed	1	1.2			Rim sherd, embossed interior; flatware
44PY394	5	A	2	15	1615	10	Historic Ceramic	Hard Paste Porcelain - Overglaze Transfer Printed	2	3.8	1820	2000	Rim sherds, flatware; interior floral decoration
44PY394	5	A	2	15	1615	11	Glass	Unidentified Curved/Vessel Glass	1	0.5			Amber/brown glass fragment; body sherd
44PY394	5	A	2	15	1615	12	Glass	Unidentified Curved/Vessel Glass	5	3			Solarized glass fragments; body sherds
44PY394	5	A	2	15	1615	13	Glass	Unidentified Curved/Vessel Glass	7	3.6			Aqua glass fragments; body sherds
44PY394	5	A	2	15	1615	14	Glass	Unidentified Curved/Vessel Glass	2	1.1			Colorless glass fragments; body sherds
44PY394	5	A	2	15	1615	15	Glass	Window Glass	20	12.6			Aqua glass fragments; body sherds; flat
44PY394	5	A	2	15	1615	16	Glass	Unidentified Curved/Vessel Glass	1	0.4			Milk glass, body sherds
44PY394	5	A	2	15	1615	17	Small Finds/Architectural	Unidentified Nail	3	23.9			Ferrous metal; nail shanks
44PY394	5	A	2	15	1615	18	Small Finds/Architectural	Unidentified Metal	4	150.3			Ferrous metal; fragments
44PY394	5	B	3	16	1616	1	Historic Ceramic	Whiteware	1	0.7	1820	2000	Rim sherd, undecorated flatware
44PY394	5	B	3	16	1616	2	Glass	Unidentified Curved/Vessel Glass	1	0.9			Colorless glass fragment; small body sherd
44PY394	5	B	3	16	1616	3	Glass	Unidentified Curved/Vessel Glass	1	0.4			Aqua glass fragment; small body sherd
44PY394	5	B	3	16	1616	4	Small Finds/Architectural	Window Glass	6	5.1			Aqua glass fragment; small fragment

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date		Comments
44PY394	5	B	3	16	1616	5	Small Finds/Architectural	Wire Nail	2	17.3	1880		Ferrous metal fragments; shank fragments
44PY394	5	C	4	17	1617	1	Historic Ceramic	Soft Paste Porcelain	1	0.4			Unidentified body sherd, undecorated
44PY394	5	C	4	17	1617	2	Glass	Unidentified Curved/Vessel Glass	1	0.3			Body sherd, aqua; small fragment
44PY398		SURFACE		23	1923	1	Historic Ceramic	Stoneware - Gray Salt Glazed	1				Body sherd; hollowware; exterior gray salt glazed; interior brown banded alkaline glaze
44PY398	j2	A		24	1924	1	Historic Ceramic	Ironstone	1		1840	2000	Body sherd; hollowware; undecorated surfaces
44PY398	j2	A		24	1924	2	Glass	Bottle	6				Brown bottle glass; body sherds; machine made
44PY398	j2	A		24	1924	3	Glass	Unidentified Curved/Vessel Glass	3				Colorless body sherds; unidentified manufacture; spalled
44PY398	j2	A		24	1924	4	Glass	Unidentified Curved/Vessel Glass	1				Colorless body sherd; embossed lettering partially visible; "..LA../4"
44PY398	j2	A		24	1924	5	Glass	Unidentified Curved/Vessel Glass	2				Olive glass; body sherds; unidentified manufacture
44PY398	j2	A		24	1924	6	Glass	Unidentified Curved/Vessel Glass	1				Aqua body sherd; very thin with elliptical bubbles; unidentified manufacture
44PY398	j2	A		24	1924	7	Small Finds/Architectural	Machine Cut Nail	1	9	1830		Ferrous metal; complete; corroded
44PY398	j2	A		24	1924	8	Small Finds/Architectural	Machine Cut Nail	1	3.2	1830		Ferrous metal; shank only; corroded
44PY398	j3	A		25	1925	1	Small Finds/Architectural	Unidentified Glass	3	1.9			Colorless glass fragments; frosted with a beveled edge; possible safety glass
44PY398	j4	A		26	1926	1	Glass	Bottle	1				Colorless finish fragment; external screw; machine made
44PY398	j4	A		26	1926	2	Glass	Unidentified Curved/Vessel Glass	8				Colorless body sherds; thick mold seam present
44PY398	j4	A		26	1926	3	Glass	Unidentified Curved/Vessel Glass	2				Aqua body sherds; unidentified manufacture
44PY398	j4	A		26	1926	4	Glass	Unidentified Curved/Vessel Glass	1				Body sherd; very thin; pale pink glass

