Resource Report 10
Alternatives

FERC Docket No. CP22-___-000

Equitrans, L.P.
Ohio Valley Connector Expansion Project
Greene County, Pennsylvania,
Wetzel County, West Virginia,
and Monroe County, Ohio

January 2022

Public Information

RESOURCE REPORT 10 - ALTERNATIVES	
SUMMARY OF FERC FILING INFORMATION	
Information	**Found In**
Minimum Filing Requirements	
1. Address the "no action" alternative. (Title 18 Code of Federal Regulations [CFR] § 380.12(1)(1)).	Section 10.1
2. For large projects, address the effect of energy conservation or energy alternatives to the project. (18 CFR § 380.12(1)(1)).	Section 10.2
3. Identify system alternatives considered during the identification of the project and provide the rationale for rejecting each alterative. (18 CFR § 380.12(1)(1)).	Section 10.3
4. Identify major and minor route alternatives considered to avoid impact on sensitive environmental areas (e.g., wetlands, parks, or residences) and provide sufficient comparative data to justify the selection of the proposed route. (18 CFR § 380.12(1)(2)(ii)).	Section 10.4.1 Section 10.4.2
5. Identify alternative sites considered for the location of major new aboveground facilities and provide sufficient comparative data to justify the selection of the proposed site. (18 CFR § 380.12(1)(2)(ii)).	Section 10.6
Additional Information Often Missing and Resulting in Data Requests	
6. Ensure that project objectives that serve as the basis for evaluating alternatives are consistent with the purpose and need discussion in Resource Report 1.	Section 10.1 Section 10.2 Section 10.3 Section 10.4 Section 10.5
7. Identify and evaluate alternatives identified by stakeholders.	Section 10.4
8. Clearly identify and compare the corresponding segments of route alternatives and route variations with the segments of the proposed route that they would replace if adopted.	Section 10.4.1 Section 10.4.2

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Acronyms and Abbreviations

CFR	Code of Federal Regulations
Dth/d	dekatherms per day
EIA	Energy Information Administration
Equitrans	Equitrans, L.P.
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
GHG	greenhouse gas
GW	gigawatts
IEA	International Energy Agency
kV	kilovolt
MP	Milepost
MVA	megavolt amperes
NHD	National Hydrography Dataset
NLCD	National Land Cover Database
NWI	National Wetlands Inventory
OH	Ohio
PA	Pennsylvania
Project	Ohio Valley Connector Expansion
psig	pounds per square inch gauge
RNG	renewable natural gas
ROW	right-of-way
SCPC	South Central Power Company
TIAC	turbine inlet air chillers
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WPP	West Penn Power
WV	West Virginia

10.0 Alternatives

A detailed description and overview map of Equitrans, L.P.'s (Equitrans') Ohio Valley Connector Expansion (Project) are provided in Resource Report 1, General Project Description. The Project is located in Greene County, Pennsylvania (PA); Wetzel County, West Virginia (WV); and Monroe County, Ohio (OH).

Resource Report 10 discusses the environmental, economic, technological, and procedural viability of the No-Action Alternative, alternative energy, system alternatives, route alternatives, and facility site alternatives considered for the proposed Project action - construction of the proposed Project. Equitrans used the results of the alternatives evaluation process to develop and refine the scope of the Project.

The following sections provide analyses and discussions commensurate with the scale of individual Project components and their overall environmental impact. The Council on Environmental Quality advises that a reasonable range of alternatives depends on the nature of the proposal and the facts in each case. The Project's statement of purpose and need informs the choice of alternatives; therefore, the choice of alternatives, and the depth of discussion of those alternatives, must be reasonable.

10.1 No-Action Alternative

Under the No-Action Alternative, the Project would not be constructed and the associated increase in system capacity would not be available. The Project is intended to expand Equitrans' Mainline System, and in particular expand the capacity and delivery capabilities of its previously installed Ohio Valley Connector assets. The proposed Project will increase Equitrans' capability to deliver natural gas volumes to take-away transmission pipelines in the Clarington, Ohio area (including deliveries to the Rockies Express and Rover pipeline systems) by approximately 350,000 dekatherms per day, which will ultimately serve the need for additional volumes of natural gas in expanding mid-continent and Gulf Coast markets. Although selection of the No-Action Alternative would avoid potential environmental and other impacts, the beneficial impact of implementing the Project (providing reliable, cost-effective access to expanding mid-continent and Gulf Coast markets) would not occur. The general level of anticipated environmental impact associated with the Project will be minimal. If the purpose and need of the Project are to be met without construction of the Project facilities, other projects and activities would be needed resulting in their own environmental impacts. This would result in the transfer of environmental impacts from one project to another but would not necessarily eliminate or reduce impacts and would not meet the purpose and need of the Project. The No-Action Alternative is not considered a viable option because it does not meet the stated purpose and need for the Project (see Resource Report 1).

10.1.1 Energy Conservation Alternative

Energy conservation has been embedded in federal and state regulatory policy in recent years. The goal of energy conservation is to take steps toward the reduction of energy consumption in order to preserve resources and reduce environmental pollution. This ideology can in part be implemented by using fewer nonrenewable natural resources and increasing efficiencies to conserve energy being consumed; however, substantial advances in technology and significant adaptations to social and cultural norms would be needed to reduce energy consumption.

The U.S. Energy Information Administration (EIA) Annual Energy Outlook 2021 projects that the total United States domestic energy consumption, which decreased to 90 percent of its 2019 level in 2020 due primarily to the economic downturn brought about by the COVID-19 pandemic, will increase annually and return to 2019 levels by 2029 (EIA, 2021a). Furthermore, a key takeaway from the Annual Energy Outlook is that assuming continued expansion of the U.S. economy and adoption of energy efficiency measures, U.S. energy consumption is not expected to decline. Therefore, energy conservation efforts alone would not be expected to

eliminate the need for oil production, or the opportunity and benefit of providing an outlet for the natural gas proposed for transport by the Project. The Project is proposed due to the current and expected demand for energy and as a result, energy conservation would not meet the purpose and need of the Project. Energy conservation measures alone cannot offset the long -term-growth in natural gas demand within the United States. !

10.1.2 No-Action Alternative Conclusion

Under the No-Action Alternative, the purpose and need for the Project would not be met, and Equitrans would not be able to provide 350,000 dekatherms per day (Dth/d) of firm transportation capacity to allow natural gas to move from the central Appalachian Basin into the interstate pipeline grid. In addition, the No-Action Alternative would not alleviate the constrained takeaway capacity from the central Appalachian region and support the overall reliability and diversification of energy infrastructure to Equitrans' current and future customers in a timely, cost-effective, efficient, and environmentally sensitive manner that minimizes incremental temporary and permanent impacts.

Equitrans' assessment is based, in part, on an analysis of Equitrans' existing natural gas pipeline system which is uniquely positioned in the central Appalachian region to accommodate increased natural gas production. Equitrans' existing natural gas pipeline system overlays areas of production in northern WV and southwestern PA which can provide adequate pipeline takeaway capacity for transportation of natural gas to meet current transportation demand in expanding mid-continent and Gulf Coast markets (see Section 10.4).

The development and implementation of additional conservation measures may have some effect on energy demand; however, energy conservation efforts alone are not expected to eliminate the need for the Project in the short- or long-term.

The No Action Alternative would force Equitrans' customers to seek other transportation services and/or depend on other future development projects with unpredictable schedules and undetermined environmental impacts.

10.2 Alternative Energy Sources

Equitrans evaluated the potential for other energy sources to meet the objectives of the Project. Energy sources were separated into two broad categories: renewable energy sources (biofuel/biomass, hydroelectric, solar, tidal, wind, renewable natural gas (RNG), and green hydrogen) and traditional energy sources (coal, nuclear, and oil). In order to be a viable alternative, another energy source must meet two criteria:

- capable of providing the equivalent energy supplied by the incremental 350,000 Dth/d of natural gas to meet demand in expanding mid-continent and Gulf Coast markets; and
- able to meet the criteria above with an environmentally superior alternative relative to the Project.

10.2.1 Renewable Energy Sources

Renewable energy sources, such as wind and solar, have experienced significant growth in recent years, and are projected to continue to grow. In the *Annual Energy Outlook 2021* (EIA, 2021a), the EIA projects that electrical generation from renewables, particularly wind and solar, in the U.S. will double by 2050 and increase from 21 percent in 2020 to 42 percent in 2050. In 2019, annual consumption from renewable energy sources surpassed that of coal for the first time (EIA, 2020a). Hydroelectric energy sources are limited to localized availability. All renewable energy sources combined are expected to average only about 20 percent of total electricity consumed in the U.S. in 2021 (EIA, 2021b).

Only about four percent of electricity in PA originates from renewable energy sources. Wind energy is PA's largest renewable source for electricity generation and provides about two-fifths of the state's renewable electricity. PA has 26 wind farms, mainly located in the southwest and northeastern portions of the state. The state's hydroelectric facilities are generally about 60 years old and may be less efficient than more modern facilities (EIA, 2021c). Biomass-fueled facilities account for one-fifth of the state's renewable generation but may affect air quality, greenhouse gas (GHG) emissions, and forests in PA (EIA, 2021c; and Booth, 2012). Solar energy contributes only eight percent of the state's renewable electricity, with the majority coming from small-scale generating facilities, such as rooftop solar panels with limited generating capabilities (EIA, 2021c).

