

# Public Notice

U.S. Army Corps of Engineers, Norfolk District

April 18, 2006

CENAO-TS-REG  
06-R0764

## FEDERAL PUBLIC NOTICE

The District Engineer and the Virginia Department of Environmental Quality have received a prospectus to establish a compensatory wetland mitigation bank for Federal and State permits as described below:

### BANK SPONSOR

Vulcan Construction Materials, LP  
ATTN: Walter Beck  
5601 Ironbridge Parkway  
Chester, Virginia 23831

WATERWAY AND LOCATION OF THE PROPOSED WORK: The project (to be known as the Puddledock Environmental Bank) would be located on the Vulcan Materials Puddledock Sand and Gravel facility. This property is located to the north of Temple Avenue Extension (Route 144) and to the north and west of the Norfolk and Western rail line in Prince George County, Virginia. The property is adjacent to the Appomattox River, a tidal waterbody, and the stream subject to restoration is Harrison Branch, a tributary of the Appomattox.

PROPOSED WORK AND PURPOSE: The bank sponsor, Vulcan Construction Materials, LP, proposes to establish, design, construct, and operate a tidal and nontidal wetland compensatory mitigation bank ("mitigation bank") on approximately 55 acres of land in Prince George County, Virginia.

The purpose of the mitigation bank is to provide off-site compensatory mitigation for projects that result in unavoidable environmental impacts within the Bank's service area. The primary goal of the bank is to develop a comprehensive environmental bank composed of wetland creation, a forested upland/wetland matrix, stream, and buffer creation. It will be one of the only public freshwater tidal mitigation banks in central Virginia.

The sponsor has proposed for purposes of Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act, that the geographic service area of this mitigation bank would include the USGS Hydrologic Unit Codes known as "02080203," "02080205," "02080206," and "02080207", which generally comprise the James River and Appomattox basins.

Oversight of this mitigation bank will be by a group of federal and state agency representatives. This interagency oversight group will be known as the Mitigation Bank Review Team (MBRT). The Norfolk District of the U.S. Army Corps of Engineers shall chair the MBRT.

This mitigation bank may be one of a number of practicable options available to applicants to compensate for unavoidable wetland impacts associated with permits issued under the authority of Section 404 and 401 of the Clean Water Act (Public Law 95-217) in southeastern and central Virginia.

The actual approval of the use of this mitigation bank for a specific project is the decision of the Corps pursuant to Section 404 of the Clean Water Act and/or Section 10 of the Rivers and Harbors Act and by the Department of Environmental Quality pursuant to Section 401 of the Clean Water Act and Title 62.1 of the Code of Virginia. The Corps and the Department of Environmental Quality provide no guarantee that any particular individual or general permit will be granted authorization to use this mitigation bank to compensate for unavoidable wetland impacts associated with a proposed permit, even though compensatory mitigation may be available. Authorization for its use for specific projects may also be required from the local wetlands boards and/or the Virginia Marine Resources Commission.

AUTHORITY: A Public Notice is recommended pursuant to Federal Guidance for the Establishment, Use and Operation of Mitigation Banks (60 Federal Register Number 228).

FEDERAL EVALUATION OF PROPOSAL: The Corps of Engineers is soliciting comments from the public; Federal, state, and local agencies and officials; Indian Tribes; and other interested parties in order to consider and evaluate this proposed mitigation bank. **This is not an application for work in Waters of the United States.** The Corps of Engineers is evaluating this proposal and will consider any comments received. Comments are used to assess impacts on endangered species, historic properties, water quality, conservation, economics, aesthetics, general environmental concerns, wetlands, fish and wildlife values, flood hazards, flood plain values, land use classification, navigation, shoreline erosion and accretion, recreation, water supply and conservation, water quality, energy needs, safety, food and fiber production, mineral needs, and consideration of property ownership.

Preliminary review indicates that: (1) no environmental impact statement will be required; (2) conduct of work will affect no species listed as threatened or endangered under the Endangered Species Act of 1973 (PL 93-205); and (3) no cultural or historic resources considered eligible or potentially eligible for listing on the National Register of Historic Places will be affected. Additional information might change any of these preliminary findings.

COMMENT PERIOD: Comments on this project should be made in writing, addressed to the Norfolk District, Corps of Engineers (ATTN: Lesley Leonard, CENAO-TS-REG), 803 Front Street, Norfolk, Virginia 23510-1096, and should be received by the close of business on May 18, 2006.

If you have any questions about this project or the permit process, please call:

Lesley Leonard, (757) 201-7540

FOR THE DISTRICT COMMANDER:

Michael A. Schwinn  
Chief, Western Virginia  
Regulatory Section

Attachment: Drawings

# **VULCAN CONSTRUCTION MATERIALS, LP**

## **PUDDLEDOCK**

### **ENVIRONMENTAL BANK**

#### **PROSPECTUS**

Sponsor:

**Vulcan Construction Materials, LP**

Prepared and Managed by:

**Resource International, Ltd**

9560 Kings Charter Drive

Ashland, Virginia 23005

804-550-9200

September 13, 2005

## **I INTRODUCTION**

Vulcan Construction Materials, LP (Vulcan) will serve as bank sponsor for the Puddledock Environmental Bank (PDEB). PDEB will provide pre-approved Environmental Credits for use in the compensatory mitigation of unavoidable environmental impacts within an approved service area. The environmental credits proposed by the bank sponsor and managed by Resource International, Ltd. (Resource) will meet the guidelines, ratios and habitat success requirements of the U.S. Army Corp of Engineers, Virginia Department of Environmental Quality, US Fish and Wildlife Service and EPA Region III. The geographic limits of the bank's service area will be determined by the sponsor and the Mitigation Bank Review Team (MBRT) and will be authorized in the Mitigation Banking Instrument (MBI) approved by signatory agencies. The bank sponsor will request authorization for any activity requiring a Local, State, or Federal permit prior to permitted activity commencing.