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date	End Date	Comments
44PY398	j5	A		27	1927	1	Historic Ceramic	Ironstone	1		1840	2000	Base sherd; flatware; undecorated surfaces
44PY398	j5	A		27	1927	2	Historic Ceramic	Ironstone	3		1840	2000	Flatware body sherds; spalled; undecorated
44PY398	j5	A		27	1927	3	Historic Ceramic	Ironstone - Colored Glaze	1		1840	2000	Hollowware body sherd; interior undecorated; exterior solid light blue glaze
44PY398	j5	A		27	1927	4	Glass	Bottle	1				Colorless finish fragment; tooled prescription finish
44PY398	j5	A		27	1927	5	Glass	Bottle	1				Paneled bottle body sherd; aqua glass; unidentified manufacture
44PY398	j5	A		27	1927	6	Glass	Jar	3				Colorless finish fragments; external screw; machine made
44PY398	j5	A		27	1927	7	Glass	Unidentified Curved/Vessel Glass	1				Colorless body sherd; machine made mold seam present
44PY398	j5	A		27	1927	8	Glass	Unidentified Curved/Vessel Glass	9				Colorless body sherds; unidentified manufacture
44PY398	j5	A		27	1927	9	Glass	Tableware/General	1				Colorless pressed glass bowl fragment; rimsherd; ruffled rim
44PY398	j5	A		27	1927	10	Small Finds/Architectural	Wire Nail	1	5.6	1880		Ferrous metal; heavy concretions; complete
44PY398	j5	A		27	1927	11	Small Finds/Architectural	Wire Nail	5	6.5	1880		Ferrous metal; fragments; heavily corroded
44PY398	j5	A		27	1927	12	Small Finds/Architectural	Unidentified Nail	1	6.1			Ferrous metal; missing tip; heavy concretions
44PY398	1	SURFACE		28	1928	1	Historic Ceramic	Stoneware - Buff Salt Glazed - Bristol & Albany Type Slips	1		1880	1950	Large base fragment; possible crock; unglazed exterior base; exterior body Bristol; interior Albany glaze
44PY398	1	SURFACE		28	1928	2	Glass	Jar	1				Colorless jar finish fragment; melted; external screw or lug
44PY398	1	SURFACE		28	1928	3	Glass	Unidentified Curved/Vessel Glass	2				Colorless body sherds; machine made mold seam present
44PY398	1	A	1	29	1929	1	Historic Ceramic	Redware - Black Glaze	1				Very small body sherd; black shiny glaze on both surfaces; molded fragment
44PY398	1	A	1	29	1929	2	Historic Ceramic	Whiteware	4		1820	2000	Flatware base and body sherds; undecorated surfaces; plate

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date		Comments
44PY398	1	A	1	29	1929	3	Historic Ceramic	Whiteware - Transfer Printed - Brown	1		1820	1915	Flatware rimsherd; scalloped rim; interior brown transfer print of filigree motif; exterior undecorated
44PY398	1	A	1	29	1929	4	Historic Ceramic	Whiteware - Transfer Printed - Clobbered/Filled in	6		1820	1915	Hollowware rim, body, and base sherds; interior brown floral transfer print clobbered in with yellow, green and blue; outward flared rim; exterior undecorated
44PY398	1	A	1	29	1929	5	Historic Ceramic	Ironstone	3		1840	2000	Hollowware rimsherds; straight rim; mend; undecorated surfaces
44PY398	1	A	1	29	1929	6	Historic Ceramic	Ironstone	6		1840	2000	Hollowware body sherds; undecorated surfaces; partially spalled fragments
44PY398	1	A	1	29	1929	7	Historic Ceramic	Ironstone - Embossed Body	4		1840	2000	Hollowware body and base fragments; very thick; molded horizontal ribs throughout body; no surface decoration
44PY398	1	A	1	29	1929	8	Historic Ceramic	Ironstone - Embossed Body	1		1840	2000	Unidentified tableware; small fragment; embossed; no surface decoration
44PY398	1	A	1	29	1929	9	Historic Ceramic	Ironstone - Decal - Overglaze	1		1880	2000	Hollowware body sherd; exterior gray decal pinstripe and floral motif; interior undecorated
44PY398	1	A	1	29	1929	10	Historic Ceramic	Ironstone - Colored Glaze	1		1840	2000	Unidentified tableware; robin's egg blue glaze on both surfaces; no crazing
44PY398	1	A	1	29	1929	11	Historic Ceramic	Stoneware - Buff Salt Glazed - Bristol & Albany Type Slips	7		1880	1950	Very large hollowware base and body sherds; most mend; interior Albany glaze, exterior body Bristol glaze; exterior of base is buff
44PY398	1	A	1	29	1929	12	Historic Ceramic	Hard Paste Porcelain	2				Hollowware body sherds; no surface decoration; molded, unidentified body shape; possible strainer hole present
44PY398	1	A	1	29	1929	13	Historic Ceramic	Hard Paste Porcelain - Biscuit	1				Flat fragment; interior and exterior bisque; no decoration
44PY398	1	A	1	29	1929	14	Glass	Bottle	4				Colorless finish fragments; mend to whole finish; extreme outward flare, no cap seat, but possible milk bottle finish
44PY398	1	A	1	29	1929	15	Glass	Condiment Bottle/Jar	3				Colorless base fragments; machine made; Owens-Illinois makers mark; plant code 3; base embossed "[D]uke's" in script, Duke's mayonnaise jar
44PY398	1	A	1	29	1929	16	Glass	Jar	2				Colorless base fragments; thick; machine made
44PY398	1	A	1	29	1929	17	Glass	Jar	11				Colorless jar body sherds; embossed lettering; Ball Mason Jar
44PY398	1	A	1	29	1929	18	Glass	Jar	4				Colorless finish fragments; external screw; machine made
44PY398	1	A	1	29	1929	19	Glass	Jar	7				Colorless finish fragments; wide mouth jar; external screw finish; machine made