Only about 5.5 percent of electricity in WV originates from renewable energy sources coming in nearly equal amounts from hydropower and wind energy. Hydropower has long been used in mountainous WV, originally to power mills and later to generate electricity. Most of the state's wind farms are located on the narrow ridges in the mountainous eastern third of the state (EIA, 2021d).

Only about three percent of electricity in OH originates from renewable energy sources (EIA, 2021e). Wind energy accounts for -three-fifths of the state's renewable source with most of the state's wind farms are located in northwestern OH, the area with the state's greatest wind potential. The state's solar energy and hydroelectric power each accounted for a little more than one-tenth of total renewable generation in 2020 with most of the state's solar energy coming from small-scale generating facilities, such as rooftop solar panels with limited generating capabilities (EIA, 2021e). Biomass-fueled facilities account for one-fifth of the state's renewable generation but may also have negative implications affecting climate and food securities (EIA, 2021e; and Field et al., 2008).

While renewable energy sources are expected to continue to meet part of the increased energy consumption demands, renewable energy capacity is not expected to be able to support all of the increased demand proposed to be met by this Project. According to the *Annual Energy Outlook 2021* (EIA, 2021a), as coal and nuclear energy facilities are retired, new capacity additions will come largely from natural gas and renewable sources. Current and projected renewable energy sources are not expected to be able to provide the reliable baseload of energy that natural gas can provide by the Project's in-service date at the scale necessary to serve as a viable alternative to the proposed Project. Additionally, due to infrastructure constraints, renewable energy sources cannot easily replace the need for natural gas delivered by local distribution companies for heating and cooking in homes and businesses. Natural gas is the primary home heating fuel for over half of households in PA, two in five households in WV, and two thirds of homes in OH (EIA, 2021c; EIA, 2021d; and EIA, 2021e). Therefore, renewable energy systems would not be available to meet all of the market demand for this Project.

Emerging fuels such as green hydrogen and RNG are expected to play an increasing role in the clean energy future, both as a storage vehicle for excess renewable energy generation (green hydrogen) and as a net-zero emitting form of natural gas (RNG) [International Energy Agency (IEA), 2019; U.S. Department of Energy, 2020; and IEA, 2020]. Green hydrogen is produced through the electrolysis of water with renewable electricity. When combusted for energy production, hydrogen produces zero GHG emissions (IEA, 2019). RNG is biomethane produced from biomass (including landfill waste decomposition and agricultural waste streams) that is interchangeable with natural gas and carbon neutral (IEA, 2020; and EIA, 2020b). Both green hydrogen and RNG can be blended to varying degrees into natural gas transmission and distribution networks to reduce the ultimate GHG emissions of downstream users of the energy. As these emerging fuels increase in market share, Equitrans will continue to evaluate adaptability with its systems such that these fuels can be blended into the natural gas delivered by the proposed Project.

10.2.2 Traditional Fuel Sources

10.2.2.1 Coal

The EIA projects that coal-fired generation will decrease by 111 gigawatts (GW) between 2020 and 2050, with most retirements expected by 2025 (EIA, 2021a). Electricity generation from coal accounted for only about 24 percent of total electricity generation in the U.S. in 2021 (EIA, 2021b).

The current availability of coal makes it a viable alternative to natural gas for electricity generation, but it is not as clean burning or efficient. Combustion of coal for energy production emits more criteria pollutants (e.g., sulfur dioxide, nitrogen oxide, carbon monoxide, and particulate matter) and GHGs (e.g., carbon dioxide) than combustion of natural gas. Such pollutants are considered a major contributor to acid rain and climate change, which is causing ecological and economic consequences. In 2019, the electric power sector was the second largest contributor of total GHG emissions in the United States, with coal contributing approximately 60 percent of carbon dioxide emissions in the sector (United States Environmental Protection Agency, 2021.

While coal remains an option for serving the energy needs of certain customers, its use may result in greater environmental impacts, in the form of additional mining and transportation requirements, than the production and transport of natural gas via transmission pipelines. The relative environmental benefits and efficiency of natural gas make it an attractive alternative to coal-fired generation. Further, natural gas provides energy for a growing residential heating market in the Project's service area (especially the Mid-Atlantic region), which cannot be directly replaced by coal. Finally, regulatory guidelines for carbon emissions do not favor an expansion of coal-fired power plants and natural gas is a preferred fuel to offset coal use in producing electricity. Therefore, coal does not represent a viable alternative for replacing the incremental natural gas to be transported by the Project.

10.2.2.2 Oil (Petroleum)

Petroleum remains the most-consumed fuel in the United States, followed by natural gas. Liquid petroleum supplies approximately 35 percent of the total energy consumed in the United States in 2021 (EIA, 2021a), but this is predominantly consumed by the transportation sector and industrial refining process for agriculture (EIA, 2021a), which is not a market that is driving the current demand for natural gas. It is possible that projected increases in the domestic petroleum supply could offset the demand for natural gas at industrial facilities in the Project's service area, but it is unlikely that oil could meet the growing demand for natural gas in the residential sector. While existing oil-fired generators have the capacity to supplement electricity needs during periods of peak demand, it is unlikely that fuel oil could significantly offset the increasing demand for natural gas at power plants.

Increased use of fuel oil would result in environmental impacts associated with transportation and the burning of petroleum products. In terms of transportation, these impacts may include increased vessel traffic and risk of in-water oil spills for products transported by ship or additional petroleum pipeline facilities that would have similar or greater impacts as the proposed Project. Therefore, oil is not a suitable alternative to the Project.

10.2.2.3 Nuclear Energy

Nuclear energy development is an option that may be considered environmentally viable, particularly in terms of limiting air emissions of criteria pollutants. However, this alternative has drawbacks, specifically negative public perception concerning safety risks and the long-term environmental impacts associated with the disposal of radioactive waste products. As a result, an unfavorable regulatory climate exists and the probability of a new nuclear facility coming online in a timely manner to serve energy demands is low. Moreover, the time required to

design, permit, and construct a nuclear generation facility would be extensive and significantly greater than the amount of time required to design, permit, and construct the Project. The EIA projects a net decrease of 27 GW in nuclear electric generating capacity between 2020 to 2050 (EIA, 2021a). At 5.1 GW, nuclear powered generators account for 56 percent of scheduled retirements in 2021 (EIA, 2021a). Consequently, the nuclear alternative would not be available to meet market demands.

10.2.3 Energy Source Alternatives Conclusion

Following a review of energy source alternatives to meet the objectives of the Project, no other energy source would satisfy the increased demand for natural gas in the service territory. Increased capacity in the Project area is being driven by expanding Equitrans' existing infrastructure. Alternative new renewable energy infrastructure would come with an increased environmental impact. Electrical energy produced by traditional energy sources, such as coalfired plants or nuclear plants, are not viable alternatives. Primarily because of environmental concerns, the capacity of these energy sources is not increasing, and the timeline to permit new facilities is not expected to be sufficient to meet the projected energy demand in the service territory within the timeframe proposed. It is unlikely that the current demand for natural gas could be satisfied by increases in fuel oil, and the increased use of oil would result in the environmental impacts associated with processing, transporting, and burning fuel. Therefore, increasing the use of fuel oil to meet the projected energy demand in the service territory would not be viable. Sufficient renewable energy sources are not currently available, cannot be available on a timely basis for largescale application to the point where they would be viable energy alternatives to the Project, and are not currently a viable replacement for heating demands. In addition, in-home natural gas energy systems would require conversion for the delivery and use of the electricity generated by the alternative energy sources discussed above. For these reasons, and because no other energy source would directly satisfy the increased demand for natural gas in the service territory, other traditional and renewable energy sources are not considered viable alternatives to satisfying the Project's purpose and need. As emerging fuels such as green hydrogen and RNG increase in market share, Equitrans will continue to evaluate adaptability with their systems such that these fuels can be blended into the natural gas delivered by the proposed Project.

10.3 System Alternatives

System alternatives are alternatives to the proposed action that would make use of other existing, modified, or proposed pipeline systems to meet the objectives of the proposed Project. A system alternative would make it unnecessary to construct all or part of the proposed Project, although some modifications or additions to another existing pipeline system may be required to increase its capacity, or another entirely new system may need to be constructed. System alternatives involving modifications or additional system facilities would also result in environmental impacts.

To be a viable system alternative to the proposed Project, potential system alternatives must meet three criteria:

- the system must be capable of transporting up to 350,000 Dth/d of natural gas to expanding mid-continent and Gulf Coast markets;
- the system alternative must be capable of transporting the required volumes within the same schedule as the proposed Project. As described in RR 1, Section 1, Equitrans is proposing an in-service date of September 2023 for Project components in WV and OH, and June 2024 for the Project components in PA; and
- use of a system alternative must be able to meet the criteria above and at the same time result in reduced environmental impacts when compared to the proposed Project.

Equitrans evaluated current system alternatives by looking at the technical and economic feasibility and practicality of the alternative, the environmental advantage of the alternative, and the alternatives' ability to meet the Project's purpose and need. System alternatives are summarized below.

