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

Prepared for



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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 188.5 miles will be located in West 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 a historic architecture investigation to be undertaken within the West 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 West Virginia Division of Culture and History's (WVDCH) *Guidelines for Phase I, II, and III Archaeological Investigations and Technical Report Preparation*. This work plan has been prepared for review by the WVDCH which functions in West Virginia as the State Historic Preservation Office.

2.0 Archaeology Survey 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 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 guide the Phase I investigation.

2.1 Background Research

Background research for archaeological survey will comply with WVDCH and FERC guidelines. Background research will include a review of known archaeological resources within one mile of the pipeline corridor, as expected by the WVDCH. The records search would extend to one mile around the Project. Prior to fieldwork, Tetra Tech will consult the National Register

of Historic Places (NRHP), and the WVDCH files in Charleston, West Virginia. Sources that may be available online would also be consulted. Additional sources that may be examined include historic maps and aerial images, historical societies, and local universities or libraries.

Research about context will focus on the 11 counties through which the Project traverses, plus any pertinent topics that have been published for the relevant regions of West Virginia and the broader surrounding 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, and mineral extraction industry history as it relates to the Project area. Research will utilize the archived resources at WVDCH in Charleston, West Virginia and various libraries in the Project area, 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 may also be consulted as they may also maintain files relevant to the Project study area.

2.1 Area of Potential Effects (APE) for Archaeology

The APE for archaeology will be identified in consultation with WVDCH. Tetra Tech anticipates that the area of potential effects (APE) for archaeology would be identified to include 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. Prior to commencing field investigation, Tetra Tech would use environmental factors such as distance to water, topographic elevation, among others, 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). In compliance with WVDCH guidelines, the Phase I archaeological survey will involve field observation of the entire APE using a variety of field methods determined by the field context (e.g., pedestrian survey where ground visibility exceeds 75 percent, shovel testing in areas of limited ground visibility, walkover and noted observations in areas of steep slopes that exceed 20 percent).

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 WVDCH 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. Detailed LIDAR information, as available, would provide a basis for slope analysis and development of an archaeological sensitivity model that would accurately identify areas sloped in excess of 20 percent, which would be excluded from subsurface testing. This model will be presented to the WVDCH for review and comment when it has been fully developed.

Historic archaeological site sensitivity will be assessed based on a review of WVDCH 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 archaeological survey in accordance with this approved work plan. In addition, the survey will conform to WVDCH’s guidelines. Archaeological survey will be conducted throughout the entire pipeline corridor.

A summary of archaeological survey methods is presented in Table 1 and discussed in detail below.

Table 1. Summary of Archaeological Survey Methods by State

Field Method	Interval/Method/Criteria
Regular Shovel Test Interval	15 meters
Radial Shovel Test Interval	5 meters
Deep Testing	Hand auger beginning at base of selected shovel tests. Evaluation by geomorphologist to determine need for 1x1 meter Test Unit
Site Boundary Delineation	cruciform delineation within the APE
Pedestrian Survey Requirement	75 percent or greater surface visibility
Site Definition	3 or more artifacts within 30 meters

Field Investigation

Systematic shovel testing will be conducted throughout the pipeline corridor in all areas with less than 75 percent ground visibility that are not obviously disturbed and that display slope of less than 20 percent. If the landform within an archaeological testing location permits, six parallel transects within the 300 ft. pipeline corridor will be excavated offset from the centerline at 25, 75 and 125 ft. on either side of the centerline.

When cultural material is discovered, close-interval (radial) shovel tests will be excavated in a cruciform pattern. Delineation shovel tests will be used to establish site boundaries within the 300 ft. pipeline corridor. Radial shovel tests will not be excavated between positive regular-interval shovel tests and full grids will not be tested.

Shovel tests will be 50 centimeters in diameter. All sediment from shovel testing will be screened through 1/4-inch hardware mesh and all artifacts will be collected by natural stratigraphic level when possible. At a minimum shovel tests will extend 10 cm into culturally sterile subsoil. Shovel testing will not be attempted in areas where standing surface water is present or below the water table.

Judgmental shovel testing may be conducted on micro-landforms suspected to contain cultural resources, in areas of visible surface features, within archaeological sites identified through pedestrian survey, or any other pertinent areas at the discretion of the field supervisor.

Shovel testing will not be conducted in areas of obvious disturbance, subsoil at the surface, standing water, fill material, modern development, or surface obstacles such as pavement or gravel.