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date	Comments
44PY398	1	A	1	29	1929	20	Glass	Jar	9			Colorless finish fragments; burned; external screw finish; machine made
44PY398	1	A	1	29	1929	21	Glass	Unidentified Bottle/Jar	9			Colorless base fragments; stippled; machine made; code "D2" visible on base
44PY398	1	A	1	29	1929	22	Glass	Unidentified Bottle/Jar	1			Colorless base fragment; machine made mold seam present; small diameter
44PY398	1	A	1	29	1929	23	Glass	Unidentified Bottle/Jar	3			Colorless base fragments; machine made; embossed plant code partially visible; thin
44PY398	1	A	1	29	1929	24	Glass	Unidentified Bottle/Jar	5			Colorless shoulder and body fragments; machine made; large container with vertical molded ribs; possible condiment bottle/jar
44PY398	1	A	1	29	1929	25	Glass	Unidentified Bottle/Jar	22			Colorless body fragments; thick vertical line embossed; machine made
44PY398	1	A	1	29	1929	26	Glass	Unidentified Bottle/Jar	21			Colorless body fragments; machine made with embossed lettering (most unreadable)
44PY398	1	A	1	29	1929	27	Glass	Unidentified Bottle/Jar	1			Colorless panel fragment; embossed lettering "..CUPS.." machine made
44PY398	1	A	1	29	1929	28	Glass	Unidentified Bottle/Jar	3			Colorless body fragments; molded vertical ribs; machine made
44PY398	1	A	1	29	1929	29	Glass	Unidentified Bottle/Jar	5			Colorless body fragments; possible panel bottle; parallel embossed lines; machine made
44PY398	1	A	1	29	1929	30	Glass	Unidentified Curved/Vessel Glass	###			Colorless body and shoulder fragments; machine made glass
44PY398	1	A	1	29	1929	31	Glass	Unidentified Curved/Vessel Glass	9			Thin colorless glass fragments; possible vial; base and body sherds present; unidentified manufacture
44PY398	1	A	1	29	1929	32	Glass	Unidentified Curved/Vessel Glass	17			Brown body sherds; some fairly flat, possible flask fragments; machine made
44PY398	1	A	1	29	1929	33	Glass	Unidentified Curved/Vessel Glass	2			Aqua body sherds; machine made
44PY398	1	A	1	29	1929	34	Glass	Tumbler	1			Colorless tumbler rim; rouletted band; machine made; straight rim
44PY398	1	A	1	29	1929	35	Glass	Tableware/General	2			Milkglass cup/vase rimsherds; molded body; gold band around straight rim; machine made
44PY398	1	A	1	29	1929	36	Glass	Tableware/General	4			Thick milkglass fragments; hollowware, possible bowl; base and body sherds present; machine made

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date	Comments
44PY398	1	A	1	29	1929	37	Small Finds/Architectural	Window Glass	39	63.3		Aqua and colorless flat glass fragments
44PY398	1	A	1	29	1929	38	Small Finds/Architectural	Window Glass	32	49.5		Aqua flat glass fragments with one frosted side
44PY398	1	A	1	29	1929	39	Small Finds/Architectural	Jar Lid	7	17.7		Milkglass jar liner fragments; machine made; "..ZINC CAP"
44PY398	1	A	1	29	1929	40	Small Finds/Architectural	Machine Cut Nail	2	5.8	1830	Ferrous metal; fragments; corroded
44PY398	1	A	1	29	1929	41	Small Finds/Architectural	Wire Nail	9	61.3	1880	Ferrous metal; complete; corroded
44PY398	1	A	1	29	1929	42	Small Finds/Architectural	Wire Nail	6	12.8	1880	Ferrous metal; fragments; corroded
44PY398	1	A	1	29	1929	43	Small Finds/Architectural	Unidentified Nail	2	4.9		Ferrous metal; fragments; corroded with large concretions
44PY398	1	A	1	29	1929	44	Small Finds/Architectural	Screw	1	5.4		Ferrous metal; complete
44PY398	1	A	1	29	1929	45	Small Finds/Architectural	Can Key	1	3.2	1858	Ferrous metal sardine can key; complete
44PY398	1	A	1	29	1929	46	Small Finds/Architectural	Screw Top Jar Lid	6	40.4		Ferrous metal jar lid; nearly complete
44PY398	1	A	1	29	1929	47	Small Finds/Architectural	U.S. Penny	1	3		Whole U.S. Penny, 1946
44PY398	1	A	1	29	1929	48	Small Finds/Architectural	Cartridge & Bullet	1	2.1		.22 caliber; corroded bullet; no headstamp
44PY398	1	A	1	29	1929	49	Small Finds/Architectural	Cartridge Casing - Unidentified	1	2.9		Base fragment; unreadable headstamp; corroded brass
44PY398	1	A	1	29	1929	50	Small Finds/Architectural	Miscellaneous Electrical Hardware	1	10.7		Bakelite capacitor; partially readable text "ELMENCO"
44PY398	1	A	1	29	1929	51	Small Finds/Architectural	Grommet	5	2.6		Possibly aluminum, light metal grommets; fragments
44PY398	1	A	1	29	1929	52	Small Finds/Architectural	Unidentified Metal	1	250.3		Thick ferrous metal bar; flat
44PY398	1	A	1	29	1929	53	Small Finds/Architectural	Unidentified Metal	2	11.1		Ferrous metal fragments; unidentified

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date		Comments
44PY398	1	A	1	29	1929	54	Small Finds/Architectural	Plastic Button	2	1.1	1930		Plastic round buttons; 4 holes; complete
44PY398	1	A	1	29	1929	55	Small Finds/Architectural	Token	1	0.5			Yellow hard plastic token
44PY398	1	A	1	29	1929	56	Small Finds/Architectural	Gasket	1	1.8			Hard rubber gasket; complete
44PY398	1	A	1	29	1929	57	Small Finds/Architectural	Unidentified Plastic	4	0.9	1930		Colorless hard plastic fragments
44PY398	2	SURFACE		30	1930	1	Glass	Unidentified Bottle/Jar	3				Mend; colorless glass; nearly whole (missing base) small bottle; machine made mold seam; wide bead finish, possibly had a cork; medicinal/condiment?
44PY398	2	SURFACE		30	1930	2	Glass	Unidentified Curved/Vessel Glass	1				Aqua body sherd; machine made glass
44PY398	2	A	1	31	1931	1	Historic Ceramic	Whiteware	1		1820	2000	Flatware base sherd; undecorated surfaces; no makers mark
44PY398	2	A	1	31	1931	2	Historic Ceramic	Stoneware - Gray Salt Glazed w/ Handpainted Decoration	1				Large hollowware body sherd; exterior gray salt glazed with blue decoration; interior unglazed; painted slip with wheel marks
44PY398	2	A	1	31	1931	3	Glass	Unidentified Curved/Vessel Glass	6				Colorless body sherds; machine made
44PY398	2	A	1	31	1931	4	Glass	Unidentified Curved/Vessel Glass	1				Colorless body sherd; sharp corner, possible small paneled bottle; unidentified manufacture
44PY398	2	A	1	31	1931	5	Glass	Unidentified Curved/Vessel Glass	1				Small olive body sherd; unidentified manufacture
44PY398	2	A	1	31	1931	6	Glass	Unidentified Curved/Vessel Glass	1				Aqua spall fragment
44PY398	2	A	1	31	1931	7	Small Finds/Architectural	Window Glass	2	2.7			Aqua flat glass fragments
44PY398	2	A	1	31	1931	8	Small Finds/Architectural	Figurine	1	4.5			Bisque porcelain figure fragment; handpainted brown bow; molded
44PY398	2	A	1	31	1931	9	Lithics	Biface Reduction Flake	1	1			Gray translucent chert; cortex and heating absent; bulb, platform, and eraillure scar present
44PY398	2	A	1	31	1931	10	Floral	Charred Wood	1	0.1			Very small fragment of charred wood; fragile
44PY398	2	B	2	32	1932	1	Historic Ceramic	Whiteware - Overglaze Handpainted	1		1820	2000	Hollowware rimsherd; interior red band painted around straight rim; exterior undecorated