10.3.1 System Alternative 1

Equitrans evaluated this alternative which would not involve the modifications at the existing Cygrymus Compressor Station. This alternative would then require Equitrans to install approximately 17 additional miles of non-jurisdictional gathering pipeline facilities to connect the well pads in the development zone, and construction of six in-field gathering compressor stations along with expansion at the existing Corona Compressor Station to meet the 350,000 Dth/d (see Figure 10.3-1 in Appendix 10-A). Construction of the 17 miles of gathering pipeline would impact approximately 206 acres during construction and 103 acres during operation and would directly impact numerous landowner parcels requiring new or expanded permanent easements. In addition, more impacts on environmentally sensitive resources would be expected to occur with construction of the gathering pipelines. It is estimated that an additional 21 acres of permanent facility footprint would be required for the six in-field compressor stations, not including workspace requirements for construction which would be significantly larger than that required for operation and dependent on parcel configuration, topography, and other constructability constraints. Leveraging the existing transmission pipelines, as proposed, reduces the number of pipeline miles by 17 to connect the well pads within the development zone and the need for large amounts of compression and associated emissions. System Alternative 1 would, therefore, result in significantly higher environmental impacts than the Project and was not considered further.

10.3.2 System Alternative 2

Equitrans evaluated an alternative which would not involve the expansion at the existing Plasma Compressor Station. Based on hydraulic modeling, this alternative would require a greenfield compressor station to be sited approximately eight miles upstream of the existing Plasma Compressor Station along the existing H-310 Pipeline (see Figure 10.3-1). The estimated footprint of the greenfield compressor station would require approximately 3.5 acres for operation and up to approximately 21 acres for construction (commensurate to the Plasma Compressor Station), depending on parcel configuration, topography, and other constructability constraints. Additional pipeline may also be required within an approximate one-mile radius, depending on compressor station siting, to connect to the H-310 Pipeline. While it is anticipated that sensitive environmental resources would not be permanently impacted by construction and operation of the greenfield station, temporary impacts are expected. In addition, more impacts on sensitive species, and cultural resources would be expected. As proposed, the expansion at the existing Plasma Compressor Station will require 1.14 acres of additional operational footprint occurring within previously disturbed areas. System Alternative 2 would, therefore, result in significantly higher environmental impacts than the Project and was not considered further.

10.3.3 System Alternative 3

Equitrans evaluated an alternative which modeled facility upgrades and new pipeline in lieu of the expansion at the existing Plasma Compressor Station. This alternative would require an additional 35 miles of 30-inch-diameter pipeline paralleling Equitrans' existing H-310 Pipeline, requiring second crossing the Ohio River by horizontal directional drill. While no new compression would be anticipated, turbine inlet air chillers (TIACs) and horsepower increases would be required at the Plasma Compressor Station (see Figure 10.3-1). Construction of the 35 miles of 30-inch-diameter pipeline would impact approximately 488 acres during construction and 244 acres during operation and would directly impact numerous landowner parcels requiring a new or expanded permanent easements. In addition, more impacts on

environmentally sensitive resources would be expected to occur with construction of the pipeline. System Alternative 3 would, therefore, result in significantly higher environmental impacts than the Project and was not considered further.

10.3.4 System Alternative 4

Equitrans evaluated another alternative which modeled uprates in lieu of the expansion at the existing Plasma Compressor Station. This alternative would require uprates of Equitrans' existing H-310 Pipeline from 1,200 pounds per square inch gauge (psig) to 1,400 psig; however, Mark West's existing Mobley Processing Facility is unable to deliver to a system greater than 1,200 psig; therefore, upgrades at that station would also be required. Additionally, the proposed H-326 Pipeline would need to be increased to a 30-inch diameter pipeline, TIACs would need to be added at the Plasma Compressor Station, and a greenfield compressor station and supporting pipeline would be required in the vicinity of the Corona Compressor Station as the station cannot handle the additional horsepower (see Figure 10.3-1). System Alternative 4 would, therefore, result in significantly higher environmental impacts than the Project and was not considered further.

10.3.5 System Alternative 5

Eastern Gas Transmission and Storage and TransCanada have existing pipelines (TL-377 and Mountaineer Xpress, respectively) that that span from east/central WV to Clarington OH; however, while Equitrans has not engaged these companies directly, Equitrans understands that these pipelines are largely at capacity, so increasing capacity throughout would require looping lines or new pipelines and the installation of incremental compression. Additionally, these existing pipeline facilities would not serve the same delivery markets as the Ohio Valley Connector, notably Rockies Express Pipeline and Rover Pipeline LLC, nor would they be able to serve the same supply points without additional facilities. System Alternative 5 would not meet the Project's purpose and need and would result in significantly higher environmental impacts than the Project; therefore, this alternative was not considered further.

10.4 Route Alternatives

Route alternatives include major route alternatives and route variations. Major route alternatives typically deviate from the proposed route for an extended distance (e.g., for several miles) or are several miles away from the proposed route. Route variations often include realignments that are identified to avoid or resolve localized issues (e.g., cultural resource sites, wetlands, residential areas, or to accommodate landowner requests). While route variations may be several miles in length, they are more typically short and relatively close to the proposed route.

Major route alternatives and minor route variations were considered during the Project planning process. Equitrans examined additional minor route variations to accommodate landowner requests, maximize constructability, minimize impacts on sensitive resources, as discussed in the following sections.

As discussed in Resource Report 1, the proposed Project involves the installation of approximately 5.4 miles of natural gas pipeline, expansion of existing compressor stations and new/expanded ancillary aboveground facilities [i.e., valve yards and internal inspection device (e.g., pig) launchers and receivers] within a new right-of-way (ROW) or new/expanded facility sites. Much of the Proposed Route includes refinements made during route development surveys that support the constructability of the Project. The primary objective in performing this analysis was to develop the most direct route that would meet the purpose and need of the Project and collocate with existing infrastructure where possible, while also avoiding or minimizing potential adverse impacts in the following areas to the extent practicable:

- environmentally sensitive areas, such as cultural resources, wetlands, streams, and forest habitats;

- engineering and constructability constraints, such as side slope and steep slopes; and
- landowner concerns and existing residences.

Maps showing the route alternatives and the Proposed Route are presented in Figure 10.4-1 and Figure 10.4-2 in Appendix 10-A.

10.4.1 Major Route Alternatives

An alternative routing analysis was conducted for the Project. The alternative routing analysis identified one potential major route alternative for the H-327 and H-328 Pipelines and two potential major route alternatives for the H-326 Pipeline. These alternatives are discussed below. The Project alignment that is now refined is referred to as the Proposed Route. An environmental comparison of the major route alternatives is included in Tables 10.4.1-1, 10.4.1-2, and 10.4.1-3.

10.4.1.1 H-327/H-328 Alternative

The H-327/H-328 Alternative Route begins at the western edge of the existing Cygrymus Compressor Station and proceeds approximately 0.28-mile west-northwest before banking roughly due west for 0.15-mile along an existing utility ROW. Here, the pipeline would connect to the alternative location of the Shough Creek Valve Yard in an open area adjacent to Gilbert Ridge Road. Approximately 76 percent of the alternative route is forested, as opposed to roughly 86 percent of the Proposed Route. The remainder of each is comprised primarily of developed land. The Proposed Route would cross one National Hydrography Dataset (NHD) stream, Garrison Fork. The alternative would likely cross at least one unnamed tributary of this stream, but further survey would be required. No National Wetlands Inventory (NWI) wetlands would be crossed by either route. The alternative route would be slightly shorter than the Proposed Route but would traverse steeper terrain. The alternative route descends west-northwest to the bottom of a valley, losing approximately 300 feet of elevation over 1,000 feet (0.19-mile) of distance, before regaining this altitude over the remainder of the route. Conversely, the Proposed Route descends steadily along the route, dropping about 400 feet over the entire length from the station to the Proposed Shough Creek Valve Yard. The steeper slopes and greater overall elevation change of the alternative route would increase the potential for erosion and the need for slide mitigation measures. Additionally, the portion of the alternative that would collocate has two existing pipelines that are on steep side slopes. This alternative route poses greater difficulties and risks for construction and maintenance of the pipeline, and therefore was deemed less favorable than the Proposed Route and not considered further.