Upon completion, PDEB will be managed to provide replacement functions and values for tidal and non-tidal wetland, stream, riparian and upland forested habitat ecosystems. The replacement systems will be managed for functional hydrologic and forest regimes representative of naturally occurring habitats found in the upper Appomattox River watershed. PDEB may provide preserved, enhanced, restored and newly created natural ecosystems. This diverse and dynamic upland/wetland complex will enhance supplemental water retention, promote infiltration, improve water quality and contribute to the headwater hydrology of the Appomattox River basin and more specifically Harrison Branch. PDEB will also create/improve indigenous upland forest to be used by wildlife as part of the natural systems on a larger scale and provide a natural corridor to the movement of wildlife to and from the Appomattox River from areas which are

now cut off by the mining activities. The bank will accomplish these goals by preserving and creating contiguous wetland and deciduous upland forest corridors and buffers along and adjacent Harrison Branch.

The PDEB site of approximately 55± acres is currently owned by Vulcan and available for initial environmental credit management. This site drains through mine workings and several mine pits before draining the Appomattox River and on to the James River, and ultimately the Chesapeake Bay. Harrison Branch as defined on the USGS topographic map can no longer be distinguished from the workings of the mine. The site includes approximately 5± acres of existing tidal/non-tidal forested wetlands along the Appomattox River. In addition Vulcan operates a Sand and Gravel mining operation which consists of approximately 1000± acres of active and previously mined upland and is located to the south and west of PDEB. The sponsor will work adjacent to the existing tidal/non-tidal wetlands in order to develop a diverse wetlands and upland buffers that will provide habitat for many species of plants and animals.

Habitats utilized for credits within the bank will be composed of creation of wetland, stream, riparian buffers, deciduous upland forest and other wildlife habitat. The sponsor, Vulcan, will implement a Bank Development Plan (BDP) that develops approximately nine (9) acres of non-tidal forested wetland credits, seven (7) acres of tidal emergent wetland credits and approximately 7,500 linear feet of waters of the U.S. The credits for waters of the U.S. will include credits for forested upland buffer and credits for an undetermined linear footage for the reconnection of intermittent/ephemeral side drainages associated with former location of Harrison Branch. The credits at the PDEB will be for use by authorized permits. These credits will target the associated long-term regulatory needs of the Appomattox and James River basins in the next five to ten years.

## **II SITE CHARACTERISTICS**

The Vulcan Puddle Dock Sand and Gravel Facility consists of approximately 1000 acres of active mining operation, which includes the approximately 55 acre proposed PDEB. The facility is located to the north of Temple Avenue Extension (Route 144) and to the north and west of the Norfolk and Western Rail Line in Prince George County, Virginia (Figures 1 and 2). The site includes an active Sand and Gravel operation, which includes several pits, sand and gravel plant, and associated offices contained within trailers. The site has been used for mining since at least the late 1930s.

Site visits by Resource, previous geotechnical studies, and published NRCS documents have identified that soils within the proposed banking area include 12 to 14 inches of topsoil. The subsoil consists of 4 to 13 feet of “sand to a gravelly sand” and “Aquia Formation glauconitic sand.” Site grades range from approximately 5 feet mean seal level (msl) to 40 feet msl with the majority of the site sloping predominantly northward toward the confluence of Harrison Branch and the Appomattox River. Surface water observations included streams, ponds, and standing water in lowland depressions.

Site hydrology contributes to the James River basin via Harrison Branch and the Appomattox River. The adjacency of this project to the Appomattox River will enhance the existing wildlife corridors and allow newly established wetland, deciduous upland forest and stream/riparian wildlife corridors to be developed within the environmental bank. The corridor created by the bank will provide a corridor in order that wildlife can access the Appomattox River from the forested portion of the Fort Lee Military Reservation. Currently the corridor only offers limited access through the mined areas. The site will be established and managed for MBI success criteria and target functional habitats containing wetlands, perennial streams, riparian buffers, uplands deciduous forest, and wildlife corridors.

Research into previous studies as well as geographical references do not indicate any legal encumbrances on the portions of the site proposed for PDEB, as the entire area is owned and under the management of Vulcan. Should further study indicate the presence of an encumbrance, it will be resolved.

Review of historical land use shows the site has been used for mining since at least the 1930s, with land cover and topography being altered as the area was mined for sand and gravel. Due to on going changes in technology and mining techniques since the origination of the mine, previously inaccessible reserves on the site are now recoverable and will be mined in the future. On-site and adjacent ecosystems will be used as reference benchmarks to guide the management and creation of all aspects of the environmental bank.

### **III THE ENVIRONMENTAL BANK PROPOSAL**

#### **PROJECT GOALS AND OBJECTIVES**

Vulcan Construction Materials, LP proposes to:

- Develop a comprehensive environmental bank composed of wetland creation, a forested upland/wetland matrix, stream and buffer creation;

Primary design and management goals for the Puddledock Environmental Bank:

- Preserve, enhance, and manage approximately 5± acres of existing tidal/non-tidal wetlands along the Appomattox River;
- Create approximately 7,500 linear feet of perennial stream, approximately 7 acres of tidal emergent wetland, and approximately 9 acres of non-tidal forested wetland;
- Restore altered wetland and stream ecology if deemed by MBRT to be a benefit to the site;
- Create new wetland ecology with low impact engineering methods;
- Create wetlands and uplands types found in the James River and Appomattox River basins;
- Provide multiple types of hydro periods and encourage seasonal draw downs common in tidal emergent wetland and non-tidal forested wetlands of Virginia;
- Created wetlands will be developed as Cowardin types appropriate for replacement of functions and values lost by wetland impacts;

- Establish a naturally self-maintaining functional wetland system requiring little or no long-term management;
- Provide pre-approved wetland, stream and environmental credit compensation through the preservation and creation of varied wetland and deciduous upland forest systems;
- Restore and create stream connections altered by past land use.

Vulcan Construction Materials, LP (Vulcan) will preserve, enhance, and create various wetland and deciduous upland forest habitats. Additionally, Vulcan will incorporate into the bank design the creation of stream and riparian habitat altered by long-term mining practices. These habitats will be used for resolution of environmental impacts in the banks approved service area. Management of the existing natural resources and development of created wetlands, deciduous upland forest and stream will be guided by a Bank Development Plan (BDP) developed by the Sponsor and its managing entity Resource International, Ltd. This BDP may include recommendation and guidance developed by the MBRT. Final success criteria, design guidelines, construction methods and implementation plans will be provided in the approved MBI and BDP. These project success and design criteria will be expressed in the signatory copy of the Mitigation Banking Instrument and final support document referred to as the Bank Development Plan.