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date	End Date	Comments
44PY398	2	B	2	32	1932	2	Historic Ceramic	Whiteware - Underglaze Handpainted	1		1820	2000	Hollowware body sherd; exterior green floral motif; interior undecorated
44PY398	2	B	2	32	1932	3	Historic Ceramic	Whiteware - Sponged	1		1820	1930	Flatware rimsherd; interior blue sponge pattern; exterior undecorated; straight rim
44PY398	2	B	2	32	1932	4	Historic Ceramic	Ironstone	1		1840	2000	Unidentified tableware base sherd/footring; undecorated surfaces; small diameter footring
44PY398	2	B	2	32	1932	5	Glass	Bottle	1				Olive bottle base/push up fragment; heavy patina; mold- or free-blown
44PY398	2	B	2	32	1932	6	Glass	Unidentified Curved/Vessel Glass	2				Colorless body sherds; thick glass; unidentified manufacture
44PY398	2	B	2	32	1932	7	Small Finds/Architectural	Machine Cut Nail	2	9.5	1830		Ferrous metal; corroded; complete
44PY398	2	B	2	32	1932	8	Small Finds/Architectural	Machine Cut Nail	2	5.2	1830		Ferrous metal; missing tips; corroded
44PY398	3	A	1	33	1933	1	Historic Ceramic	Whiteware	4		1820	2000	Flatware body sherds; heavily spalled; no decoration visible
44PY398	3	A	1	33	1933	2	Glass	Bottle	1				Possible pharmaceutical bottle; tooled prescription finish; aqua
44PY398	3	A	1	33	1933	3	Glass	Unidentified Bottle/Jar	1				Colorless finish fragment; external screw; machine made
44PY398	3	A	1	33	1933	4	Glass	Unidentified Curved/Vessel Glass	1				Colorless base fragment; unidentified manufacture
44PY398	3	A	1	33	1933	5	Glass	Unidentified Curved/Vessel Glass	1				Pale aqua body sherd; unidentified manufacture
44PY398	3	B	2	34	1934	1	Historic Ceramic	Whiteware	4		1820	2000	Flatware body sherds; heavily spalled; undecorated surfaces
44PY398	3	B	2	34	1934	2	Historic Ceramic	Ironstone	1		1840	2000	Hollowware body sherd; undecorated surfaces
44PY398	3	B	2	34	1934	3	Glass	Unidentified Curved/Vessel Glass	4				Colorless body sherds; unidentified manufacture
44PY398	3	B	2	34	1934	4	Glass	Unidentified Curved/Vessel Glass	1				Slightly solarized body sherd; embossed dots present; unidentified manufacture
44PY398	3	B	2	34	1934	5	Glass	Unidentified Curved/Vessel Glass	1				Aqua body sherd; machine made

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date		Comments
44PY398	3	B	2	34	1934	6	Glass	Tableware/General	1				Possible cup rim; colorless glass; two stippled bands around rim; machine made
44PY398	3	B	2	34	1934	7	Glass	Unidentified Melted Glass	2	1.9			Solarized melted glass fragments
44PY398	3	B	2	34	1934	8	Small Finds/Architectural	Wire Nail	1	2.2	1880		Ferrous metal; fragment; corroded with concretions
44PY398	3	B	2	34	1934	9	Small Finds/Architectural	Unidentified Nail	1	2			Ferrous metal; fragment; encased in concretions
44PY398	3	B	2	34	1934	10	Small Finds/Architectural	Battery Part	2	2.5			Mend; graphite rod, likely battery core
44PY398	3	B	2	34	1934	11	Small Finds/Architectural	Unidentified Material	1	1.8			Possible scorched glass; lightweight; slag-like
44PY398	6	SURFACE		35	1935	1	Historic Ceramic	Ironstone - Decal - Overglaze	2		1880	2000	Hollowware body and base sherds; interior orange floral decal; exterior undecorated
44PY398	6	SURFACE		35	1935	2	Glass	Jar	1				Colorless finish fragment; external screw; machine made
44PY398	6	SURFACE		35	1935	3	Glass	Unidentified Bottle/Jar	1				Amber shoulder fragment; molded vertical lines; unidentified manufacture
44PY398	6	SURFACE		35	1935	4	Glass	Unidentified Curved/Vessel Glass	2				Colorless body sherds; machine made; small amount of stippling visible
44PY398	6	A	1	36	1936	1	Historic Ceramic	Whiteware	1		1820	2000	Flatware base fragment; plate; undecorated surfaces
44PY398	6	A	1	36	1936	2	Historic Ceramic	Whiteware - Decal - Overglaze	1		1880	2000	Thin flatware body sherd; one surface floral decal decorated; opposite surface undecorated
44PY398	6	A	1	36	1936	3	Historic Ceramic	Whiteware - Transfer Printed - Clobbered/Filled in	7		1820	1915	Cross mends with 1929.4; hollowware rim, body, and base sherds; interior brown floral and landscape transfer print clobbered in with yellow and green; outward flared rim; exterior undecorated
44PY398	6	A	1	36	1936	4	Historic Ceramic	Ironstone	5		1840	2000	Cross mends with 1929.5; mend; Flatware rim and body sherds; straight rim; undecorated surfaces
44PY398	6	A	1	36	1936	5	Historic Ceramic	Ironstone	2		1840	2000	Cross mends with 1929.7; Thick base sherds; undeocrated; flatware
44PY398	6	A	1	36	1936	6	Historic Ceramic	Ironstone - Decal - Overglaze	3		1880	2000	Cross mends with 1929.9; Rim and body sherds; two mend; exterior green and pink floral decal; interior undecorated; cup form
44PY398	6	A	1	36	1936	7	Historic Ceramic	Ironstone - Decal - Overglaze	1		1880	2000	Flatware rimsherd; interior floral decal; exterior undecorated; lightly scalloped; small fragment