As per the WVDCH guidelines, some form of deep testing may be necessary on alluvial landforms within the pipeline corridor where there may be effects from Project construction. It is anticipated that most of the major stream crossings will be bored using conventional or horizontal direction drilling methods via bore pits placed outside the 100 year floodplain. In locations where alluvial deposits cannot be avoided by the Project, a hand auger test will be initiated at the base of selected shovel tests on alluvial landforms. The auger core will be evaluated by a geomorphologist to assess the potential for deeply buried archaeological deposits.

Based on recommendations by a geomorphologist, recommendations will be made for excavation of 1x1-meter Test Unit/s or possibly for machine-assisted deep testing. If hand-excavated test units are excavated, each Test Unit will be excavated in 10-centimeter levels within natural stratigraphic layers. Excavated soil will be passed through 1/4-inch hardware cloth. Artifacts recovered in the field will be bagged along with information pertaining to their provenience within the test unit. Representative profiles, annotated with information concerning the thickness, texture, and Munsell color for each stratigraphic horizon encountered, will be photo-documented and drawn to scale for each Test Unit.

Testing strategies for machine-assisted deep testing will be developed specifically to address each location where recommended. Deep testing would take place following consultation with WVDCH and subsequent to the initial Phase I field investigation.

Pedestrian walkover may be conducted in lieu of shovel testing in certain areas. In West Virginia, these areas will include areas with greater than 75 percent visibility and 20 percent or greater slope. If a site is discovered during pedestrian survey, judgmental shovel testing will be conducted if feasible. At least two shovel tests will be excavated at each site, regardless of its method of discovery (with the exception of rock shelters).

Any rock shelters identified during this survey will be recorded on project mapping. WVDCH will be consulted prior to any subsurface testing.

If a cemetery is encountered in the pipeline corridor it will be recorded using the WVDCH cemetery form. No subsurface excavation will be initiated.

For this Project, an archaeological site is defined as the presence of three or more artifacts (pre-1960) from the same, broad cultural period within a 30-meter radius, or by the presence of cultural features. An isolated find is defined by the presence of two or fewer artifacts within a 30-meter radius, recent twentieth-century artifacts, those that appear to be obviously redeposited or otherwise disturbed, or that represent a single artifact class from a single depositional episode, such as broken pieces of a single glass bottle.

Recording of all archaeological sites will include shovel testing, GPS recording, photography, stratigraphic evaluations, and artifact collection. Upon discovery of a site through shovel testing, an arbitrary grid will be established. Regular interval shovel testing will first be conducted through the area. Close interval shovel tests will then be excavated around all positives at 5 meter intervals. A sample of positive shovel tests will be selected for photography and the recording of soil profiles including depths, soil types, and Munsell colors. Overview photographs will also be taken of each site. Field notes will include landform, vegetation, site type, cultural features, and any visible disturbances. All identified cultural features will be described, mapped, photographed, and profiled (if necessary). GPS units will be used to record the site boundary, positive shovel tests, disturbances, and natural and cultural features.

Site boundaries will be delineated within the 300 ft. pipeline corridor. Site boundaries will be delineated with shovel testing, pedestrian survey, previous research, topography, and disturbances. Site boundaries will be placed along areas of obvious disturbance (natural or cultural), the edges of surface scatters, or when two negative shovel tests were excavated. Site delineation will be restricted to within the pipeline corridor.

Horizontal control will be maintained through a variety of methods including pacing, arbitrary grids, and GPS units. The location of the APE and study area will be delineated prior to the fieldwork in geographic information systems (GIS) software (ArcGIS 10). The shapefiles will be imported into Pathfinder Office 4.0 and uploaded to the GPS receivers. Tetra Tech will use Trimble GeoXH GPS units for this project. These units have a sub-meter positional accuracy following post-processing. All GPS units will include a data dictionary to standardize data collection in the field.

Digital photographs will be used throughout the project. Photographs will be taken of all sites, historic buildings, survey areas, disturbances, personnel, various field activities, features, and a sample of shovel test profiles. Photographic logs will be kept for all photographs.

All collected artifacts will be placed in archival plastic bags. Each bag will be given a bag number and a tag. The bag tag will contain the following information: project number, state, field/state site number, transect number, shovel test number, northing, easting, level number/depth, surface type, recorder, date, and notes.