The establishment of the bank will be performed in two to four development phases over a three to eight year period of time, responding to the market needs of the watersheds impact types. Detailed design plans in the form of a BDP will be utilized for ongoing development of each stream/wetland/upland preservation or creation phase. The sponsor will develop these natural systems in advance as pre-approved regulatory solutions for unavoidable impacts to the environment. Existing on-site resources and adjacent indigenous habitats with similar landscape position will provide long-term reference systems of natural functions.

Credit ratios will be established by the sponsor and the MBRT for each established ecological system. These ratios will be specified in the signatory copy of the MBI and BDP. The regulatory authorization of the banks MBI and BDP plans will allow approved credits to be transferred as compensation for authorized impacts within the service area. The proposed service area will include VA HUCs 02080203, 02080205, 02080206, and 02080207 and will be consistent with other banks authorized in the James River and Appomattox Watershed basin. In addition, presale credits will be requested as a percentage of the overall proposed bank creation acreage.

Environmental presale credits resolved at the bank will be secured by adequate financial assurances for a reasonable period of time. At the request of the sponsor, use of the bank for impacts outside the service area by authorized permit entities will be considered on a case-by-case basis for unavoidable environmental impacts. This case-by-case review will be given consideration for the health, welfare, and safety needs of the public.

## **TECHNICAL OVERVIEW**

Environmentally sensitive construction, moist soil management, natural hydrologic and bio-engineering techniques, Rosgen design principles, and specific low impact construction techniques will be used to guide the implementation of each bank phase. These techniques will be adjusted in response to adaptive management strategies utilized to accommodate specific on-site conditions that become apparent during implementation of the project. This approach to site development and management of existing and proposed systems will allow the sponsor to respond to ever changing site conditions.

To establish baseline information for the project the site characteristics, land use history, landscape position and previous site studies were reviewed. The various published baseline data researched included the US Virginia Hydrologic Unit Code Map (Figure 3), Petersburg USGS 7.5-minute quadrangle map (Figures 1 and 4), USGS maps, USDA-NRCS County Soils (Figure 7) and historical black and white, (figures 7, 8, and 9). Actual topographic conditions will be verified by additional aerial photography with interpretation and mapping of one-foot topography to guide bank development and selection of areas requiring minimal construction for wetland creation. Site visits were conducted by Resource International, Ltd. and relevant baseline data was gathered along with additional site-specific information.

Background data and a preliminary wetland study suggest that limited jurisdictional wetlands and Waters of the U.S. are present within the site boundaries. Two jurisdictional determinations by the U.S. Army Corps of Engineers have been issued for the site and both are included in Appendix B. The site exhibits many qualities documented in public record, which demonstrates that the site would be an excellent opportunity to create stream and wetlands. These include the presence of clayey soils, the benefit of a long term owner with a great deal of information on the site and the fact that some of the areas that were previously mined and still under mine permit have good potential for the creation of wetlands. This and other information will be presented to the MBRT as it is concurrently refined.

The existing wetlands on the site will receive perpetual management and preservation. The sponsor will preserve the natural wetland and created perennial stream and other intermittent stream systems in conjunction with creation of wetlands, riparian buffers and deciduous upland forest credits on the site.

Site development will follow strict programmatic design guidelines. These guidelines include: development of micro-topography/surface roughness to promote infiltration and water retention versus run-off, establishment of site stabilization techniques that promote establishment and colonization of natural vegetation, implementation of strict moist soil management practices and preservation of natural soil densities by using low ground pressure construction equipment so as not to compact the soils during construction, preservation of organics by retaining and incorporating natural debris and organics in the topsoil, allowing adjacent upland areas to contribute to the watershed of both the existing and creation areas, promotion of a natural watershed flow to existing wetlands and practicing natural resource management by promoting diversity and sound design concepts to create functional high value natural resources.

To establish a functional environmental bank the sponsor, Vulcan and the MBRT will develop and identify criteria to gauge the development and functional success of the natural systems proposed. These success criteria will guide the release of bank credits to be used for the liability resolution of unavoidable environmental impacts authorized by regulatory agencies. All success criteria will be established in the MBI and will be consistent with the guidelines used for other authorized environmental banks in the James and Appomattox River basins.

Success criteria may include:

- ◆ Establishment of hydrology, plant communities, function and values in the existing and proposed wetland, stream and upland forest systems;
- ◆ Successful preservation, enhancement, restoration or creation of hydrologic regimes found in existing wetlands, streams and upland forest as per MBI & BDP guidelines;
- ◆ Establishment of hydrologic regimes targeting soil saturation, or ponding during the growing season and tidal regimes as per MBI & BDP guidelines for target communities;
- ◆ Monitoring of system hydrology with groundwater wells as per MBI & BDP guidelines;
- ◆ Establishment and monitoring of selected wetland communities and forest plant material as per MBI & BDP guidelines;
- ◆ Establish direct accountability by the sponsor for all implementation and development practices assuring compliances and adherence to the authorized MBI and BDP designs;
- ◆ Restoration of documented US Waters / riparian systems modified by past mining practices.

Use of these success criteria by the sponsor and MBRT during the construction, maintenance and monitoring period will allow the development of on-site reference data to be used in long-term project management. Specific project data will be compiled and compared with regional climate trends, on-site reference systems and site specific monitoring. Local climate trends and local reference systems will be used to gauge success in any typical year.

## **GENERAL APPROACH TO RELEVANT BANKING ISSUES**

**Environmental Bank Credits and Debits:** The development of actual available credits at the bank will be determined by the MBI and active credit ledger. Credits will be available at the ratios specified in the MBI for each type of ecological system.

**Credit Ledger System:** A ledger system will be established and approved by the MBRT to document credit availability and credit/debit withdrawals from the bank. The sponsor will submit annual reports to the MBRT chair of the approved transactions that have occurred at the bank. Upon written request the bank credit ledger will be available for inspection and accounting review.

**Credit Availability and Release:** Release of credits from the bank will be determined by the MBRT and authorized by success criteria outlined in the MBI. The sponsor upon signature of the MBI will make advance presale credits available for use by signatory agencies.