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date		Comments
44PY398	6	A	1	36	1936	8	Historic Ceramic	Ironstone - Decal - Overglaze	1		1880	2000	Hollowware body sherd; floral decal on exterior; interior undecorated
44PY398	6	A	1	36	1936	9	Historic Ceramic	Ironstone - Decal - Overglaze	1		1880	2000	Cross mends with 1935.1; hollowware base sherd; interior orange floral decal; exterior undecorated
44PY398	6	A	1	36	1936	10	Historic Ceramic	Hard Paste Porcelain	1				Cross mends with 1929.12; molded body sherd; unidentified form; undecorated surfaces
44PY398	6	A	1	36	1936	11	Glass	Bottle	1				Amber bottle body fragment; machine made; no markings
44PY398	6	A	1	36	1936	12	Glass	Jar	16				Colorless body sherds; Ball Mason jar fragments; machine made; embossed lettering
44PY398	6	A	1	36	1936	13	Glass	Jar	3				Colorless finish fragments; wide mouth jar; machine made; external screw finish
44PY398	6	A	1	36	1936	14	Glass	Jar	2				Colorless finish fragments; machine made; external screw finish
44PY398	6	A	1	36	1936	15	Glass	Pharmaceutical	1				Aqua panel body sherd; embossed "…RLAIN'[S] / REMEDY.." unidentified manufacture
44PY398	6	A	1	36	1936	16	Glass	Unidentified Bottle/Jar	5				Colorless base sherds; likely a jar; stippled base; machine made
44PY398	6	A	1	36	1936	17	Glass	Unidentified Bottle/Jar	5				Colorless base sherds; likely a jar, large diameter; machine made
44PY398	6	A	1	36	1936	18	Glass	Unidentified Bottle/Jar	1				Colorless base fragment; oval base; machine made suction scar
44PY398	6	A	1	36	1936	19	Glass	Unidentified Bottle/Jar	2				Colorless body sherds, possible flask; machine made; embossed "FEDERAL LAW [PROHIBITS] / [R]E-USE OF TH[IS BOTTLE]"
44PY398	6	A	1	36	1936	20	Glass	Unidentified Bottle/Jar	7				Colorless body sherds; embossed lines; machine made
44PY398	6	A	1	36	1936	21	Glass	Unidentified Bottle/Jar	17				Colorless body sherds; embossed parallel lines; embossed lettering "; machine made
44PY398	6	A	1	36	1936	22	Glass	Unidentified Bottle/Jar	4				Brown body and shoulder sherds; machine made; embossed lettering partially visible
44PY398	6	A	1	36	1936	23	Glass	Unidentified Bottle/Jar	3				Colorless finish fragments; narrow diameter mouth, external screw finish; machine made
44PY398	6	A	1	36	1936	24	Glass	Unidentified Curved/Vessel Glass	###				Colorless body sherds; machine made glass; unmarked fragments

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date	Comments
44PY398	6	A	1	36	1936	25	Glass	Unidentified Curved/Vessel Glass	6			Aqua body sherds; likely machine made (one has seam); small fragments
44PY398	6	A	1	36	1936	26	Glass	Tableware/General	6			Cross mend with 1929.36; thick milkglass hollowware fragments; possible bowl; body sherds; machine made
44PY398	6	A	1	36	1936	27	Glass	Unidentified Glass	1			Colorless glass fragment; thick with frosted exterior; possible tableware rimsherd
44PY398	6	A	1	36	1936	28	Glass	Unidentified Glass	1			Very thin milkglass hollowware fragment; body sherd; undecorated
44PY398	6	A	1	36	1936	29	Small Finds/Architectural	Window Glass	35	29.3		Aqua flat glass fragments
44PY398	6	A	1	36	1936	30	Small Finds/Architectural	Jar Lid	8	15.1		Milkglass jar liner fragments; machine made; no lettering visible
44PY398	6	A	1	36	1936	31	Small Finds/Architectural	Machine Cut Nail	11	55.4	1830	Ferrous metal; many are complete; one clinched; corroded
44PY398	6	A	1	36	1936	32	Small Finds/Architectural	Wire Nail	6	21.1	1880	Ferrous metal; complete; corroded
44PY398	6	A	1	36	1936	33	Small Finds/Architectural	Screw	2	13.1		Ferrous metal; round head, threaded screws; corroded; complete
44PY398	6	A	1	36	1936	34	Small Finds/Architectural	Fence Staple	1	1.6		Ferrous metal; fragment; corroded
44PY398	6	A	1	36	1936	35	Small Finds/Architectural	Spring	1	41.8		Ferrous metal spring with hooks on either end; ferrous metal; complete; large concretions
44PY398	6	A	1	36	1936	36	Small Finds/Architectural	Chain Link	1	5.9		Ferrous metal D-ring; complete; concretions
44PY398	6	A	1	36	1936	37	Small Finds/Architectural	Miscellaneous Wire	1	3.3	1831	Ferrous metal; thin wire fragment, one end bent to a hook
44PY398	6	A	1	36	1936	38	Small Finds/Architectural	U.S. Penny	1	3		Complete U.S. "Wheat" penny; dated 1935
44PY398	6	A	1	36	1936	39	Small Finds/Architectural	Glass Marble (Unknown Manufacture)	1	7.5		Olive green and white swirl glass marble; unidentified manufacture; complete; several impact marks from play
44PY398	6	A	1	36	1936	40	Small Finds/Architectural	Cartridge Casing - 22 Caliber	2	0.6		Brass cartridge heads; rimfire; "U" headstamp (Remington); fragments
44PY398	6	A	1	36	1936	41	Small Finds/Architectural	Cartridge Casing - 22 Caliber	1	0.7		Nickel plated brass cartridge head; headstamp reads "U / HI SPEED"; rimfire