Laboratory Analysis

Conservation, identification, and cataloging of artifacts will begin in the field. All artifacts will be bagged according to the appropriate provenience in polyethylene bags. Provenience control will be maintained using bag numbers. Each individual provenience will be assigned a bag number and recorded on a bag list. The bag list will be updated daily and checked against the artifact bags on a regular basis.

Because of the size of this project, a field laboratory will be used to expedite and manage the collected materials. Artifacts will be collected from field crews at regular intervals and transported to the field laboratory for check-in, washing, and initial analysis. Artifacts will periodically be transported from the field laboratories to Tetra Tech's Pittsburgh Lab for final analysis and curation at the approved WVDCH repository at Grave Creek.

Once received from the field, all submitted samples will be cleaned. Durable artifacts will be washed in tap water using a soft brush. All artifacts will be allowed to thoroughly dry before analysis. A generalized analysis will be conducted on all artifact types. Standard definitions and references will be used for all historic artifacts.

All artifacts will be cataloged according to the appropriate state standards. Cataloging and data management will provide a coherent structure to the collection and enabled cultural patterns to be recognizable within the assemblage. All artifacts will be sorted by provenience, material type and when possible, by object identification. Objects will be counted and individual object forms will then be bagged separately. Catalog numbers will be assigned to each object form based on the system followed by the final curation facility. All of this information will be entered into a relational database that ties provenience, artifact, and known temporal and cultural data about given artifact forms into a common data set. Artifact data will be entered directly into the database at the time of analysis, thereby reducing the opportunity for clerical errors.

All curation will comply with federal standards (36 CFR 79) and WVDCH curation guidelines. In general, this will include placing them in heavy duty, archival zip-lock plastic bags for permanent storage. An acid-free provenience tag will be placed in each bag. The site and catalog number and provenience information will also be written on the outside of the bags, using a permanent marker. All cultural material and associated documentation will be curated.

Report

All reporting will comply with the WVDCH guidelines, the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 Fed. Reg. 44716-42), National Register Bulletins, and the ACHP's *Consulting About Archaeology Under Section 106 and Treatment of Archaeological Properties*.

All sites and resources will be evaluated for their eligibility for nomination to the National Register. Sites and resources will be classified as either eligible, not eligible, or eligibility unknown – additional information needed to make a determination. Additional phases of investigation that may be required to determine if a resource is eligible to the NRHP are not included within this work plan.

3.0 Historic Architecture Survey Design

The APE for historic architecture will be identified in consultation with WVDCH staff. Tetra Tech anticipates that the APE for historic architecture would be identified to include areas with views of the new pipeline corridor and appurtenant facilities such as compressor stations where there may be above-ground structures that have the potential to be eligible to the NRHP.

Historic architecture survey will begin with site file research of the WVDCH site files. Resources that are located within one mile of either side of the center line will be noted. These resource locations will be entered into the Project's GIS database. History sources collected during background research for the archaeology phase will be reviewed to develop an understanding of the region's history and significant trends, themes, and events that will need to be considered during survey and evaluations. This review will also inform survey expectations. Finally, historic maps will be geo-referenced in GIS to project the locations of towns, factories, battlefields, and other mapped resources.

Following completion of the background review, a field approach to historic architecture that may be affected by the project will be developed in consultation with WVDCH. MVP currently assumes that a focused historic architecture strategy based on cultural resource concerns of the WVDCH may be a preferable approach for this Project rather than setting an arbitrary APE definition and inventorying structures within that APE.

For areas that may be inventoried, the exteriors of all resources, including primary buildings and any contributing outbuildings, will be digitally photographed from public rights-of-way and recorded on West Virginia Historic Property Inventory (HPI). The architectural historian will record the architectural style, condition, and important features of each resource and note major changes or alterations. In the evaluation of these resources, the architectural integrity of each will be assessed. Within the concept of integrity, the NRHP Criteria recognize seven aspects that, in

various quantities, define integrity: location, design, setting, materials, workmanship, feeling, and association. Site forms would be prepared pursuant to WVDCH guidelines for structures recommended as potentially eligible to the NRHP. All reporting will comply with WVDCH state guidelines, the Secretary of the Interior's *Standards and Guidelines for Archaeology and Historic Preservation* (48 Fed. Reg. 44716-42), National Register Bulletins, and the ACHP's *Consulting About Archaeology Under Section 106 and Treatment of Archaeological Properties*. Reports will meet professional standards.

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 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 a 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.