Financial Assurances: The sponsor will offer adequate financial assurances for all transferred credits. No credits will be transferred until financial assurances are in place. Financial assurances in the form of letter of credit, or licensed corporate surety bond will be provided in favor of the Norfolk District of the USACOE.

Annual Reporting of site conditions, field adaptations and success monitoring: The sponsor will prepare annual reports detailing the activity on the site. These reports will document any substantial design changes, amount of construction completed, planting success, review of the proposed hydrologic character on the site.

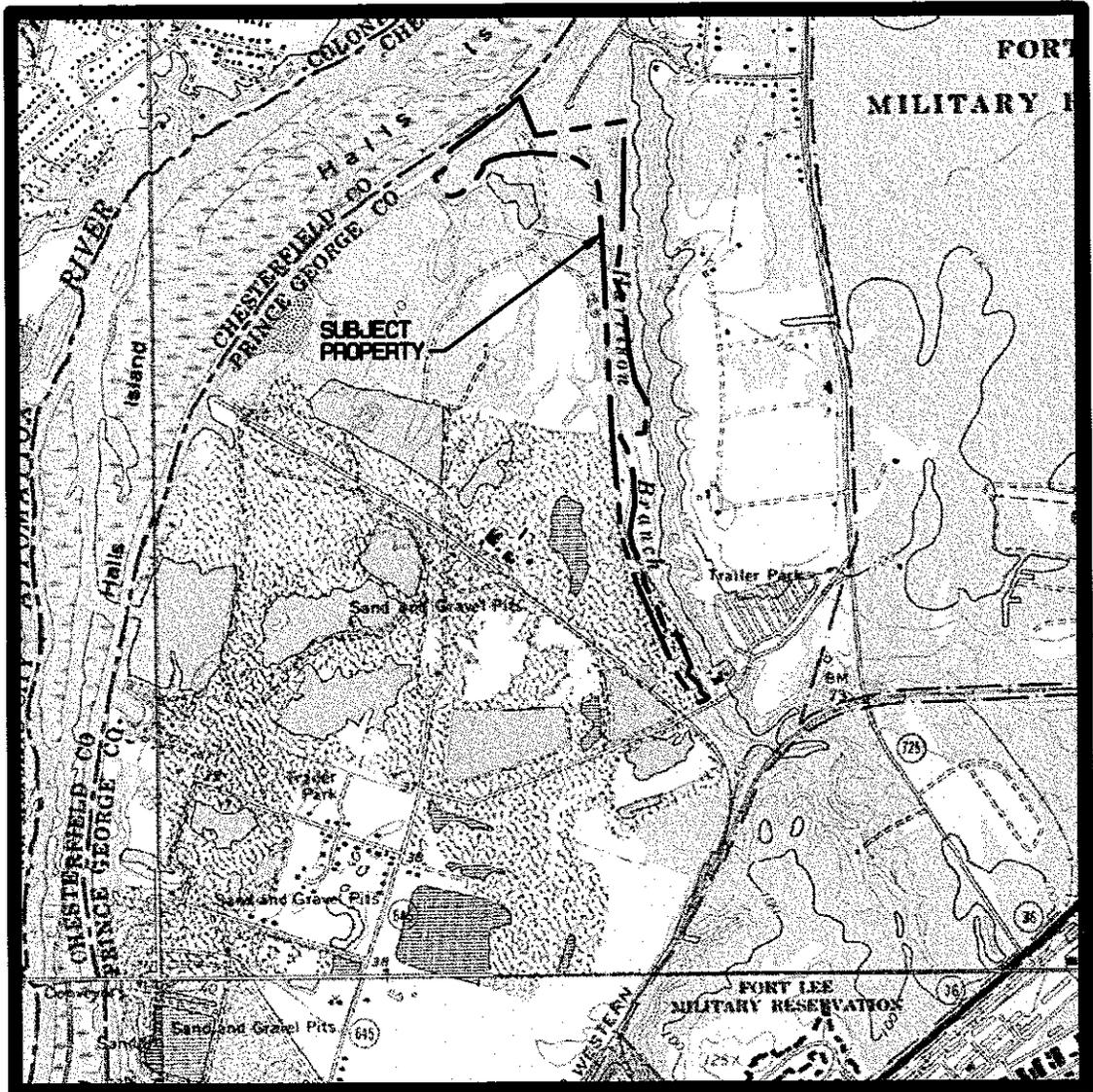
Provisions for Long-term Management and Maintenance: The sponsor will provide long-term protection in the form of a perpetual legal instrument or conservation real estate easement that is agreeable to the MBRT. Perpetual easement will be transferred concurrently with approved credit transfers. A permanent management fund will be established to allow for perpetual stewardship of the bank site.

#### **IV Request for Authorization to Proceed**

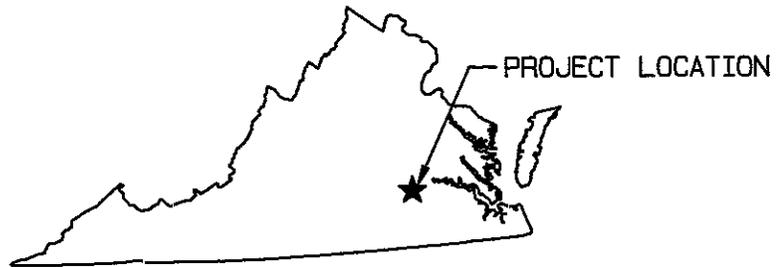
The Bank Sponsor requests authorization from the Chair of the MBRT to proceed with the development of the Puddledock Environmental Bank located in Prince George County, Virginia. The sponsor also requests the U.S. Army Corps of Engineers assemble an MBRT to review, guide and develop a consensus MBI and BDP instrument that meets the needs of regulatory agencies governing environmental impacts in the Commonwealth of Virginia.

#### **V FIGURES**

1. Vicinity Map
2. Site Location Map
3. Virginia Hydrologic Unit Code Map
4. USGS 7.5 minute Chester, Hopewell, Petersburg and Prince George quadrangles 1"=1000'
5. USGS National Wetland Inventory Map
6. USDA Soil Survey for Prince George County
7. 1989 Aerial photo
8. 1994 Aerial photo
9. 2000 Aerial photo
10. Site photos



U.S.G.S. 7.5 MINUTE SERIES QUADRANGLE  
HOPEWELL, VIRGINIA, 1969, PHOTOREVISED 1987  
CHESTER, VIRGINIA, 1969, PHOTOREVISED 1987  
SCALE: 1" = 2000'



NOTE: ALL LOCATIONS ARE APPROXIMATE.