Table 10.4.1-1
Environmental Comparison of Major H-327/H-328 Route Alternative

Environmental Factor	Proposed Route	H-327/H-328 Route Alternative
Total Length (miles)	0.46	0.43
Estimated ROW Requirements[1]		
Construction ROW (acres)	5.56	5.18
Permanent ROW (acres)	2.78	2.58
Wetlands[2]		
Forested wetlands (acres)	0.00	0.00
Scrub-shrub wetlands (acres)	0.00	0.00
Emergent wetlands (acres)	0.00	0.00
Unconsolidated bottom wetlands (acres)	0.00	0.00

Table 10.4.1-1 (Continued)

Environmental Factor	Proposed Route	H-327/H-328 Route Alternative
Wetlands[2] (Continued)		
Total wetlands (acres)	0.00	0.00
Total wetlands (miles)	0.00	0.00
Waterbodies[2]		
Total Waterbodies (no.)	1	1
Ponds/lakes (no.)	0	0
Flood Hazard Areas (no.)	0	0
Land Use[3]		
Developed (acres [percent])	0.22 (4.01%)	0.11 (2.04%)
Barren (acres [percent])	0.00 (0%)	0.00 (0%)
Forest (acres [percent])	4.79 (86.15%)	3.92 (75.68%)
Agriculture/Pasture (acres [percent])	0.55 (9.84%)	0.00 (0%)
Open Land (acres [percent])	0.00 (0%)	1.15 (22.28%)
Wetland (acres [percent])	0.00 (0%)	0.00 (0%)
Open Water (acres [percent])	0.00 (0%)	0.00 (0%)
Transportation[4]		
Roads (no.)	0	0
Railroads (no.)	0	0
Residences[5]		
Anticipated Residences within 50 feet of construction ROW (no.)	0	0
Constructability Concern		
Side Slope Construction [miles (percent)][6]	0.05 (11%)	0.14 (30%)

Notes:

1 Impact estimates are based on a 100-foot-wide construction ROW and 50-foot-wide permanent ROW.

2 To enable a comparative analysis between the Proposed Route and Major Route Alternative (for which no field survey data is available), desktop data from the NWI [United States Fish and Wildlife Service (USFWS), 2020] and NHD [United States Geological Survey (USGS), 2020] was utilized for this analysis as well as aerial imagery review for streams. Floodplain data is provided by Federal Emergency Management Agency (FEMA) (FEMA, 2020). Counts and acreages reflect the estimated 100-foot-wide construction ROW.

3 Land use cover was generated based on publicly available data from the USGS National Land Cover Database (NLCD) 2019 Land Cover Conterminous United States (Multi-Resolution Land Characteristics Consortium, published 2021) and was not verified with aerial imagery. Acreages are based on the estimated 100-foot-wide construction ROW.

4 Road and railroad crossings were generated based on a review of aerial imagery. Crossing counts are based on the pipeline centerline.

5 Residences were identified based on aerial imagery.

6 Areas of side slope construction were approximated through a desktop review of USGS topographic maps and review of aerial imagery.

10.4.1.2 H-326 Alternative 1

This alternative begins at the north end of the existing Corona Compressor Station and heads north-northwest for approximately 0.25-mile before turning west and continuing 0.5-mile further along a ridgeline. As the route approaches North Fork Road, it begins to turn north, and collocates in the same area as the Proposed Route approximate to milepost (MP) 1.3. From here, it follows the Proposed Route until approximate MP 1.8, where it heads to the north for approximately 0.7-mile, then approximately 1.6 miles west. This alternative would connect to the existing OVC Interconnect, with a total length of approximately 3.7 miles. The alternative is roughly the same length as the Proposed Route, but it would not be collocated with the H-330 Pipeline. The Proposed Route collocates with the H-330 Pipeline for approximately 0.2-mile, thus reducing the overall disturbance as compared to the H-326 Alternative 1. Additional pipeline installation would also be required to connect a lateral off the alternative route to tie-in to the Pickenpaw Interconnect similar to that of the Proposed H-329 Pipeline. Further, H-326 Alternative 1 would entail additional waterbody crossings as compared to the Proposed Route and would also impact a larger amount of forest. Desktop review of USGS topographic mapping indicated this alternative would require more side slope construction which increases the likelihood for mitigation measures and construction issues. Additionally, the alternative impacts a parcel with known landowner issues, unrelated to the Project. In addition to the landowner issues, this alternative route poses greater environmental impacts, difficulties and risks for construction and maintenance of the pipeline, and therefore was deemed less favorable than the Proposed Route and not considered further.

Table 10.4.1-2

Environmental Comparison of Major H-326 Route Alternative 1

Environmental Factor	Proposed Route	H-326 Route Alternative 1
Total Length (miles)	3.71	3.67
Estimated ROW Requirements[1]		
Construction ROW (acres)	44.84	44.35
Permanent ROW (acres)	22.44	22.24
Wetlands[2]		
Forested wetlands (acres)	0.00	0.00
Scrub-shrub wetlands (acres)	0.00	0.00
Emergent wetlands (acres)	0.00	0.00
Unconsolidated bottom wetlands (acres)	0.00	0.07
Total wetlands (acres)	0.00	0.07
Total wetlands (miles)	0.00	<0.01
Waterbodies[2]		
Total Waterbodies (no.)	3	5
Ponds/lakes (no.)	0	0
Flood Hazard Areas (no.)	2	2
Land Use[3]		
Developed (acres [percent])	4.26 (9.5%)	1.27 (2.87%)
Barren (acres [percent])	0.00 (0%)	0.00 (0%)

Table 10.4.1-2 (Continued)

Environmental Factor	Proposed Route	H-326 Route Alternative 1
Forest (acres [percent])	31.01 (69.15%)	38.54 (86.9%)
Agriculture/Pasture (acres [percent])	0.31 (.69%)	0.31 (.7%)
Open Land (acres [percent])	9.26 (20.66%)	4.23 (9.53%)
Wetland (acres [percent])	0.00 (0%)	0.00 (0%)
Open Water (acres [percent])	0.00 (0%)	0.00 (0%)
Transportation[4]		
Roads (no.)	6	5
Railroads (no.)	0	0
Residences[5]		
Anticipated Residences within 50 feet of construction ROW (no.)	0	0
Constructability Concern		
Side Slope Construction [miles (percent)][6]	0.44 (11%)	0.55 (15%)

Notes:

1 Impact estimates are based on a 100-foot-wide construction ROW and 50-foot-wide permanent ROW.

2 To enable a comparative analysis between the Proposed Route and Major Route Alternative (for which no field survey data is available), desktop data from the NWI (USFWS, 2020) and NHD (USGS, 2020) was utilized for this analysis as well as aerial imagery review for streams. Floodplain data is provided by FEMA (FEMA, 2020). Counts and acreages reflect the estimated 100-foot-wide construction ROW.

3 Land use cover was generated based on publicly available data from the USGS National Land Cover Database (NLCD) 2019 Land Cover Conterminous United States (Multi-Resolution Land Characteristics Consortium, published 2021) and was not verified with aerial imagery. Acreages are based on the estimated 100-foot-wide construction ROW.

4 Road and railroad crossings were generated based on a review of aerial imagery. Crossing counts are based on the pipeline centerline.

5 Residences were identified based on aerial imagery.

6 Areas of side slope construction were approximated through a desktop review of USGS topographic maps and review of aerial imagery.

10.4.1.3 H-326 Alternative 2

This alternative begins at the southern end of the existing Corona Compressor Station and follows a similar alignment as the Proposed Route until MP 0.6. From here, it diverges to the west and collocates along existing ROW until it enters Logansport Station. From Logansport Station, the alternative turns 90 degrees to connect to the existing OVC Interconnect after approximately 0.5-mile. The H-326 Alternative 2 is approximately 3.75 miles in length and would be collocated with two existing pipelines (H-306 and GSF912) which poses a constructability concern due positioning on ridgetops. This route would require four additional waterbody crossings, a greater amount of forest clearing, and significantly more side slope construction. The alternative includes several steep hillsides; therefore, poses greater difficulties and risks for construction and maintenance of the pipeline and was not considered further.

Table 10.4.1-3

Environmental Comparison of Major H-326 Route Alternative 2

Environmental Factor	Proposed Route	H-326 Route Alternative 2
Total Length (miles)	3.71	3.75
Estimated ROW Requirements[1]		
Construction ROW (acres)	44.84	45.59
Permanent ROW (acres)	22.44	22.74
Wetlands[2]		
Forested wetlands (acres)	0.00	0.00
Scrub-shrub wetlands (acres)	0.00	0.00
Emergent wetlands (acres)	0.00	0.00
Unconsolidated bottom wetlands (acres)	0.00	0.00
Total wetlands (acres)	0.00	0.00
Total wetlands (miles)	0.00	0.00
Waterbodies[2]		
Total Waterbodies (no.)	3	7
Ponds/lakes (no.)	0	0
Flood Hazard Areas (no.)	2	1
Land Use[3]		
Developed (acres [percent])	4.26 (9.5%)	1.27 (2.87%)
Barren (acres [percent])	0.00 (0%)	0.00 (0%)
Forest (acres [percent])	31.01 (69.15%)	38.54 (86.9%)
Agriculture/Pasture (acres [percent])	0.31 (.69%)	0.31 (0.7%)
Open Land (acres [percent])	9.26 (20.66%)	4.23 (9.53%)
Wetland (acres [percent])	0.00 (0%)	0.00 (0%)
Open Water (acres [percent])	0.00 (0%)	0.00 (0%)
Transportation[4]		
Roads (no.)	6	5
Railroads (no.)	0	0
Residences[5]		
Anticipated Residences within 50 feet of construction ROW (no.)	0	0
Constructability Concern		
Side Slope Construction [miles (percent)][6]	0.44 (11%)	0.74 (20%)

Notes:

1 Impact estimates are based on a 100-foot-wide construction ROW and 50-foot-wide permanent ROW.

2 To enable a comparative analysis between the Proposed Route and Major Route Alternative (for which no field survey data is available), desktop data from the NWI (USFWS, 2020) and NHD (USGS, 2020) was utilized for this analysis as well as aerial imagery review for streams. Floodplain data is provided by FEMA (FEMA, 2020). Counts and acreages reflect the estimated 100-foot-wide construction ROW.

