
**MOUNTAIN VALLEY PIPELINE PROJECT
ARCHAEOLOGY AND HISTORIC ARCHITECTURE
VIRGINIA WORK PLAN**

Prepared for



October 2014

Prepared by



1.0 Introduction

Mountain Valley Pipeline, LLC (MVP) is a joint venture of EQT Corporation and a subsidiary of NextEra Energy, Inc. MVP proposes to construct a natural gas pipeline (the Project) that would extend from the existing Equitrans transmission system in Wetzel County, West Virginia to Transcontinental Gas Pipeline Company's Zone 5 compressor station 165 in Pittsylvania County, Virginia. The Project will be approximately 300 miles, of which 98.1 miles will be located in Virginia. The Project will include the construction of four new compressor stations along the pipeline route. Staging areas for construction equipment will be sited along the Project corridor, although at the current stage of design no specific locations have been selected.

This work plan describes the methods proposed for a Phase I archaeological investigation and for historic architectural investigation to be undertaken within the Virginia portion of the Project. The cultural resources investigations for this project will be performed in conformance with FERC's 2002 *Guidelines for Reporting on Cultural Resources Investigations For Pipeline Projects*, all other applicable FERC regulations (18 CFR 380), the Advisory Council on Historic Preservation (ACHP) guidelines (36 CFR part 800, as amended), the National Historic Preservation Act of 1966, as amended, the Native American Graves Protection and Repatriation Act (NAGPRA), and Virginia Department of Historic Resources' (VDHR) Guidelines for Conducting Historic Resources Survey in Virginia (2011).

1.0 Archaeology Research Design

The goal of the Phase I investigation is to identify all cultural resources within the Project study area and APE that might be eligible for listing on the National Register of Historic Places (NRHP), including previously documented and undocumented resources. Research objectives will focus on gathering sufficient information on each resource to be able to recommend whether further cultural resource investigations are necessary to evaluate NRHP eligibility. The methodologies to achieve these objectives will include, background research, predictive modeling of site distribution, fieldwork, artifact analysis, and site type identification. In combination, these objectives and methodologies constitute the research design which guides the Phase I investigation.

2.1 Background Research

Background research will focus on the pipeline route plus a one-mile buffer on either side of the centerline. Virginia site files will be consulted to collect site locational data, and, depending upon the quality of the site file information, may include data regarding subsistence and temporal patterns relevant to an understanding of various periods of human occupation of the Project

vicinity. These data may provide information on the range of archaeological site types that may be expected in the field study area and possibly give an idea of the expected frequency of sites that may be anticipated

Research about context will focus on the five counties through which the Project traverses, plus any pertinent topics that have been published for southwestern and south-central Virginia and for the broader Appalachian and Piedmont regions. These research topics will include but not be limited to geology, soils, plants, wildlife, prehistoric settlement patterns, historical patterns of Euro-American settlement, slavery, the Civil War, and the transition of farming from subsistence and tenancy to agribusiness. Research will utilize the archived resources at VDHR and the Library of Virginia (state library) in Richmond, local and county historical societies, available online documentary and cartographic resources, and relevant published material. Local offices of the National Park Service and the U.S. Forest Service will also be consulted as they may also maintain files relevant to the Project study area.

2.2 Area of Potential Effects (APE) for Archaeology

Tetra Tech and Mountain Valley Pipeline, LLC staff discussed the Project APE for archaeology during a meeting at VDHR in Richmond, Virginia, on October 15, 2014. All concurred that the area of potential effects (APE) for archaeology includes all locations where construction of the Project involves ground disturbance, such as that resulting from grubbing and clearing rights-of-way, grading for access roads and staging areas, and excavation for pipeline installation and compressor station foundations. VDHR staff welcomed an approach to Phase I archaeological survey that may involve development of an archaeological site sensitivity model and an appropriate test of that model. Environmental factors such as distance to water, topographic elevation, among others would be used to predict areas of high sensitivity (i.e. areas that are likely to contain archaeological resources that may be eligible to the NRHP) and areas of low sensitivity (i.e. areas that are likely not to contain archaeological resources that may be NRHP-eligible). An archaeological site sensitivity model will be developed and provided to VDHR for review (discussed in more detail in Section 2.3 below). A testing strategy that gives priority to high sensitivity areas while still sampling low sensitivity areas will be implemented following consultation with VDHR. A recommended testing strategy is discussed below in Section 2.4).

The study area for archaeological field investigation is defined as the pipeline centerline plus 150 feet to both sides, creating a 300-foot wide corridor the length of the Project pipeline. It is expected that the actual APE for archaeology of the pipeline would be contained within the 300-foot wide corridor and would include a 75-foot wide pipeline trench and 50-foot wide adjacent temporary impact area where machinery would travel along the pipeline route and where excavated soils would be temporarily stockpiled and then replaced in the trench after the pipeline is installed. The purpose of the survey of the more extensive study area is to account for the

potential for the final Project design to avoid potentially NRHP-eligible cultural resources (or other resources that may need to be avoided) without requiring last-minute additional survey to accommodate the final route.