Site No.	STP/Unit	Stratum	Level	Cat #	Field #	Spec #	Class	Artifact Description:	Count	Weight (g)	Begin Date - End Date	Comments
44PY398	6	A	1	36	1936	42	Small Finds/Architectural	Shotgun Shell	1	2.7		Brass shell head; headstamp reads "WESTERN/XPERT/No. 12/MADE IN USA"
44PY398	6	A	1	36	1936	43	Small Finds/Architectural	Metal Can/Container	4	8.2		Ferrous metal fragments; possible screw top lid for a jar; heavily corroded
44PY398	6	A	1	36	1936	44	Small Finds/Architectural	Twist Cap	1	2.8		Aluminum screw top lid; complete; no brand name visible
44PY398	6	A	1	36	1936	45	Small Finds/Architectural	Unidentified Button	1	1.4		Complete button disc; not sew-through; possible plastic disc with a thin pink plastic shell that is peeling off
44PY398	6	A	1	36	1936	46	Small Finds/Architectural	Plastic Button	1	0.6	1930	Black plastic button; sew through, 4 holes; anchor motif stamped on face
44PY398	6	A	1	36	1936	47	Small Finds/Architectural	Unidentified Metal	2	9.7		Ferrous metal round disks; possible buttons or caps; heavily corroded
44PY398	6	A	1	36	1936	48	Small Finds/Architectural	Bottle Opener	1	25.3		Ferrous metal bar with a large central hole; heavily corroded
44PY398	6	A	1	36	1936	49	Small Finds/Architectural	Unidentified Closure	1	0.8		Aluminum fragment; possible bottle seal/closure; crumpled
44PY398	6	A	1	36	1936	50	Small Finds/Architectural	Unidentified Rubber	5	52.7	1839	Hard black rubber seal fragments; thick
44PY398	6	A	1	36	1936	51	Small Finds/Architectural	Unidentified Plastic	18	11.9	1930	Various hard plastic fragments; 3 red; 9 colorless; 5 white; 1 yellow
44PY398	6	A	1	36	1936	52	Faunal	Large Mammal	9	40.5		Some mend; large rib fragments; possible cow; unmodified
44PY398	6	B	2	37	1937	1	Glass	Unidentified Curved/Vessel Glass	2			Colorless body/shoulder sherds; unidentified manufacture
44PY398	6	B	2	37	1937	2	Small Finds/Architectural	Window Glass	1	0.9		Aqua flat glass fragment
44PY398	6	B	2	37	1937	3	Small Finds/Architectural	Machine Cut Nail	1	16.1	1830	Ferrous metal; complete; encased in concretions

COMMONWEALTH of VIRGINIA

Matthew Strickler
Secretary of Natural Resources

Department of Historic Resources
2801 Kensington Avenue, Richmond, Virginia 23221

Julie V. Langan
Director

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December 30, 2020

Ms. Hope E. Luhman
Louis Berger - A WSP Company
1100 Boulders Parkway, Suite 720
Richmond, VA 23225

Re: SoVA Megasite – Berry Hill Industrial Park Lots 1-5 and 8-9
Pittsylvania County, Virginia
DHR File No. 2012-0023

Dear Ms. Luhman:

The Department of Historic Resources (DHR) has received your request for comments on the report entitled *National Register Survey and Evaluations of Archaeological Sites and Evaluations of Architectural Resources in Lots 1,2,3,4,5,8 and 9, Southern Virginia Megasite at Berry Hill* prepared by WSP in support of the SoVA Megasite located on Lots 1-5 and 8-9 of the Berry Hill Industrial Park. The project proponent seeks site certification through Quest's Industrial Site Evaluations and Certification Program. We have not been notified by any Federal agency of their involvement in this project or the applicability of Section 106 of the National Historic Preservation Act. As there is currently no federal action, DHR has no statutory authority to review this project. However, if a federal action is defined, for instance if federal funds or assistance will be utilized or if permits will be required from the U.S. Army Corps of Engineers or any other regulatory agencies, it will be necessary to enter into formal consultation with our office at a later date. We provide the following comments as technical assistance in the site certification process and reserve the right to provide additional comments under Section 106, if warranted.