Table 10.4.1-3 (Continued)

[3] Land use cover was generated based on publicly available data from the USGS National Land Cover Database (NLCD) 2019 Land Cover Conterminous United States (Multi-Resolution Land Characteristics Consortium, published 2021) and was not verified with aerial imagery. Acreages are based on the estimated 100-foot-wide construction ROW.

[4] Road and railroad crossings were generated based on a review of aerial imagery. Crossing counts are based on the pipeline centerline.

[5] Residences were identified based on aerial imagery.

[6] Areas of side slope construction were approximated through a desktop review of USGS topographic maps and review of aerial imagery.

10.4.2 Minor Route Variations

As part of an initial routing review, one minor route variation was evaluated for the H-327 and H-328 Pipelines and three minor route variations were evaluated for the H-326 Pipeline. Equitrans evaluated these minor route variations during routing reviews in conjunction with landowner feedback to refine the pipeline alignment for the Project. Minor route variations were assessed for feasibility based on constructability, environmental, landowner concerns, or other technical considerations. Based on the analysis summarized below, Equitrans incorporated the minor route variations, where considered preferable, into the route to create the Proposed Route identified in this Environmental Report. As demonstrated by the analysis below, the Proposed Route is the most feasible from both a constructability standpoint and minimizes environmental impacts when compared with other minor route variations that were considered.

The minor route variations, and the Proposed Route are presented in Figure 10.4-1 and Figure 10.4-2 in Appendix 10-A. Comparisons of the potential impacts for the route variations to the corresponding segments of the Proposed Route are discussed below.

10.4.2.1 H-327/H-328 Minor Alternative 1 VAR-MP0.33

This minor route variation begins at approximate MP 0.33 and is approximately 0.07-mile in length. Although the difference in length is negligible, this alternative has more environmental impacts. The Proposed Route was adapted to cross the stream perpendicular, minimize wetland impacts at the stream crossing as well as to avoid permanent conversion of the scrub-shrub wetland approximate to MP 0.43. Therefore, this variation was abandoned to avoid and minimize impacts to environmental features identified during field review.

10.4.2.2 H-326 Minor Alternative 1 VAR-MP0.86

This minor route variation is approximately 0.79-mile in length and begins at approximate MP 0.86 of the Proposed Route. This variation heads west for 0.1-mile before turning north and continuing until it rejoins the Proposed Route at approximate MP 1.75. The length of this variation is similar to the Proposed Route, but the hillsides traversed are much steeper, with a maximum slope of 60 percent and is not collocated as is the Proposed Route. Approximately 95 percent of this variation is forested as compared to the Proposed Route which is predominately collocated with existing ROW. Additionally, this minor route variation was not preferred by the landowner. Therefore, this variation was abandoned due to landowner preference, increased forest clearing and steep slope constructability concerns.

10.4.2.3 H-326 Minor Alternative 2 VAR-MP2.30

This minor route variation largely parallels the Proposed Route and is approximately 0.72-mile in length. This variation would follow the spine of a ridge in an attempt to avoid side slope construction. Equitrans met with the landowner on site to make necessary adjustments to meet landowner preference and for constructability. For these reasons the Proposed Route is the preferred option.

10.4.2.4 H-326 Minor Alternative 3 VAR-MP3.10

The minor route variation proceeds north-northwest from MP 3.1 of the Proposed Route for approximately 0.34-mile and then proceeds 0.22-mile before connecting with the existing OVC Interconnect. This variation would cross steep forested slopes and would not be collocated to the extent that the Proposed Route would be in this location. Additionally, this variation had the same landowner issues as discussed in the Major H-326 Route Alternative 1. Therefore, this variation was abandoned due to landowner issues, steep slope constructability concerns and additional tree clearing required due to lack of collocation. For these reasons the Proposed Route is the preferred option.

10.4.2.5 H-330 Minor Alternative 1 VAR-MP0.00

The minor route variation includes a short spur (0.01-mile) and proceeds southwest from the proposed Liberty Valve Yard and includes a tie-in to the H-306 Pipeline. This variation would involve active construction in a stream to implement the tie-in to the H-306 Pipeline as well as temporary construction and minor operational wetland impacts. Equitrans, in coordination with landowners, identified a conservation easement associated with this minor route variation. As discussed in Resource Report 8, the easement is administered by the West Virginia Department of Environmental Protection and the United States Army Corps of Engineers and restricts new construction, earth disturbance, topography changes, and vegetation removal unless maintaining existing utilities along an area of floodplain to North Fork Fishing Creek in Wetzel County, WV. The Proposed Route includes the H-330 Spur which avoids the conservation easement. Temporary construction and minor operational wetland impacts associated with the Proposed Route are required (See Resource Report 2); however, no instream work is required to implement the tie-in to the H-306 Pipeline. For these reasons the H-330 Spur is selected as the Proposed Route.

10.5 Electric Motor-Driven Compression Alternative

As discussed in detail in Resource Report 1, the Project consists of modifications at existing compressor stations including Cygrymus Compressor Station in Greene County, PA, Corona Compressor Station in Wetzel County, WV, and Plasma Compressor Station in Monroe County, OH. Equitrans evaluated the feasibility of using electric-driven compressor units in lieu of the proposed natural gas-fired compressor units for the modifications at Cygrymus, Corona and Plasma Compressor Stations. Several factors were considered in evaluating the type of unit to install, including: proximity to existing electric power sources; the need for new or modified electric power sources or transmission facilities; the need for additional ancillary facilities, such as substations; the ability of power companies to design, permit and construct new facilities in a timeframe reasonably close to the Project; additional environmental and landowner impacts associated with construction of new facilities; and the ability to comply with emissions standards during operations at each site using natural gas. The economics of utilizing higher-priced electricity rather than natural gas to operate the compressor units is also a consideration but is not discussed further herein. Additionally, siting new compressor stations in closer proximity to the electric transmission grids would require new permanent impacts to site the compressor as well as unnecessary pipeline to connect the stations to Equitrans' existing pipeline system, and therefore was not evaluated as an alternative.

10.5.1 Cygrymus Compressor Station

As detailed in Resource Report 1, the proposed modifications at Cygrymus Compressor Station will utilize the existing permanent footprint of the station with a small increase in permanent footprint (0.8-acre) to accommodate the two new Taurus 70 turbine-driven centrifugal compressors. Equitrans evaluated the feasibility of using electric-driven compressors units in lieu of these natural gas-fired compressor units.

The Cygrymus Compressor Station is located within the service area of West Penn Power (WPP), a FirstEnergy Company, and would require a load of 5 megavolt amperes (MVA) of power for electric motor-driven compression. Discussions between Equitrans and WPP determined that adding 5 MVA to the three phase 12 kilovolt (kV) distribution circuit in the area is not possible and that this type of load would have to be on WPP's sub-transmission 25kV distribution circuit, the nearest of which is approximately 11.5 miles (straight line approximation) to the northeast of the compressor station. Additionally, a new approximate 2.5-acre electric substation would be required and sited in proximity to the compressor station. WPP indicated an approximate cost of $500,000 per mile for new power line installation, and that it would require significant work requiring no less than two years to complete. A cost estimate for the required substation was not provided by WPP, but as discussed in Section 10.5.3, costs for the substation could be commensurate with estimates provided by South Central Power Company ($1.8 to $2.5 million).

Even if this option were technically feasible, use of electric-powered compressor units at the Cygrymus Compressor Station would in turn increase the overall acreage of impacts required for the Project to install a new substation and an estimated 11.5 miles (assuming a direct route) of dedicated service lines to be run from WPP's sub-transmission 25kV distribution circuit to the compressor station. A new power line ROW is estimated to require at least 50 feet of width to construct and operate (resulting in an estimated 69.7 acres of permanent power line ROW required to power the compressor station). Rough siting for the substation would place it approximately 0.15-mile northeast of the compressor station on a forested hilltop. A depiction of the approximate connect point provided by WPP and a potential powerline and substation siting is provided as Figure 10.5-1.

The final location for a power line or substation would need to be determined by the transmission provider after siting and line evaluation that considers terrain, parcels and area impacts. It should be noted that the final location and distance may be further than initially estimated by the transmission provider.

Installing electric-driven compression at the Cygrymus Compressor Station would not be cost effective nor meet Project timelines and would result in a total of at least 72.2 acres of additional environmental impacts (disturbance of soils, wetlands, waterbodies, land use and visual) and would result in impacts to a significant number of new landowners from construction and operation of the new power line and substation.

10.5.2 Corona Compressor Station

As detailed in Resource Report 1, the proposed modification at Corona Compressor Station will utilize the existing permanent footprint of the station with no new permanent footprint required to accommodate the additional Mars 100 gas turbine engine driving a centrifugal compressor. Equitrans evaluated the feasibility of using electric-driven compressor units in lieu of the additional natural gas-fired compressor unit.