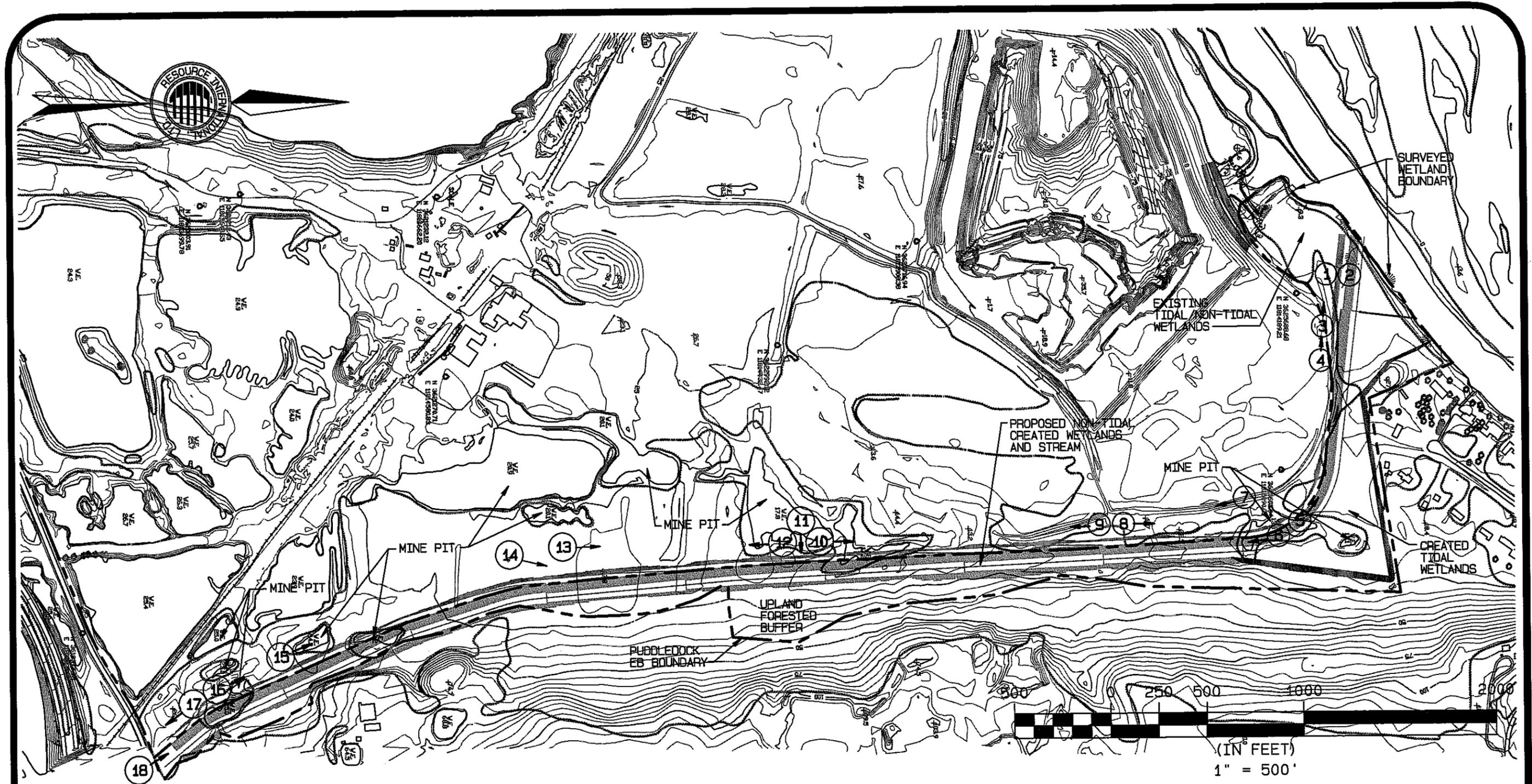
FIGURE 1  
VICINITY MAP  
PUDDLEDOCK EB  
PRINCE GEORGE COUNTY, VIRGINIA



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H:\95062-01.14A\FIG2.PRD



NOTE: ALL LOCATIONS ARE APPROXIMATE.

**Vulcan**  
Materials Company

**PUDDLEDOCK  
QUARRY**

**LEGEND**

— (shaded area) — WETLANDS

① — PHOTOGRAPH LOCATIONS

FIGURE 2  
SITE LOCATION MAP  
PUDDLEDOCK EB  
PRINCE GEORGE COUNTY, VIRGINIA

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HY 95062-01.14 MITIGATION.PRO