The report documents the evaluation of twenty-six (26) previously recorded archaeological sites and two previously recorded architectural resources. Seven (7) sites (44PY0026, 44PY0353, 44PY0354, 44PY0355, 44PY0356, 44PY0357, 44PY0370) are described as low density prehistoric scatters consisting of mostly non-diagnostic lithic debitage. Two (2) sites (44PY0395 and 44PY0397) are multicomponent sites consisting of low density prehistoric lithic scatters and evidence of 19th to mid-20th century occupation. The remaining seventeen (17) sites (44PY0329, 44PY0331, 44PY0332, 44PY333, 44PY0334, 44PY0373, 44PY0374, 44PY0375, 44PY0376, 33PY0380, 44PY0382, 44PY0386, 44PY0394, 44PY0396, 44PY0398, 44PY0454, and 44PY0455) consist of structural remnants and historic artifact assemblages dating from the 19th to mid-20th century. These sites likely represent sharecropper or tenant occupations and/or agricultural support structures. Two architectural resources (DHR Nos. 071-5313 and 071-5333) are also evaluated for eligibility to be listed in the National Register of Historic Places (NRHP)

WSP completed Phase II evaluations for the following sites: 44PY0380, 44PY0382, 44PY386, 44PY0356, 44PY0373, 44PY0374, 44PY0375, 44PY0376, 44PY0454, and 44PY0455. WSP concluded that the previous testing at 44PY0331 and 44PY0332 is sufficient, and conducted additional archival research to address DHR previous comments (dated 12-09-2019). WSP recommends all twenty-six sites as not eligible for listing in the NRHP.

Based on the submitted information, DHR agrees the following resources are *not eligible* for listing in the NRHP: **44PY0026, 44PY0329, 44PY0353, 44PY0354, 44PY0355, 44PY0357, 44PY0370, 44PY0395 44PY0396, 44PY0397, 071-5313** and **071-5333.** DHR recommends that the following archaeological sites be considered *potentially eligible* for listing the NRHP and additional archaeological testing should be conducted to determine the eligibility of the sites: **44PY0394, 44PY0398, 44PY0333, 44PY0334.** Please see the attached table for a list of DHR's recommendations.

On December 28, 2020, the archaeological subcommittee of DHR's National Register Eligibility Evaluation Team met to consider the eligibility of sites 44PY0331, 44PY0332, 44PY0380, 44PY0382, 44PY386, 44PY0356, 44PY0373, 44PY0374, 44PY0375, 44PY0376, 44PY0454, and 44PY0455. Based on the information provided, the committee agrees with the recommendations for **44PY0356** and **44PY0380,** and believes these sites to be *not eligible* for listing in the NRHP.

Based on the information provided, the Evaluation Team was not able to reach a consensus on the NRHP eligibility of sites 44PY0331, 44PY0332, 44PY0382, 44PY386, 44PY0373, 44PY0374, 44PY0375, 44PY0376, 44PY0454, and 44PY0455. Given that building foundations and other features were often found intact, the Evaluation Team does not feel the report adequately demonstrates disturbance or lack of integrity at these sites. While many of the sites appear to not be eligible for listing *individually* under criterion D, the Evaluation Team believes the sites are significant *collectively* as a potential archaeological district defined by a rare collection of post-emancipation African American domestic/agricultural tenant farmer sites clearly associated with the Hairston Plantations of Berry Hill and Oak Hill.

This potential district appears to be largely unaltered by modern development and encroachment, which is a rarity for similar late 19th to early 20th century rural Black communities in Virginia, and could provide important research information related to the cultural and historic landscape of a former plantation in the period of transition to tenant farming and use of space by African American and white tenant farmers during the late 19th to 20th century. Cumulatively, they present opportunities for better understanding the post-Civil War choices and experiences of a diverse population of sharecroppers, tenant farmers, and renters. The Hairston family maintains an extensive archives that may be useful for understanding changes in land use, and the relationships between the property owners and the occupants of these sites. Through more in-depth research it may be possible to identify individuals or families associated with the different sites. Comparative study of the distinct assemblages and cultural features associated with these sites may provide a foundational dataset for elucidating patterned and divergent practices of an underrepresented population and complex of relationships in the context of the post-emancipation bright leaf tobacco industry and its twentieth century decline. Given the industry's influence in regional social dynamics and the global economy, it might be argued that an understanding of these themes is of local, state, and national significance.

Please keep in mind that DHR is unable to comment on the potential effects of this project on historic properties. If a project were to require state permits or federal permits, licenses, funds, loans, grants, or assistance for development, we would recommend to the federal or state agency or agencies that:

- Additional or supplemental phase I investigations may be needed within the project area. Further consultation with DHR is recommended.
- For those resources for which NRHP eligibility remains *not evaluated*, additional investigations may be necessary to provide NRHP recommendations or to supplement the Phase I survey. Further consultation with DHR is recommended.
- For resources recommended *potentially eligible*, DHR recommends avoidance or Phase II evaluation to formally determine their eligibility for listing in the NRHP. Further consultation with DHR is recommended.
- For resources recommended as *eligible* for listing in the NRHP, DHR recommends avoidance or mitigation of effects. Further consultation with DHR is recommended.
- Consultation with stakeholders, including descendant communities, may provide additional information in the evaluation of the historic significance of identified resources.
- Effects to architectural resources outside of the proposed site certification boundaries should also be considered for future undertakings. Further consultation with DHR is recommended.
- Per DHR's *Survey Guidelines*, resources for which existing survey data is five years of age or older may need to be resurveyed. Further consultation with DHR is recommended.

Thank you for seeking our comments on this project. If you have any questions at this time, please do not hesitate to contact me at jennifer.bellville-marrion@dhr.virginia.gov.