The Corona Compressor Station is located within the service area of WPP and would require a load of 5 MVA of power for electric motor-driven compression. Discussions between Equitrans

and WPP determined that adding 5 MVA to the three phase 12kV distribution circuit in the area is not possible and that this type of load would have to be on WPP's sub-transmission 25kV distribution circuit. WPP indicated that the closest 25kV distribution circuit that could handle the capacity is approximately 9 miles (straight line approximation) east of the compressor station and that this source is questionable and would require a study to verify if it would be an option. Additionally, a new approximate 2.5-acre electric substation would be required and sited in proximity to the compressor station. WPP indicated an approximate cost of $500,000 per mile for new power line installation, and that it would require significant work requiring no less than two years to complete. A cost estimate for the required substation was not provided by WPP, but as discussed in Section 10.5.3, costs for the substation could be commensurate with estimates provided by South Central Power Company ($1.8 to $2.5 million).

Even if this option were technically feasible, use of an electric-powered compressor unit at the Corona Compressor Station would in turn increase the overall acreage of impacts required for the Project to install a new substation and an estimated 9 miles (assuming a direct route and its feasibility to tie into WPP service at the provided location) of dedicated service lines to be run from WPP's sub-transmission 25kV distribution circuit to the compressor station. A new power line ROW is estimated to require at least 50 feet of width to construct and operate (resulting in an estimated 54.5 acres of permanent power line ROW required to power the compressor station). Rough siting for the substation would place it approximately 0.25-mile east of the compressor station on a forested hilltop. A depiction of the approximate connect point provided by WPP and a potential powerline and substation siting is provided as Figure 10.5-2. The final location for a power line or substation would need to be determined by the transmission provider after siting and line evaluation that considers terrain, parcels and area impacts. It should be noted that the final location and distance may be further than initially estimated by the transmission provider.

Installing electric-driven compression at the Corona Compressor Station would not be cost effective nor meet Project timelines, and would result in at least 57 acres of additional environmental impacts (disturbance of soils, wetlands, waterbodies, land use and visual) and would result in impacts to a significant number of new landowners from construction and operation of the new power line and substation.

10.5.3 Plasma Compressor Station

As detailed in Resource Report 1, the proposed modification at Plasma Compressor Station will utilize the existing permanent footprint of the station with a 1.14-acre increase in permanent footprint to accommodate the additional Titan 130 gas turbine-driven centrifugal compressor. Equitrans evaluated the feasibility of using electric-driven compressors units in lieu of the additional natural gas-fired compressor unit.

The Plasma Compressor Station is located within the service area of South Central Power Company (SCPC) and would require a load of 20 MVA of power for electric motor-driven compression. Discussions between SCPC and Equitrans determined that the nearest 138kV connection point that would provide this type of load is approximately 1.5 miles (straight line approximation) south of the compressor station. SCPC indicated a cost for new power line is not required upfront but is incorporated into the transmission rate and estimated 18-24 months to complete a new power line. Additionally, SCPC specified that an approximate 138kV/12kV at 20 MVA distribution substation would also be required and estimated roughly $1.8 to $2.5 million to construct with a timeframe of 18-24 months. Timeframes for the substation would also be dependent on substation material lead times, land acquisition, site prep, grading, etc. The substation would be a dedicated delivery point/substation owned by Equitrans and as a result, typically, Equitrans would be responsible for building, owning, and maintaining the substation. SCPC estimated the approximate footprint required for the substation to be approximately 3 acres due to the voltage required.

Even if this option were technically feasible, use of an electric-powered compressor unit at the Plasma Compressor Station would in turn increase the overall acreage of impacts required for the Project to install a new substation, and based on a rough power line route, an estimated 1.4 miles of dedicated service lines to be run from the respective distribution line to the compressor station. A new power line ROW is estimated to require at least 50 feet of width to construct and operate (resulting in 8.5 acres of permanent power line ROW required to power the compressor station). Rough siting of such a substation, taking into consideration nearby foreign lines, residences, and topography, would place it approximately 0.5-mile northwest of the compressor station on a cleared hilltop. Because the location of the substation would be approximately 0.5 miles away, it is estimated that Equitrans would lose roughly 1-2% of the energy provided to the compressor station. A depiction of the approximate connect point provided by WPP and a potential powerline and substation siting is provided as Figure 10.5-3. The final location for a power line or substation would be determined by the transmission provider after siting and line evaluation that considers terrain, parcels and area impacts. It should be noted that the final location and distance may be further than initially estimated by the transmission provider.

Installing electric-driven compression at the Plasma Compressor Station would not be cost effective nor meet Project timelines and would result in a total of at least 11.5 acres of additional environmental impacts (disturbance of soils, wetlands, waterbodies, land use and visual) and would result in impacts to new landowners from construction and operation of the new power line and substation.

10.5.4 Electric Motor-Driven Compression Alternative Conclusion

The use of electric motor-driven compressor units for the modifications proposed at the existing Cygrymus, Corona and Plasma Compressor Stations would require Equitrans to purchase electricity from an outside supplier and the construction of significant additional non-jurisdictional electric transmission infrastructure (as opposed to the relatively minor modifications required for the additional turbines at the existing stations). Utilizing electric-powered compressor units for the Project would increase the overall acreage of impacts required to install 21.9 miles of new power line ROW and 3 substations. The overall acreage for the power line ROWs and substations are estimated to require at least 140.7 acres of disturbance including soils, wetlands, waterbodies, land use, visual effects, and would result in impacts on new landowners from construction and operation of non-jurisdictional electric transmission infrastructure. These non-jurisdictional facilities would greatly increase the overall disturbance and impacts for construction and operation of the compressor stations and would be cost prohibitive relative to the Project as proposed.

Additionally, a single power source to operate the added electric-driven compressors, which Equitrans is not in control of, decreases the reliability of the compressor station maintaining power. Consequently, in the event of a regional utility power outage, a considerable amount of compression at the existing stations would be unavailable, hindering the operation of Equitrans' Mainline System. This would significantly impede Equitrans' ability to provide service during electric interruptions, whereas the natural gas turbine-driven compressors are self-sustaining. This is an especially important for electric generation facilities that utilize natural gas, as an electric power outage that negatively affects Equitrans' ability to deliver natural gas to the interstate grid could cause additional power outages due to insufficient downstream natural gas supplies. For these reasons, Equitrans has determined that natural gas turbine-driven compression at Cygrymus, Corona and Plasma Compressor Stations are highly preferable for system and public reliability.

As further discussed in Resource Report 9, emissions from the proposed operations for the Project, as well as existing equipment at the stations, were included in air dispersion models. The modeled impacts, combined with ambient background concentrations to represent existing

emission sources in the area, are below the national ambient air quality standards. Consistent with the EPA guidance, proposed sources have met the requirement to demonstrate that they do not cause or contribute to a violation by showing that the ambient air quality impacts resulting from the proposed source's emissions would be below these concentration levels (1990 Draft NSR Workshop Manual at C.51-C.52). The results of dispersion modeling conducted shows that the impacts from the compressor stations are below these thresholds for modeled pollutants no more than approximately 0.5 miles from the facility. As such, the Project would not be considered to cause or contribute to a violation of an applicable air quality standard at these locations.

Although local air emissions from electric-driven compressors would be expected to be lower than those from natural gas-driven compressors, use of electric-driven compressors would result in higher load on the electric grid. Regionally, the electric grid is powered by a combination of traditional and renewable sources, including nuclear plants, natural gas plants, wind farms, and coal fired plants. Although it is difficult to assess the draw of power at any one time, a significant portion of power regionally is still provided by coal fired plants, which have significantly higher air emissions than the clean burning natural gas used to power the proposed low emission natural gas turbine-driven compressor units proposed by Equitrans. Based on information provided by WPP, their territory generates electricity by a mix of fuels and renewables with the majority being provided by natural gas at 36,850 megawatts (MW), followed by nuclear at 33,933 MW and coal at 32,888 MW. Renewables accounted for 7,567 MW (PJM, 2022). Buckeye Power's (SPCP's generation & transmission provider) base load consists of a mix of fuels and renewables with the majority being provided by coal at 1,664 MW, followed by natural gas at 710 MW and renewables accounting for 71.2. While utilizing electric-driven compressors may benefit local air emissions in proximity to the Project, air emissions are simply being transferred to another location since the predominant fuel source that would provide electric-driven compression for Cygrymus, Corona and Plasma Compressor Stations would be generated predominantly by natural gas and coal.

For all of the reasons stated above in this section, the electric-driven compressor options are not viable for the Project

10.6 Alternative Sites for Aboveground Facilities

The Federal Energy Regulatory Commission (FERC) requires that alternative sites for major aboveground facilities, such as LNG facilities and compressor stations, be discussed. The Project consists of modifications at existing compressor stations; no new major aboveground facility sites are proposed as part of the Project.

10.7 Conclusions

For the reasons discussed in the preceding sections, the proposed Project is the most appropriate to accomplish the Project purpose and need while supporting constructability, mitigating landowner concerns, and minimizing environmental impacts. Compressor station modifications and ancillary aboveground facilities have been located within previously disturbed land, to the extent practicable. Construction of the Project as proposed is considered by Equitrans to be preferable from an environmental and economic standpoint. To minimize environmental impacts, the Project will adhere to the conditions of FERC's *Upland Erosion Control, Revegetation, and Maintenance Plan* and *Wetland and Waterbody Construction and Mitigation Procedures,* with variances requested in this Environmental Report and to be approved by FERC, as well as the conditions of applicable federal, state, and local permits. With implementation of appropriate mitigation measures, the Project is not anticipated to result in significant environmental impacts.