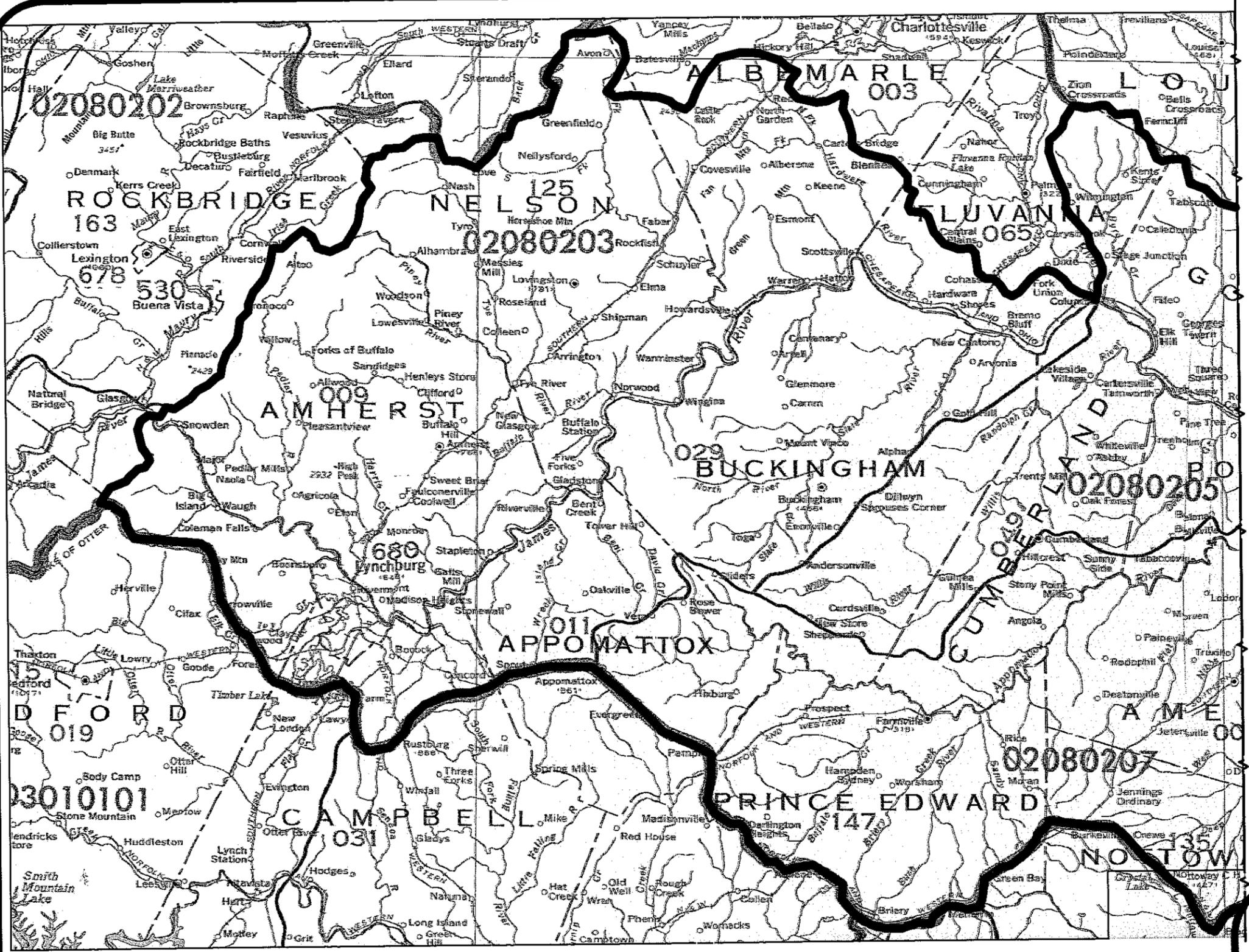


FIGURE 3A  
 VIRGINIA HYDROLOGIC UNIT CODE MAP  
 PUDDLEDOCK EB  
 PRINCE GEORGE COUNTY, VIRGINIA

NOTE: ALL LOCATIONS ARE APPROXIMATE.