Sincerely,

Jenny Bellville-Marrion, Project Review Archaeologist
Review and Compliance Division

ATTACHMENT
December 29, 2020
DHR File No. 2012-0023

Evaluated Sites For Lots 1-5, 8, and 9 (Bold indicates Phase II Evaluation)

DHR ID #	Consultant Recommendations (WSP 2020)	DHR Comments
Lot 1		
44PY0370	Not Eligible	Concur; Not Eligible
44PY0396	Not Eligible	Concur; Not Eligible
44PY0397	Not Eligible	Concur; Not Eligible
44PY0398	Not Eligible	Potentially Eligible; Avoidance or Phase II testing
Lot 2		
44PY0394	Not Eligible	Potentially Eligible; Avoidance or Phase II testing.
44PY0395	Not Eligible	Concur; Not Eligible
Lot 3		
44PY0329	Not Eligible	Concur; Not Eligible
44PY0331	**Not Eligible**	**Potentially Eligible as District**
44PY0332	**Not Eligible**	**Potentially Eligible as District**
44PY0333	Not Eligible	Potentially Eligible; Avoidance or Phase II testing
44PY0334	Not Eligible	Potentially Eligible; Avoidance or Phase II testing
Lot 4		
44PY0380	**Not Eligible – (not relocated)**	**Concur; Not eligible (if location is correct)**
44PY0382	**Not Eligible**	**Potentially Eligible as District**
Lot 5		
44PY0386	**Not Eligible**	**Potentially Eligible as District**
Lot 8		
44PY0026	Not Eligible	Concur; Not Eligible
44PY0353	Not Eligible	Concur; Not Eligible
44PY0356	**Not Eligible**	**Concur; Not Eligible**
44PY0373	**Not Eligible**	**Potentially Eligible as District**
44PY0374	**Not Eligible**	**Potentially Eligible as District**
44PY0375	**Not Eligible**	**Potentially Eligible as District**
44PY0454	**Not Eligible**	**Potentially Eligible as District**
44PY0455	**Not Eligible**	**Potentially Eligible as District**
Lot 9		
44PY0354	Not Eligible	Concur; Not Eligible
44PY0355	Not Eligible	Concur; Not Eligible
44PY0357	Not Eligible	Concur; Not Eligible
44PY0376	**Not Eligible**	**Potentially Eligible as District**
Architecture Resources		
071-5313	Not Eligible	Concur; Not Eligible
071-5333	Not Eligible	Concur; Not Eligible

DEPARTMENT OF THE ARMY
US ARMY CORPS OF ENGINEERS
NORFOLK DISTRICT
FORT NORFOLK
803 FRONT STREET
NORFOLK VA 23510-1011

April 5, 2021

APPROVED JURISDICTIONAL DETERMINATION

Western Virginia Regulatory Section
NAO 2010-00423 (Overall Site)

Pittsylvania County
Berry Hill Industrial Park (Overall Site)
C/O Mr. Troy Shelton
Dewberry
551 Piney Forest Road
Danville, Virginia 24540

Dear Shelton:

This letter is regarding your request for an approved jurisdictional determination for waters of the U.S. (including wetlands) located at the Southern Virginia Mega-site at Berry Hill. The site is located near Berry Hill Road, Pittsylvania County, Virginia. This letter supersedes any previous determinations for the Berry Hill site.

An on-site jurisdictional determination (July 23, 2020, September 2, 2020) has found waters regulated under Section 404 of the Clean Water Act (33 U.S.C. 1344) on the property listed above. Both jurisdictional and non-jurisdictional features have been identified on the site. This letter shall serve to confirm the streams, as surveyed and shown on the map titled, "Southern Virginia Mega-site at Berry Hill - Overall Federal Jurisdiction", dated September 2, 2020 by Dewberry, are under Federal jurisdiction as well as those water features not under Federal jurisdiction.

Our basis for this determination is the application of the Corps' definition of waters of the United States. These waters are part of a tributary system to interstate waters (33 CFR 328.3 (a)) and have an ordinary high water mark. This letter is not confirming the Cowardin classifications of these aquatic resources.

The attached approved jurisdictional determination form shows the acreage/linear feet) of water features (both under Federal Jurisdiction and non-Federal jurisdiction) on the Berry Hill site. Any discharge of dredged and/or fill material into any non-Federally regulated will not require a Department of the Army permit. However, a permit may be required from the Virginia Department of Environmental Quality (DEQ) and we are notifying them by copy of this letter.

Discharges of dredged or fill material, including those associated with mechanized landclearing, into jurisdictional waters and/or wetlands on this site will require a Department of the Army permit and may require authorization by state and local authorities, including a Virginia Water Protection Permit from the Virginia Department of

Environmental Quality (DEQ), a permit from the Virginia Marine Resources Commission (VMRC) and/or a permit from your local wetlands board. This letter is a confirmation of the Corps jurisdiction for the waters on the subject property and does not authorize any work in these jurisdictional areas. Please obtain all required permits before starting work in the delineated waters/wetland areas.

This letter contains an approved jurisdictional determination for your subject site. If you object to this determination, you may request an administrative appeal under Corps regulations at 33 CFR Part 331. Enclosed you will find a Notification of Appeal Process (NAP) fact sheet and Request for Appeal (RFA) form. If you request to appeal this determination you must submit a completed RFA form to the North Atlantic Division Office at the following address:

ATTN:
Ms. Naomi J. Handell
Regulatory Program Manager (CENAD-PD-OR)
U.S. Army Corps of Engineers
Fort Hamilton Military Community
301 General Lee Avenue
Brooklyn, New York 11252-6700
Telephone number: (917) 789-4841
Naomi.J.Handell@usace.army.mil

In order for an RFA to be accepted by the Corps, the Corps must determine that it is complete, that it meets the criteria for appeal under 33 C.F.R. part 331.5, and that it has been received by the Division Office within 60 days of the date of the NAP. Should you decide to submit an RFA form, it must be received at the above address by June 5, 2021. It is not necessary to submit an RFA form to the Division office if you do not object to the determination in this letter.

This jurisdictional determination is valid for a period of five (5) years from the date of this letter unless new information warrants revision prior to the expiration date. If you have any questions, please contact me at Vincent.d.pero@usace.army.mil or at 757-297-0011

Sincerely,

Vincent D. Pero

Vincent D. Pero
Project Manager, Western Virginia
Regulatory Section

Enclosure(s)

Cc: VA-DEQ