10.8 References

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APPENDIX 10-A
Figures

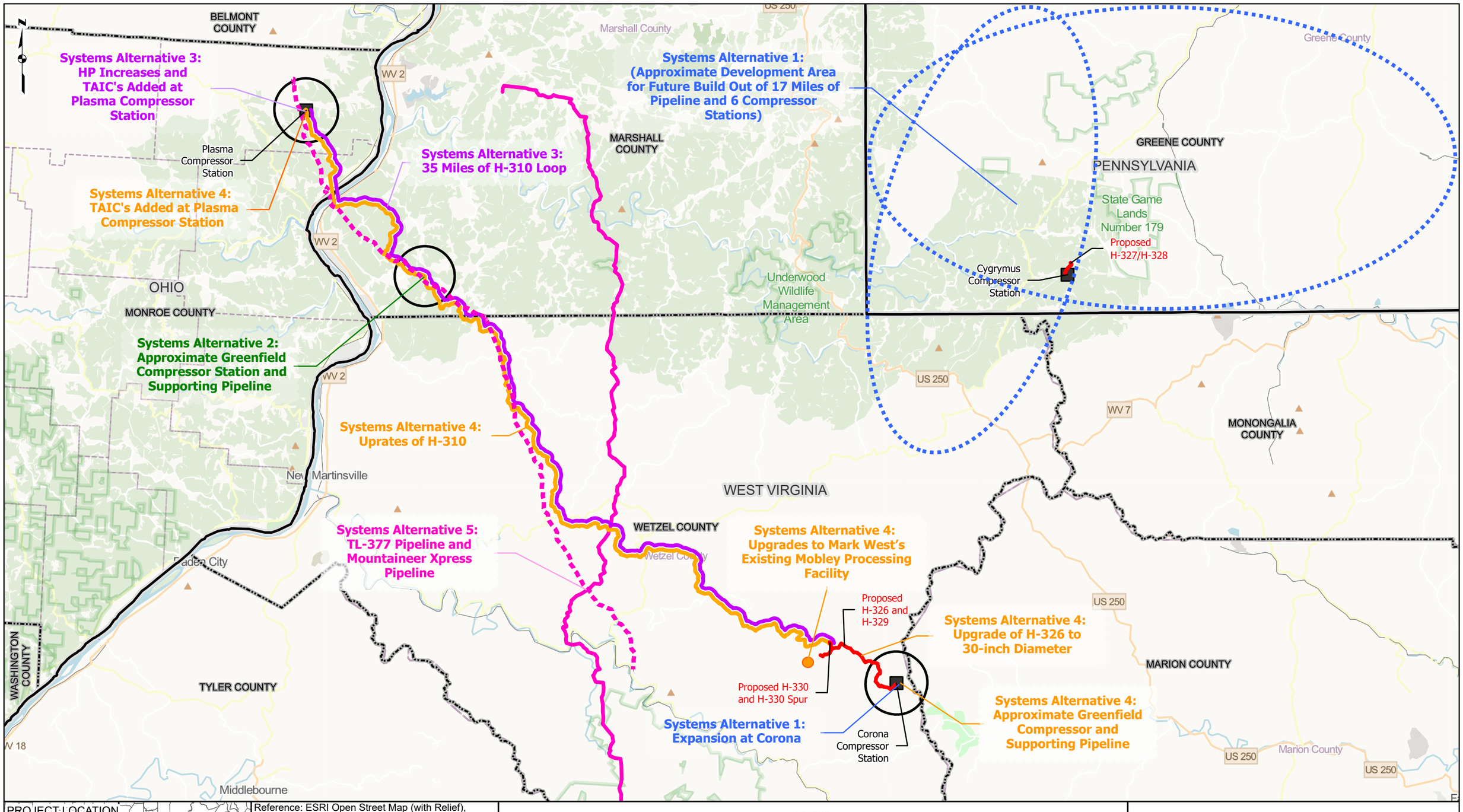

FIGURE 10.3-1
SYSTEMS ALTERNATIVES

OHIO VALLEY CONNECTOR EXPANSION PROJECT
EQUITRANS, L.P.

gai consultants

EQUITRANS

DRAWN BY: TAF
CHECKED: KJT
DATE: 12/22/2021
APPROVED: JJP

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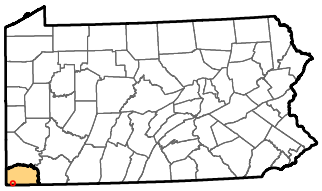
PROJECT LOCATION



GREENE COUNTY, PENNSYLVANIA

LEGEND

- H-327/328 Major Alternative
- Shough Creek Valve Yard Major Alternative
- H-328 Minor Alternative
- H-327 Minor Alternative
- Proposed H-327 Milepost
- Proposed H-328 Milepost
- Proposed H-327 Pipeline
- Proposed H-328 Pipeline
- Ancillary Aboveground Facility
- Compressor Station
- County Boundary

0 250 500 1,000 Feet

FIGURE 10.4-1
MAJOR AND MINOR ROUTE ALTERNATIVES
H-327/H-328 PIPELINE

OHIO VALLEY CONNECTOR EXPANSION PROJECT
EQUITRANS, L.P.

gai consultants

EQUITRANS

DRAWN BY: TAF DATE: 11/9/2021
CHECKED: KJT APPROVED: JJP

REFERENCE: PENNSYLVANIA PEMA IMAGERY 2018 WEB, AND HYBRID REFERENCE LAYER (LOCAL LANGUAGE) MAP SERVERS, ACCESSED 11/9/2021.
PA PEMA 6-INCH ORTHOIMAGERY (2018).

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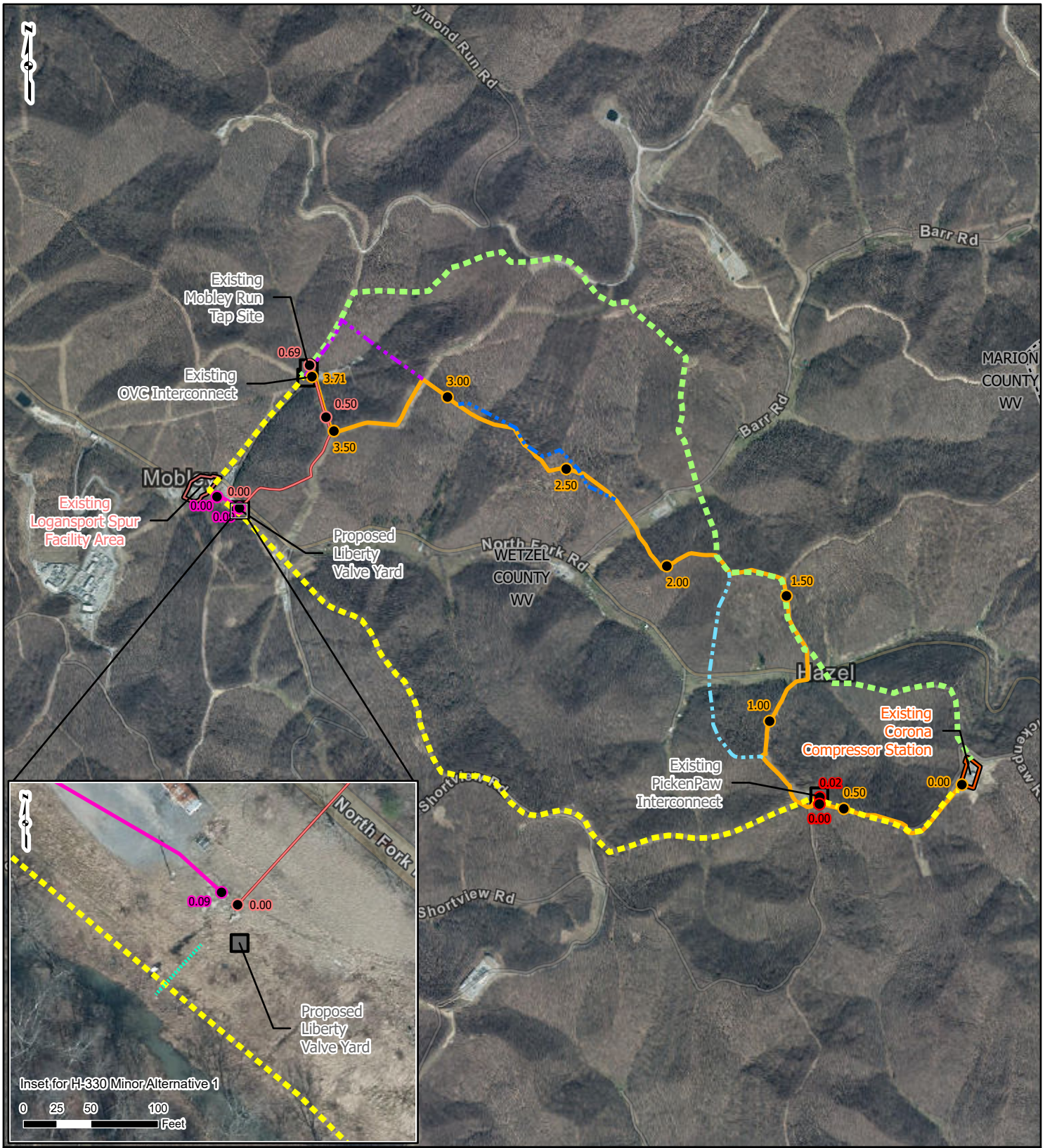

FIGURE 10.4-2
MAJOR AND MINOR ROUTE ALTERNATIVES
H-326 PIPELINE

OHIO VALLEY CONNECTOR EXPANSION PROJECT
EQUITRANS, L.P.

gai consultants

EQUITRANS

DRAWN BY: TAF DATE: 12/8/2021
CHECKED: KJT APPROVED: JJP

REFERENCE: WEST VIRGINIA WVGISTC 1-FOOT OR BETTER LEAF-OFF 2010-2018 MOSAIC AERIAL IMAGERY, AND HYBRID REFERENCE LAYER (LOCAL LANGUAGE) MAP SERVERS, ACCESSED 12/8/2021.