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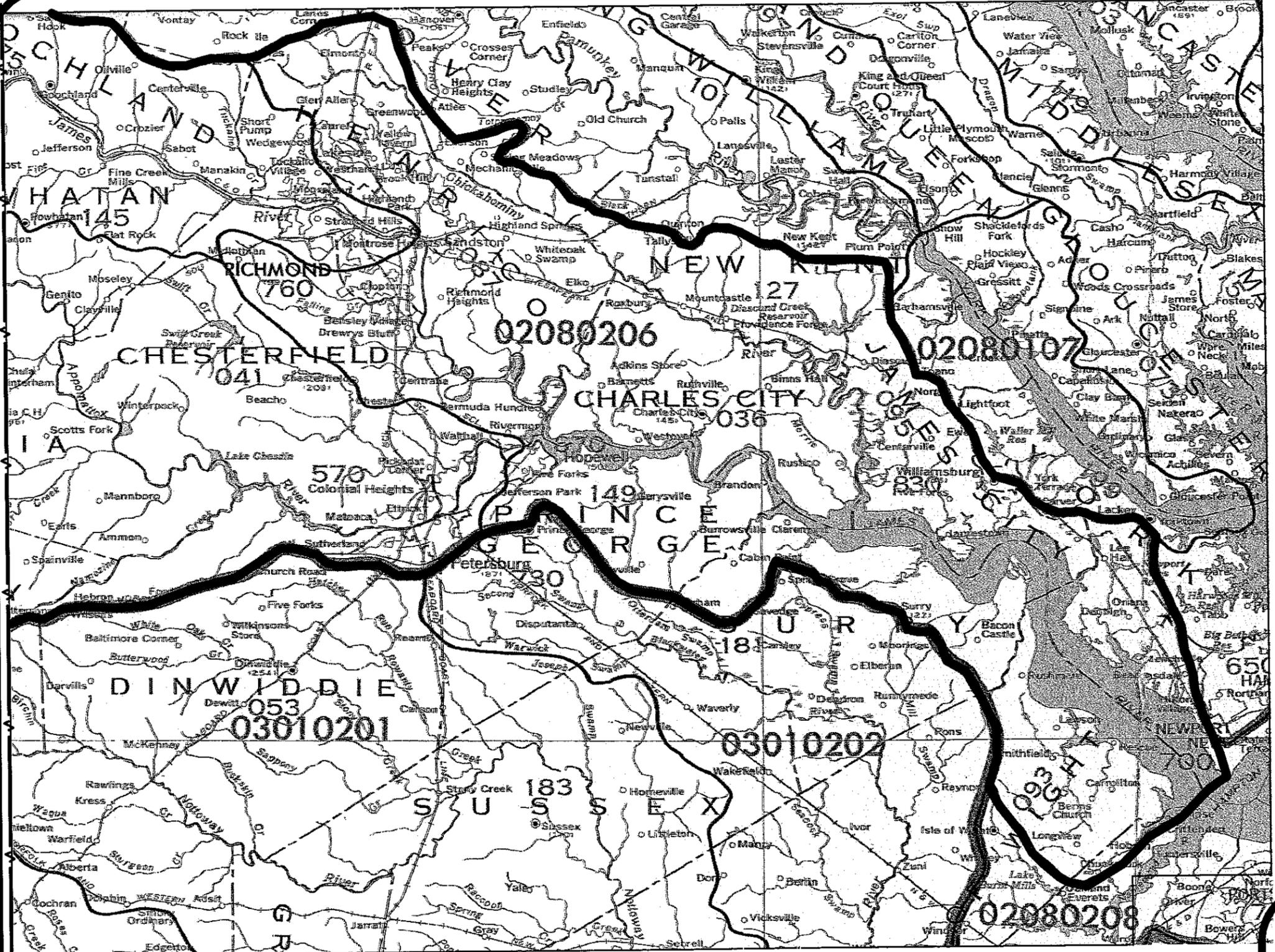
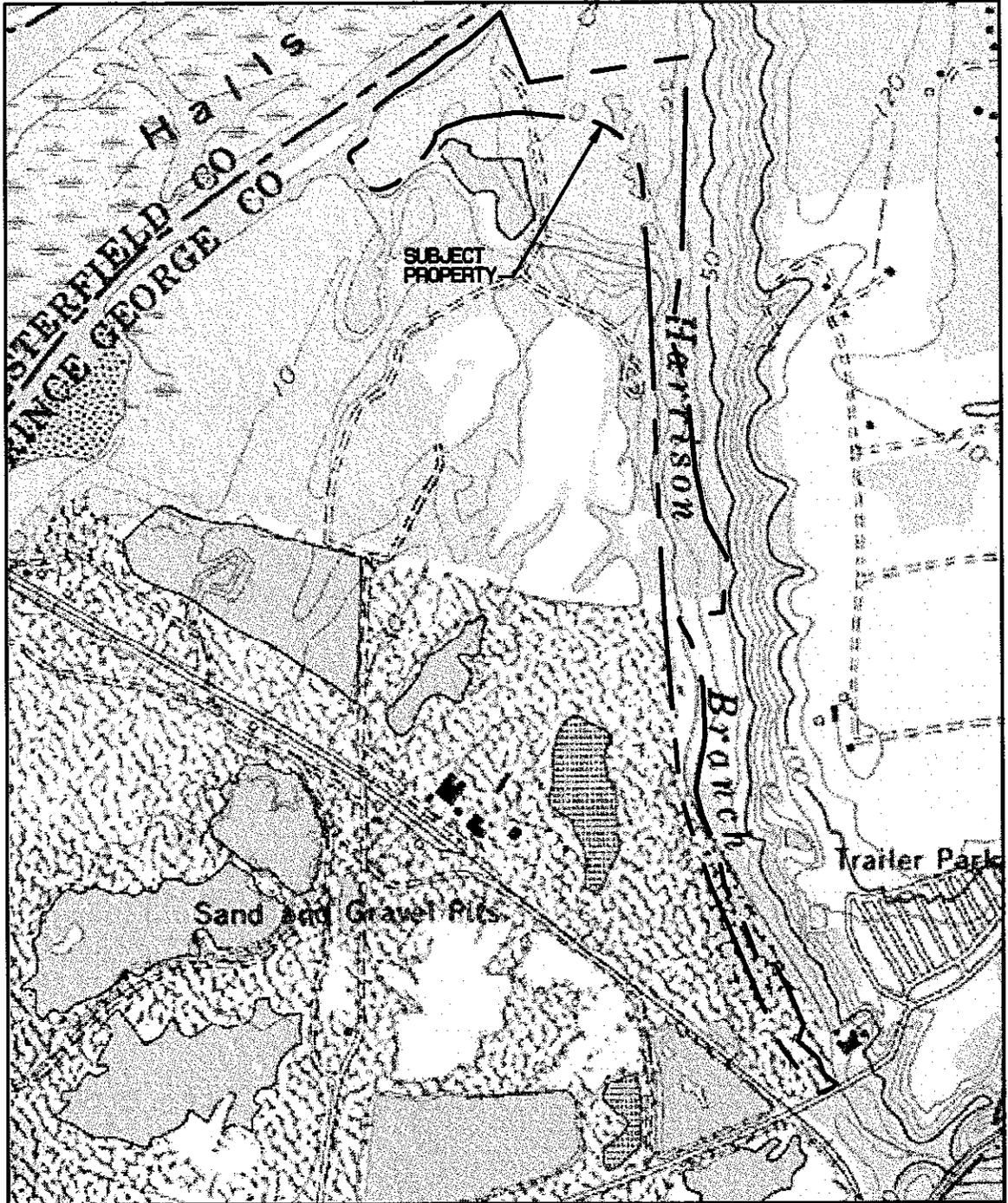


FIGURE 3B  
 VIRGINIA HYDROLOGIC UNIT CODE MAP  
 PUDDLEDOCK EB  
 PRINCE GEORGE COUNTY, VIRGINIA

NOTE: ALL LOCATIONS ARE APPROXIMATE.

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U.S.G.S. 7.5 MINUTE SERIES QUADRANGLE  
HOPEWELL, VIRGINIA, 1969, PHOTOREVISED 1987  
CHESTER, VIRGINIA, 1969, PHOTOREVISED 1987  
SCALE: 1" = 1000'

NOTE: ALL LOCATIONS ARE APPROXIMATE.

FIGURE 4  
SITE LOCATION AND TOPOGRAPHY MAP  
PUDDLEDOCK EB  
PRINCE GEORGE COUNTY, VIRGINIA



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U.S. DEPARTMENT OF INTERIOR FISH AND WILDLIFE SERVICE  
 NATIONAL WETLANDS INVENTORY MAP  
 7.5 MINUTE QUADRANGLE, HOPEWELL, VIRGINIA, 1974  
 AND CHESTER, VIRGINIA, 1974  
 SCALE: 1" = 2000'

WETLANDS LEGEND

- POWZ -PALUSTRINE, OPEN WATER, INTERMITTENTLY EXPOSED/PERMANENT
- POWZx -PALUSTRINE, OPEN WATER, INTERMITTENTLY EXPOSED/PERMANENT, EXCAVATED
- PFO1Y -PALUSTRINE, FORESTEST, BROAD LEAFED DECIDUOUS, SATURATED/  
SEMIPERMANENT/SEASONALS

NOTE: ALL LOCATIONS ARE APPROXIMATE.