The field study area for access roads would include a 100-foot wide corridor for the length of each respective access road. The study area would contain the access road right-of-way which would measure 50 feet wide and would provide some flexibility to avoid sensitive resources as described above for the pipeline.

In the event that planned Project actions involving ground disturbances will occur outside of the 300-foot wide pipeline corridor or the 100-foot wide access road corridor, the field study for archaeology will be performed in all such locations.

2.3 Archaeological Sensitivity in Project APE

Archaeological sensitivity is described as the relative potential for specific locations or generalized landform types to contain archaeological resources, mediated by the presence of key environmental factors (e.g., water sources, well-drained soils, natural resources) or built-environment infrastructure (e.g., roads, railroads, and canals). Reliable estimates of archaeological sensitivity, or potential, are essential for the implementation of effective and meaningful survey strategies. After a review of VDHR site files, Tetra Tech will synthesize site location data along with slope data and distance-to-water measurements within the Project APE to develop a sensitivity model. This model may be tailored to each of the four major physiographic provinces through which the Project crosses: Ridge and Valley, Great Valley, Blue Ridge, and Piedmont.

For reasons of comfort, structure stability, security, and avoidance of rainfall runoff, prehistoric sites are most frequently located on level ground. Areas of excessive slope are unlikely to contain terrain features that would have encouraged preferential pre-modern settlement and the consequent formation of an archaeological site. VDHR has established that terrain exceeding 15 percent slopes is generally of low archaeological sensitivity and does not require subsurface testing (VDHR 2011, Chap 6:6).

In general, patterns of prehistoric site distribution throughout the Eastern Woodlands correlate well with locations that minimize distance to water sources, including rivers, streams, lakes, springs, and wetlands. Water was essential for human survival, not only for drinking and cooking, but also as transportation routes and as sources of fish and shellfish, aquatic plants, and game. Regional surveys of archaeological site locations in the northeast, Middle Atlantic, and southeast have reported a wide range of site distances to water, and include; a “great majority” of sites in the Susquehanna Valley within 100 meters (Funk 1993:70); an average of 280 meters in

north-central Ohio (Keener et. al. 2008:36); 80 percent of sites are located within 150 meters of water in the Passaic Basin in New Jersey (Hasenstab 1991); distances of 200 meters or less, defined as high probability in mid-peninsular Delaware (Lothrop 1987:29); within 100 meters of freshwater in coastal North Carolina (Lofffield 1981); and, 68 percent of sites were located within 250 meters of a stream or depressional wetlands along the Savannah River in South Carolina (Brooks et al. 2010:152).

Following an analysis of site data collected from VDHR, a baseline assessment of the Project's prehistoric sensitivity will be organized around calculated values of slope and distance to water values. Not only are slope and distance to water key environmental factors, they are easily quantified for any given point on a map. The intersection of these two mapped datasets will provide a zone of high archaeological sensitivity within the Project APE. Areas laying outside this intersection of datasets, i.e., those that exhibit distances-to-water greater than the benchmark or slopes greater than 15 percent, will be classified as low sensitivity for archaeology. As a test of this model, 100 percent of high sensitivity areas and up to ten percent of low sensitivity areas will be surveyed by pedestrian survey (where ground visibility is greater than 50 percent) or through shovel testing at 50-foot intervals where ground visibility is less than 50 percent. Certain classes of sites, such as rock shelters, stone quarries, and cemeteries, not necessarily associated with proximity to water or minimal slope, would also be accounted for in the model. Geographic Information System (GIS) technology will be used to assist in developing and fine-tuning the sensitivity model that will be tested by field investigation.

Historic archaeological site sensitivity will be assessed based on a review of VDHR site files and historic cartographic sources including nineteenth century Civil War atlases, county atlases and historic USGS quadrangle sheets to obtain approximate geographic coordinates for Map-Documented Structures (MDSs) potentially located in the vicinity of the Project APE for archaeology. Survey of the APE in the vicinity of an MDS will be triggered if the MDS appears to be located 100 meters (330 feet) or less from the edge of the APE, based on either visible traces of the MDS such as a cellarhole or traces of a foundation or upon map analysis. A certain degree of cartographic imprecision is inherent in the nineteenth century county atlases and, to a somewhat lesser extent, the late-nineteenth century USGS 15-minute quadrangle maps. Exact locations of the MDSs will be determined through additional map analysis or field inspections.

2.4 Phase I Archaeological Field Investigation, Laboratory Analysis, and Reporting

MVP will conduct the Phase I subsurface archeological survey in accordance with this approved work plan. In addition, the survey will conform to VDHR's "Guidelines for Conducting Survey in Virginia" (2011).