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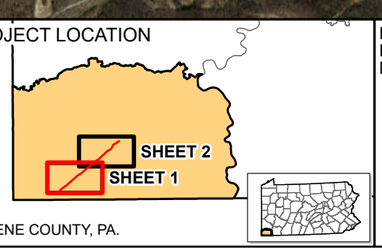
SHEET 2
SHEET 1

GREENE
COUNTY
PA

PROJECT LOCATION



GREENE COUNTY, PA.

Reference: PA PEMA 2018 6-inch Orthoimagery and ESRI Hybrid Reference Layer (Local Language) Map Servers, Accessed 1/24/2022.

LEGEND

- Nearest Approximate Connection Point
- Potential Powerline Route
- Potential Substation Location
- Cygrymus Compressor Station
- County Boundary

0 0.25 0.5 1 Miles

FIGURE 10.5-1
CYGRYMUS COMPRESSOR STATION
ELECTRIC MOTOR-DRIVEN COMPRESSION ALTERNATIVE
SHEET 1 OF 2

OHIO VALLEY CONNECTOR EXPANSION PROJECT
EQUITRANS, L.P.

gai consultants

EQUITRANS

DRAWN BY: TAF
CHECKED: KJT
DATE: 1/24/2022
APPROVED: JJP

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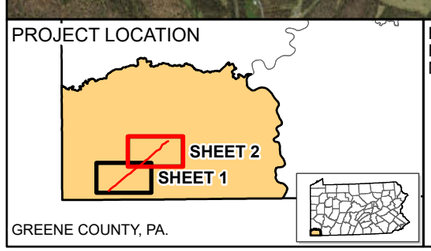
GREENE
COUNTY
PA

SHEET 2
SHEET 1

PROJECT LOCATION



GREENE COUNTY, PA.

Reference: PA PEMA 2018 6-inch Orthoimagery and ESRI Hybrid Reference Layer (Local Language) Map Servers, Accessed 1/24/2022.

LEGEND

- Nearest Approximate Connection Point
- Potential Powerline Route
- Potential Substation Location
- County Boundary

0 0.25 0.5 1 Miles

FIGURE 10.5-1
CYGRYMUS COMPRESSOR STATION
ELECTRIC MOTOR-DRIVEN COMPRESSION ALTERNATIVE
SHEET 2 OF 2

OHIO VALLEY CONNECTOR EXPANSION PROJECT
EQUITRANS, L.P.

gai consultants

EQUITRANS

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CHECKED: KJT
DATE: 1/24/2022
APPROVED: JJP

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PROJECT LOCATION

MARION & WETZEL COUNTIES, WV.

Reference: West Virginia WVGISTC 1-foot or better Leaf-Off 2010-2018 Mosaic Aerial Imagery, and ESRI Hybrid Reference Layer (Local Language) Map Servers, Accessed 1/24/2022.

LEGEND

- Nearest Approximate Connection Point
- Potential Powerline Route
- Potential Substation Location
- Corona Compressor Station
- County Boundary

0 0.3 0.6 1.2 Miles

FIGURE 10.5-2
CORONA COMPRESSOR STATION
ELECTRIC MOTOR-DRIVEN COMPRESSION ALTERNATIVE

OHIO VALLEY CONNECTOR EXPANSION PROJECT
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DRAWN BY: TAF DATE: 1/24/2022
CHECKED: KJT APPROVED: JJP

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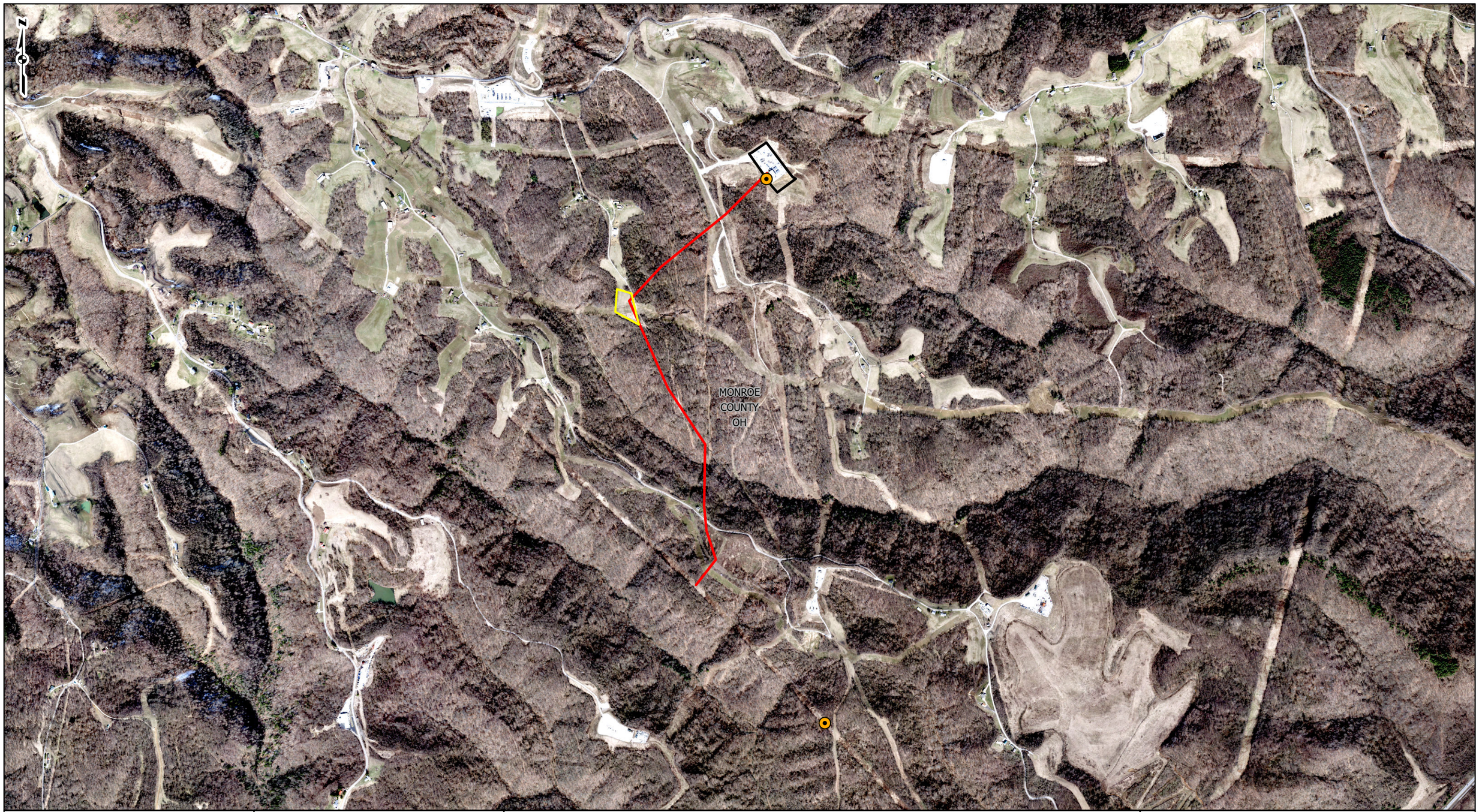

PROJECT LOCATION

MONROE COUNTY, OH.

Reference: OSIP 2020 6-inch Aerial Imagery and ESRI Hybrid Reference Layer (Local Language) Map Servers, Accessed 1/24/2022.

LEGEND

- Nearest Approximate Connection Point
- Potential Powerline Route
- Potential Substation Location
- Plasma Compressor Station
- County Boundary

0 0.13 0.25 0.5 Miles

FIGURE 10.5-3
PLASMA COMPRESSOR STATION
ELECTRIC MOTOR-DRIVEN COMPRESSION ALTERNATIVE

OHIO VALLEY CONNECTOR EXPANSION PROJECT
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EQUITRANS

DRAWN BY: TAF DATE: 1/24/2022
CHECKED: KJT APPROVED: JJP

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