FIGURE 5  
 NATIONAL WETLANDS INVENTORY MAP  
 PUDDLEDOCK EB  
 PRINCE GEORGE COUNTY, VIRGINIA



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U.S. DEPARTMENT OF AGRICULTURE  
 SOIL CONSERVATION SERVICE  
 SOIL SURVEY OF PRINCE GEORGE COUNTY, VIRGINIA, MAY, 1985  
 SCALE: 1" = 1/4 MILE

SOILS LEGEND

- 15 - LEVY SILT LOAM- DEEP V.P. DRAINED- FORMERLY ON TIDAL MARSHES  
 ALONG CREEKS AND RIVERS, SLOPED LESS THAN 1%
- 26 - UDORTHENTS, LOAMY- DEEP, NEARLY LEVEL TO VERY STEEP  
 LOAMY AND CLAYEY SOIL MATERIAL- WELL DRAINED TO MODERATELY  
 WELL DRAINED

\* - DENOTES HYDRIC SOILS      NOTE: ALL LOCATIONS ARE APPROXIMATE.

FIGURE 6  
 SCS SOIL SURVEY MAP  
 PUDDLEDOCK EB  
 PRINCE GEORGE COUNTY, VIRGINIA



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VDOT AERIAL PHOTOGRAPH  
DATE: 3-24-1954  
SCALE: 1" = 2200'

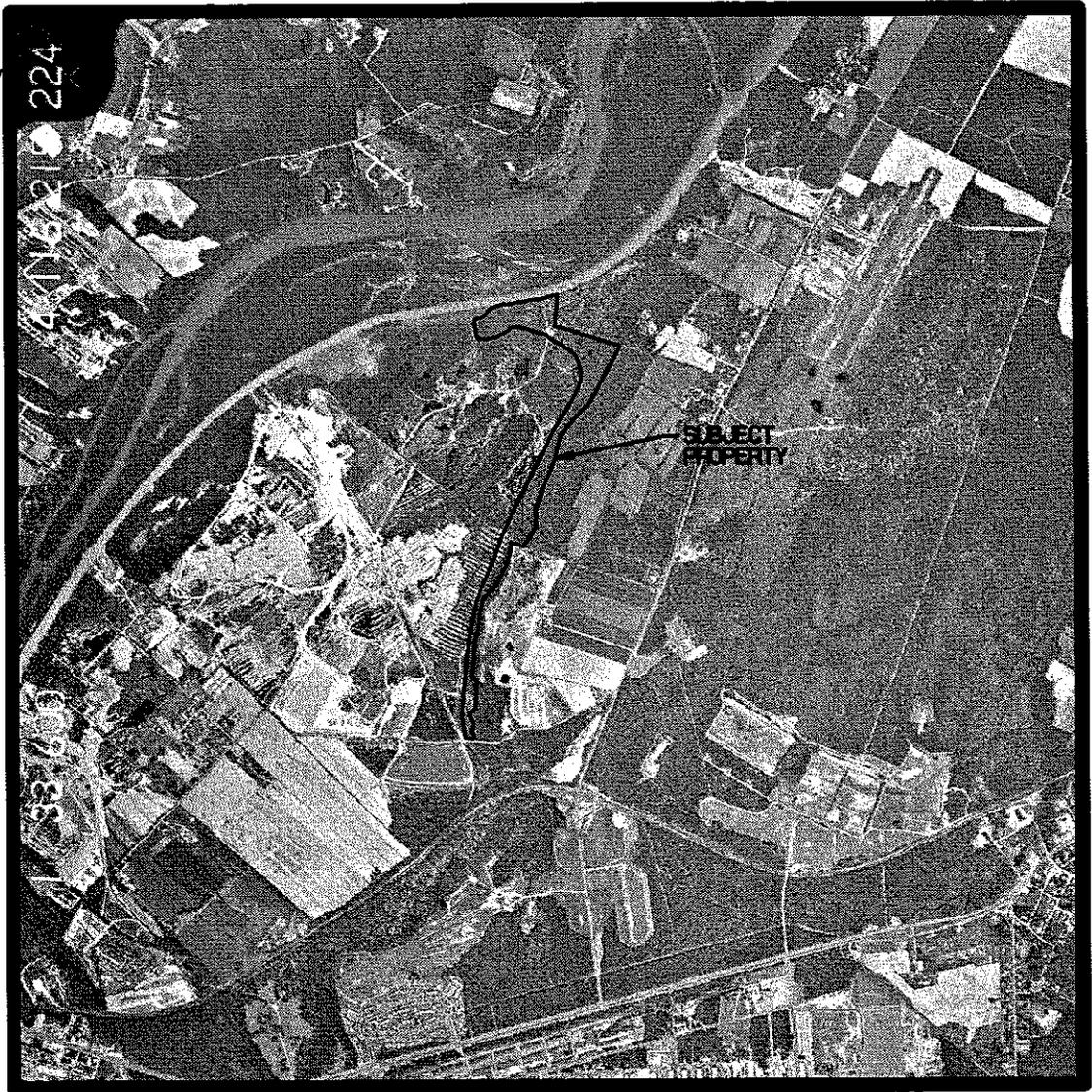
NOTE: ALL LOCATIONS ARE APPROXIMATE.

FIGURE 7  
1954 VDOT AERIAL PHOTOGRAPH  
PUDDLEDOCK EB  
PRINCE GEORGE COUNTY, VIRGINIA



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VDOT AERIAL PHOTOGRAPH  
DATE: 5-06-1966  
SCALE: 1" = 2800'

NOTE: ALL LOCATIONS ARE APPROXIMATE.

FIGURE 8  
1966 VDOT AERIAL PHOTOGRAPH  
PUDDLEDOCK EB  
PRINCE GEORGE COUNTY, VIRGINIA



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VDOT AERIAL PHOTOGRAPH  
DATE: 10-19-1990  
SCALE: 1" = 2000'

NOTE: ALL LOCATIONS ARE APPROXIMATE.

FIGURE 9  
1990 VDOT AERIAL PHOTOGRAPH  
PUDDLEDOCK EB  
PRINCE GEORGE COUNTY, VIRGINIA



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Photograph 1: Downstream portion of the drainage (facing upstream) during moderate flows. Note exposed and eroding right bank.



Photograph 2: Edge drainage (facing upstream) showing the eroding left bank upstream from Photograph 1.



Photograph 3: Point at which the drainage exits the former mine workings (facing upstream). Note beaver dam has been constructed at narrow point along the drainage.



Photograph 4: Facing downstream in mine works, where stream channel does not exist. Slopes represent the overburden from previous mining activities.



Photograph 5: Facing downstream along drainage above mine works.