Field Investigation

In accordance with VDHR guidelines, shovel tests will be arrayed at intervals of 50 feet (or less, depending on circumstances) along linear transects. They will be hand-excavated and will typically measure approximately 40 centimeters in diameter at the surface. Shovel tests will be excavated to a depth below which archaeological deposits are not likely to occur or until an impasse is reached below which hand excavation is not possible. In upland settings with limited alluvial deposits, it is anticipated that shovel tests will be around 30 to 40 centimeters (12-16 inches) deep. Deeper soils are anticipated on stream floodplains, and may extend to one meter or more. In areas of deep alluvium, shovel testing will be augmented with soil augers to assess the potential for buried cultural horizons. Tetra Tech will identify locations containing soil layers that exceed the ability of hand-held tools to reach terminal depths. Where such locations cannot be avoided by Project impacts, Tetra Tech will present recommendations regarding machine-assisted deep testing strategies. It is anticipated that horizontal direct drilling (HDD) will be utilized to convey the pipeline across major streams. Some HDD pads may also require deep testing if situated on flood plains. Soil will be screened through 0.25-inch mesh sieves to facilitate systematic artifact recovery. Any non-modern artifacts that are recovered will be retained for cleaning, identification, and inventory. Each shovel test will be assigned a unique, project-specific identifier. Shovel test results will be recorded using standard terminology, such as USDA soil texture categories and Munsell color codes. Each shovel test will be promptly backfilled after excavation and recordation. Shovel test locations will be recorded using a GPS receiver with sub-meter accuracy. Digital photographs of typical conditions and features of notable interest will be taken as necessary to document the field investigation.

Areas displaying greater than 50 percent ground visibility will be investigated through pedestrian survey. Transects aligned at 50-foot separation, as possible, will be walked by the field team. Observed non-modern artifacts will be noted, mapped using GPS at sub-meter accuracy, and collected.

Laboratory Analysis

Artifacts recovered from shovel testing and pedestrian survey will be cleaned, analyzed, and inventoried in Tetra Tech's archaeology lab. The analysis of prehistoric lithic artifacts will be grounded in an approach linking attributes of form and function to particular stages in stone tool reduction and use strategies.

Historic period artifacts will be classified by major functional groups, e.g., architectural, household, and personal. They will then further be categorized by material class, e.g., square-cut nail, bottle glass, and clothing buttons.

At the conclusion of analysis, all artifacts will be placed in acid-free reclosable polyethylene bags and tagged with relevant provenience information. If all or part of the artifact assemblage is determined to possess research value, it will be cataloged and curated for long-term storage according to VDHR standards (2011).

Report

Following fieldwork, MVP will prepare a full Phase I cultural resources investigation report conforming to VDHR standards and guidelines. The report will include, but will not be limited to: introduction; environmental, prehistoric, and historic background; sensitivity model; field methods; survey results; recommendations and conclusions; and bibliography. The report will be supported by appropriate appendices and illustrative materials. As a necessary part of report preparation MVP will submit site registration forms to VDHR to obtain inventory numbers for any newly-discovered sites. In conformance with standard practices, MVP will also submit GIS data locating the boundary of all archaeologically-tested and observed-and-noted areas.

3.0 Historic Architecture

In general, the APE for historic architecture would include all areas that might be visually affected by pipeline construction and operation. Typical components or actions of pipeline construction and operation that result in adverse visual effects are structures, such as the compressor stations, and forest clearing to create a corridor or to widen an existing one.

Based on discussions with VDHR, the APE for historic architecture will be defined following site file review and subsequent additional consultation with VDHR. Rather than arbitrarily defining an APE distance in which an inventory survey would be conducted, VDHR suggested a more focused approach to historic architecture survey possibly based on areas of special concern that might be present within the APE for historic architecture. Such areas of special concern might include farm complexes, village centers, cemeteries, and traditional cultural properties. The foci for historic architecture field investigation will be determined following completion of the site file search and a second meeting with VDHR staff.

Following completion of the background research and site file search that will cover a two-mile wide search area around the Project, data will be summarized in a letter report that will be provided to VDHR for review. A consultation meeting will then be arranged for discussion of further steps that may be requested for consideration of potential effects to historic architecture.

4.0 Tribal Outreach

MVP will develop a list of Native American Tribes who may have historical connection to the Project area and who may have interest or concerns about results of surveys or the presence of known sensitive tribal traditional cultural properties. MVP will prepare written consultation letters to be sent to the federally-recognized Tribes. These letters would inform the respective tribes about the Project and would include a map. These letters would be sent subject to Equitrans and FERC approval.

5.0 Unanticipated Discovery Plan

MVP will develop a state-specific plan that would outline the procedures that would be followed in the event that an archaeological site or human remains are found during the course of Project construction and operation. Such plans are required by FERC and would include a protocol to be followed in the field and would provide contact information for key local individuals who would need to be contacted should an unanticipated discovery be made.

6.0 References Cited

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